Use of Mobile Technology for Providing Library Services by College Libraries of Goa: A Study

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by

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "Use of Mobile Technology for Providing Library Services by College Libraries of Goa: A Study" is based on the results of investigations carried out by me in the Library and Information Science at the D.D. Kosambi School of Social Sciences and Behavioural Studies, Goa University under the Supervision of Dr. Carlos Matheus Fernandes and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will be not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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Place: Goa University

COMPLETION CERTIFICATE

This is to certify that the dissertation report **"Use of Mobile Technology for Providing Library Services by College Libraries of Goa: A Study"** is a bonafide work carried out by **Ms. Renushri Shrikant Amonkar** under my supervision in partial fulfilment of the requirements for the award of the degree of **M.L.I.Sc.** in the Discipline Library and Information Science at the D.D. Kosambi School of Social Sciences and Behavioural Studies, Goa University.

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CHAPTER I

INTRODUCTION

1.1 INTRODUCTION

Faster access to information has been made possible by information and communication technology (ICT), but libraries are finding it difficult to rethink and redesign their programs in order to include these technological advancements. In addition to altering how individuals obtain information, the application and importance of information and communication technologies (ICTs) have spawned new avenues for communication. The swift progress of mobile technology has had a significant impact on our day-to-day existence, presenting novel prospects for creativity in various domains. College libraries are using mobile technologies more frequently to improve user experiences and expand services as higher education institutions adapt to the changing needs of their students and technological trends. College libraries are adopting mobile technologies in response to the growing ubiquity of smartphones and other mobile devices.

College libraries have embraced the use of mobile technology to improve accessibility, convenience, and efficiency in providing library services in light of the growing use of smartphones and other mobile devices. The study looks at how mobile technologies might be used into the service models of college libraries. Meeting student expectations while upholding traditional ideals, such conserving print collections and encouraging intellectual curiosity, is a special challenge for college libraries. These organizations may provide more individualized, adaptable, and accessible library services by utilizing mobile technology, which will improve the learning environment as a whole. The purpose of this research is to investigate the effects and consequences of using mobile technology to deliver library services in college libraries. This study aims to shed light on the potential's benefits, challenges and future prospects of mobile technology by analysing its many applications in this context.

1.2 OBJECTIVES OF THE STUDY

- To Explore the current state of mobile technology-based library services in academic college libraries.
- To ascertain the impact of mobile technology-based services on library users.
- To study the different infrastructural facilities required to provide Mobile Library Services.
- To know the benefits and challenges faced by library professionals in providing Mobile Library Services.

1.3 SCOPE OF STUDY: -

The study has highlighted the different services provided under Mobile Library Services in Digital Era for providing library services.

1.4 HYPOTHESES OF THE STUDY:

- Mobile Technology-based library services in academic college libraries are in developing stage.
- Library users are not fully aware about Mobile Technology-based library services.

1.5 POPULATION OF THE STUDY:

The study has included library professionals particularly Librarians, system administrators and Students to complete the Dissertation.

1.6 RESEARCH METHODOLOGY

I. The researcher at the beginning has browsed all the literature available on the topic and had prepared literature review.

II. The researcher has also browsed all the websites dealing with the mobile library services.

III. The researcher has personally visited college libraries under the study to acquaint with required infrastructure and technology.

IV. Further the researcher has prepared a questionnaire on the topic and had circulated among all librarians and library user.

V. Further the researcher has discussed the topic with the Experts and IT professionals.

VI. The researcher has further analysed the collected data for analysis and interpretation.

VII. The researcher has used all the statistical tools to analyse and interpret the data with Graphs, Charts, explanations on the issue to get clear and precise analyses.

VIII. At the end of the study, finding and suggestions has been recorded for future researchers benefits.

1.7 ORGANIZATION OF THE STUDY: -

CHAPTERI: Introduction.

CHAPTER II: Review of Literature.

CHAPTER III: Mobile Technology-based Library Services and its features.

CHAPTER IV: Mobile Technology-based Library Services functioning at National and International level.

CHAPTER V: Data Interpretation and Analysis.

CHAPTER VI: Observation, Finding, Suggestions and Conclusion.

1.8 CONCLUSION

The study that was willing to do is based on entirely modern information technology, namely the utilization of mobile technology-based library services in academic libraries. The study demonstrates several forms of mobile technology-based library services, as well as their impacts, problems, challenges, and opportunities for academic library professionals and students.

CHAPTER II

REVIEW OF LITERATURE

2.1 INTRODUCTION

A literature review is the synthesis of the available literature regarding your research topic. This synthesis merges the conclusions of many different sources to explain the overall understanding of the topic, thus laying a foundation for both the research question and primary research. Although a literature review will cite sources and should discuss the credibility of the sources included, it is more than an annotated bibliography. Your literature review needs to review all the significant sources on a topic, regardless of whether or not they support the claims you will eventually be working toward.

Literature review builds new concepts in the mind of researchers and also useful to support the fact deduced in research on opinion given by others on the literature. Literature review helps in avoiding of research concepts and support to views of researchers to record firmly. It provides systematic approach to the research undertaken, helps to summarize the results of previous studies in order for you to use them as data base for your findings.

While conducting the present research study an attempt was made to identify literature published in different types of information sources like research reports, articles, books, thesis and other information sources, related to the topic of research. The secondary sources in the discipline are also researchers and stating the different nature of the research covered in the study.

2.2 REVIEW OF LITERATURE

(Srivastava & Srivatava, 2023)[1] The working lifestyle of libraries has changed due to the introduction of mobile technology. Internet Mobile is one of the evolving trends brought about by mobile technology in libraries. Short messaging systems, multimedia messaging systems, and mobile multimedia technologies. It changes how libraries and information seekers do mobile searches. Libraries today employ the expanding capabilities of mobile technology to boost both the offerings and the number of users. By creating mobile-friendly websites and online public access catalogues, offering mobile reference services when

needed by users, and initiating mobile access to e-books, journals, video, audio books, and multimedia content, they can now expand their actual services.

(kumar & Sumi , 2023)[2] With eight billion mobile phone users worldwide, it is expected that within five years, mobile Internet usage would surpass that of desktop PCs. The data shown here is somewhat unexpected given the recent developments in ICT and the increasing popularity of smartphones. In this cutthroat environment, people want to be able to stay in touch no matter where they are. The number of free programs available on smartphones, including e-mail, web search, games, video chat, social media, productivity tools, e-learning, and entertainment, is staggering. Libraries are not distant from this technology, and in an effort to stay in touch with their clients, they have begun investigating new educational applications. Many libraries provide their patrons with mobile applications or mobile websites that allow them to access resources, user accounts, the library catalogue, and numerous databases. Customers have responded well since they find using these services to be more convenient than going to the library in person.

(Odeshi & Ezechukwu, 2023)[3] Examining the "Mobile reference service adoption as predictors of digital library service delivery" was the aim of this study. To do this, a single goal and a single hypothesis were developed to direct the investigation. The literature was examined in light of the variables being investigated. For this study, a survey research design was chosen. The study's population consisted of all 253 library professionals and paraprofessionals at Federal Universities South-South, Nigeria. The questionnaire was the tool utilised to gather data. With 205 correctly completed and returned questionnaires, 81% of the total were returned. Software from the statistical package for social sciences (SPSS) was used to code the data, and frequencies, percentages, and basic linear regression analysis were used for analysis. The results showed that digital library service and mobile reference services are highly predictive of one another. The study's recommendations included the following: information communication technology (ICT) infrastructure should be installed in university libraries to improve the provision of digital library services through smartphones and other mobile devices; libraries should make sure that reference services are extended beyond library closing hours using mobile reference services like emails, SMS, and phone calls.

(Yusuf & Jimoh, 2023)[4] In Federal Polytechnic in Southwest Nigeria, the awareness and uptake of mobile technology-based library services are examined in this paper. The study used a descriptive survey with a mixed method that combines quantitative and qualitative approaches in order to meet its goals. The study's target group consisted of registered students at Federal Polytechnics in Southwest Nigeria for the academic years 2022–2023 and 2021–2022. The proposal of Nwana (1992) supported the sample size of 390 registered users, or 10% of the student body, and 10 library staff members. The method of convenience sampling was applied. Version 22.0 of Statistical Products for Service Solutions (SPSS) was used to analyse the data. A survey concluded that Federal Polytechnic students in Southwest Nigeria have a deep appreciation for and unmet demand for mobile technology-based library services. It was also disclosed that the management of the library intends to implement future mobile technology-based library services, such as mobile SMS alert systems and mobile online public access catalogue (MOPAC). It was determined that pupils have a good understanding of mobile technology-based library services. The study suggested that academic libraries establish a program to consistently improve their human resources through hiring and professional development; the staff as a whole need to be trained in order to guarantee that they stay up to date with emerging technological trends

(Sadia Sultana Emu, 2023)[5] In the modern era, the mobile library is crucial since it provides services right to students' doors, even those who are unable to visit the academic library. The goal of the mobile library is to provide users with a speedy and convenient service. It makes an effort to offer a service that is as close to the user as possible and offers a plethora of amenities to ensure user satisfaction. The author of this poll attempts to give as much detail as possible on the mobile library, including its resources and offerings, before assessing how satisfied university students are with those resources. The barriers and upcoming advances of the mobile library were also necessary for this article. Additionally, the author attempts to adhere to the observation and pilot research methodology, gathering about 300 data points. Microsoft Excel is utilized for the data analysis. The questionnaire approach was employed to collect the data.

(S, Sumadevi) [6] This study examines how mobile technology is used in academic libraries; how mobile technology can be used to provide remote access to the resources in the library.

Users can easily search the library catalogue, access electronic databases, and read or download full-text articles from journals at anytime, anywhere, by using mobile applications and optimised websites. With the help of this mobile-enabled access, time and geographical constraints are removed, allowing researchers and students to access material whenever they need it—even outside of regular library hours. The study also looks at how mobile technology enhances communication between patrons and librarians in libraries. Real-time communication via video conferencing, instant messaging, and numerous chatbots is made possible by mobile platforms. The integration of mobile technology with library services, including mobile payment choices and self-checkout systems, is highlighted in the article. Users can pay fines, manage their accounts, check out and return library materials, and more by using mobile devices. Integration expedites back-end operations, cutting down on wait times and raising user satisfaction. In order to promote active learning and information exploration, mobile learning and engagement efforts make use of interactive platforms and gamification in educational apps. The study also discusses the difficulties in integrating mobile technology, such as security issues, the need for technological infrastructure, and guaranteeing accessibility to varied user bases. The statement underscores the significance of implementing strong data protection protocols and providing user training to optimize the advantages of mobile technology in library services.

(Prakash, 2022)[7] New technologies have always been employed by libraries to support libraries. Our goal is to offer our clients effective and efficient services. Obtain prompt access to the data you require. Libraries have always been at the forefront of technology development and are a great example. Utilizing additional data and technologies of communication to enhance or automate the Services. By using ICT, libraries have improved the services they offer. Users are assisted in real time by this high-tech domain, regardless of their location. Libraries are now investigating the incorporation of mobile technology as a result of the substantial expansion of the mobile environment. In a short amount of time, mobile technology has linked libraries with readers all over the world. Its computerized system has brought about a revolution. This article focused on the challenges of mobile applications and library services. The current article describes the main strategies used by major libraries to provide services via mobile devices. The proliferation of mobile apps provides convenient and contextual access to library resources.

(Revathi, 2022)[8] Libraries are at the forefront of technology innovation, and librarians are constantly coming up with new and creative methods to offer mobile-friendly library services. In daily living, mobile computing are transforming the ways in which individuals look for, obtain, and use information. Academic libraries are prepared to adjust to new developments in order to offer

(Rivo & Žumer, 2022)[9] In order to improve academic library services, this study aims to investigate how University of Ljubljana (UL), Slovenian students use mobile technology. Specifically, it focused on how students use mobile library services of academic libraries in general and how they read full text resources on mobile devices in particular. A questionnaire was distributed online to gather data from students within all faculties of the University of Ljubljana. The research was conducted in the context of the Technology Acceptance Model (TAM), assuming that students' perceptions of mobile devices also affect their attitudes towards using them to read scholarly e-resources. They don't think mobile devices are acceptable for reading, but they do think they're useful for quick access to e-resources. Considering how little mobile users utilise library online resources, UL libraries ought to determine how to create engaging mobile services and effectively market.

(Revathi & Mohan, 2022)[10] This article illustrates the transition from traditional library and information services to mobile information services based on mobile technology use, services, and requirements for implementation, as well as advantages and disadvantages. In this paper, the most recent emerging trends for future libraries were also covered. Customers are able to learn and reflect more about their life thanks to these mobile devices and their technology. It has shown to be very beneficial for the libraries. Libraries can provide their services to users remotely by utilizing mobile technologies. It is imperative that libraries remain adaptable and shift their perspectives in order to adopt and use emerging modern technologies and to promote their library services and goods. via the internet as per the needs of users.

(Tang et al., 2022)[11] The purpose of this study was to thoroughly review journal articles on library-supported mobile learning (LibML). The study papers were screened and categorized using a coding scheme that was adopted based on the literature and included research topics, mobile learning methodologies, and library types. The structural relationships between the publications were then analyzed and visualized using a co-citation network analysis. From the Scopus database, 53 eligible papers with 1370 citations in follow-up research were gathered. The findings demonstrated that, from the overall network structure, two primary research streams of LibML were identified, including mobile learning supported by libraries and museums. Regarding the mobile learning approach, research financed by libraries was primarily concerned with self-directed learning, while research supported by museums placed more emphasis on inquiry-based learning. Research financed by libraries primarily concentrated on self-directed learning when it came to the mobile learning method, whereas research backed by museums prioritized inquiry-based learning. In terms of research topics, the majority of research financed by libraries concentrated on the affective engagement of patrons, while research supported by museums prioritized learning performance. In order to identify research trends and mainstream LibML research, this study offers a citation-based methodology. The primary benefit of merging social network analysis and co-citation is the creation of a network diagram that illustrates LibML research. There are some noted limitations to the methodological approach. Future directions and a discussion from the follow-up study are given.

(Kumar, 2022)[12] In addition to describing the benefits and drawbacks of mobile technology, this article aims to define the term and explain its use to library services. These days, mobile computing has completely changed libraries by giving patrons stress-free access to "information on the go" services. Because Google and other search engines are so widely used and so successful for mobile users, libraries must stay competitive to stay relevant. It is impossible to overstate the importance of mobile technology and mobile library efforts for academic libraries' information access needs. This paper highlights several mobile projects, using university examples, such as mobile library websites, MOPACs, mobile SMS reference services, mobile library notifications, QR codes, augmented reality, etc.

(Yi et al., 2022)[13] The goal of this project is to create a prototype that uses the idea of content curation to offer mobile curation services. The software development process for mobile applications was employed in this study, and it comprised five stages: architecture design, navigation design, page design and execution, usability testing, and user and organizational requirements. A university used online questionnaires to measure usability with twenty college students in total. Key user demands were found through meta-analysis to include more personalization, diversity of services, active interaction with librarians, improved information quality, and improved user interfaces. Four primary service modules were developed based on user and organizational requirements: Curation Services, Live Chat, My Page, and My Log. The results of usability testing pertaining to perceived utility, convenience of use, and satisfaction showed that users were content with the prototype. The study broadens the conversation on high-quality academic library services by presenting the idea of content curation, which leverages mobile technology' benefits to get over current restrictions in library services that make them insufficient for fulfilling the demands of specific users.

(Duncan, 2021)[14] Advised Jamaican academic libraries to evaluate the advantages of investigating the offering of mobile services For patrons and be motivated to learn more about mobile devices in order to support the growth of the library's information services delivery. The study's findings showed that only a small number of university libraries have a thorough mobile plan, and the majority were just concerned with joining the movement without taking into account the greater chance to recreate the academic cyber library. This study also showed that Jamaica is making amazing progress in establishing a mobile academic library service. Academic libraries are creating and expanding their mobile services portfolio rapidly. Examples of these services include mobile printing and reservation services.

(Rafique et al., 2021)[15] The present era of digital students is reflected in the rapid use of internet-based apps such as mobile library applications (MLA), and literature has extensively explored the early student adoption of MLA. To overcome an acceptance-discontinuance gap, it is necessary to look at apps' intentions for continued use. phenomena.

As a result, this study integrated media affinity theory, extended expectation confirmation model (EECM), technological acceptance model (TAM), and service quality to provide empirical justification for the continued use of MLA. The goal of this study was to identify the variables that were impeding the long-term use of MLA. The self-controlled cross-sectional survey-based methodology was used to carry it out. In total, 307 surveys were gathered in order to use structural equation modeling (SEM) to validate the suggested theoretical model. In total, 307 surveys were gathered using the structural equation modeling (SEM) technique to validate the suggested theoretical model. The study's conclusions suggested that factors such as perceived usefulness, contentment, service quality, MLA affinity, confirmation, and perceived ease of use account for a significant portion of the direct or indirect effects on MLA users' continued usage. Recent studies evaluated scientifically to reveal the profound intuition about consumers intend to utilize MLA continuously. Results will serve as a controller for operational decisions on resource allocation and development aimed at verifying the achievement of the purpose and vision of the mobile library application.

(Ogungbeni & Nwosu, 2021)[16] This study looked into undergraduates' use of mobile technology-based library services and academic self-efficacy in universities in Southwest Nigeria. The study used a multistage sampling technique with a survey design. Two surveys were utilized to sample 1,086 people. undergraduates from six universities in South-West Nigeria, spread over three faculties. 1,045 replies were subjected to statistical analysis. According to the survey, undergraduate students at South-West Nigerian universities have a high level of academic self-efficacy. Short Messaging Services (SMS), e-books, mobile websites, and databases are heavily utilized by undergraduates in South-West Nigeria. The utilization of mobile technology-based library services was positively correlated with academic self-efficacy, but not significantly (Pearson r = 0.084). According to the study's findings, undergraduate students at South West Nigerian universities will be best served by raise their level of academic self-efficacy to make better use of mobile technology-based library services.

(Acheampong & Agyemang, 2021)[17] The purpose of this paper is to investigate the possibilities for improving academic library services delivery in Ghana's remote learning

environment through the use of mobile technologies, or "m-techs." The aim of this study is to evaluate the level of knowledge and appreciation among students for mobile technology-based library services, as well as the however, meant that academic libraries in Ghana were lagging behind in moving toward the delivery of library services on m-tech platforms, according to the study's findings. The results have useful implications for supporting academic libraries not only in Ghana but also in other nations as they create roadmaps for leveraging mobile technologies to improve academic device use is in academic settings and suggest ways that librarians might enhance their ability to transition to providing m-tech services. This study closes a gap in the literature on m-tech research in the context of remote learning and library services because no previous research of this kind has been done in Ghana. ability of librarians to transition to providing these services. Employing a questionnaire and a descriptive survey was conducted online to gather information from 118 library staff members and 382 students at two public institutions in Ghana. The final analysis was conducted using 453 responses in total. The data was analyzed using a descriptive analysis method. The findings showed that the pupils understood the benefits of a mobile technology-based library and expressed gratitude for them. Their expectations regarding the availability were quite high. Regarding the accessibility of library services on mobile technology platforms in Ghana, they had high expectations. The lack of technical and experienced people with m-tech skills in the chosen libraries.

(Shashikantbhai Bhoj, 2021)[18] It is impossible to overlook how mobile phone technology is used in all facets of our daily lives, including libraries and other organizations. Hence, for more effective and efficient services, libraries in industrialized nations have embraced the mobile phone revolution. However, academic libraries in India do not generally offer mobile-based services. They have not yet. Academic and research libraries have welcomed it. The results of a survey on mobile-based library services conducted in many Indian libraries are reported in this study. The study's objective was to find out what customers thought about using mobile devices for library services. It aimed to ascertain if they would be open to making use of such a service.

(Panda, 2021)[19] The way people connect and engage with the outside world is changing as mobile phones become a necessary component of daily life. An overview of the idea and the

use of advancements in web technologies and mobile telecommunication systems to give omnipresent, current information services that are dynamic, personalized, and easy to use for library patrons. Additionally, more research is conducted to shed light on the advantages of and difficulties in implementing mobile technologies in libraries to accommodate this "new normal." The findings' theoretical and practical ramifications have been examined

(Ocran et al., 2020)[20] This study determines how ready the University of Cape Coast Library is to adopt a mobile technology-based library service. Following the study, recommendations were made that library staff members must have sufficient training and that students be made aware of the advantages of using mobile devices to access library services. For the resources to be implemented successfully, management needs set aside additional funding.

(Acheampong & De-Graft, 2020)[21] A few of the difficulties in providing library services on mobile technology (m-tech) platforms are evaluated in this study. This study was conducted using a mixed method approach using a survey research methodology. The study's list of mobile digital repositories, mobile online public access catalogues, referencing services, SMS alerts, selective information distribution, and mobile tour guides and instructional guides comprises mobile library services. The study found that, in addition to budgetary restrictions, the full implementation of m-tech in libraries was hindered by inadequate ICT infrastructure, bureaucratic procedures, low internet bandwidth, a shortage of IT specialists and staff, a lack of a policy framework, an irregular or unstable power supply, and a lack of support from university administration. Based on these conclusions, the study makes some suggestions that could help to partially address the difficulties involved in implementing m-tech-based library services in academic libraries.

(De-Graft, 2020)[22] The purpose of this study was to determine whether academic libraries in Ghana could accept and use m-tech based library services. The study employed a mixed-methods approach and was a descriptive survey. The main conclusions were that although students and library management expressed a significant knowledge and enthusiasm for the usage of m-tech library services, these services have not yet been adopted in libraries for a

variety of reasons. These include a lack of a policy framework for the implementation of the technology, a skills gap brought on by a lack of training, inadequate ICT infrastructure, and overcoming the challenge of persuading university administration to embrace the technology. Consequently, it was suggested that the libraries should increase their investments in ICT infrastructure, particularly m-tech infrastructure, and strengthen their human resource base by hiring new staff members and providing them with expert training on emerging technologies.

(Acheampong & Dei, 2020)[23] The goal of this study was to evaluate how ready Ghanaian academic libraries' library management was to adopt m-tech library services. 365 respondents' data were gathered for the study using a mixed-methods approach and a descriptive survey. According to the study, most respondents knew that they could use their mobile devices to access library services, and they were prepared to get training, adjust, and upgrade their abilities to fit any technical changes made to mobile services in academic libraries. The primary mobile gadgets that are accessible and utilized to offer services to the clients include PDAs, e-book readers, iPods, cell phones, portable tablets, and smartphones. But the study also discovered that the absence of a culture of staff training and necessary skills was a barrier to the adoption of m-tech in libraries.

(Kari, 2020)[24] In this study, the researcher looked at professionals' and library users' perspectives on the usage of mobile devices in libraries. To accomplish the goals of the study, the researcher investigated five hypotheses. The study employed a survey research design. Twenty-five librarians in all 250 Nigerian library patrons made up the study's sample. The sample was chosen on purpose. Nigerian state and federal universities owned the libraries where the librarians worked. Undergraduate students from the University of Nigeria, Nsukka, used the library. The tool used to collect the data was a questionnaire that the researcher created on their own. A questionnaire was determined to be appropriate for the study since it helped the researcher collect a significant amount of primary data. The questionnaire instrument used a four-point Likert scale for the psychographic answer and multiple choice for the demographics. Part A and Part B of the questionnaire were thus created. As though Whereas the latter sought psychographic data, the former sought

demographic information. The questionnaire was evaluated by three specialists from Federal University Otueke in total. The investigator asked the specialists to review the tool, paying particular attention to presentational logic, appropriateness, and clarity. The instrument's reliability was assessed using the test-retest method. The study's findings were analysed using both descriptive and inferential statistics. Not one of the five hypotheses was supported ($p>0.05$). Thus, the researcher draws the conclusion that library patrons and Professionals are aware of mobile technologies, prepared to incorporate them into library services, and swayed by their perceived utility and ease of use. These findings provide the Technology Acceptance Model with substantial support. The findings also suggest that professionals and library users alike should be mindful of how libraries provide services in the twenty-first century will be prepared to back any legislation or initiative that encourages the use of mobile devices in library operations and user behaviour. This study's primary contribution is that it has provided empirical insights into the opinions of library professionals and users regarding library practice. This information could direct the monitoring and execution of policy advocacy. Considering the outcomes, a result of this study, libraries in Nigeria are advised to completely incorporate mobile technologies into their operations and services. In order to better serve their target clients, libraries are advised to conduct research that provide them with insights about the mobile technology preferences of their patrons. Additionally, more research is advised to look at the degree of mobility technology found in Nigerian academic libraries. Lastly, more research should be done to provide light on the obstacles Nigerian libraries face while implementing mobile technology. The results' theoretical and practical ramifications have been examined.

(Dar, 2019)[25] The purpose of the study was to gather user opinions about the utilization of mobile library services using various projects, ascertain the features and services that users would like to have available in such initiatives. The purpose of the poll was to learn what features students would like to see included in the various mobile library programs and, in turn, to raise students' awareness of the new opportunities available on the mobile web. Libraries and institutions should be aware of this and incorporate the development of mobile applications into their strategic planning processes. The study's overall conclusions show that there is unpredictability in the delivery of mobile services and endeavours. Out of all the institutions under investigation, not a single library has mobile access to its collection, and none plans to add one anytime soon. According to the report, every respondent has

access to a smartphone and other mobile devices for Internet access. This study's initial objective was to draw attention to how users felt about possible initiatives for mobile libraries. According to the comments, a sizable portion of students are prepared for their respective libraries to implement mobile library projects. The study's findings have given us the essential knowledge about what users actually desire.

(Shaikh & Dodiya, 2019)[26] Faster access to information has been made possible by digital technology, but it is also forcing libraries to reconsider and redesign their programs in order to keep up with the times. These days, cell phones are becoming a need for everyone and are altering the way people communicate and engage with the outside world. Mobile technology will be very helpful to libraries in this evolving environment to improve user-oriented services for current patrons and to fortify their relationship with existing patrons. Libraries have the potential to engage with remote people who were previously thought to be unlikely to connect due to a lack of a medium. Due to the advancement of mobile technology, academic settings have shifted from traditional classroom settings to mobile learning environments. Applications of mobile technology in library and information services were covered in this study. In the end, it envisions how mobile library technology will develop. It also looks at the kind of infrastructure that libraries need in order to offer these services. A summary of the latest developments in mobile technologies and their uses for libraries was also provided. These included mobile internet, mobile multimedia, SMS/text messaging, and more. The study also looked into how mobile phone services are used in educational settings.

(Rahane, 2018)[27] The issue for library and information science in the modern period is the digital technological revaluation, both in India and elsewhere. The field of libraries places a great deal of attention and difficulty on customer happiness. A librarian must demonstrate to clients their propensity for a variety of necessary services. It is the librarianship of the twenty-first century. The caliber of LIS Professionals have also made progress in producing new dimensions of work. Boost the information and communication technology's (ICT) access and utilization. The greatest library service for mobile technology is covered in this essay.

(Potnis & Allard, 2018)[28] For millions of people, mobile devices are an indispensable part of their everyday existence. A user's information needs can be efficiently met by these gadgets. When it comes to choosing, buying, designing, developing, deploying, and maintaining mobile applications, librarians can help and associated technologies (MAT). The Institute of Museum and Library Services funded Project MISSILE (Mobile Information Skills and Solutions in Library Education), which developed an interdisciplinary curriculum plan to prepare library and information science (LIS) students to work as mobile technology consultants (MTC) for libraries and other non-profit organizations, such as schools and churches. This document presents the curriculum that was created based on an evaluation conducted by our advisory board's specialists. Our distinctive curriculum combines field trips, guest lecture series, and practica with practical instruction under the cooperative interdisciplinary supervision of academics and practitioners. The Missile Curriculum develops information, communications, and technology skills for the twenty-first century like reading, reasoning, and problem-solving skills.

(Gholami et al., 2018)[29] The purpose of this study is to pinpoint the key elements that influence the adoption of mobile technologies in library settings. In order to do this, a conceptual model built on an integrated model of the technology organization and environment (TOE) and technology acceptance model (TAM) was introduced. A questionnaire created by the researcher was dispersed throughout 120 academic librarians. Seven factors from the combined TAM and TOE model were selected to look into their impact on the uptake of mobile technologies. The study's findings indicate that the integrated model of TAM and TOE, which has been suggested, is a good choice for determining the key elements influencing the adoption of mobile technology in a library setting. Regression analysis also revealed that among these seven factors, perceived utility, compatibility, relative advantage, perceived ease of use, and organizational competency are the most important factor for adopting mobile library services in Academic libraries.

(Pakdaman Naeini et al., 2018)[30] This paper aims to examine the current state of mobile service usage in the best university libraries worldwide. The state of employing mobile-based services in the libraries of the best institutions in the world was assessed by the writers in this direct observation and quantitative research study. The findings revealed that while 84 percent of the world's top 50 university libraries have mobile-friendly websites and offer mobile-friendly services, only thirty percent of them have created mobile library applications. The study's conclusions showed that more than half of the libraries offering mobile-based services had used features like "Search catalog," "Hour of library," "Contact," "Ask the librarian," and "News." Although certain services, such as "Services for disabled," "Library card," "Library Strategic Plan" and "Financial services" are less important to deliver on the mobile platform. Another drawback of this effort is that certain mobile library applications do not allow full access to all of their functions. Another disadvantage of the study is that some academic apps could not be downloaded from the regular App store because of the researchers' nationality. The writers look for additional information about these applications that link users to this statistical society's librarians. According to the study's findings, the majority of libraries at the best universities in the world have shifted to creating and utilizing mobile platforms on their websites. Based on the experience of academic libraries at prestigious universities, this report recommends that academic libraries in developing nations should plug in the most frequently used services in order to follow this trend.

(Chaputula & Mutula, 2018)[31] The purpose of this paper is to provide the results of a study that was done to determine the existing situation regarding the provision and accessibility of library and information services in Malawi's public university libraries via mobile devices. The investigator conducted comprehensive semi-structured interviews with interview guidelines are used by college and university librarians. Because they oversee the operations of their libraries, university and college librarians were specifically chosen to participate in the interviews, putting them in a better position to offer information related to the study's goals. A tape recorder was used to capture the interview proceedings, and a notebook was used to record backup notes. NVivo software was used to analyze and transcribe the data. The study's conclusions showed that while the other libraries were heading in the right direction, only one library had completely adopted the provision of library and information services via mobile devices. On mobile devices, user and reference

services were provided by e-journals, Facebook, WhatsApp, Online SMS and Public Access Catalogue. The study's participating institutions provided mobile phone access to e-books, e-journals, and institutional repositories, among other resources. Lack of resources, high cost of using a mobile phone to access services, and infrastructure damage related to information and communications technologies. The study's conclusions are useful because they can be used as a model to schedule the rollout of mobile library and information services at Malawi's public university libraries as well as other nearby institutions and international institutions. skills and network congestion are some of the factors that may affect the offering of library and information services through mobile phones.

(Hamad et al., 2018)[32] Skills and network congestion are some of the factors that may affect the offering of library and information services through mobile phones. Academic library stakeholders have been interested in mobile technologies (MT) for a while now because they see MT as a powerful communication tool that can provide cutting-edge library services. Additionally, MT can provide library patrons with a variety of adaptable options. Consequently, the primary goal of This study looks into the possibilities of using MT in academic libraries in Jordanian public universities from the perspective of the library personnel. Another goal is to investigate what library employees expect from MT in order to improve library services. Examining how age, occupation, education, and experience affect library employees' perceptions of MT use and role in Jordanian university libraries is also crucial. of skills and network congestion are some of the factors that may affect the offering of library and information services through mobile phones. A questionnaire was created and sent to all 174 library employees at ten public universities using a case study methodology. There were about 121 replies. According to the study, there is a significant degree of knowledge about the benefits of utilizing MT in Jordanian academic libraries The study also shows that, despite the fact that library employees are aware of the importance and significance of MT in academic libraries, MT has not yet been properly utilized in these settings in Jordan for a variety of reasons. These include a deficiency in training and an unsuitable IT infrastructure. Therefore, in order to improve their performance and the caliber of services they provide, these libraries must increase their investment in MT and encourage their patrons to use technology.

(Singh & Nikandia, 2017)[33] The future of mobile devices in libraries and information centers is the main topic of this essay. The use of mobile technology has altered how individuals communicate and obtain information. Consumers desire quick and simple access to pertinent information, forcing experts in library and information science (LIS) to consider unconventional approaches to addressing information needs. Using mobile devices to deliver information and library services is a big step in the right direction. Professionals in information science and libraries in the twenty-first century mostly use mobile technology in libraries, with new technology providing additional technical choices for librarians. Libraries are in a good position to provide their patrons new and varied kinds of services. This study offers a fresh way to connect with students and staff members. This study's primary goal is to investigate the effective use of mobile technology in higher education generally and in libraries and library services specifically.

(Maideen, 2017)[34] The necessity, benefits, drawbacks, obstacles, and solutions for the successful integration of mobile technology in libraries are covered in this study. It also looks at the kinds of infrastructure that libraries need in order to offering these services in library settings. Mobile phones are transforming how people connect and interact with the world and are quickly becoming an essential component of daily life. Mobile technology will be very helpful to libraries in this evolving environment to improve user-oriented services for current users and to fortify their relationship with them. Libraries have the potential to engage with remote people who were previously thought to be unlikely to connect due to a lack of a medium.

(Thuo et al., 2017)[35] This study aims to determine the global adoption of mobile resources in university libraries, with a particular focus on universities in developed and developing nations. Based on the International Monetary Fund's (IMF) 2016 report, which classified Zimbabwe, Uganda, and Kenya as poor countries and the United States and the United Kingdom as developed ones, the countries were chosen. Based on the QS World University Rankings 2016–17, which identified Harvard and Massachusetts Institute of Technology in the United States and Cambridge University in the United Kingdom among developed countries, high-research universities were chosen. Among the emerging countries were the

Universities of Zimbabwe, Makerere, and Nairobi. In order to complete the survey, connections to the mobile library website and other mobile library applications have to be found on the websites of the universities and their libraries. Where there was no such link ascertained, a search for the term "mobile" was carried out in each of the University's search icons that were available on the homepage. The results illustrate the current state of mobile resource adoption by showing that university libraries in industrialized nations have a vast assortment of mobile resources available anytime, anywhere. In contrast, mobile resources in university libraries in impoverished countries are typically inadequate and of low quality; this is not the case with the University of Zimbabwe's library. The study suggests goodwill and financial support from mother institutions in poor countries, as well as partnerships and networking across university libraries worldwide.

(Wei & Yang, 2017)[36] The purpose of this study is to present a brand-new mobile library service called "WeChat Library," which was created as part of the public service platform of the social media site WeChat. Using Chongqing University Library as an example, the conception and implementation of WeChat Library is also showcased. This study examined the benefits of the new service mode, WeChat Library of Chongqing University Library, built a new mobile library service system, and examined construction costs and utilization data. According to the investigation's findings, 84.6% of the "985" universities established WeChat libraries, indicating that WeChat Library has grown to be a significant mobile service option for Chinese university libraries. Customers expressed great gratitude for the WeChat Library; After 20 months of operation, 20.3% of Chongqing University students had made use of the WeChat Library. OPAC retrieval, things borrowed, personal centre, resource discovery, and announcements are the top five services utilized most frequently. Numerous benefits of WeChat Library were discovered, including low development costs, automatic cross-platform services, adaptive screens, low acceptance costs, simpler marketing, high user traffic, robust interactivity, and real-time consulting. Using the Chongqing University Library as an example, the technological architecture and functional design of the WeChat Library were demonstrated. It was also showed how other unique services, such space reservations, overdue reminders, and QR code access, are technically realized. Positive recommendations and references for other libraries that have also launched the WeChat Library will be given by the study. The most prominent advantages of

WeChat Library are its low development cost and low technology threshold. WeChat Library can provide a better solution for mobile library services.

(Siregar & Dewiyana, 2018)[37] The goal of this paper is to identify the fundamental requirements for mobile technology services and the mobile services that library users most need. It also aims to identify the barriers that libraries and users must overcome in order to apply mobile technology effectively. Methods of data collection included questionnaires, interviews, and direct observation. The results of the use of mobile technology applications in libraries bring great advantages to provide better library services and to improve accessibility of library resources in the most convenient way, but many libraries are unable to provide this service with very good results due to a lack of funds.

(Cottrell & Bell, 2016)[38] Many libraries have hurried to offer mobile-compatible services in response to the current mobile phenomena in order to stay relevant in today's rapidly changing information services, Marketplace. The University of St. Francis (USF) Laverne and Dorothy Brown Library started a data tracking initiative using Google Analytics in 2010 to find out how much student use of mobile-specific library resources was occurring for access to resources and services. Data analysis has demonstrated that, in order to realistically anticipate the durability and sustainability of any mobile resource, the emphasis on future development of mobile library resources should be weighed against development expenses.

(Torres-Pérez et al., 2016)[39] In order to determine whether the quality of academic apps and mobile websites is on par with the overall online impact of top-tier universities, this paper will examine the degree of adoption of mobile access to academic libraries at the world's best universities as well as the calibre of services provided. For the top 50 colleges as ranked by We ascertained whether the libraries of the Ranking Web of Universities (2014) have a mobile website or app. In the end, it assessed the provided services using a set of fourteen factors. The study's findings demonstrate the high degree of mobile adoption in prestigious universities, with 88% of the 44 libraries under study providing online or app access for mobile users. There is a glaring disparity in the form: just 34% (17) have an app,

whereas 80% (40) provide mobile web access. Regarding the substance, no the library provided all 14 of the assessed points, with varying degrees of success. Just 50% of apps satisfy at least half of the requirements. With regard to mobile web, this percentage significantly increases to 74.3%. The world's top colleges have a high adoption rate for mobile web, but the quality does not match their level of excellence.

(Lee, 2016)[40] This study investigates the kind of issues and circumstances that graduate students who use the UWM mobile library services face. A case study is employed as a research design for a multifaceted and all-encompassing method to address these research topics. Interviews, observations, and document reviews were carried out to collect data. Open coding schemes are utilized in data analysis to pinpoint the causes of and issues with UWM's mobile library service adoption. This study, in contrast to earlier studies, focuses on the perception and identification of users and graduate students. This study's data analysis reveals issues with mobile library service uptake as well as the influence phenomenon that prevents users from using these services. Therefore, a user's emotional decisions are influenced by their perception and recognition of the functioning of mobile services, and eventually those emotions become the most significant obstacle to graduate students for adopting mobile library services.

(Wei et al., 2015)[41] The aim of this article is to evaluate the usability of Chongqing University's mobile library app and offer suggestions for enhancing the user experience. In this study, usability testing was carried out using pre-test questionnaires, tasks to complete, and post-test surveys. Both the App's effectiveness and users' satisfaction were evaluated. Although the effectiveness of the mobile app was demonstrated, there was still room for development. The criteria "usefulness" and "clarity" scored highest and lowest, respectively, in terms of user satisfaction. Although users were perplexed by the vague descriptions of mobile services, they found the services offered by this app to be interesting and helpful. Several recommendations were made by this study based on the measured user experience for enhancing usability of the App. Smartphones will probably play a major role in the provision of information services in the future. Considering how widely Chongqing University Library in China uses the Super Star Mobile Library system, the system's

usability needs to be looked into. The user experience of the mobile library app can be improved by making it more user-friendly.

(Hiremath & Kenchakkanavar, 2015)[42] The potential of mobile devices in libraries and information centers is the main topic of this article. We currently reside in a virtual world. Professionals in the fields of information science and libraries in the twenty-first century mostly use mobile technology in libraries. providing technology solutions for librarian outreach. Libraries are in a good position to provide their patrons new and varied kinds of services. This study offers a fresh way to connect with faculty and students. The primary goal of this study is to determine how well mobile technology can be used in higher education, especially in libraries and library services.

(Elahi & Islam, 2014)[43] The purpose of this research article is to provide an overview of how students feel about the potential use and integration of mobile phones into library services offered by Dhaka University Library (DUL). It also seeks to identify any potential benefits and relative disadvantages of using mobile-based library services for DUL.The study was carried out using a survey approach and a structured questionnaire. The remainder of the study and its conclusions were derived from data gathered from various faculty members. Students at Dhaka University (DU), both undergraduate and graduate, provided the data. Particularly, replies on 7-point Likert scales were subjected to descriptive analysis techniques in SPSS 20.0, while general statistics were employed to evaluate responses to other closed-ended questions. The study's findings indicate that Dhaka University (DU) students now use their phones in a suitable manner. The study's conclusion show that students at DUL have a consensus on the use of mobile phones for service delivery. This research offers proof of the degree to which DUL students really utilize their phones to obtain information and how they feel about the institution of a mobile-based library system.

(Nazi et al., 2014)[44] In order to suggest new services for the National Library and Archives of the Islamic Republic of Iran (NLAI), this study aims to ascertain the opinions of its patrons on mobile library services. This study employed the descriptive survey approach,

and the necessary data were gathered from 150 randomly chosen samples using a questionnaire that the researcher created. Results indicated that 68% of respondents did not think that using a mobile phone at a library was disruptive and were in favor of it. The overdue day reminder (in the bar or at the circulation desk of the NLAI public library) was the most well-liked of the various suggested services, receiving 76% of the vote. With 33% of respondents, audio tours of the library piqued the least interest. Overall, in 79% of proposed services, respondents' consent was more than 50%.

(Aharony, 2014)[45] Based on the Technological Acceptance Model (TAM), this study aims to determine whether LIS students and librarians are aware of the most recent technological advancements and whether they are prepared to embrace them. them. Two populations were taken into consideration in the study, which was carried out in Israel in the first and second semesters of the 2012 academic year: librarians and LIS students. A personal details questionnaire and a mobile technology questionnaire were the two tools employed by the researchers to collect data. Overall, the study provided support for the two main TAM factors (perceived usefulness and ease of use) as well as personal innovativeness, which may be a predictor of students' and librarians' behavioral intention to utilize mobile services in the library.

(Trott & Jackson, 2013)[46] An instance in time is described in this article. In order to ascertain whether the library had a mobile website, how accessible it was, and what content it offered, the author examined 99 ARL websites. The database lists of the standard library websites were also examined to see if they included any databases with mobile websites. In conclusion, the author examined all parent ARL institutions to see whether they had mobile websites and whether those websites connected to their libraries. A present snapshot offers benchmarks for future development of mobile websites in academic libraries, given the interest in developing mobile websites for both institutions and their libraries.

(Vassilakaki, 2014)[47] Reviewing the literature on mobile information services is the goal of this paper. Only peer-reviewed works written in English and released between 2004 and

2014 are taken into account. The relevant literature was gathered and examined using the systematic review method. The final week of July 2014 saw the searches throughout several databases, and 76 papers in all were taken into consideration following the application of inclusion and exclusion criteria. Results: The following seven themes surfaced: "introducing mobile libraries," "reporting on current trends," "presenting libraries' mobile services," "presenting mobile technology use in libraries," "reporting case studies," "exploring users' perceptions of libraries' mobile services," and "reporting on evaluation of libraries' mobile services." It is clear that mobile library research is still in its infancy and that its primary goal is to advance the Library and Information Science Professionals to provide mobile information services. This paper provides a critical overview and summary of the pertinent research on mobile information services provided by libraries. It enhances the knowledge of librarians and libraries about the latest advancements in mobile technology for the effective delivery of information services.

(Lippincott, 2010)[48] It's possible that mobile device use in higher education—in general, and libraries in particular—is about to enter a revolutionary phase. This paper speaks about tackling these issues. The paper explores the potential of mobile devices in academic libraries by looking at trends and technological advancements in the field of mobile devices and reviewing their potential. The majority of college students own computers and cell phones, and these gadgets' and other technologies' capabilities are growing. Libraries can create, license, or otherwise make available scholarly content that is optimized for mobile devices in addition to offering new services to users of mobile devices. The ideal scenario is for libraries to join an institutional procedure for planning the creation of mobile services. The proliferation of cell phones among students, the adoption of e-readers, and the growing application of mobile devices in some curriculum areas have serious consequences for libraries. In recent years, academic library stakeholders around the world have embraced mobile technologies (m-tech) as a medium that may provide convenient library services to library users.

(Potnis et al., 2009)[49] This article takes a practice-driven approach, identifying the particular knowledge and skills required to create a mobile workforce for 21st-century libraries by drawing on the experiences, stories, and recommendations of practitioners.

Walsh's (2012) handbook on using mobile technology to deliver library services served as the study's starting point. It offers recommendations on how libraries might use mobile technologies to provide services to a variety of client populations. Almost seventy-five items, including books, ALA library technology reports, handbooks, and scholarly research articles hosted on the EBSCO and Information Science Source databases, were gathered using the snowball sampling technique. Human-computer interaction (HCI), computer networking, mobile application development with an emphasis on web programming, and planning and management of mobile technologies are among the fundamental competencies, most of which are associated with IT. In the future, LIS students will be able to operate as mobile workforces for libraries thanks to their additional competencies in project management (including communication management), change management, data curation and management, policy management, and grant writing.

(Aittola et al., 2003)[50] This paper introduces SmartLibrary, a location-aware mobile library service that is seen in action in the University of Oulu's main library. Using a PDA, the program offers map-based direction to books and collections. Without requiring any extra hardware, SmartLibrary is a fully software-based solution that can be deployed on top of a WLAN that has been set up for wireless Internet access. For discovering books, users favored SmartLibrary over standard shelf classification in a user test with over thirty participants. Following user assessment, the main library integrated SmartLibrary into its regular customer support offerings.

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CHAPTER III

MOBILE TECHNOLOGY-BASED LIBRARY SERVICES & ITS FEATURES

3.1 INTRODUCTION

New developments in the library and information sector, particularly in the academic setting, call for distant and limitless access to library resources. It has been determined that mobile technology is the one that people throughout the world have embraced the most. Students will benefit greatly from the implementation of this technical innovation on an academic level. People's lives are altering as a result of innovative services and mobile Internet applications. Additionally, it is altering how individuals communicate and obtain information at the same time. As the name suggests, mobile technology is simply technology that is portable. Thanks to this technology, people can now communicate and obtain information quickly and easily from anywhere due to use of a mobile phone.

In the modern digital era, mobile technology has revolutionized the way library services are offered and accessed. This chapter aims to delve into the definition, concepts, characteristics, and various types of mobile library services, while also exploring their advantages and disadvantages for both users and librarians.

3.2 CONCEPT OF MOBILE TECHNOLOGY-BASED LIBRARY SERVICES.

Mobile technology-based library services refer to the use of mobile devices such as smartphones and tablets to access and utilize library resources and services. This concept encompasses a wide range of functionalities including mobile library catalogues, electronic book borrowing, access to digital resources, and interactive communication with librarians. By leveraging mobile technology, users can conveniently search for library materials, access e-books and e-journals, receive real-time assistance from librarians, and even participate in virtual library programs and events from anywhere at any time. Additionally, mobile technology enables libraries to offer location-based services, personalized recommendations,

and seamless integration with social media platforms, enhancing the overall user experience. Embracing mobile technology-based library services not only expands access to information and knowledge but also caters to the evolving needs and preferences of modern library patrons in an increasingly digital and mobile-centric world.

Today, smart advances Mobile devices can run on complex software's interact with the cloud services, plays rich multimedia content, and allow for advanced user interactivity. New tools and hardware technologies such as accelerometers, multi touch screens, android phone software applications, global positioning systems (GPS), Wi-Fi, Bluetooth, mobile hotspot, sharing apps, and capture tools such as Camera, Scanner, are all parts of the mobile environment. **(Rahane, 2018)**

Mobile Technology has become a very important part of our lives nowadays. Mobile phones were developed primarily for communication purpose. Mobile phones have gained importance in both the developed and developing countries. The mobile phone is a device that enables users to communicate, connect, transact and innovate. Mobile devices and mobile technologies have potential to facilitate the teaching and learning process in a great way. Mobile applications can support learning by making library resources more omnipresent, by bringing new users to the library through increased accessibility to the library resources, and by creating a new way to enhance connections between patrons and libraries. This increased use of mobile phones provides an untapped resource for delivering library resources to patrons. The mobile web is the next step for libraries in providing universal access to resource and information. **(Nalluri & Gaddam, 2016)**

Due to the evolution of the Mobile Technology, the Mobile Technology-based library services came into trend. This technology has changed from being a status symbol to became an important item that almost everybody has.

3.3 DEFINATIONS OF MOBILE TECHNOLOGY AND MOBILE TECHNOLOGY-BASED LIBRARY SERVICES.

(Kumar, 2022) Mobile technology is just indicating – technology that is transportable; it is mentions to any device that you can move with you to do a wide variety of "tasks". This technology is allowing those tasks to be performed via mobile phone, eBook reader, Tablet Pc, laptops, etc.

(Sharma & Sahoo, 2014) Mobile technology is exactly what the name indicates – technology that is portable; it refers to any device that you can carry with you to perform a wide variety of "tasks". It is technology that allows those tasks to be performed via cellular phone, PDA, vehicles, laptops, etc.

(Hamad et al., 2018) Mobile Technology are handheld information technology (IT) objects that encompass hardware (devices), software (interface and applications) and communication (network services). They include mobile phones, portable digital assistants and integrated wireless enterprise solutions

(Kim, Kotz, & Kim) define mobile technology as "technology that uses radio frequency spectrum in any band to facilitate transmission of text data, voice, video, or multimedia services to mobile devices with freedom of time and location limitation". In this study, the term mobile technology means the delivery platform using any of the communication technologies.

(Allison, 2011) The Mobile library isn't s a bookmobile driving between locations; rather, the mobile library refers to a library services and materials that are available 24 hours a day on any type of device.

(Liu, 2013) The idea of the mobile library is built on wireless network capability, the internet and multimedia technology. Through the use of various mobile devices, it provides access with no constraints imposed by time, location or space.

3.4 CHARACTERISTICS OF MOBILE TECHNOLOGY-BASED LIBRARY SERVICES.

The characteristics of mobile technology-based library services encompass a range of features and functionalities that leverage mobile technology to enhance access to library resources and services. These characteristics are designed to cater to the evolving needs of library users in an increasingly digital and mobile-centric society which enhance accessibility, convenience, and engagement, while leveraging the capabilities of mobile devices to deliver library resources and services.

- **Accessibility**: These services prioritize accessibility, allowing users to conveniently access library resources and services from their mobile devices at any time and from any location.
- **Digital Resource Access**: Users can browse, search, and access digital collections, including e-books, e-journals, audiobooks, and digital media, directly from their mobile devices.
- **Personalization**: Mobile-based library services often incorporate personalization features, such as tailored recommendations, reading histories, and customizable user profiles, to enhance the user experience.
- **Mobile Apps and Responsive Websites**: Libraries develop custom mobile apps and optimize their websites for mobile viewing, providing a user-friendly interface for patrons to access catalogues, manage accounts, and engage with digital resources
- **Seamless Integration**: Mobile-based library services seamlessly integrate with existing library systems, allowing patrons to seamlessly transition between physical and digital resources.
- **Account Management**: Patrons can manage their library accounts, including borrowing and returning items, renewing materials, and accessing account information, all from their mobile devices.
- **Mobility**: Here we can transfer the information from one place to another place without any time limit. Also, Patrons can conveniently access library resources and services on the go, without being restricted by the operating hours or physical location of the library.

3.5 DIFFERENT TYPES OF MOBILE TECHNOLOGY-BASED LIBRARY SERVICES

- **Virtual Reference Service**: Due to the constraints of the current "new normal," library patrons are unable to ask reference librarians questions in person or over the phone. Instead, the libraries have implemented an electronic, real-time & mobile-friendly reference services, such as Ask a Librarian, that allow users to interact with reference workers without physically being there through the appropriate channel or interaction with the mobile library website.
- **Library SMS Notifications**: In compliance with regulatory standards, libraries may send out notifications by SMS and MMS to users, wherever they may be, about events, news, and notices. Users can receive instant notifications with notice alerts, such as notifications when new books are brought to users' attention for suggestions, notifications when documents are received by users, notifications when reserved documents are available for pickup, assessments of overdue books and unpaid fines, reminders to return library materials, renew books, library circulars, subscribed to e-journals, changes in hours, and notifications of significant events, among other things. These alert alerts can be distributed to a number of users at once using several free applications, or they can be produced automatically by an integrated library management system or software.
- **M-OPAC (Mobile Catalogue)**: The mobile-friendly online public access catalogue is called M-OPAC. It provides all libraries with affordable cloud hosting services so they can store their library catalogue in a shared database with their customers at no cost, and any library can participate. To locate the necessary resources using M-OPAC, users can enter a variety of search criteria, such as author, subject, keyword, or title. For instance, Duke University Library, OCLC's Worldcat Mobile, etc.
- **Mobile Circulation**: In every library, circulation is a tedious and repetitive task. Using a mobile library app and a bar code or QR code scanner makes circulation work simple. Numerous mobile applications additionally emerge that offer similar mobile circulation services. For instance, SirsiDynix PocketCirc is a practical solution for remote circulation that gives library users and staff remote access to library materials.
- **E-resources with Mobile Interfaces**: To combat this difficult circumstance, some publishers currently provide e-books (text and audio) that are accessed through mobile devices. It provides access to numerous databases and online resources, including

mobile-friendly electronic books, e-journals, Web databases, theses, audiobooks, movies, photos, and song streaming. Users can either borrow mobile devices from libraries that already have the collections on them, or they can download these collections directly from the library websites on their own devices. There is a vast selection of audiobooks that can be downloaded for free or through a subscription service, and they can also be transferred to mobile devices. Multimedia messaging services (MMS) allow libraries to exchange audio, video, and photo content on mobile devices.

- **Quick Response (QR) Codes**: QR codes have the ability to store a variety of types of data, including text, numbers, calendar entries, contact details, email addresses, SMS, and maps. establishing a link to a website where customers can find books teen literature prize nominee, cast their vote for their favourite, post comments, and so on. Librarians can include the codes, which lead to online electronic holdings of print resources or relevant subject guides, in the magazine/journal sections or library stacks. The code can be integrated into the library's website to offer features like a virtual tour, access to numerous publishers' websites, and a list of recently accessed works. Basic information on an item, such as its location and call number in catalogue data, can be provided by libraries to their patrons. Instead of writing or printing, users can scan the code, head to the stacks, tape to video/DVD cases, or link to mobile-friendly video trailers. adding code to research guides and staff directory pages that point users to mobile-friendly websites so they can access them later. putting a code that links to room reservation forms on the doors of study rooms.
- **Text Reference Service**: Librarians may offer immediate responses and live links to resources in response to a high frequency of requests for concise responses, such as dictionary definitions, specifics, or service information. References and articles. Academics, researchers, teachers, and students are increasingly in need of short-term reference inquiries, which would be greatly beneficial for a mobile-based text reference service.
- **Interlibrary Loan, Document Delivery, and Mobile Document Supply**: The use of mobile technology opens up new possibilities for automating administrative tasks, tracking the usage of collections, and submitting document requests and scanned photos. A user can send an email, SMS, or other request for a document to his mobile device.

- **Mobile Library Website**: The first step towards using m-library services is visiting the mobile library website. With the library website optimised into a single window, all of the aforementioned services can be combined into one. either ADR (Auto-Detect and Reformat Software) or CSS (Cascading Style Sheets) to create a mobile-friendly interface that can reorganise its control and navigation to fit the size of the screen being viewed on. The UK's Cambridge University Library is one example.
- **Mobile Library Apps**: Often referred to as "apps," mobile applications are specialised software programmes or websites that improve the functionality of mobile devices and provide attractive, dependable information access. They serve as a developing fresh service for customers who use mobile devices. Duke University Library apps, for instance. Mobile library apps can be an effective means of informing library patrons in the current climate of social alienation and lockdown. The primary library website can be combined with mobile library apps.
- **Embedded Librarianship**: Often spanning a semester, embedded librarians are integrated information specialists that provide faculty and student groups with more in-depth research support than is usually provided during a one-shot instruction session. Thanks to mobile devices, embedded librarians' job has become more pleasant and specific. With aid of the library's mobile website or apps, he or she may now assist each user in accordance with their needs and reach out to distance learners.
- **Location based services**: Smartphone users can receive location-based services, such as virtual tours and library maps, more quickly. The actual location of the library and the best route there are provided by direct navigation using Google map services (GPS) at any time. On the other hand, virtual tours can offer the services found within the actual library.
- **Mobile services for people with disabilities**: People with specific abilities, such as those with vision or hearing problems, can benefit from using mobile technology in special libraries. Such folks are often unable to acquire access because there is no particular interface for them. Display Mobile devices like smartphones come with readers that can help people with disabilities access information. People with physical limitations can use mobile phones thanks to features like speech recognition, auto texting, and visual or vibrating notifications. For instance, LibriVox, which offers free access to more than 24,000 audio books, serves as a portal for these users, who may access it from their mobile devices.

3.6 ADVANTAGES OF MOBILE TECHNOLOGY-BASED LIBRARY SERVICES TO THE USERS

Mobile Technology-based library services offer numerous advantages for the users, revolutionizing the way people access and utilize library resources. Here are some of the Mobile Technology-based library services advantages:

- **Convenience**: Users can access library resources anytime, anywhere, making it convenient for those with busy schedules.
- **Accessibility**: Mobile library services enable users to access a vast array of resources without being physically present at a library.
- **24/7 Access**: Users can access library services round the clock, allowing for flexibility in studying and research.
- **Remote Access to Resources**: Users can remotely access e-books, academic journals, and other digital resources from their mobile devices.
- **Real-time Updates**: Users can receive real-time updates on new acquisitions, events, and library news through mobile apps.
- **Notification Alerts**: Users can receive notifications for due dates, book availability, and library events, helping them stay organized.
- **Personalized Services**: Mobile library apps can offer personalized recommendations based on users' preferences and previous searches.
- **Interactive Learning**: Mobile technology enables interactive learning experiences through multimedia resources like videos, podcasts, and interactive e-books.
- **Digital Borrowing**: Users can borrow and return e-books and audiobooks through mobile apps, eliminating the need to visit the physical library.
- **Research Support**: Mobile library services provide access to research databases, citation tools, and academic resources to support users' research needs.
- **Collaboration Tools**: Users can collaborate with peers and access group study resources through mobile platforms.
- **Navigation Assistance**: Mobile apps can provide navigation assistance within physical libraries, helping users locate books and resources efficiently.
- **Language Support**: Mobile library apps can offer language support, benefiting users who are non-native speakers or studying foreign languages.

- **Resource Reservation**: Users can reserve physical resources such as books and study rooms through mobile apps, streamlining the process.
- **Library Account Management**: Users can manage their library accounts, including renewing borrowed items and paying fines, through mobile services.
- **Integration with Learning Management Systems**: Mobile library services can integrate with learning platforms used by educational institutions, providing seamless access to library resources.
- **Accessibility Features**: Mobile library apps can incorporate accessibility features to cater to users with disabilities, enhancing inclusivity.
- **Environmental Impact**: By promoting digital resources, mobile library services contribute to reducing paper waste and the environmental impact of traditional libraries.
- **Community Engagement**: Mobile technology-based library services can facilitate community engagement through features such as book clubs, discussion forums, and virtual events, fostering a sense of belonging among users.

These advantages demonstrate how mobile technology-based library services enhance accessibility, convenience, and the overall user experience for library patrons.

3.7 DRAWBACKS OF MOBILE TECHNOLOGY-BASED LIBRARY SERVICES TO THE USERS

While mobile technology-based library services offer numerous benefits, there are also some disadvantages that users may encounter when utilizing these services. Here are potential disadvantages of mobile technology-based library services for users:

- **Technical Issues**: Users may experience technical problems such as app crashes, connectivity issues, or compatibility issues with their devices, which can disrupt their access to library resources.
- **Digital Divide**: Not all users may have access to smartphones or reliable internet connections, creating a digital divide and limiting their ability to benefit from mobile library services.
- **Screen Limitations**: Prolonged use of mobile devices for reading and research may lead to eye strain and other physical discomforts associated with screen time.

- **Limited Access to Physical Materials**: While digital resources are convenient, mobile library services may limit users' access to physical materials such as rare books, archives, or specialized collections that are only available in print.
- **Privacy Concerns**: Users may have concerns about the privacy and security of their personal data when using mobile library apps, especially in cases where sensitive information is involved.
- **Distractions**: Mobile devices are inherently multi-functional, and users may be more prone to distractions from notifications, social media, and other apps while using library services, impacting their focus on academic tasks.
- **Dependency on Battery Life**: Users are dependent on the battery life of their mobile devices, and a dead battery can impede their access to library resources, especially in situations where charging may not be immediately available.
- **Learning Curve**: Some users, particularly older individuals or those unfamiliar with technology, may face challenges in adapting to mobile library apps and navigating their features effectively.
- **Limited Functionality for Complex Tasks**: Certain complex library tasks, such as in-depth research, may be more effectively conducted using traditional library resources and services, which may not be fully replicated in mobile apps.
- **Digital Rights Management Restrictions**: Users may encounter restrictions on digital resources due to digital rights management (DRM) limitations, such as limited printing or copying of e-books, which can hinder their use of certain materials.

These potential disadvantages highlight the importance of considering the diverse needs and circumstances of library users and the need for a balanced approach in providing access to library resources through both traditional and mobile technology-based services.

3.8 ADVANTAGES OF MOBILE TECHNOLO-BASED LIBRARY SERVICES TO THE LIBRARY

Implementing mobile technology-based library services offers numerous advantages to the library, enhancing its ability to serve patrons and adapt to evolving technological trends. Here are some advantages of mobile technology-based library services to the library:

- **Extended Reach**: Mobile services enable the library to reach users beyond its physical location, expanding its user base and impact.
- **Enhanced User Engagement**: Mobile apps facilitate direct and personalized communication with users, leading to increased engagement with library resources and services.
- **Convenient Access to Resources**: Mobile technology allows libraries to provide convenient access to digital resources, including e-books, audiobooks, and online databases, without constraints of physical space.
- **Data Analytics**: Mobile apps enable libraries to gather valuable user data, facilitating analysis of user behaviour and preferences to improve services and resource offerings.
- **Real-time Communication**: Libraries can use mobile apps to communicate real-time updates on events, new acquisitions, and service changes to users.
- **Cost-effective Service Delivery**: Mobile technology can streamline library operations, reducing the need for physical infrastructure and personnel for certain services, thereby optimizing costs.
- **Community Building**: Mobile library services can foster a sense of community among users through features such as book clubs, discussion forums, and virtual events, enhancing the library's role as a community hub.
- **Promotion of Digital Literacy**: Libraries can use mobile services to promote digital literacy by providing access to digital resources and offering guidance on using technology for educational purposes.
- **24/7 Availability**: Mobile technology ensures that library services are available to users round the clock, enhancing the library's accessibility and relevance.
- **Customized Services**: Libraries can offer personalized recommendations and services tailored to individual user preferences through mobile apps, improving the overall user experience.

- **Efficient Resource Management**: Mobile technology facilitates efficient management of digital collections, including cataloguing, circulation, and access control.
- **Integration with Learning Platforms**: Libraries can integrate mobile services with educational institutions' learning management systems, providing seamless access to library resources for students and faculty.
- **Promotion of Library Programs and Services**: Mobile apps serve as a platform to promote library programs, workshops, and educational services, increasing awareness and participation.
- **Remote Reference Services**: Libraries can offer remote reference and research support through mobile apps, catering to users who cannot visit the library in person.
- **Environmental Sustainability**: By promoting digital resources, mobile library services contribute to reducing paper waste and the environmental impact of traditional libraries.
- **Improved Communication with Staff**: Mobile apps enable efficient communication between library staff and users, enhancing customer service and support.
- **Accessibility Compliance**: Mobile library services can be designed to comply with accessibility standards, ensuring inclusivity for users with disabilities.
- **Adaptation to Technological Trends**: Embracing mobile technology positions the library at the forefront of technological innovation, demonstrating its commitment to meeting users' evolving needs.
- **Partnership Opportunities**: Mobile library services can create opportunities for collaboration with other institutions, publishers, and technology providers to expand resource offerings and service capabilities.
- **Competitive Edge**: Offering mobile technology-based library services gives the library a competitive edge, attracting tech-savvy users and positioning the library as a modern, forward-thinking institution.

These advantages demonstrate how mobile technology-based library services can significantly benefit the library, enhancing its services, outreach, and relevance in the digital age.

3.9 DRAWBACKS OF MOBILE TECHNOLOGY-BASED LIBRARY SERVICES TO THE LIBRARY

While mobile technology-based library services offer numerous advantages, there are also some potential disadvantages that libraries may encounter when implementing these services. Here are some disadvantages of mobile technology-based library services to the library:

- **Initial Investment**: Developing and maintaining mobile apps and digital platforms requires significant initial investment in terms of technology, resources, and expertise.
- **Technical Support**: Libraries need to allocate resources for ongoing technical support and maintenance of mobile apps, including troubleshooting user issues and keeping up with evolving technology.
- **Security Concerns**: Mobile apps may pose security risks, such as data breaches and unauthorized access to library resources, requiring robust security measures and protocols.
- **Digital Divide**: Libraries need to consider the digital divide, ensuring that users without access to smartphones or reliable internet connectivity are not excluded from accessing library resources.
- **Integration Challenges**: Integrating mobile services with existing library systems and databases can be complex and may require significant resources and technical expertise.
- **Privacy Compliance**: Libraries must navigate privacy regulations when collecting and managing user data through mobile apps, ensuring compliance with data protection laws.
- **Dependency on Third-party Platforms**: Libraries relying on third-party platforms for mobile services may face challenges related to platform changes, service disruptions, or unexpected costs.
- **Training and Education**: Libraries need to invest in training staff and users to effectively utilize mobile apps and digital resources, requiring additional time and resources.
- **Digital Preservation**: Libraries must address the long-term preservation of digital materials and ensure ongoing access to digital resources as technology evolves.
- **Balancing Digital and Physical Services**: Libraries need to strike a balance between digital and physical services to cater to diverse user preferences and ensure equitable access to resources for all patrons.

These potential disadvantages highlight the need for careful planning, resource allocation, and ongoing assessment when implementing mobile technology-based library services to mitigate challenges and maximize the benefits for both the library and its users.

3.10 CONCLUSION

These characteristics reflect the adaptation of library services to the mobile-centric lifestyles of contemporary society, meeting users where they are. Mobile technology-based library services continue to evolve to meet the dynamic needs of library patrons in an increasingly mobile and digital environment, providing an array of benefits and opportunities for enhanced access to information and resources.

The diverse types of mobile-based library services, ranging from mobile apps to virtual access and location-based services, enhance user experience, accessibility, and efficiency in library operations. By leveraging mobile technology, libraries can provide personalized services, improve information access, save time for users, and strengthen the user-librarian relationship, ultimately enhancing the overall library service delivery and user satisfaction. while mobile technology offers significant advantages in library services such as improved access, efficiency, and user engagement, libraries need to address challenges related to staff readiness, infrastructure, content adaptation, and financial constraints to fully leverage the benefits of mobile technology for enhanced service delivery.

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CHAPTER IV

MOBILE TECHNOLOGY-BASED LIBRARY SERVICES FUNCTIONING AT NATIONAL & INTERNATIONAL LEVEL

4.1 INTRODUCTION

The emergence of mobile technology has significantly transformed the traditional concept of libraries. With the widespread adoption of smartphones and other mobile devices, libraries have been compelled to adapt their services to meet the evolving needs of their tech-savvy patrons. This evolution has led to the development of innovative mobile-based library services that cater to the demands of users in an increasingly digital world. In recent years, the advancement of mobile technology has revolutionized the way library services are delivered both at national and international levels. Mobile technology has provided libraries with new opportunities to engage with their users, expand their reach, and enhance the overall library experience. This chapter aims to explore the impact of mobile technology on library services, focusing on both national and international perspectives.

4.2 Mobile Technology-based Library Services at International Level.

1. Massachusetts Institute of Technology

The MIT library provides a range of essential services to cater to the diverse needs of its patrons, including:

- **Ask Us**: This service enables users to seek assistance and guidance from knowledgeable librarians and staff members. Patrons can obtain support for various queries, including research assistance, resource recommendations, and general library-related inquiries. The "Ask Us" service underscores the library's commitment to facilitating a conducive and supportive learning and research environment.
- **Search for Our Collection**: The "Search for Our Collection" service empowers users to explore and access the extensive array of resources housed within the MIT library. Through advanced search functionalities and comprehensive cataloging, patrons can

efficiently locate books, journals, electronic resources, multimedia materials, and other items available within the library's collection.

- **Borrow and Request**: MIT's library offers a "Borrow and Request" service, allowing patrons to check out physical materials for a specified loan period. Additionally, users can request items that are currently on loan to other patrons, thereby facilitating equitable access to in-demand resources. This service reflects the library's commitment to ensuring equitable and inclusive access to its physical collection.
- **Search and Deliver Service**: The "Search and Deliver Service" is designed to facilitate the seamless access to digital documents within the library's collection. This service streamlines the process of locating and obtaining specific documents in digital format, thereby enhancing the accessibility and convenience of scholarly resources for the library's users. The emphasis on digital delivery aligns with contemporary trends in academic libraries, catering to the evolving needs of researchers and scholars.
- **Online Public Access Catalogue (OPAC)**: MIT's library provides an Online Public Access Catalogue (OPAC), which serves as a user-friendly and comprehensive platform for accessing the library's resources. This digital interface enables patrons to search, browse, and access the library's collection, while also providing features such as account management, resource recommendations, and real-time availability of materials. The OPAC serves as a pivotal tool for enhancing the discoverability and utilization of the library's extensive holdings.

2. Stanford Library

Stanford University's library offers a comprehensive array of services to cater to the diverse needs of its patrons, including:

- **Online Public Access Catalogue (OPAC)**: Stanford's library provides an Online Public Access Catalogue (OPAC), which facilitates seamless access to the library's extensive collection. This user-friendly interface enables patrons to search, browse, and access a wide range of resources, thereby enhancing the discoverability and utilization of the library's holdings.

- **Email Alerts for Due Dates**: The library employs an email notification system to alert users about upcoming due dates for borrowed items. This proactive approach helps in ensuring timely returns and efficient management of borrowed materials, contributing to a conducive borrowing experience for patrons.
- **Proxy Borrowing**: Stanford faculty members have the option to designate proxies to borrow materials on their behalf. This service allows faculty to authorize up to two proxies, who are issued a special library card for borrowing. Faculty can monitor proxy activity, including charges and requested items, through their My Account, while proxies can access the same information via My Library Account using their proxy library card.
- **Online Renewal of Books or Items**: Patrons have the convenience of renewing books or items online through their user library account. This streamlined process allows for the extension of loan periods, contributing to the efficient management of borrowed materials and enhancing user experience.
- **Scan and Deliver**: The library offers a "Scan and Deliver" service, enabling users to request specific sections of a book or periodical, such as a chapter or article, to be scanned and delivered electronically. This digital delivery mode enhances accessibility and convenience, aligning with contemporary trends in academic library services.
- **Interlibrary Loan**: Through the Interlibrary Loan service, Stanford patrons can access materials not available within the university's collection. This global network allows libraries around the world to send items to Stanford for users to check out, expanding the breadth of accessible resources for scholarly inquiry and research.
- **Request and Pickup**: Patrons can place requests online for physical items, which can then be delivered to a branch of the library of their choice for convenient pickup. If the requested item is checked out by another patron, library staff will endeavours to locate another copy from a partner library, enhancing access to in-demand materials.

3. Havard library

The Harvard Library offers a range of services aimed at facilitating access to resources and supporting the scholarly endeavours of its users. These services include:

- **Hollis Library Catalogue**: The Hollis library catalogue is an extensive database that provides access to the vast collection of resources held by the Harvard Library. This

online catalogue allows users to search for books, journals, articles, multimedia materials, and more, thereby enabling efficient discovery of relevant academic resources.

- **Ask a Librarian**: The "Ask a Librarian" service offers users the opportunity to seek assistance from knowledgeable library staff who can provide guidance and support for research inquiries, resource recommendations, and information regarding library services and facilities. This service is designed to facilitate and enhance the research process by connecting users with expert assistance.
- **Interlibrary Loan**: Through the interlibrary loan service, users have the ability to request materials that are not available within the Harvard Library's collections. This service facilitates access to resources held by other libraries, thereby expanding the range of materials accessible to Harvard affiliates for their academic and research needs.
- **Tech Loan:** The Tech Loan service provides users with access to a variety of technological devices, such as laptops, tablets, and other equipment, for academic purposes. This resource is particularly valuable for users who may require temporary access to specific technological tools to support their research and study requirements.
- **Scan and deliver through Hollis**: This service enables users to request digital copies of materials from the library's collections, which are then delivered via email. The digital copies are made available for download for a period of 30 days, thereby allowing users to access and utilize the materials electronically for a specified duration. This service enhances accessibility to library resources, particularly for users who may not be able to access physical materials on-site.
- **Find a Space Service**: The "Find a Space" service assists users in locating suitable study and research spaces within the library. This service aims to help users identify and access appropriate environments for focused academic work, collaborative projects, and scholarly activities within the library's facilities.

4. National Library of Singapore

The NLB (National Library Board) Mobile App is a versatile tool that enables users to access a wide array of educational resources, thereby promoting continuous learning and knowledge

acquisition. This app is designed to facilitate seamless engagement with library materials, providing users with the flexibility to read and learn on the go, at any time, and from any location.

Key Features of the NLB Mobile App:

- **E-Books and E-Audio Books**: The app offers users the ability to read e-books and listen to e-audio books online, thus granting access to a diverse collection of literary works and educational materials.
- **Access to Current Issues of E-Newspapers and E-Magazines:** Users can stay informed with up-to-date news and insights by accessing current issues of e-newspapers and e-magazines through the app.
- **E-Learning Video Tutorials**: The app provides access to a repository of e-learning video tutorials, catering to diverse educational needs and preferences, thereby fostering continuous skill development and knowledge enhancement.
- **Library Catalogue Search**: Users can easily search for titles and resources within the library's catalogue, streamlining the process of discovering and accessing relevant materials.
- **Account Management and Payment**: The app facilitates the management of user accounts, allowing individuals to check their account status and efficiently settle outstanding charges using Payfull or credit card services, thereby ensuring a seamless user experience.
- **Compatibility and Availability**: The NLB Mobile App is accessible on both DOS and Android platforms, ensuring compatibility with a wide range of devices and operating systems. This broad accessibility underscores the NLB's commitment to inclusivity and the promotion of learning opportunities for a diverse user base.

5. Library of Congress

The Library of Congress offers a selection of mobile apps that provide innovative ways to connect with its vast collections, services, and special features using smartphones and other mobile devices.

- **LOC Collections App**: This app grants access to the Library of Congress digital collections, which include iconic photos, historic maps, books, films, newspapers, manuscripts, and sound recordings.

  Availability: iPhone/iPad and Android devices.

- **BARD Mobile App**: Provided by the National Library Service for the Blind and Print Disabled (NLS), this app offers direct access to braille and talking books from the NLS Braille and Audio Reading Download (BARD). It contains tens of thousands of books, magazines, and music scores in audio and braille formats, with new selections added daily.

  Availability: iPhone/iPad, Android, and Amazon devices.

- **Aesop for Children App**: This interactive book contains over 140 classic fables, accompanied by beautiful illustrations and interactive animations, designed to be enjoyed by readers of any age.

  Availability: iPhone/iPad and Android devices.

Through these mobile apps, the Library of Congress aims to provide convenient and engaging access to its diverse resources, catering to various interests and needs of its users. For further engagement and updates, the Library of Congress also utilizes social media technologies, email newsletters, and open-source software distribution to facilitate interaction and dissemination of valuable content from its collections.

4.3Mobile Technology-based Library Services at National Level

1. The Indian Institute of Technology, Kharagpur

The institute has spearheaded an innovative mobile library initiative through the National Digital Library of India (NDLI) app, granting users free access to an extensive collection of 65 lakh books and study materials. This pioneering endeavour not only facilitates convenient access to educational resources via smartphones but also significantly enriches learning opportunities for students and researchers.

- **Document Delivery Services**: The Central Library at IIT Kharagpur provides a cutting-edge document delivery service, wherein soft copies of book chapters or journal articles are gathered as per users' requirements and subsequently dispatched to the concerned individuals via email. This streamlined process ensures swift and efficient access to essential academic materials.
- **Virtual Reality Facility**: In line with its commitment to fostering immersive learning experiences, IIT Kharagpur offers students access to a diverse array of virtual reality educational content, encompassing videos, simulations, and interactive activities. This innovative facility serves to augment traditional pedagogical methods and enhance student engagement through immersive and interactive learning environments.
- **Comprehensive Digital Library Services**: The digital library at IIT Kharagpur goes beyond offering a repository of resources; it encompasses a spectrum of reference and referral services, instructional support, value-added services, and promotional initiatives. This comprehensive framework not only caters to the academic needs of its users but also strives to elevate the overall scholarly experience through integrated services and resources.
- **Interactive Library Website**: The library's website serves as a gateway to a wealth of electronic resources, enabling users to access subscribed materials and previous years' question papers. Additionally, it furnishes regular updates on new arrivals, thereby keeping the academic community abreast of the latest additions to its repository.

2. The Central Library at IIT Madras

Library offers a comprehensive range of services to augment the academic experience of its students and faculty. These services include:

- **OPAC (Online Public Access Catalogue):** Enables users to search and locate resources within the library's collection.
- **Self-Check-In/Self-Checkout and Book Renewal**: Provides a convenient and efficient way for users to manage borrowed items and renew books on their own.
- **Video Viewing**: Offers access to educational and entertainment videos to supplement learning beyond traditional resources.

- **Inter Library Loan and Document Delivery**: Facilitates access to a wide range of inter library loans and efficient document delivery services to support academic pursuits.
- **Access to E-Resources**: Provides on-campus and off-campus access to a plethora of scholarly electronic resources subscribed by the library, including e-ShodhSindhu and materials from other renowned publishers.
- **Off-Campus Access**: Grants students' seamless access to subscribed scholarly electronic resources from outside the IIT Madras campus for 24/7 wherein username and password are provided to the users. These services are designed to not only expand the reach of the library's resources but also to adapt to the evolving needs of the academic community at IIT Madras.

3. Delhi University Library

The Delhi University library offers a range of services to its users, aimed at enhancing accessibility to academic resources and facilitating research and learning. These services include:

- **E-Library App Access**: The library provides an e-library app that allows users to access a wide array of digital resources, including e-books, academic journals, and other scholarly materials. This app is available for access 24/7, enabling users to conveniently retrieve information at any time.
- **Tutorials for App Usage**: The library offers tutorials to assist users in effectively utilizing the e-library app. These tutorials are designed to familiarize users with the app's features and functionalities, thereby enhancing their ability to navigate and retrieve relevant academic content.
- **Newspaper & Magazine Viewing**: Through the e-library app, users have the opportunity to access and view newspapers and Magazines thereby staying informed about current events and developments. This service contributes to the enhancement of users' knowledge and understanding of contemporary issues.
- **Request an Item**: The library offers a "Request an Item" service, allowing users to request specific resources such as chapters from books, which can be delivered to them

in online mode. This service facilitates access to specific information, enabling users to engage with relevant content without physical constraints.

4. **National Institute of Technology Calicut**

The library website of the National Institute of Technology Calicut provides access to the Knimbus Mlibrary app, which offers various services aimed at enhancing the academic experience. The app includes the following key services:

- **OPAC (Online Public Access Catalogue):** The OPAC tool allows users to explore the entire collection of the library through mobile technology. Users can search for books, subscribed e-books, and print journals using keywords such as title, author, or subject. Upon finding a desired item, specific information such as call number, location, and availability status is provided.
- **Book Recommendations**: The library website facilitates the process of recommending print and e-books through dedicated forms available on the website. This service allows users to suggest books that they believe should be included in the library's collection.
- **Ask a Librarian**: The "Ask a Librarian" feature enables users to seek assistance from library staff for queries related to research, resources, or any other library-related assistance.

5. **National Institute Of Technology Sarathkar**

The services offered by the NIT Sarathkar Library reflect a commitment to providing a modern, user-friendly, and comprehensive library experience for its academic community. By leveraging the Knimbus mLibrary platform, the library facilitates seamless access to digital resources, supports research activities, and enhances the overall learning and academic experience for students, faculty, and researchers

- **Online Public Access Catalogue (OPAC):** The library offers an Online Public Access Catalogue (OPAC) service through Knimbus mLibrary, providing users with a comprehensive platform to search and access the library's resources.

- **Access to E-Resources**: Users can access a wide range of electronic resources including online databases, full-text databases, bibliographic databases, single e-journals, e-book collections, course textbooks, institutional repository, open access resources, trial access databases, and videos.
- **Institutional Digital Repository**: The library provides access to an institutional digital repository containing faculty publications, theses & dissertations, journals, media, and annual reports.
- **Librarian Interaction**: Users can utilize the "Ask Librarian" feature to interact with the library staff for assistance, queries, and recommendations.
- **Library Account Features**

Through their library account, users can perform various activities such as:

- Renew items

- Suggest new purchases

- Receive notifications about new arrivals

- Pay library fees online

- Access the faculty recent article list

- Utilize research support services like plagiarism check, Grammarly, article request, and writing & citation tools.

4.4 CONCLUSION

The impact of mobile technology on library services at the national and international levels has been profound. The opportunities presented by mobile technology are vast, and while challenges exist, the potential for continued innovation and improvement is promising. By embracing the transformative power of mobile technology, libraries can continue to evolve and thrive in an increasingly digital world, ultimately enhancing the accessibility and delivery of information to users worldwide.

4.5 REFERENCES:

https://www.loc.gov/

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https://library.iitkgp.ac.in/

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https://www.du.ac.in/index.php?page=du-library-system

CHAPTER V

DATA INTERPRETATION & ANALYSIS

5.1 INRODUCTION

Data analysis is the process of uncovering patterns and trends in the data. It assists researchers in categorizing, manipulating and summarizing data to answer critical questions. The goal behind the data analysis in research to present reliable and accurate data.

Data interpretation is the process of assigning meaning to the data. It involves explaining those discovered patterns and trends in the data. Data interpretation is the process of reviewing data and arriving at relevant conclusions using various analytical methods.

Data Collection:

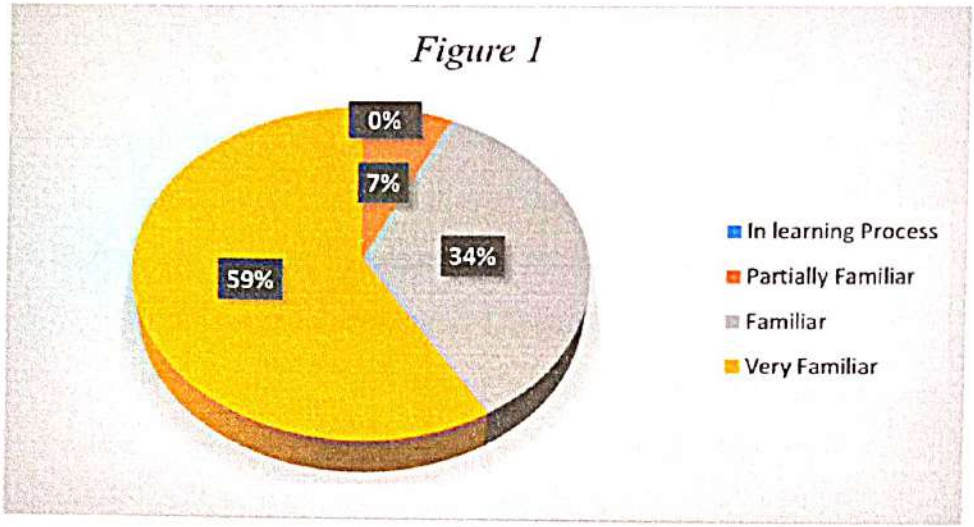
The Data has been collected from the librarians and from the library users of Academic College Libraries of Goa. Questionnaire was circulated in form of google forms and some were personally given by researcher through person visit. Based on the answers or the replies to the questionnaire from the librarians and library users of Academic College Libraries the following founding are listed below:

5.2 LIBRARIANS' ANALYSIS: -

Questionnaire was sent to almost all the academic college libraries of Goa; this study has been done to find out the viewpoint of the library professionals on Mobile Technology-based library services.

1. **How familiar are you with the use of Mobile Technology for delivery of Library Services?**

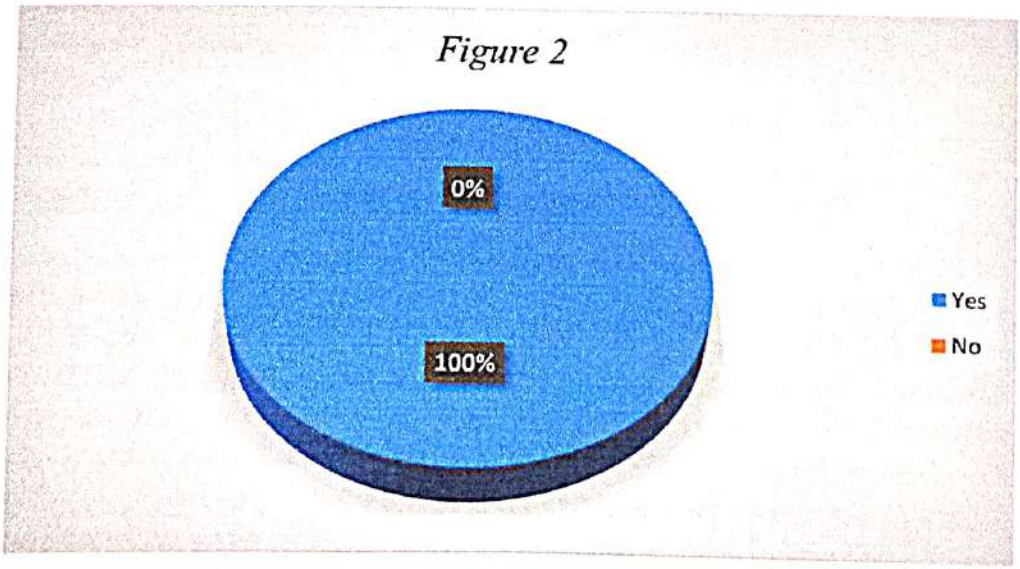
Figure 1



The pie chart depicts the distribution of librarians based on their familiarity with mobile technology for delivering library services. Specifically, it shows that 59% of librarians are highly familiar with mobile technology, while 34% have a moderate level of familiarity, and 7% are only partially familiar with using mobile technology for delivering library services.

2. **Is Mobile Technology currently being utilized in your Library for service delivery?**

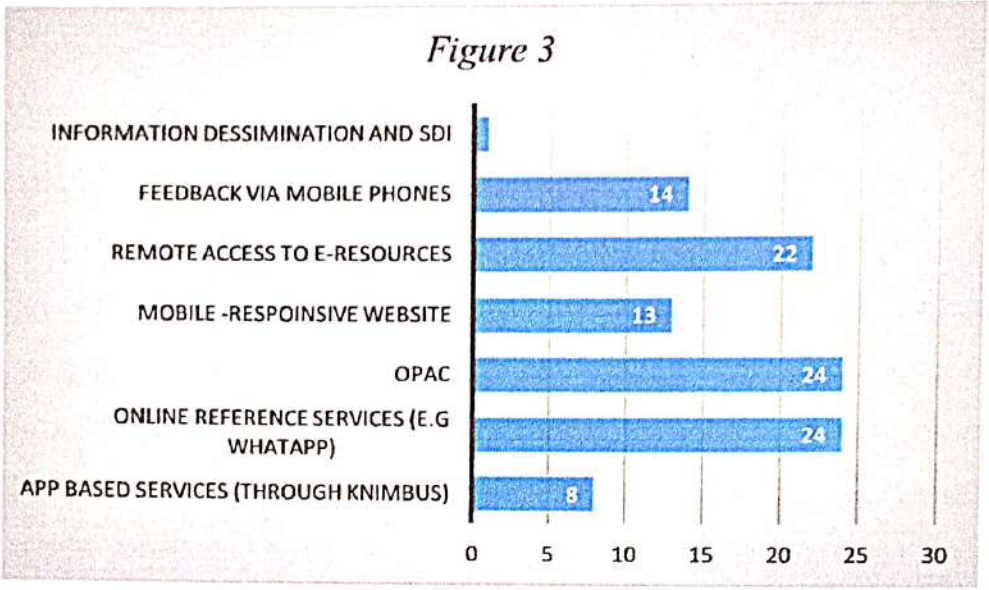
Figure 2



The pie chart depicts that nearly 100% of libraries are employing mobile technology for delivering services. This indicates a widespread embrace of emerging technologies and tools by libraries to enhanced the provision of their services.

3. **Which of the following Mobile Technology-based library Services are being used?**

Figure 3

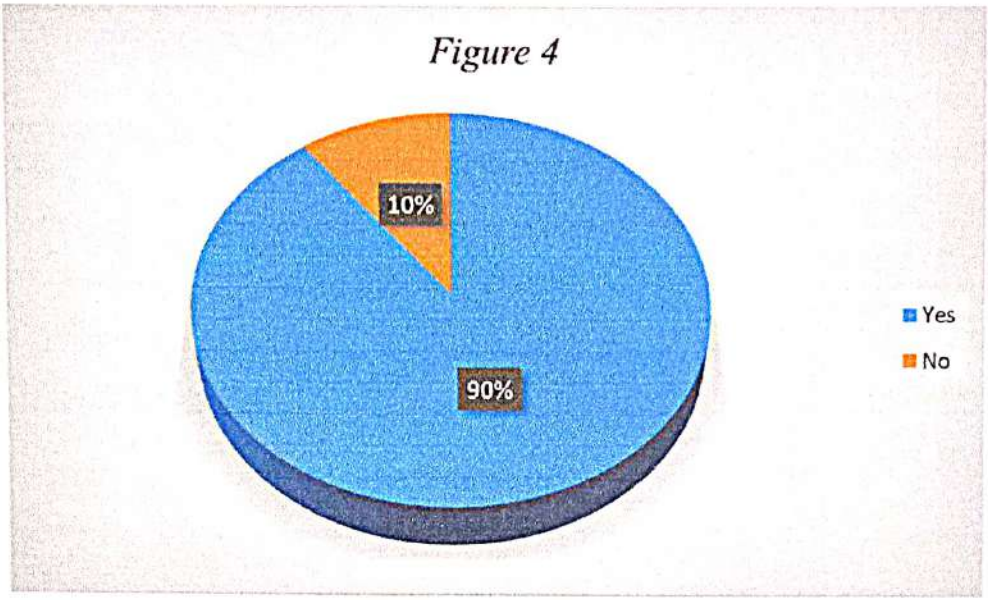


Particulars	Number of Libraries	Percentage
App based Services (through knimbus)	8	27.58621
Online Reference Services (e.g WhatApp)	24	82.75862
OPAC	24	82.75862
Mobile -respoinsive Website	13	44.82759
Remote Access to e-resources	22	75.86207
Feedback via Mobile Phones	14	48.27586
Information Dessimination and SDI	1	3.448276

The provided statistics from the above table and bar graph reveal that approximately 27.5% of libraries offer app- based services, while about 82.7% provide online reference services and access to OPAC/Catalogue. Furthermore, 44.8% of libraries have mobile-responsive websites, and 75.8% provide remote access to e-resources. Additionally, nearly 48.2% of libraries receive user feedback via mobile phones, and approximately 3.4% offer information dissemination and SDI services. Here we can clearly notice that different kinds of mobile technology-based library services are provided to the users by different libraries.

4. **Have you been involved in the implementation of mobile technology for library services?**

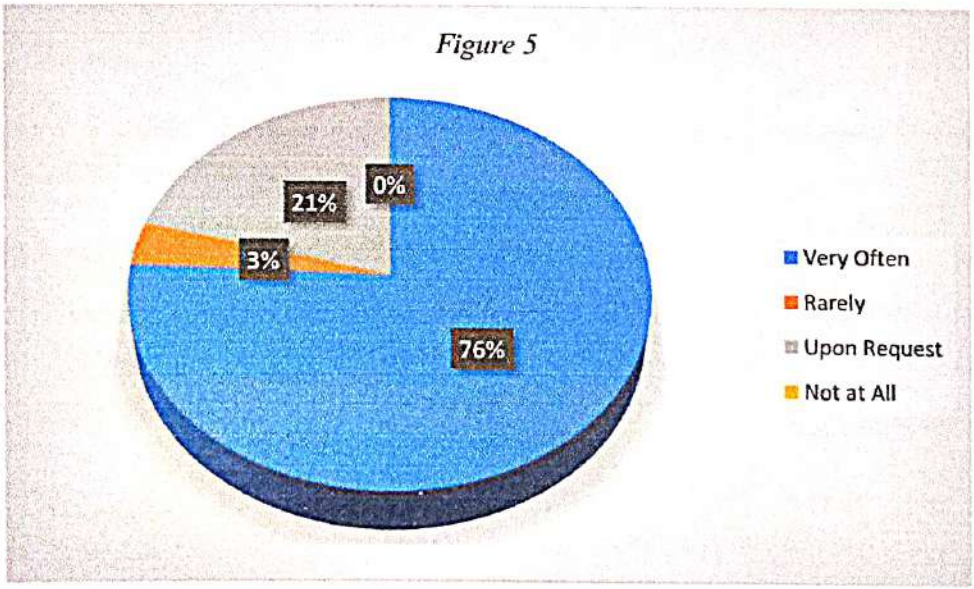
Figure 4



According to the pie chart, 90% of the librarians have been actively involved in the implementation of mobile technology-based library services in their college libraries, while 10% have not been involved in this implementation.

5. **How often do you use Mobile technology-based Library Services for providing information to the users?**

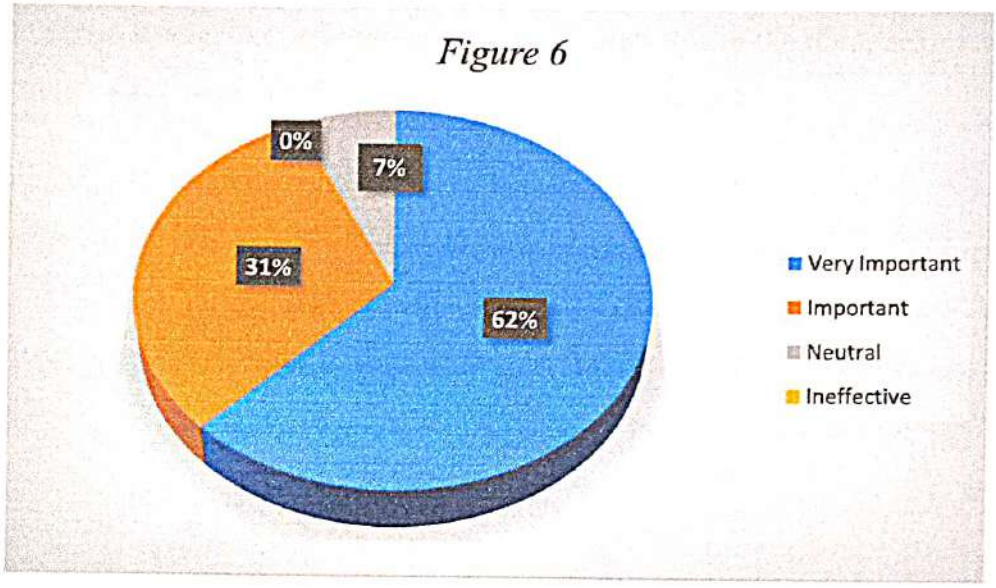
Figure 5



The aforementioned pie chart illustrates that a significant majority, comprising 76% of libraries, frequently offer mobile technology-based library services. Additionally, approximately 21% of libraries provide these services upon user request, while a mere 3% of libraries do so infrequently.

6. **How important is the convenience of accessing library services at various locations through mobile technology-based library services?**

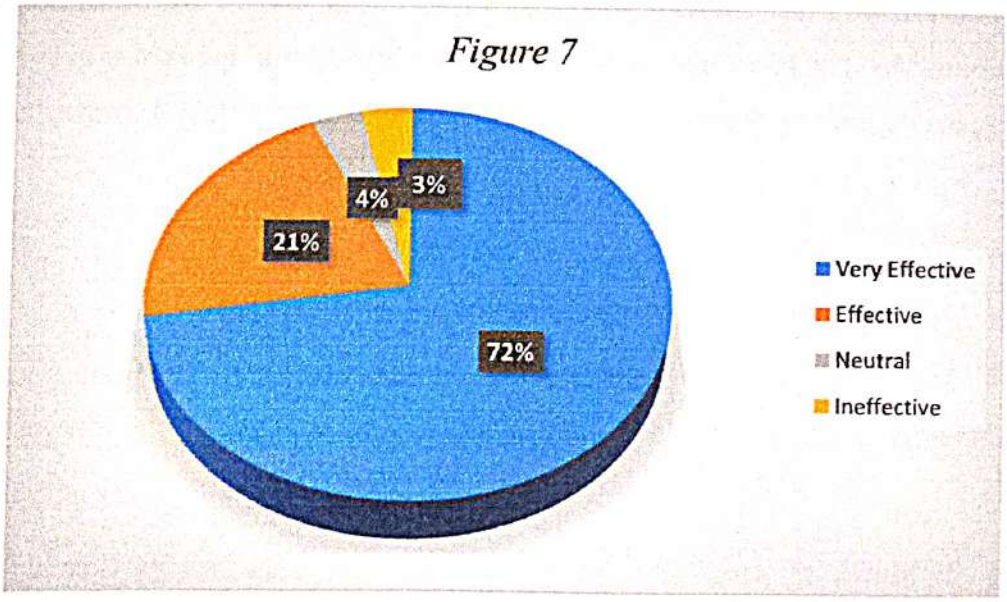
Figure 6



The pie chart indicates that a significant majority, comprising 62% of librarians, consider the convenience of accessing library services at various locations through mobile technology to be very important. Furthermore, the data reveals that 31% of librarians deem this convenience as important. Additionally, approximately 7% of librarians expressed a neutral stance on the matter.

7. **How effective do you think mobile technology-based library services are in engaging patrons who may not visit a physical library?**

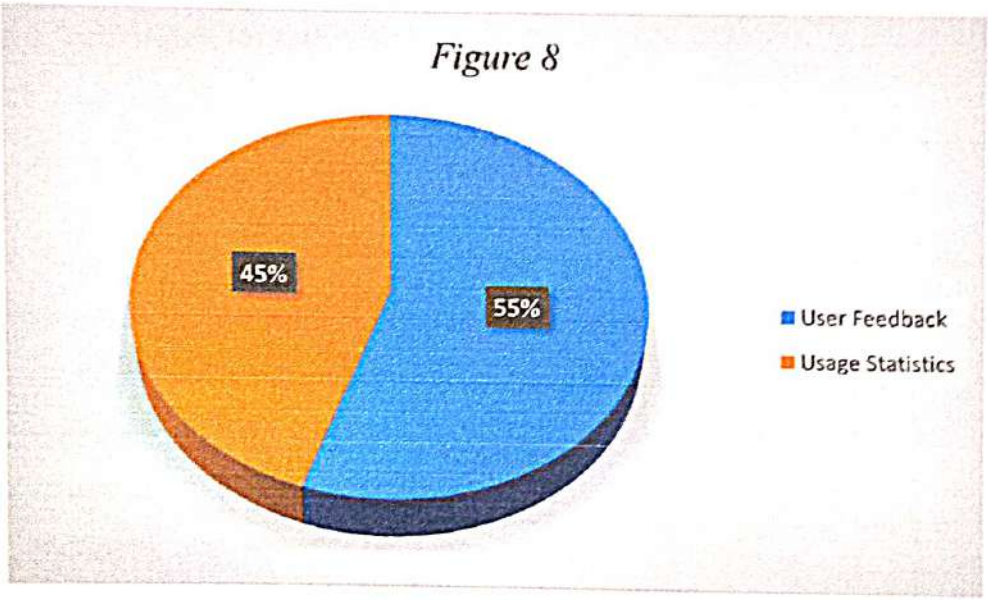
Figure 7



The above pie chart illustrates the perceptions of librarians regarding the effectiveness of mobile technology in engaging patrons who may not visit a physical library. According to the data, 72% of the librarians found mobile technology to be very effective in this regard, while 21% considered it effective. Additionally, approximately 4% of the librarians found it to be a neutral factor, and a minimal 3% deemed it to be ineffective.

8. **How do you measure the effectiveness of mobile technology in enhancing library services?**

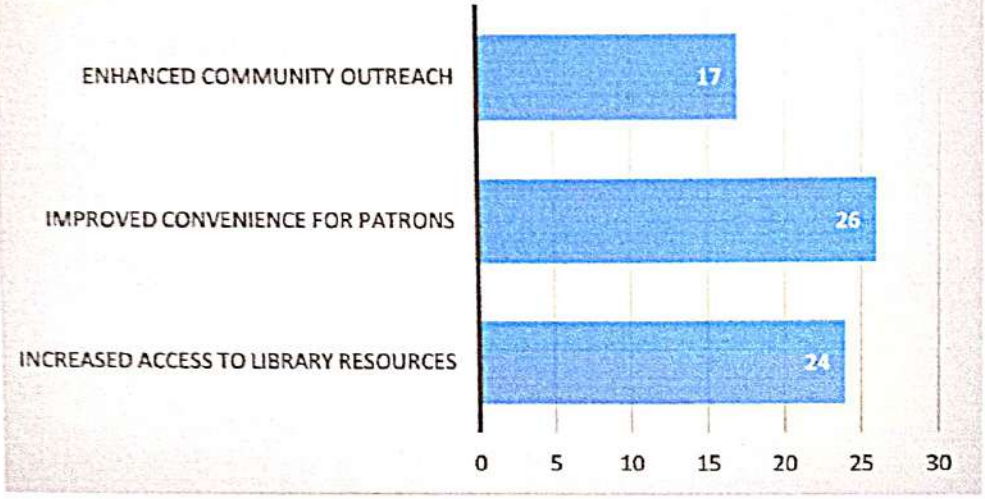
Figure 8



The above pie chart reveals that 55% of librarians measure the effectiveness of mobile technology in enhancing library services through user feedback and 45% of librarians measure the effectiveness of mobile technology in enhancing library services through usage statistics.

9. **In your opinion, what are the primary benefits of integrating Mobile Technology for service delivery in academic libraries?**

Figure 9

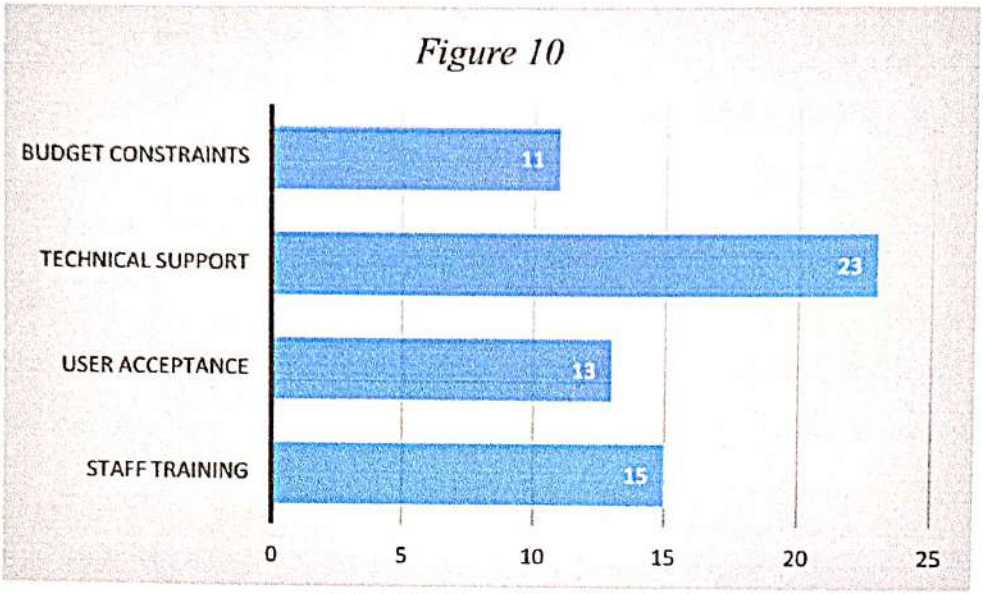


Increased access to library resources	24	82.75862
Improved convenience for Patrons	26	89.65517
Enhanced community outreach	17	58.62069

The above table and bar graph shows that 82.7% of librarians found the integration of mobile technology to be beneficial as it enhances access to library resources. About 89.6% of librarians recognized the benefit of mobile technology integration in terms of improving convenience for patrons and about 58.6% of librarians acknowledged the beneficial impact of mobile technology integration on community outreach.

10. What are the Primary challenges faced in implementing Mobile Technology-based Library Services?

Figure 10

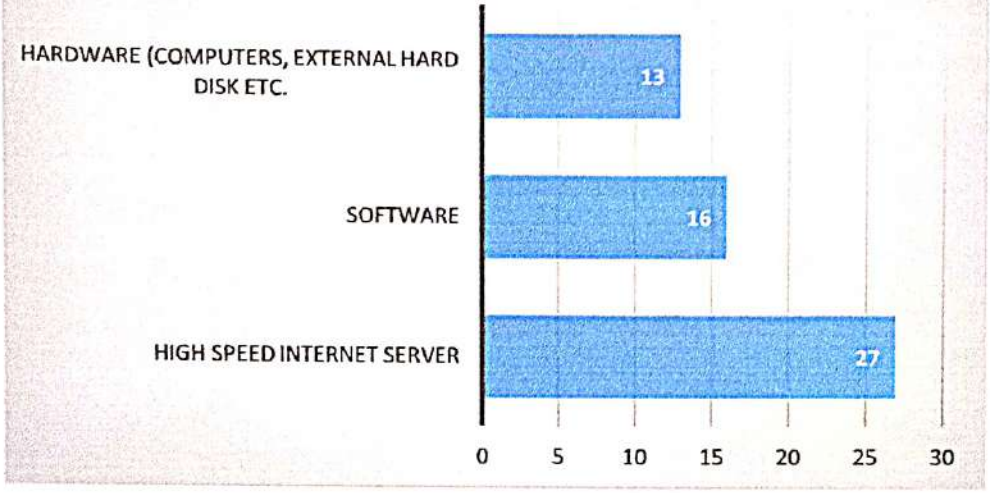


Particulars	Number of Libraries	Percentage
Staff training	15	51.72414
User acceptance	13	44.82759
Technical support	23	79.31034
Budget constraints	11	37.93103

The table and bar graph above illustrate the primary challenges encountered by libraries in the implementation of mobile technology- based library services. It is notable that 51.7% of libraries identified staff training as their primary challenge, while approximately 44.8% cited user acceptance as a significant obstacle. Moreover, an overwhelming 79.3% of libraries noted technical support as their primary challenge, with about 37.9% indicating budget constraints as a major hurdle in the implementation of mobile technology-based library services.

11. What Infrastructure is required to facilitate Mobile Library Services

Figure 11

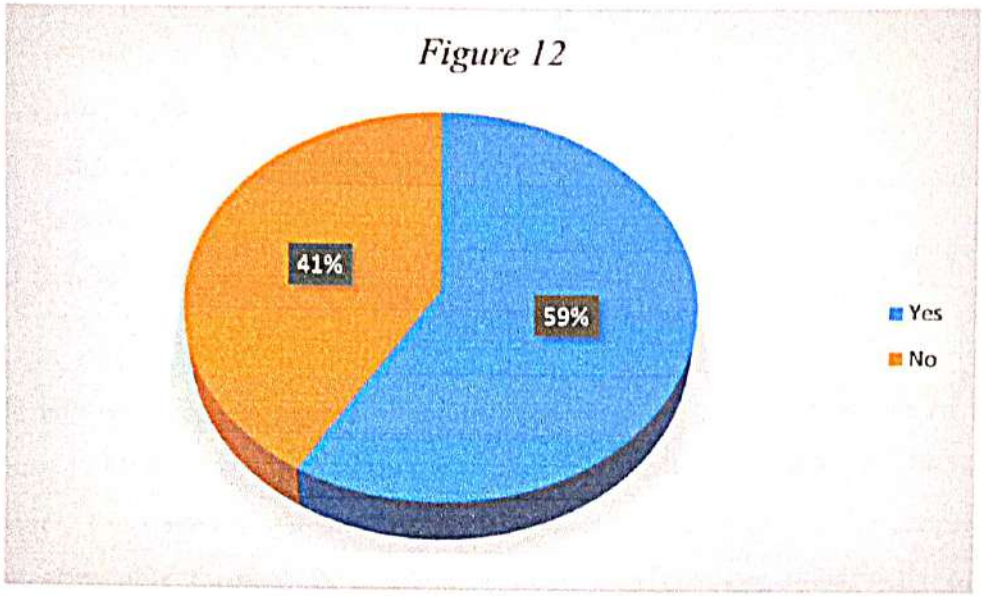


Particulars	Number of libraries	Percentage
High Speed Internet Server	27	93.10345
Software	16	55.17241
Hardware (computers, external hard disk etc.	13	44.82759

Based on the data presented in the table and bar graph, it is evident that the facilitation of mobile technology-based library services necessitates various infrastructural components. Notably, 93.1% of librarians identified high-speed internet servers as a significant requirement for such services, with 55.1% emphasizing the need for appropriate software, and 44.8% indicating the necessity of hardware such as computers and hard disks.

12. Does your library have QR Code application?

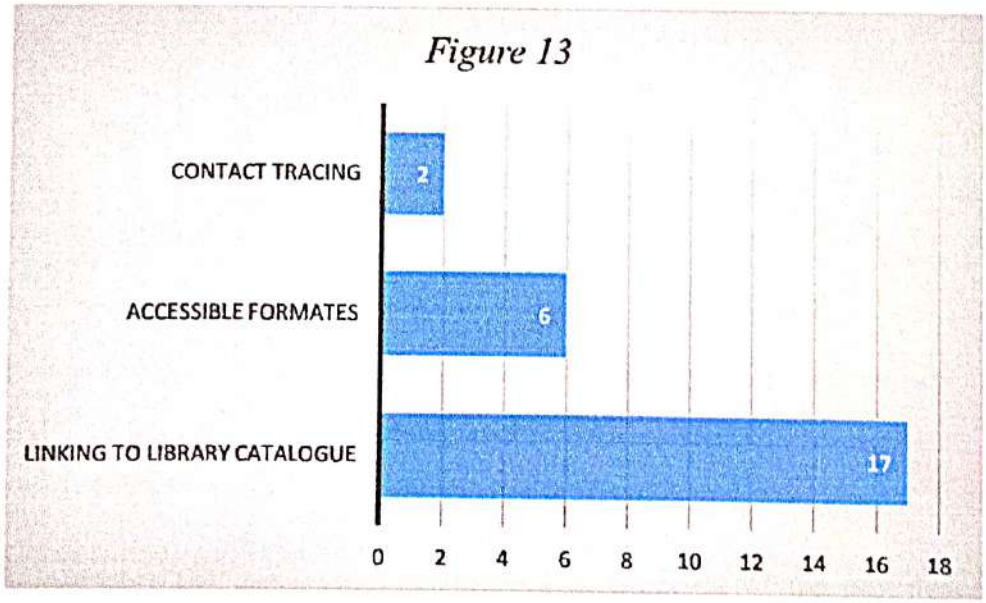
Figure 12



The pie chart illustrates that 59% of the surveyed libraries possess a QR code application, whereas 41% do not have this feature.

13. If yes, how QR code is used to improve library services?

Figure 13

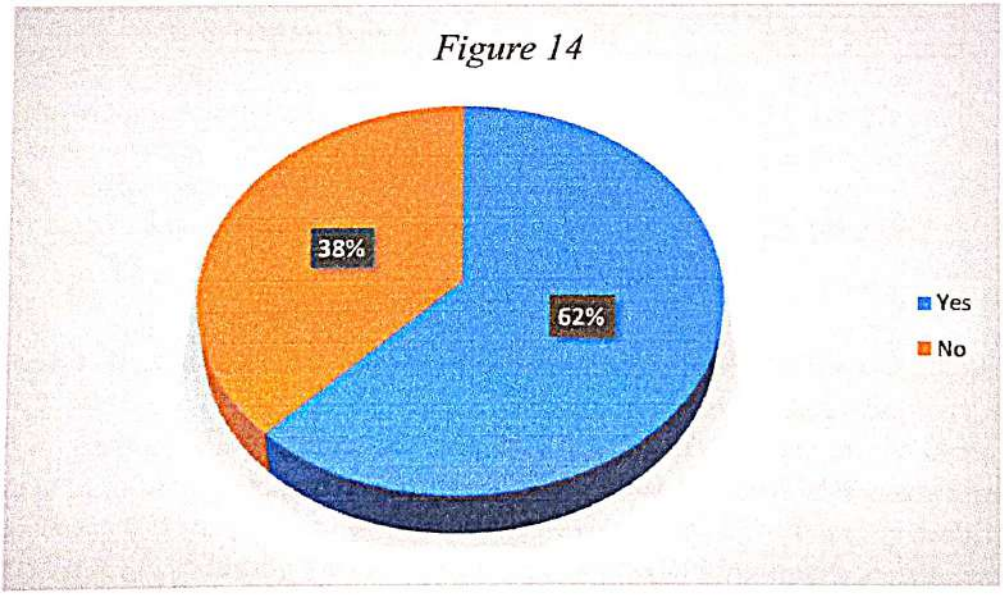


Particulars	Number of Libraries	Percentage
Linking to library catalogue	17	58.62069
Accessible formats	6	20.68966
Contact Tracing	2	6.896552

The table and bar graph presented above illustrate that the predominant use of library QR applications is for linking to the library catalogue, accounting for 58.6% of the respondents. Furthermore, the data reveals that 20.6% of the respondents utilize QR applications for accessing accessible formats. In addition, a smaller percentage, specifically 6.8% of the respondents, reported using QR applications for contact tracing purposes within the library setting.

14. Does the library have Mobile responsive website?

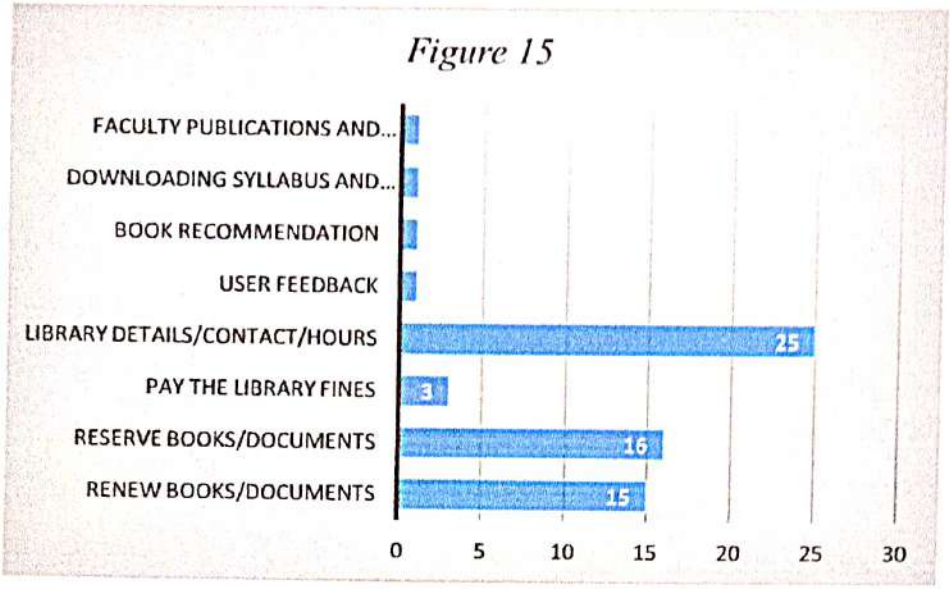
Figure 14



The depicted pie chart provides a comprehensive overview of the prevalence of mobile responsive websites among libraries. According to the chart, 62% of the represented libraries have integrated mobile responsive design into their websites and 38% of the libraries are yet to adopt mobile responsive website design.

15. Which of the following options are allowed to perform on the library website?

Figure 15

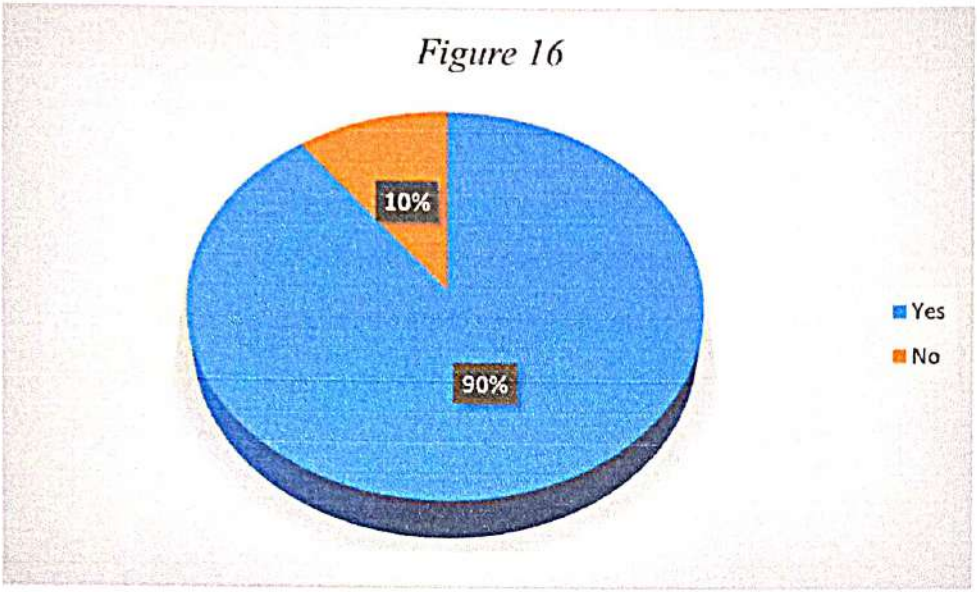


Particulars	Number of Libraries	Percentage
Renew books/Documents	15	51.72414
Reserve books/Documents	16	55.17241
Pay the library fines	3	10.34483
Library details/contact/hours	25	86.2069
User Feedback	1	3.448276
Book Recommendation	1	3.448276
Downloading Syllabus and Previous years question papers	1	3.448276
Faculty publications and newspaper clippings	1	3.448276

The data presented in the table and bar graph indicates various features available on library websites. These features include the ability for users to renew books/documents, with 51.7% of libraries offering this service. Furthermore, 55.1% of libraries allow users to reserve books/documents through their website. Moreover, a notable 10.3% of libraries enable users to pay fines through their website, while an overwhelming 86.2% of library websites provide crucial details such as library contact information and operating hours. Furthermore, a small percentage of libraries, at 3.4%, allow users to recommend books, download previous question papers and syllabi, and access faculty publications and newspaper clippings through their website.

16. **Does your Library Management Software provide alerts to users after issue of library resource?**

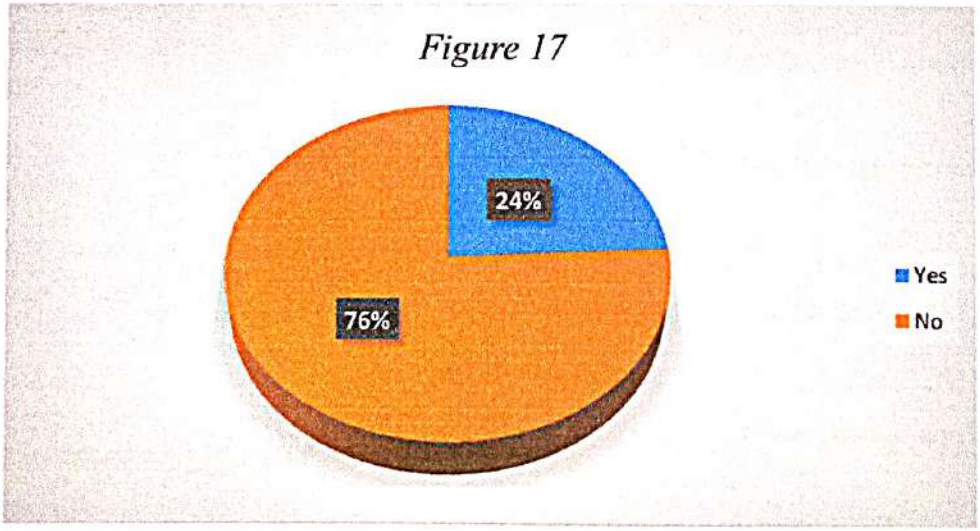
Figure 16



The pie chart illustrates that the majority of library management software, accounting for 90%, offers alerts to users following the issuance of library resources, while the remaining 10% of library management software does not include this feature.

17. **If no, do you wish to provide SMS alerts to your users when they issue a book or when their books are due to be returned?**

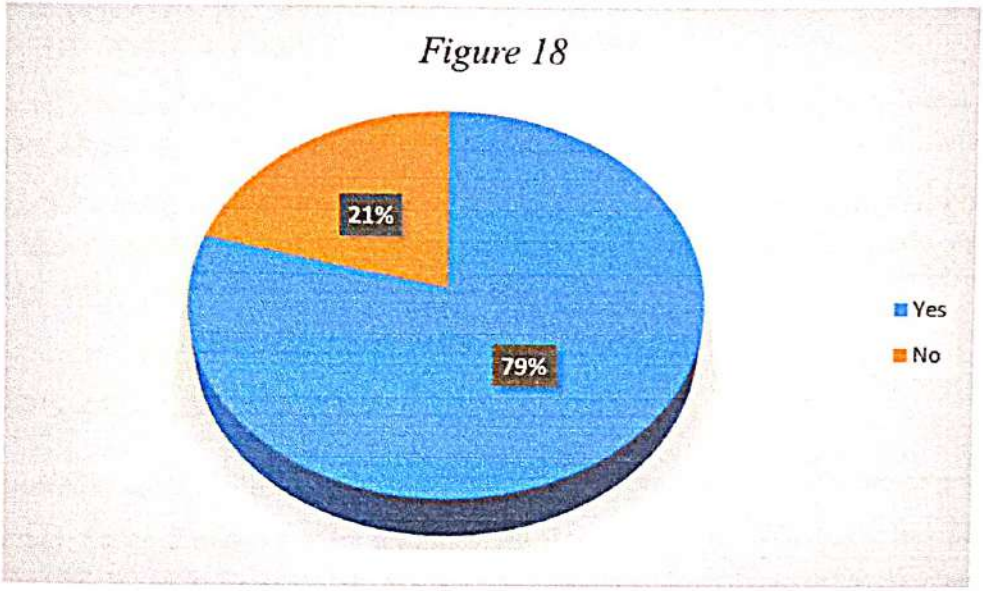
Figure 17



The aforementioned pie chart illustrates that 76% of librarians express a preference for offering SMS alerts to users upon book issuance or when their books are due for return, while 24% indicate a lack of interest in providing this service.

18. Have you received any formal training or professional development related to utilizing mobile technology for library services?

Figure 18



The pie chart above illustrates that a significant majority, comprising 79% of librarians, have not undergone any formal training or professional development pertaining to the utilization of mobile technology for library services. Conversely, a minority, constituting 21% of librarians, have received training in this area.

19. How do you ensure the security and privacy of library users in the context of mobile technology?

Librarian 'A' emphasis the safeguarding pf security and privacy for library users within realm of mobile technology by implementing robust measures such as data encryption, authentication and authorisation.

Librarian 'B' said that they address this problem by organizing awareness programs, thereby fostering informed practices among library users.

Librarian 'C' said that they adopt a principled stance by declining the services that accumulate excessive user data, thereby prioritizing privacy and ethical consideration.

20. What advancements in mobile technology service do you think could further enhance library service delivery in the future?

Librarian 'A' underscores the potential of advancements in mobile technology to enhance library services delivery in the future. Specifically, the integration of augmented and virtual reality can revolutionize user experiences.

Librarian 'B' advocates for the strategic fusion of artificial intelligence (Al) and location-based services within library operations.

Librarian 'C' emphasizes the importance of fostering community engagement through discussion forums.

Librarian 'D' recognizes the significance of providing eBooks in E-pub format directly to users' mobile devices, enhancing convenience and accessibility.

Librarian 'E' underscores the value of developing a dedicated library app, which can serve as a versatile gateway for patrons to access resources and services.

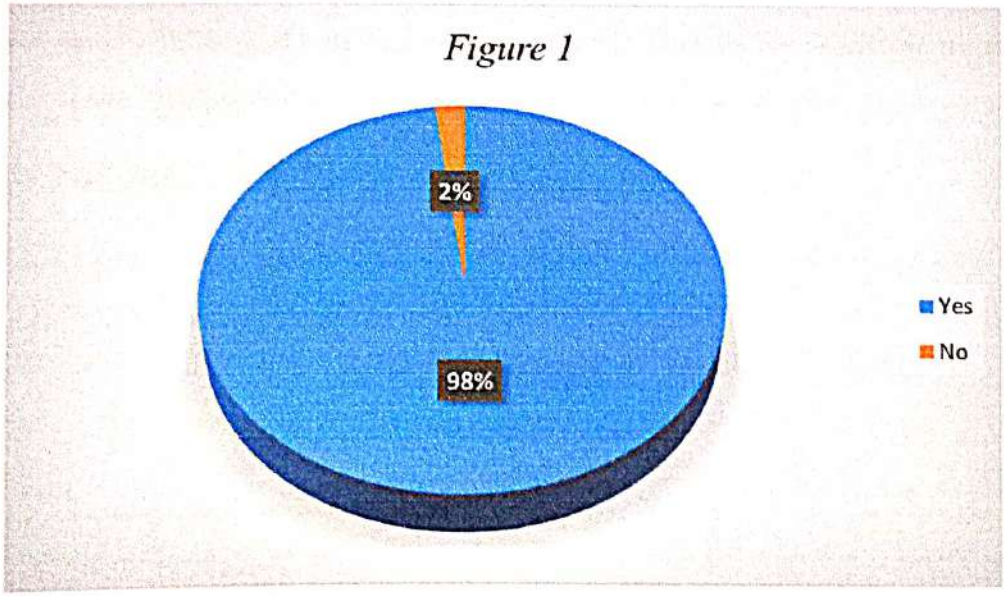
Librarian 'F' envisions a collaborative platform- a union blog-where users and librarians can actively share insights, articles, and research papers, fostering a dynamic exchange of knowledge within the library community.

5.3 USER'S ANALYSIS: -

Questionnaire was sent to user of the academic college libraries of Goa i.e. undergraduate, post graduate etc. Some through survey and through Google Forms. This study has been done to find out the viewpoint on Mobile Technology-based library services that are provided in their respective college library.

1. **Do you own a smartphone or tablet?**

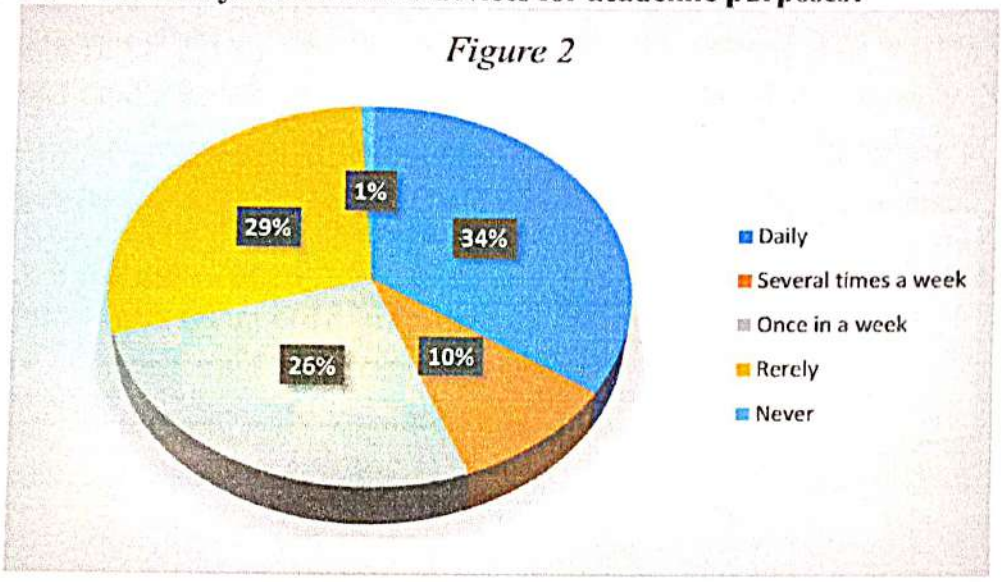
Figure 1



The pie chart illustrates that 98% of college library users, comprising both postgraduate and undergraduate students, possess either a smartphone or a tablet, while only 2% of the users do not own either of these devices.

2. **How often do you use mobile devices for academic purposes?**

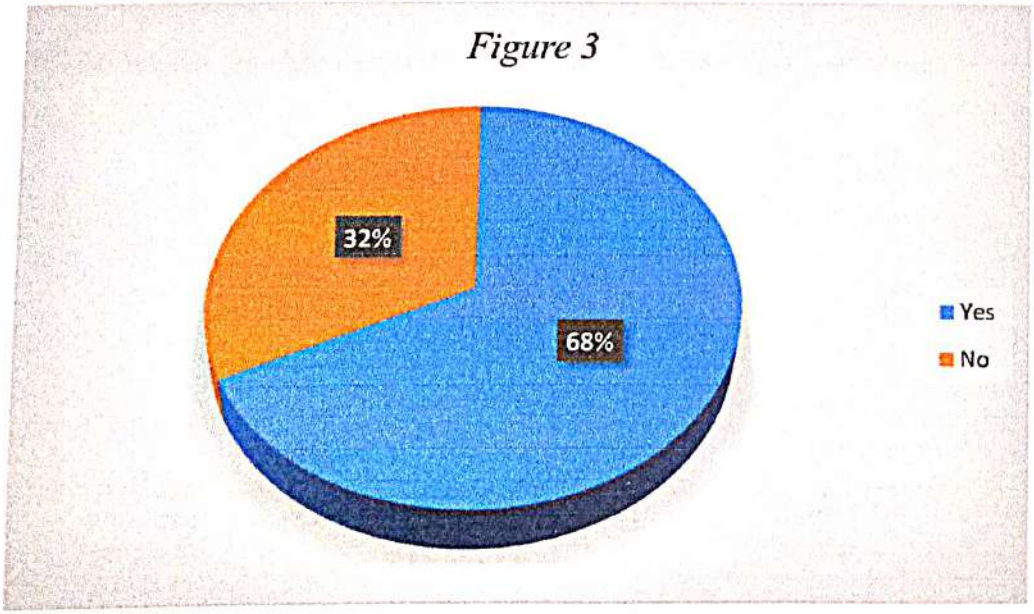
Figure 2



The provided data illustrates the frequency of mobile device usage for academic purposes among the surveyed users. Approximately 34% of the users utilize mobile devices for academic purposes on a daily basis, indicating a significant portion of the user base engaging with their devices regularly for academic activities. Around 10% of the users utilize mobile devices for academic purposes several times a week, while approximately 26% use them once a week. Moreover, nearly 29% of the users rarely use mobile devices for academic purposes, and a minimal 1% never engage in academic activities using mobile devices

3. **Is your library website user friendly?**

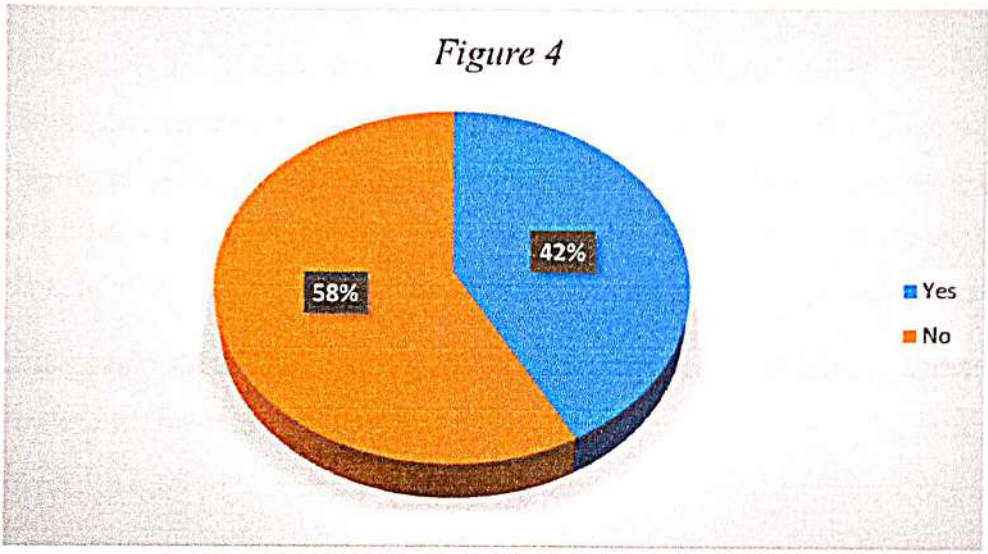
Figure 3



The data presented in the pie chart indicates that 68% of the surveyed users perceive their college library website as being user-friendly, while approximately 32% express the opposite sentiment, implying that they do not find the website to be user-friendly. This insight underscores the importance of evaluating and enhancing the user experience of the college library website to better meet the needs and expectations of its diverse user base.

4. **Are you aware of any library services that are made currently available through mobile technology? (e.g. Websites, app etc)**

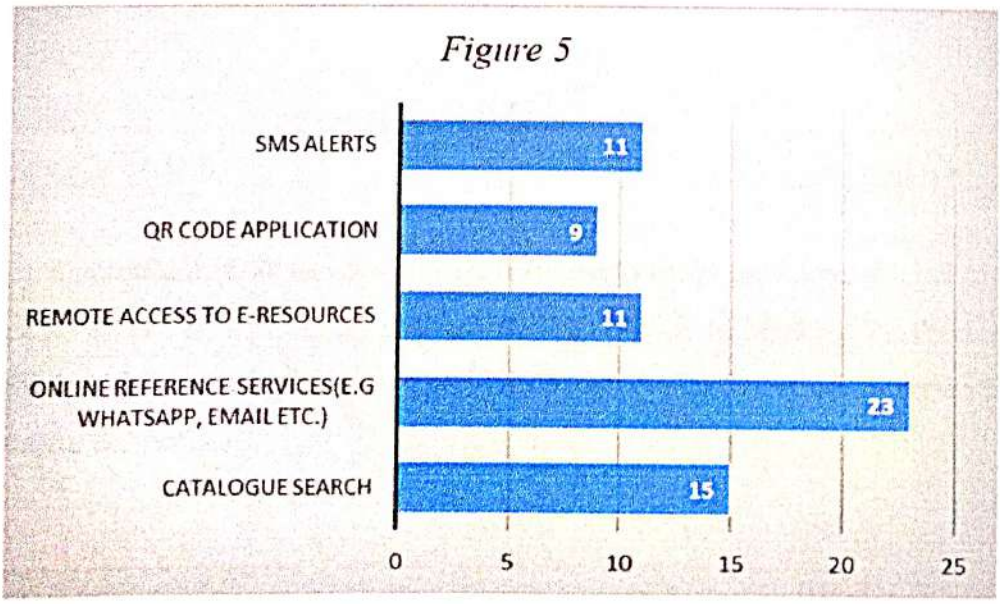
Figure 4



The pie chart data reveals that 42%% of college library users are aware of the library services available through mobile technology, while approximately 58% of users lack awareness regarding the same.

5. **If yes, which specific library services have you accessed or utilized?**

Figure 5

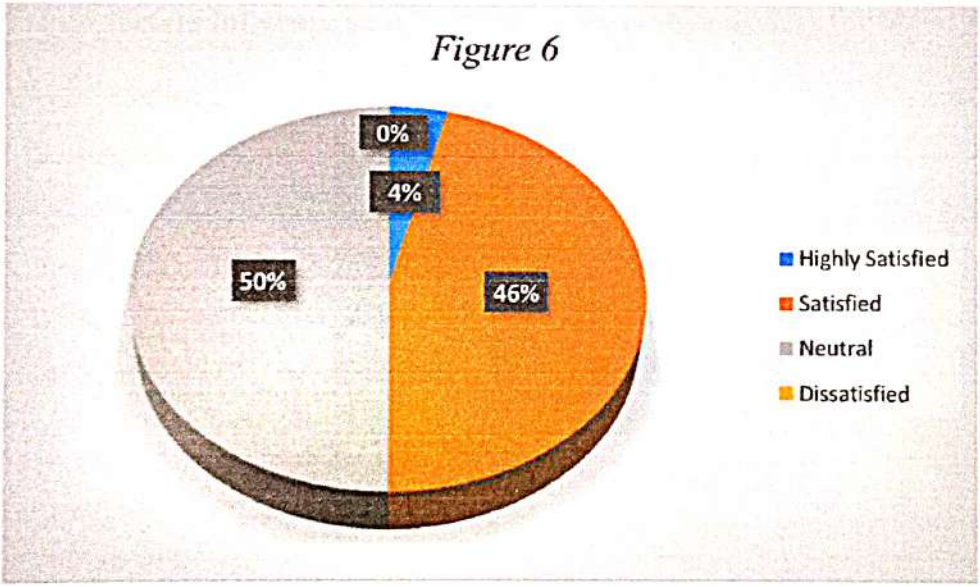


Particulars	Percentage
Catalogue Search	15
Online reference services(e.g WhatsApp, email etc.)	23
Remote access to e-resources	11
QR code application	9
SMS alerts	11

The data depicted in the table and bar graph reveals that approximately 15% of users have availed themselves of the catalogue search service provided by the college library. In addition, 23% of users have utilized online reference services, while 11% have made use of remote access to e-resources. Furthermore, 9% of users have employed the QR code application, and around 11% have taken advantage of the SMS alerts service offered by the college library

6. **Rate your satisfaction levels with the current delivery of library services through mobile technology?**

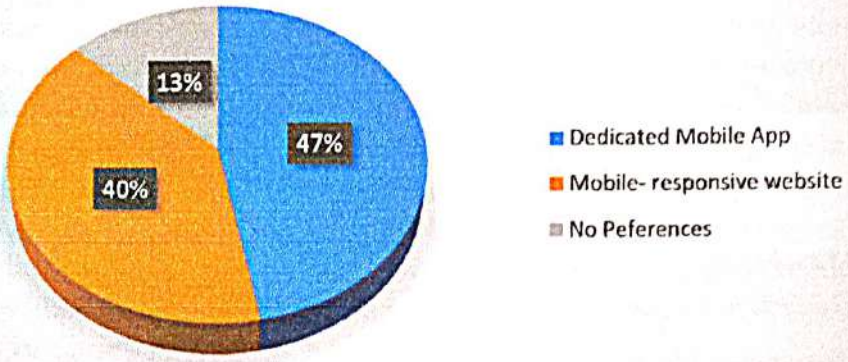
Figure 6



The study illustrates that 50% of the college library users express a neutral level of satisfaction with the current delivery of library services through mobile technology. Furthermore, 46% of users indicate satisfaction with the services, while a small percentage of 4% report being highly satisfied with the services

7. **Would you prefer to access library e-content and services through a dedicated mobile app or a mobile-responsive website?**

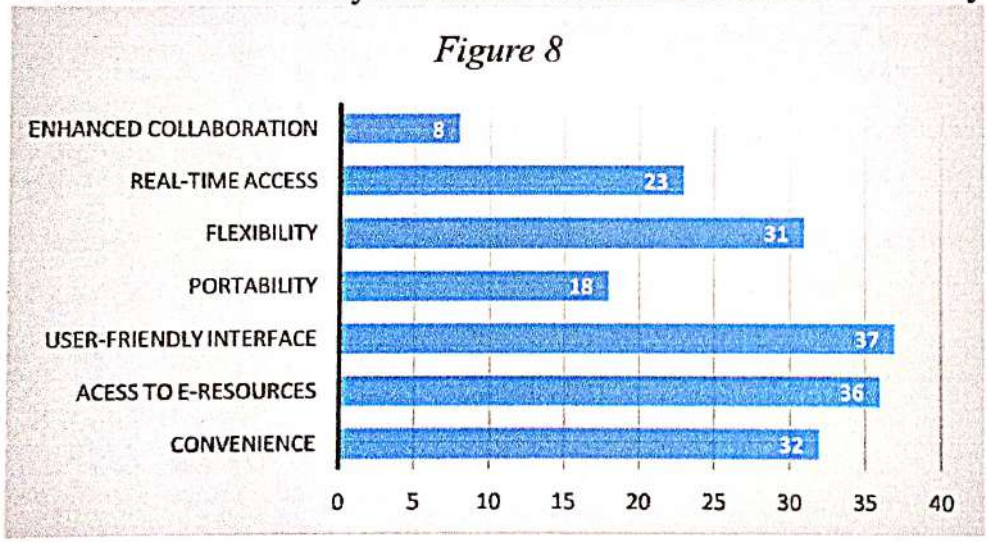
Figure 7



The observation indicates that 47% of college library users express a preference for a dedicated mobile app to access library e- content, while approximately 40% Favor a mobile-responsive website. Notably, around 13% of users have no specific preference regarding the means of accessing library e- content.

8. **Which factors influence your decision to use mobile devices for library services?**

Figure 8

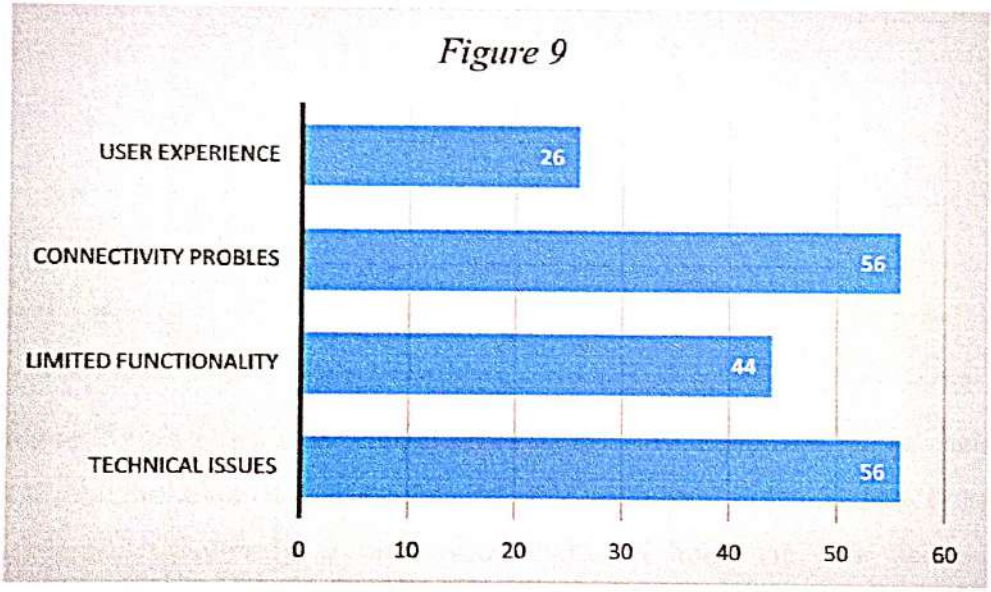


Particulars	Percentage
Convenience	32
Acess to e-resources	36
User-friendly interface	37
Portability	18
Flexibility	31
Real-time access	23
Enhanced collaboration	8

The above table and bar graph depict the influential factors driving the utilization of mobile devices for library services. The data reveals that: Approximately 32% of the respondent's cited convenience as a significant factor influencing their decision to use mobile devices for library services. About 36% of the participants indicated that access to electronic resources played a pivotal role in their decision-making process. A substantial 37% of the respondents highlighted the importance of a user-friendly interface in influencing their choice to use mobile devices for library services. A notable 18% of the participants acknowledged portability as a factor impacting their decision to utilize mobile devices for library services. Approximately 31% of the respondents identified flexibility as a key determinant in their decision to use mobile devices for library services.23% of the participants recognized real-time access as an influential factor in their decision to employ mobile devices for library services. A modest 8% of the respondents specified enhanced collaboration as a contributing factor to their decision to use mobile devices for library services

9. **What are the challenges encountered by you while using mobile devices to obtain library services?**

Figure 9

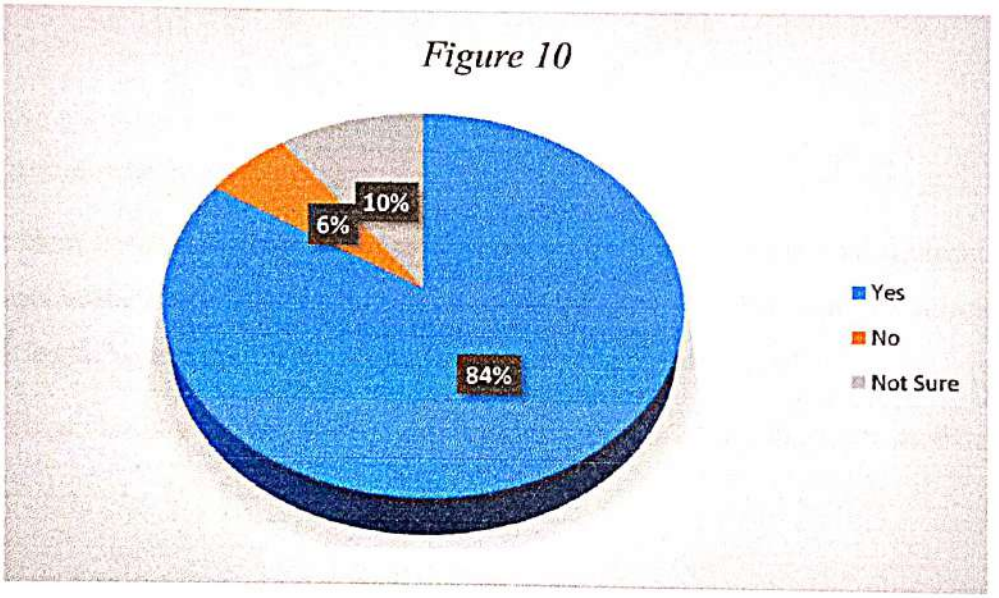


Particulars	Percentage
Technical issues	56
Limited Functionality	44
Connectivity probles	56
User Experience	26

The table and bar graph presented above illustrate the challenges experienced by users when utilizing mobile devices to access library services. The data reveals that the majority, accounting for 56% of the users, encountered technical issues while utilizing mobile devices to access library services. Nearly 44% of the users reported facing limitations in functionality when accessing library services through their mobile devices. A significant 56% of the users encountered connectivity issues while attempting to access library services on their mobile devices. Approximately 26% of the users expressed facing challenges related to user experience when utilizing mobile devices to access library services.

10. Do you think the library should invest more in mobile technology for better service delivery?

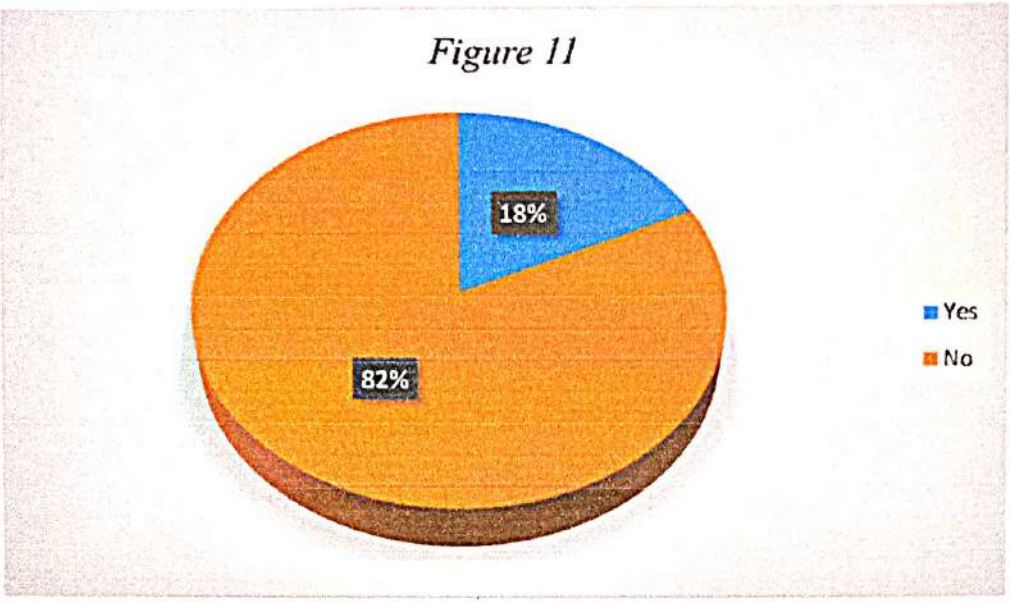
Figure 10



According to the pie chart, a significant majority, approximately 84% of the users, express a favourable opinion towards increased investment in mobile technology to enhance library service delivery. Conversely, a minority of about 6% holds the view that no additional investment is necessary, while roughly 10% of the users appear undecided about the prospect of further investment in mobile technology for improved library services.

11. Have you received any formal training on how to use mobile library services through your library?

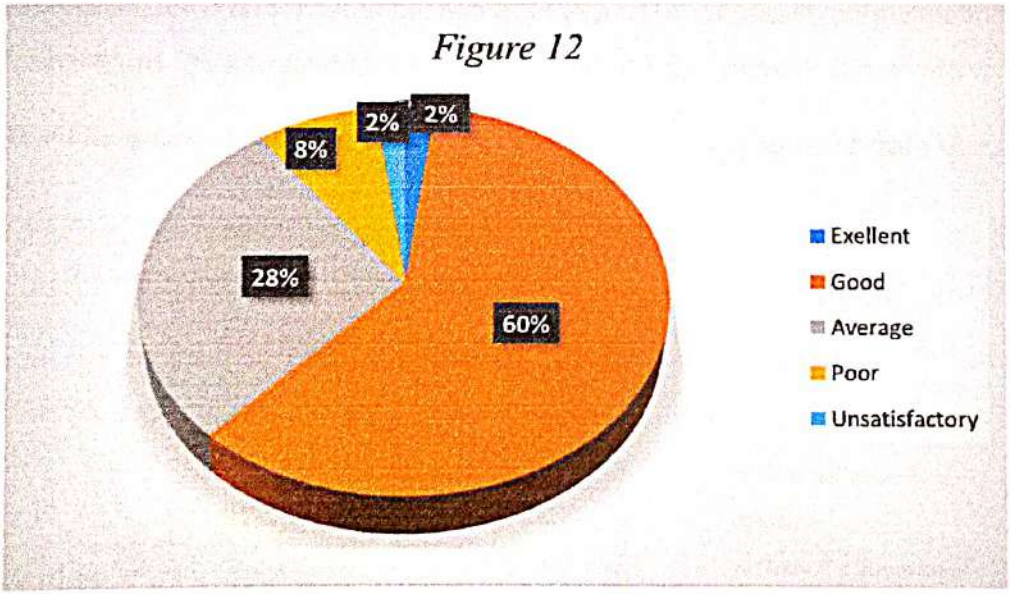
Figure 11



The pie chart illustrates that a mere 18% of users have undergone formal training in utilizing mobile technology-based library services through the library, while the overwhelming majority, constituting 82%, has not received any formal training in this regard.

12. How would you rate the overall user experience of the library's mobile services?

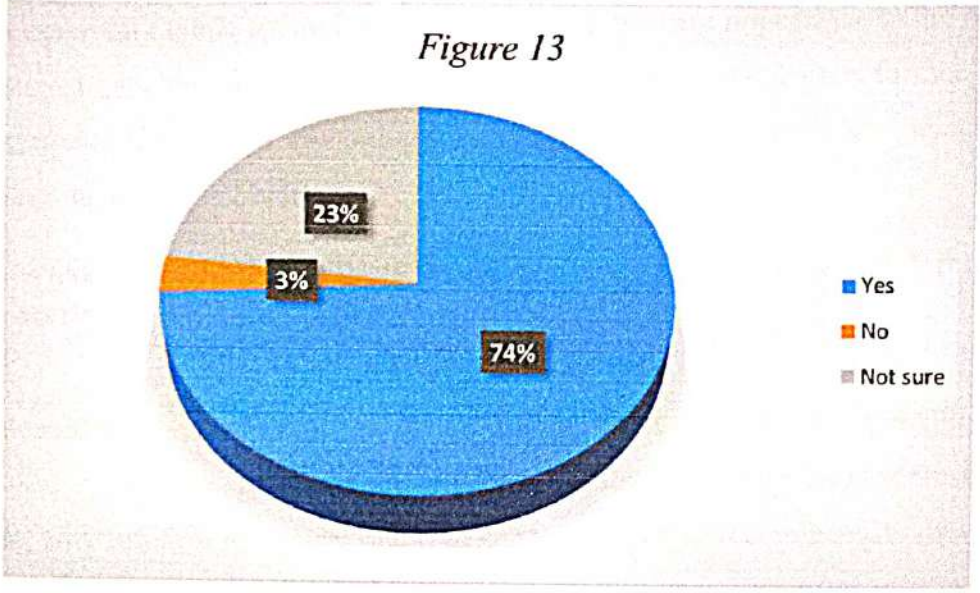
Figure 12



The pie chart depicts the distribution of user rating for overall experience of mobile technology-based library services. It is evident that the majority of users, consisting 69% reported having a positive experience. Additionally, 28% of users rated their experience as average, while 8% expressed dissatisfactions, indicating poor experience. A smaller portion of users, approximately 2% each, reported having an excellent and unsatisfactory experience.

13. Do you think higher usage of mobile technology can improve library services for academic purposes?

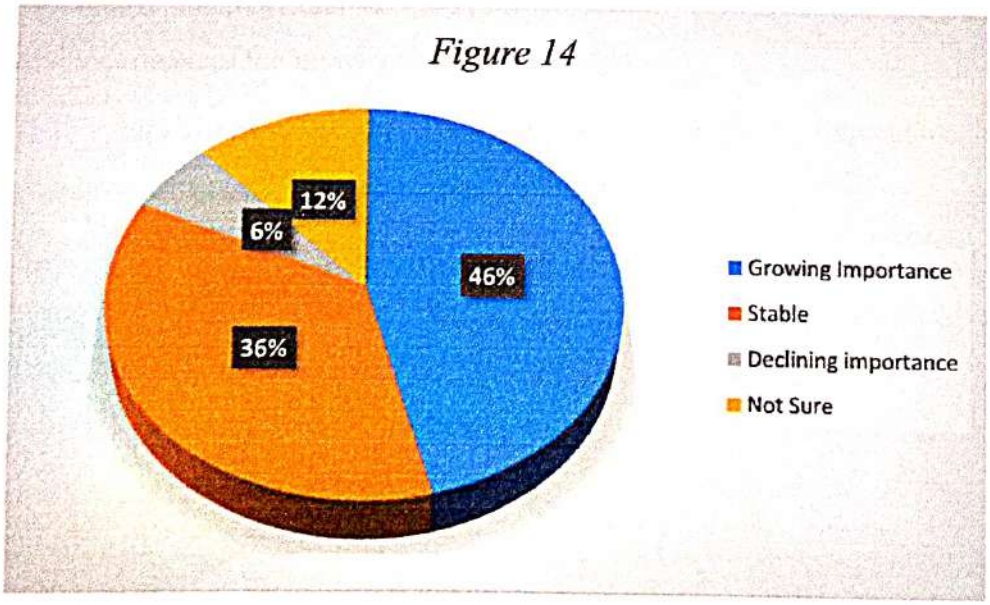
Figure 13



The provided pie chart illustrates the perceptions of users regarding the potential improvement of library services for academic purposes through increased usage of mobile technology. The data indicates that a significant majority of users, comprising 74%, believe that higher usage of mobile technology can enhance library services for academic purposes. Furthermore, 23% of users expressed uncertainty about the potential impact of increased mobile technology usage, while a minority of 3% expressed the view that it would not improve library services for

14. How do you perceive the future of mobile technology in academic libraries?

Figure 14



The provided pie chart illustrates the responses of library users regarding their perceptions of the future importance of mobile technology in academic libraries. The data reveals that 46% of users believe that mobile technology will experience growing importance in the future, while 36% anticipate its importance to remain stable. Additionally, 6% of users foresee a decline in the importance of mobile technology, and 12% expressed uncertainty about its future importance in academic libraries.

15. What features or functions would you like to see incorporated into a mobile service?

User 'A' said that he/she would like to have Library Chatbots. Integrating intelligent chatbots within library services can facilitate real-time interactions with users, addressing queries, assisting with resource discovery, and providing personalized recommendations.

User 'B' said that he/she would like to have Robust Internet Connectivity.Ensuring reliable and high-speed internet connectivity across the campus is pivotal for seamless utilization of mobile technology-based library services. A

User 'C' said he/she would like to attend Interactive Events. Organizing interactive events within the library ecosystem fosters community engagement.

User 'D' said that about Virtual Bookshelf. Implementing a virtual bookshelf allows users to organize and manage their digital collections effectively.

User 'E' talked about Virtual and Augmented Reality (VR/AR). Leveraging VR and AR technologies enhances the immersive library experience.

User 'F' said about Enhanced eBook Availability and Flexibility. Expanding the availability and flexibility of eBooks caters to diverse user preferences.

User 'G' talked about User-Friendly Interface. Designing an intuitive and user-friendly interface is paramount.

CHAPTER VI

OBSERVATIONS, FINDINGS, SUGGESTIONS & CONCLUSION

6.1 INTRODUCTION

The chapter highlights the data interpretation's result, suggestion and conclusion. This chapter investigates the data of 'Library Professionals' and the 'Library users' perspective on the use of mobile technology in improving the quality of Library services in this new technological era.

6.2 OBSERVATION AND FINDINGS FROM LIBRARIANS' RESPONSES

This study revealed the perception of Library Professionals working at the academic colleges in Goa on application and use of Mobile Technology in improving library service quality.

1. The study depicts the distribution of librarians based on their familiarity with mobile technology for delivering library services. Specifically, it shows that 59% of librarians are highly familiar with mobile technology, while 34% have a moderate level of familiarity, and 7% are only partially familiar with using mobile technology for delivering library services.
2. The study disclosed that nearly 100% of libraries are employing mobile technology for delivering services. This indicates a widespread embrace of emerging technologies and tools by libraries to enhanced the provision of their services.
3. It is observed that approximately 27.5% of libraries offer app- based services, while about 82.7% provide online reference services and access to OPAC/Catalogue. Furthermore, 44.8% of libraries have mobile-responsive websites, and 75.8% provide remote access to e-resources. Additionally, nearly 48.2% of libraries receive user feedback via mobile phones, and approximately 3.4% offer information dissemination and SDI services. Here we can clearly notice that different kinds of mobile technology-based library services are provided to the users by different libraries.
4. According to the study, 90% of the librarians have been actively involved in the implementation of mobile technology-based library services in their college libraries, while 10% have not been involved in this implementation.
   The high percentage of librarians involved in implementing mobile technology-based library services suggests a widespread recognition of the importance of leveraging technology to enhance library services. This trend aligns with the increasing reliance on mobile devices for accessing information and signifies a proactive approach by librarians to adopt to evolving technology in the pursuit of proving better library services.
5. The study found out that a significant majority, comprising 76% of libraries, frequently offer mobile technology-based library services. Additionally, approximately 21% of libraries provide these services upon user request, while a mere 3% of libraries do so infrequently.it clearly demonstrates the prevalence of mobile technology-based library services, with majority of libraries actively incorporating these services into their

regular offerings. This also shows the widespread integration of modern technology into library services catering to the evolving needs and preferences of library patrons.

6. The observation indicates that a significant majority, comprising 62% of librarians, consider the convenience of accessing library services at various locations through mobile technology to be very important. This suggests a strong emphasis on the need for mobile technology to facilitate library services. Furthermore, the data reveals that 31% of librarians deem this convenience as important, signifying a considerable proportion of individuals who recognize the value of mobile technology for accessing library services. Additionally, approximately 7% of librarians expressed a neutral stance on the matter. This suggest that while the majority hold strong opinion on the importance of mobile technology for accessing library services, there is still notable minority whose views are more ambivalent.
7. The study illustrates the perceptions of librarians regarding the effectiveness of mobile technology in engaging patrons who may not visit a physical library. According to the data, 72% of the librarians found mobile technology to be very effective in this regard, while 21% considered it effective. Additionally, approximately 4% of the librarians found it to be a neutral factor, and a minimal 3% deemed it to be ineffective. This data indicates a strong consensus among librarians regarding the positive impact of mobile technology in reaching out to patrons who may not physically visit the library. The overwhelming majority of respondents classified it as either very effective or effective, suggesting a widespread recognition of the value that mobile technology brings to engaging patrons in today's digital age. The relatively low percentages of neutral and ineffective responses further emphasize the overall positive perception of mobile technology's role in library engagement.
8. The study found out that 55% of librarians measure the effectiveness of mobile technology in enhancing library services through user feedback. This indicates a significant reliance on direct input from users to assess the impact of mobile technology on library services and 45% of librarians measure the effectiveness of mobile technology in enhancing library services through usage statistics. This suggests that a considerable portion of librarians rely on quantitative data such as usage statistics to evaluate the impact of mobile technology on library services. These findings highlight the importance of both qualitative (user feedback) and quantitative (usage statistics) methods in assessing the impact of mobile technology on library services, demonstrating a balanced approach to evaluating the effectiveness of technological enhancements in libraries.
9. 82.7% of librarians found the integration of mobile technology to be beneficial as it enhances access to library resources. This finding underscores the positive impact of mobile technology in breaking down barriers to accessing scholarly materials, thereby potentially enriching the academic pursuits of students and faculty. 89.6% of librarians recognized the benefit of mobile technology integration in terms of improving convenience for patrons.58.6% of librarians acknowledged the beneficial impact of mobile technology integration on community outreach. This finding suggests that mobile technology can serve as a valuable tool for engaging with and extending library services to a broader community, potentially fostering community, potentially fostering greater inclusivity and engagement. The findings underscore the increasingly pivotal role of mobile technology in shaping the modern academic library landscape, not only

in facilitating access to resources and services This observation underscores the role of mobile technology in streamlining access to library services and resources.

10. It is notable that 51.7% of libraries identified staff training as their primary challenge, while approximately 44.8% cited user acceptance as a significant obstacle. Moreover, an overwhelming 79.3% of libraries noted technical support as their primary challenge, with about 37.9% indicating budget constraints as a major hurdle in the implementation of mobile technology-based library services.
11. It is evident that the facilitation of mobile technology-based library services necessitates various infrastructural components. Notably, 93.1% of librarians identified high-speed internet servers as a significant requirement for such services, with 55.1% emphasizing the need for appropriate software, and 44.8% indicating the necessity of hardware such as computers and hard disks.
12. The study showed that 59% of the surveyed libraries possess a QR code application, whereas 41% do not have this feature.
13. It is observed that the predominant use of library QR applications is for linking to the library catalogue, accounting for 58.6% of the respondents. This signifies a substantial reliance on QR technology for accessing library resources. Furthermore, the data reveals that 20.6% of the respondents utilize QR applications for accessing accessible formats, indicating a significant but notably lower usage in comparison to linking to the library catalogue. In addition, a smaller percentage, specifically 6.8% of the respondents, reported using QR applications for contact tracing purposes within the library setting. This usage, while relatively minimal, suggests a potential role for QR technology in promoting safety measures within library spaces. Overall, the findings emphasize the diverse applications of QR technology within library environments, with a notable emphasis on accessing library catalogues and a growing interest in facilitating accessibility and safety measures through QR applications.
14. The study provides a comprehensive overview of the prevalence of mobile responsive websites among libraries. According to the chart, 62% of the represented libraries have integrated mobile responsive design into their websites, indicating a substantial majority that have recognized the importance of catering to users accessing their platforms through mobile devices. Conversely, 38% of the libraries are yet to adopt mobile responsive website design, signifying a notable proportion that may be at a disadvantage in terms of providing an optimal user experience for visitors accessing their websites via mobile devices. This data underscores the significance of mobile responsive website design in the context of libraries, highlighting a need for further attention to ensure that all libraries are equipped to provide an inclusive and user-friendly online experience, irrespective of the device used for access.
15. The study indicates various features available on library websites. These features include the ability for users to renew books/documents, with 51.7% of libraries offering this service. Furthermore, 55.1% of libraries allow users to reserve books/documents through their website. Moreover, a notable 10.3% of libraries enable users to pay fines through their website, while an overwhelming 86.2% of library websites provide crucial details such as library contact information and operating hours. Furthermore, a small percentage of libraries, at 3.4%, allow users to recommend books, download previous question papers and syllabi, and access faculty publications and newspaper clippings through their website. This data provides valuable insights into the range of services

offered by library websites, highlighting the diverse ways in which users can engage with and benefit from these online platforms.

16. It is noticeable that a significant majority of library management software systems prioritize user engagement and communication by incorporating alert functionalities. This feature likely serves to notify users about due dates, over dues, or other pertinent information related to the resources they have borrowed. Conversely, a smaller proportion of library management software systems appear not to have integrated this alert feature, which may suggest varying priorities or functionalities within these systems. This disparity in alert provision among library management software systems underscores the diversity in features and capabilities offered within the library technology landscape, potentially reflecting differing user needs and preferences.
17. The aforementioned pie chart illustrates that 76% of librarians express a preference for offering SMS alerts to users upon book issuance or when their books are due for return, while 24% indicate a lack of interest in providing this service.
18. The pie chart above illustrates that a significant majority, comprising 79% of librarians, have not undergone any formal training or professional development pertaining to the utilization of mobile technology for library services. Conversely, a minority, constituting 21% of librarians, have received training in this area.
19. Librarian 'A' emphasis the safeguarding pf security and privacy for library users within realm of mobile technology by implementing robust measures such as data encryption, authentication and authorisation.

    Librarian 'B' said that they address this problem by organizing awareness programs, thereby fostering informed practices among library users.

    Librarian 'C' said that they adopt a principled stance by declining the services that accumulate excessive user data, thereby prioritizing privacy and ethical consideration
20. Librarian 'A' underscores the potential of advancements in mobile technology to enhance library services delivery in the future. Specifically, the integration of augmented and virtual reality can revolutionize user experiences, while mobile transactions offer streamlined access to library resources.

    Librarian 'B' advocates for the strategic fusion of artificial intelligence (AI) and location-based services within library operations. This synergy can lead to personalized and context-aware services, ultimately benefiting patrons.

    Librarian 'C' emphasizes the importance of fostering community engagement through discussion forums. Additionally, a focus on improving accessibility features and harnessing AI technologies aligns with the evolving needs of library users.

    Librarian 'D' recognizes the significance of providing eBooks in E-pub format directly to users' mobile devices, enhancing convenience and accessibility.

    Librarian 'E' underscores the value of developing a dedicated library app, which can serve as a versatile gateway for patrons to access resources and services.

    Librarian 'F' envisions a collaborative platform- a union blog-where users and librarians can actively share insights, articles, and research papers, fostering a dynamic exchange of knowledge within the library community.

6.3 OBSERVATION AND FINDINGS FROM USERS' RESPONSES: -

1. A significant majority, 98%, of the surveyed users possess either a smartphone or a tablet, indicating a high level of technological integration among the student body. This data suggests a widespread reliance on mobile devices for academic and personal purposes, highlighting the need for digital resources and services within the college library to cater to this prevalent trend. The 2% minority of users who do not own a smartphone or tablet may represent a smaller, but still noteworthy, cohort that may require alternative or traditional library resources and services.
   The findings emphasize the importance of ensuring that the library's offerings are accessible and optimized for mobile platforms to effectively engage and support the technological needs of the student population.
2. The provided data illustrates the frequency of mobile device usage for academic purposes among the surveyed users. Approximately 34% of the users utilize mobile devices for academic purposes on a daily basis, indicating a significant portion of the user base engaging with their devices regularly for academic activities. Around 10% of the users utilize mobile devices for academic purposes several times a week, while approximately 26% use them once a week. Moreover, nearly 29% of the users rarely use mobile devices for academic purposes, and a minimal 1% never engage in academic activities using mobile devices. These findings shed light on the diverse patterns of mobile device utilization for academic purposes among the surveyed users, emphasizing the need for tailored digital resources and services to accommodate these varying usage frequencies.
3. It is observed that 68% of the surveyed users perceive their college library website as being user-friendly, while approximately 32% express the opposite sentiment, implying that they do not find the website to be user-friendly. This insight underscores the importance of evaluating and enhancing the user experience of the college library website to better meet the needs and expectations of its diverse user base.
4. The pie chart data reveals that 42% of college library users are aware of the library services available through mobile technology, while approximately 58% of users lack awareness regarding the same. This indicates a need for increased promotion and communication of the mobile technology services offered by the college library to enhance user engagement and utilization of these resources.
5. The findings from the table and bar graph underscore the varying degrees of engagement with different services offered by the college library. Approximately 15% of users have utilized the catalogue search service, indicating a moderate level of engagement with this specific resource. This may suggest a need for further promotion or enhancement of the catalogue search service to increase user uptake and maximize its utility. A notable 23% of users have engaged with online reference services, implying a relatively higher level of utilization and potentially highlighting the value and convenience of this particular offering to the user base. The data shows that 11% of users have made use of remote access to e-resources. While this percentage is lower than online reference services, it still indicates a noteworthy portion of the user base utilizing this service, emphasizing the importance of providing convenient access to electronic resources for academic pursuits. The utilization of the QR code application by 9% of users and the SMS alerts service by about 11% of users suggests a moderate level of engagement with these technologies. These findings may encourage further

exploration into the factors influencing user adoption of these services and potential strategies for increasing their usage and effectiveness. These insights provide valuable guidance for the college library in refining its service offerings, communication strategies, and technological implementations to better cater to the diverse needs and preferences of its user base.

6. The study illustrates that 50% of the college library users express a neutral level of satisfaction with the current delivery of library services through mobile technology. Furthermore, 46% of users indicate satisfaction with the services, while a small percentage of 4% report being highly satisfied with the services. This insight emphasizes the need for further analysis to understand the factors contributing to the neutral sentiment and to potentially enhance the mobile technology services provided by the college library to meet the varying satisfaction levels of its user base.
7. The observation indicates that 47% of college library users express a preference for a dedicated mobile app to access library e- content, while approximately 40% Favor a mobile-responsive website. Notably, around 13% of users have no specific preference regarding the means of accessing library e- content. These findings highlight the varying user preferences for accessing library resources via mobile technology, which can inform the development and prioritization of mobile platforms and services to best cater to the needs of the user base.
8. The data reveals that Approximately 32% of the respondent's cited convenience as a significant factor influencing their decision to use mobile devices for library services. About 36% of the participants indicated that access to electronic resources played a pivotal role in their decision-making process. A substantial 37% of the respondents highlighted the importance of a user-friendly interface in influencing their choice to use mobile devices for library services. A notable 18% of the participants acknowledged portability as a factor impacting their decision to utilize mobile devices for library services.

   Approximately 31% of the respondents identified flexibility as a key determinant in their decision to use mobile devices for library services.

   23% of the participants recognized real-time access as an influential factor in their decision to employ mobile devices for library services.

   A modest 8% of the respondents specified enhanced collaboration as a contributing factor to their decision to use mobile devices for library services. This empirical evidence underscores the multifaceted nature of the factors influencing the adoption of mobile devices for accessing library services, shedding light on the diverse considerations that inform users' choices in this domain.
9. The data illustrate the challenges experienced by users when utilizing mobile devices to access library services. It reveals that the majority, accounting for 56% of the users, encountered technical issues while utilizing mobile devices to access library services. This indicates a noteworthy hindrance in the seamless utilization of library resources through mobile platforms.

   Nearly 44% of the users reported facing limitations in functionality when accessing library services through their mobile devices. This suggests a substantial portion of users experienced constraints in the range of services or features available to them via mobile platforms.

   A significant 56% of the users encountered connectivity issues while attempting to access library services on their mobile devices. This highlights a prevalent challenge in

maintaining a stable and reliable connection for accessing library resources via mobile technology.

Approximately 26% of the users expressed facing challenges related to user experience when utilizing mobile devices to access library services. This points to aspects such as interface usability, navigation, and overall satisfaction with the mobile library service experience. It is evident from the data that a significant portion of users encountered various issues.

10. It is observed that a significant majority, approximately 84% of the users, express a favourable opinion towards increased investment in mobile technology to enhance library service delivery. Conversely, a minority of about 6% holds the view that no additional investment is necessary, while roughly 10% of the users appear undecided about the prospect of further investment in mobile technology for improved library services. These findings underscore the prevalent inclination towards increased investment in mobile technology to augment the quality of library service delivery.
11. The pie chart illustrates the distribution of formal training received by users in utilizing mobile technology-based library services through the library. It indicates that only 18% of users have undergone formal training, while a substantial 82% have not received any formal training in this area. This suggests a significant gap in the provision of formal training for utilizing mobile technology-based library services, which may impact the effective utilization of these resources by the majority of ↓ users.
12. The user ratings for mobile technology-based library services present a comprehensive overview of user satisfaction and experience. The substantial majority of users, accounting for 69%, reported having a good experience with the mobile technology-based library services. This signifies a commendable level of satisfaction among the users. Although a significant portion of users had a positive experience, the 28% who rated their experience as average reflects a potential area for improvement. Understanding the factors contributing to this average rating can aid in enhancing the overall user experience.

    The 8% of users who reported a poor experience necessitate immediate attention. Identifying the pain points and addressing them can help mitigate dissatisfaction and improve the quality of service provided.

    While the percentages of users reporting excellent and unsatisfactory experiences are relatively low (2% each), they are still noteworthy. Understanding the aspects that led to these extreme ratings can provide valuable insights for further enhancement. of user ratings underscores the significance of continually refining mobile technology-based library services to meet user expectations and enhance overall satisfaction. Understanding the nuances behind each rating category can guide strategic improvements to elevate the user experience.
13. The data on user perceptions regarding the influence of increased mobile technology usage on library services for academic purposes provides valuable insights.The substantial majority of users, encompassing 74%, hold a positive stance on the potential of higher mobile technology usage to enhance library services for academic purposes. This indicates an optimistic view regarding the integration of mobile technology into academic library services. The 23% of users who expressed uncertainty about the impact of increased mobile technology usage signify a notable segment of the user base. Understanding the reasons behind this uncertainty can help identify areas for clarification and potential concerns that need to be addressed. A small proportion of

users, approximately 3%, hold the viewpoint that increased mobile technology usage would not improve library services for academic purposes. Exploring the rationale behind this scepticism can provide valuable insights into potential drawbacks or reservations regarding the integration of mobile technology in academic libraries. The overwhelmingly positive perception of a majority of users suggests a favourable environment for the integration of mobile technology into library services for academic purposes. However, it is crucial to address the concerns of the uncertain and sceptical segments to ensure a comprehensive and well-received implementation strategy.

14. The observation pertaining to user perceptions on the future importance of mobile technology in academic libraries offer valuable implications:

    The plurality of users, constituting 46%, foresee a growing significance of mobile technology in academic libraries. This perception suggests an expectation of increased integration and utilization of mobile technology to cater to evolving academic needs.

    A substantial portion of users, comprising 36%, hold the belief that the importance of mobile technology in academic libraries will remain stable. This viewpoint indicates a level of confidence in the enduring relevance and utility of mobile technology for academic purposes.

    A notable minority of users, approximately 6%, expressed the perspective that mobile technology will experience declining importance in academic libraries. Understanding the underlying reasons for this outlook can provide insights into potential apprehensions or perceived challenges related to the sustained relevance of mobile technology. The 12% of users who expressed uncertainty about the future importance of mobile technology in academic libraries represent a segment requiring further exploration. In summary, the analysis of user perceptions regarding the future importance of mobile technology in academic libraries emphasizes the need for a comprehensive understanding of user expectations and concerns. This understanding can guide strategic planning and initiatives aimed at leveraging mobile technology to meet the evolving needs of academic library users.

15. User 'A' said that he/she would like to have Library Chatbots. Integrating intelligent chatbots within library services can facilitate real-time interactions with users, addressing queries, assisting with resource discovery, and providing personalized recommendations. These automated conversational agents enhance efficiency and user engagement.

    User 'B' said that he/she would like to have Robust Internet Connectivity. Ensuring reliable and high-speed internet connectivity across the campus is pivotal for seamless utilization of mobile technology-based library services. A robust network infrastructure enables efficient access to digital resources, online catalogues, and collaborative platforms.

    User 'C' said he/she would like to attend Interactive Events. Organizing interactive events within the library ecosystem fosters community engagement. Workshops, author talks, book clubs, and collaborative learning sessions create a vibrant space for knowledge exchange and social interaction.

    User 'D' said that about Virtual Bookshelf. Implementing a virtual bookshelf allows users to organize and manage their digital collections effectively. Users can curate personalized reading lists, track borrowed materials, and seamlessly transition between physical and digital formats.

User 'E' talked about Virtual and Augmented Reality (VR/AR). Leveraging VR and AR technologies enhances the immersive library experience. Virtual tours, interactive historical reconstructions, and 3D visualizations of rare artifacts enrich learning opportunities and captivate users.

User 'F' said about Enhanced eBook Availability and Flexibility. Expanding the availability and flexibility of eBooks caters to diverse user preferences. Offering a wide range of titles, supporting multiple formats (such as E-pub files), and enabling offline access ensures convenient and adaptable reading experiences.

User 'G' talked about User-Friendly Interface. Designing an intuitive and user-friendly interface is paramount. Clear navigation, efficient search functionalities, personalized recommendations, and accessible features contribute to a positive user experience. Incorporating these features thoughtfully can elevate mobile technology-based library services, aligning them with evolving user needs and technological advancements.

6.4 SUGGESTIONS

1. Develop user-friendly mobile apps that provide seamless access to library resources. These apps should allow users to search the catalogue, check out books, receive notifications, and access e-resources. Can provide interactive maps within the app to guide users to specific sections, study areas, and service desks.
2. Create virtual tours of the library using augmented reality (AR) or virtual reality (VR) technologies. These tours can help users explore the library layout, locate sections, and learn about available services.
3. It is observed in the study that even though all college library provides mobile technology-based library services still majority of users i.e. students of the college are not utilizing these services because they are not aware of these services. Some ways to create awareness about the same;
4. Collaborate with Faculty. Work closely with faculty members to integrate library resources into course syllabi. Encourage professors to recommend specific e-books or articles to students.
5. Social Media Campaigns. Leverage social media platforms to create awareness. Share success stories, library tips, and updates about new services. Encourage users to follow the library's social media accounts.
6. Library Ambassadors. Appoint student library ambassadors who can promote library services among their peers. These ambassadors can organize events, create content, and encourage library usage.
7. Collaborate with Student Organizations. Partner with student clubs and organizations to host library-related events. Offer incentives for participation, such as book giveaways or library swag.
8. It is observed in the study that library most library face challenges in implementing mobile technology-based services because of technical support. Library should work to solve the problem of technical support require to provide mobile technology-based library services.

9. The whole concept of mobile technology-based library services is totally based on network and the study shows both librarian and user face this issue so more efforts should be done to improve the network.
10. Academic libraries urgently need to develop website with mobile view interface. it is observed that many libraries do not have mobile responsive website. When any user opens the website on their mobile phones it doesn't open appropriately due to their resolution and design/format.
11. The Management should provide some sort of formal training to the librarians on the role and the usage of mobile technology-based library services as well as its adaptation and use in libraries. Due to this training they will able to fully appreciate and support the use of mobile technology in libraries.
12. Users should also receive formal training to gain knowledge about mobile technology-based library services so that they can utilize these services.
13. Collaborative platform can be formed like a union blog-where users and librarians can actively share insights, articles, and research papers, fostering a dynamic exchange of knowledge within the library community.
14. Library can also use Artificial Intelligence within library operation for better services delivery.

6.5 CONCLUSION

In this technological era, many new latest technologies and tools are being developed, introduced in order to meet the needs of its users in every field of life. Mobile technology has become a very important part of our lives nowadays. As we, people also demand for the latest, fastest and easiest way to sort out their problem. In library, users also demand for the latest, fast and easy access to pertinent information this has created pressure on the library professionals and this is the reason why libraries have to reconfigure their existing traditional services and adapt to mobile- based-services. Mobile applications can support learning by making library resources omnipresent, by bringing new users to the library through increasing accessibility to the library resources, and also creating a good communication, good relation between patrons and libraries.

There is need to increase or to raise the awareness on the value of Mobile library services in libraries. So that the users can take advantage of this new services from their mobile phones from anywhere. Application of this mobile based services, definitely the library professionals and other staff of the libraries required training. The library professionals must overcome number of challenges with this technology if they wanted to be functional in libraries.

Almost all the academic colleges of Goa state offered or provided at least one mobile based services and majority of the libraries offered or provided multiple services. To be functional in libraries, the library professionals must overcome numerous challenges with mobile technology/mobile based services, particularly in our developing country, India where there is a lack of financial constraints, lack of resources, and lack of awareness of these mobile technologies and how to implement them properly for the better functions of library. Mobile applications have bridged geographical boundaries, allowing users to access library resources in real-time. Whether it's searching for scholarly articles, checking out e-books,

or receiving notifications, mobile technology has facilitated seamless interactions between libraries and their patrons.

Students and library patrons expect services to be delivered through mobile technology. As libraries continue to evolve, they must prioritize mobile-friendly solutions to meet user demands effectively. The adoption of mobile technology in college libraries has revolutionized the way information is accessed and shared. By embracing innovative mobile solutions, libraries can continue to provide efficient and effective services to their diverse user base.

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LIST OF THE COLLEGES OF GOA UNDER STUDY

1. Parvatibai Chowgule college of Arts and Science,Margao
2. St.Joseph Vaz College
3. GVMs Gopal Govind Poy Raiturcar
4. Government College of Commerce and Economics, Borda
5. MES Vasant Joshi college Zuarinagar
6. Sant. Sohirobanath Ambiye Government College of arts and commerce Virnoda Pernem Goa
7. The CES College of Arts and Commerce, Cuncolim Goa
8. Narayan Zantye College of Commerce
9. Government College of Arts, Science and Commerce Quepem Goa
10. Govt.College Khandola
11. V.M.Salgaocar College of Law
12. Fr. Agnel College of Arts & Commerce, Pilar, Goa
13. GVM's Dr Dada Vaidya College of Education
14. NIE
15. PES RSN college of arts and science, Farmagudi Ponda Goa
16. GPCOE
17. Vidya Prabodhini College
18. D. C. T's S. S. Dempo College of Commerce and Economics
19. SES's Sridora Caculo College of Commerce and Management Studies
20. Rosary College of Commerce & Arts
21. Swami Vivekanand vidyaprasarak Mandal's college of Commerce
22. Carmel College of Arts, Science and Commerce for Women
23. Kala Academy Goa's College of Theatre Arts
24. Mandre College of commerce, economics and management
25. Dnyanprassarak Mandal's College and Research Centre
26. DPM's SHREE MALLIKARJUN & Shri Chetan Manju Desai College, Canacona Goa
27. Government College Sanquelim
28. Goa college of home science
29. Dhempe college of Arts and Science

Use of Mobile Technology for providing library services in Academic College library of North Goa: A study

INTRODUCTION

Systems implementation is a major organisational investment and a crucial indicator of successful implementation is employees utilising the new technologies competently. Persuading users to accept and integrate new information technologies persists an on-going challenge implicit in the implementation of new information systems. Institutions of higher developing information and communication technology.

The ability to gain information anywhere, anytime Is increasing. in other words, the process of getting information need not separate the user from their normal activities or routines. This trend leads towards delivery of library services through mobile. Mobile Technology has now come up with "libraries in hand" trend. Librarians are in move to determine these devices that are affecting information access and ensure that they are communicating with patrons and providing information in the most appropriate and effect ways.

REVIEW OF LITERATURE

Srinivas Rao, Brahmaiah, Gaddam. (2016) Talk about the cutting-edge methods that creative libraries are employing to provide services via mobile devices. Additionally, it offers a summary of current developments in mobile tools and how libraries might use them.

Saravani, Sarah-Jane. (2015) presents a model that was created during research into potential elements that could affect how library services are delivered via mobile devices using a grounded theory method.

Lorraine Paterson, Boon low. (2011) gives information on a quickly developing field of technology. It's critical to recognise how frequently pupils are using mobile devices. Academic libraries have a responsibility to adapt to changing student behaviour by offering mobile device-optimized services.

Yoon, Hye Young. (2016) In this article investigate user acceptance of mobile library services using smartphone application. In addition, it advances the approach in the field of research on mobile library services

Li, Aiguo. (2013) Talk about how libraries should be built to adapt to the changing requirements of their patrons. In today's fast-paced world, mobile library services can help consumers find the information they need.

OBJECTIVES OF THE STUDY

- To Explore the current state of mobile technology-based library services in academic college libraries
- To ascertain the impact of mobile technology-based services on library users
- To study the different infrastructural facilities required to provide Mobile Library Services.
- To know the benefits and challenges faced by library professionals in providing Mobile Library Services.

SCOPE OF STUDY: -

The study will highlight the different services provided under Mobile Library Services in Digital Era in providing library services.

HYPOTHESES OF THE STUDY:

- Mobile Technology-based library services in academic college libraries are in developing stage.
- Library users are not fully aware about Mobile Technology-based library services.

POPULATION OF THE STUDY:

The study has included library professionals particularly Librarians, system administrators and Students to complete the Dissertation.

RESEARCH METHODOLOGY

I. The researcher at the beginning will browse all the literature available on the topic and will prepare literature review.

II. The researcher will also browse all the websites dealing with the mobile library services.

III. The researcher will personally visit college library under the study to acquaint with required infrastructure and technology.

IV. Further the researcher will prepare a questionnaire on the topic and will be circulated among all librarian and library user.

V. Further the researcher will discuss the topic with the Experts and IT professionals.

VI. The researcher will further analyse the collected data for analysis and interpretation.

VII. The researcher will use all the statistical tools to analyse and interpret the data with Graphs, Charts, explanations on the issue to get clear and precise analyses.

VIII. At the end of the study, finding and suggestions will be recorded for future researchers benefits.

ORGANIZATION OF THE STUDY: -

CHAPTERI: Introduction.

CHAPTER II: Review of Literature.

CHAPTER III: Mobile Technology-based Library Services and its features.

CHAPTER IV: Mobile Technology-based Library Services functioning at National and International level.

CHAPTER V: Data Interpretation and Analysis.

CHAPTER VI: Observation, Finding, Suggestions and Conclusion.

CONCLUSION

The study that I am willing to do is based on entirely modern information technology, namely the utilization of mobile library services in academic libraries. The study demonstrates several forms of mobile library services, as well as their impacts, problems, challenges, and opportunities for academic library professionals and students.

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QUESTIONNAIRE FOR LIBRARIANS'

I am Miss Renushri Amonkar, student at Goa University pursuing a degree in Masters of Library and Information Science. As a part of my studies, I have undertaken minor research on the topic entitled **"Use of Mobile Technology for Providing Library Services by College Libraries Goa: A Study"** under the guidance of Dr. Carlos Fernandes, Assistant Professor, Program Director of Library and information science. In this regard, I have to collect primary data through survey method I request you to spare few minutes from your valuable time in attempting the questions and providing the answers which will help in generating reliable result. I assure you that your response will be treated with secrecy and be used for academic purpose only.

Name: (optional)

Institution Name:

Designation:

Email:

Years of Experience:

Age:

1. How familiar are you with the use of Mobile Technology for delivery of Library Services?
   - ☐ In learning process
   - ☐ Partially Familiar
   - ☐ Familiar
   - ☐ Very Familiar
2. Is Mobile Technology currently being utilized in your Library for service delivery?
   - ☐ Yes
   - ☐ No
3. Which of the following Mobile Technology-based Services are being used? (select all that apply)
   - ☐ App based services (through knimbus)
   - ☐ Online Reference Services (e.g. WhatsApp etc)
   - ☐ OPAC

- ☐ Mobile -responsive website
- ☐ Remote access to e-resources
- ☐ Feedback via Mobile Phones
- ☐ Other (please specify):

4. Have you been involved in the implementation of mobile technology for library services?
   - ☐ Yes
   - ☐ No
5. How often do you use Mobile Technology-based Library Services for providing information to the users?
   - ☐ Very Often
   - ☐ Rarely
   - ☐ Upon Request
   - ☐ Not at All
6. How important is the convenience of accessing library services at various locations through mobile technology-based library services?
   - ☐ Very Important
   - ☐ Important
   - ☐ Neutral
   - ☐ Not Important
7. How effective do you think mobile technology-based library services are in engaging patrons who may not visit a physical library?
   - ☐ Very Effective
   - ☐ Effective
   - ☐ Neutral
   - ☐ Ineffective
8. How do you measure the effectiveness of mobile technology in enhancing library services?
   - ☐ Usage Statistics
   - ☐ User feedback
   - ☐ Other (please specify)
9. In your opinion, what are the primary benefits of integrating Mobile Technology for service delivery in academic libraries? (select all that apply)

- ☐ Increased access to library resources
- ☐ Improved convenience for patrons
- ☐ Enhanced community outreach
- ☐ Other (please specify):

10. What are the Primary challenges faced in implementing Mobile Technology-based Library Services? (select all that apply)
    - ☐ Staff training
    - ☐ User acceptance
    - ☐ Technical support
    - ☐ Budget constraints
    - ☐ Other (please specify):
11. What Infrastructure is required to facilitate Mobile Library Services? (select all that apply)
    - ☐ High Speed Internet Server
    - ☐ Software
    - ☐ Hardware (Computers, external hard disks etc.)
    - ☐ Other (please specify):
12. Does your library have QR Code application?
    - ☐ Yes
    - ☐ No

12.b. If yes, how QR code is used to improve library services? (select all that apply)

- ☐ Linking of library catalogue
- ☐ Accessible Formats
- ☐ Contact Tracing
- ☐ Other (please specify)

13. Does the library have Mobile responsive website?
    - ☐ Yes
    - ☐ No
14. which of the following options are allowed to perform on the library website? (select all that apply)
    - ☐ Renew books/documents
    - ☐ Reserve books/documents
    - ☐ Pay the library fines

- ☐ Library detail/contact/hours
- ☐ None
- ☐ Others

15. Does your Library Management Software provide alerts to users after issue of library resource?
    - ☐ Yes
    - ☐ No

16. If no, do you wish to provide SMS alerts to your users when they issue a book or when their books are due to be returned?
    - ☐ Yes
    - ☐ No

17. Have you received any formal training or professional development related to utilizing mobile technology for library services?
    - ☐ Yes
    - ☐ No

18. How do you ensure the security and privacy of library users in the context of mobile technology?

19. What advancements in mobile technology service do you think could further enhance library service delivery in the future?

20. Is there anything else you would like to add regarding the use of mobile technology for the delivery of library services in academic libraries?

Thank you for taking the time to answer these questions.

QUESTIONNAIRE FOR USERS

I am Miss Renushri Amonkar, student at Goa University pursuing a degree in Masters of Library and Information Science. As a part of my studies, I have undertaken minor research on the topic entitled **"Use of Mobile Technology for Providing Library Services by College Libraries of Goa: A Study"** under the guidance of Dr. Carlos Fernandes, Assistant Professor, Program Director of Library and information science. In this regard, I have to collect primary data through survey method I request you to spare few minutes from your valuable time in attempting the questions and providing the answers which will help in generating reliable result. I assure you that your response will be treated with secrecy and be used for academic purpose only.

Name:

Age:

Institution:

Field of study:

1. Do you own a smartphone or tablet?
   - ☐ Yes
   - ☐ No
2. How often do you use mobile devices for academic purposes?
   - ☐ Daily
   - ☐ Several times a week
   - ☐ Once in a week
   - ☐ Rarely
   - ☐ Never
3. Is your library website user friendly?
   - ☐ Yes
   - ☐ No
4. Are you aware of any library services that are made currently available through mobile technology? (e.g. Websites, app etc)
   - ☐ Yes
   - ☐ No
5. If yes, which specific library services have you accessed or utilized? (select all that apply)
   - ☐ Catalogue Search

- ☐ Online Reference Services (e.g. WhatsApp, e-mail etc)
- ☐ Remote access to e-resources
- ☐ QR code application
- ☐ SMS alerts
- ☐ Other (please specify):

6. Rate your satisfaction levels with the current delivery of library services through mobile technology?
   - ☐ Highly satisfied
   - ☐ Satisfied
   - ☐ Neutral
   - ☐ Dissatisfied
7. Would you prefer to access library e-content and services through a dedicated mobile app or a mobile-responsive website?
   - ☐ Dedicated mobile app
   - ☐ Mobile-responsive website
   - ☐ No preference
8. Which factors influence your decision to use mobile devices for library services? (select all that apply)
   - ☐ Convenience
   - ☐ Access to e-Resources
   - ☐ User-friendly interface
   - ☐ Portability
   - ☐ Flexibility
   - ☐ Real-time access
   - ☐ Enhanced collaboration
   - ☐ Other (please specify)
9. What are the challenges encountered by you while using mobile devices to obtain library services? (Select all that apply)
   - ☐ Technical issues
   - ☐ Limited functionality
   - ☐ Connectivity problems
   - ☐ User experience
   - ☐ Other (please specify)
10. Do you think the library should invest more in mobile technology for better service delivery?
    - ☐ Yes

☐No

☐ Not sure

11.Have you received any formal training on how to use mobile library services through your library?

☐Yes

☐ No

12. How would you rate the overall user experience of the library's mobile services?

☐Excellent

☐Good

☐Average

☐Poor

☐Unsatisfactory

13. Do you think higher usage of mobile technology can improve library services for academic purposes?

☐Yes

☐No

☐ Not sure

14.How do you perceive the future of mobile technology in academic libraries?

☐ Growing importance

☐ Stable

☐ Declining relevance

☐ Not sure

15.What features or functions would you like to see incorporated into a mobile service?

16.Do you have any additional comments or suggestions for improving the use of mobile technology for delivering better library services?

Thank you for taking the time to answer these questions.