



**INTERNATIONAL JOURNAL OF DEVELOPMENT IN SOCIAL
SCIENCE AND HUMANITIES**

e-ISSN:2455-5142; p-ISSN: 2455-7730

**A CRITICAL STUDY ON CHALLENGES AND IMPACT OF
INFORMATION AND COMMUNICATION TECHNOLOGY ON
LIBRARY AND INFORMATION SERVICES**

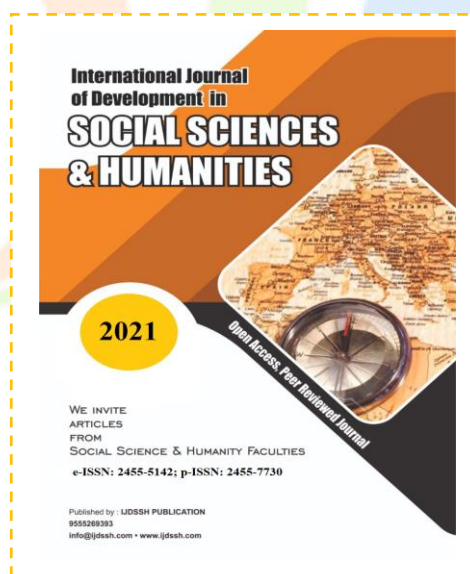
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Paper Received: 24th September 2021; **Paper Accepted:** 26th November 2021;
Paper Published: 11th December 2021

How to cite the article:

Sagar Smita Shankarrao, Dr. Janardhan
Rao A N, A Critical Study on
Challenges and Impact of Information
and Communication Technology on
Library and Information Services,
IJSSH, July-December 2021, Vol 12,
142-154



ABSTRACT

An investigation of the difficulties and effects that Information and Communication Technology (ICT) has had on library and information services is presented in this article. As a result of the progression of technology, libraries have been forced to continuously adapt to overcome challenges such as the accumulation of information, the preservation of digital content, and the need for ongoing technical changes. The findings of the research suggest that the development of information and communication technology (ICT) is one of the most remarkable contributions to contemporary science and technology, which has resulted in significant alterations to the historical context of library and information science. Internet of Things (ICT) applications in libraries and information operate hand in hand. The conventional conception of libraries as sites for the storage of books has been transformed into an intellectual information hub as a result of this process.

Keywords: *Information and Communication Technology; Knowledge; Library; Challenges; Digitization.*

INTRODUCTION

Many different aspects of society have been severely impacted by the development of information and communication technology (ICT), and libraries and information services are not an exception to this widespread phenomenon. There has been a considerable shift in the function of libraries as a result of the advent of the digital age, which has brought forth both difficulties and possibilities. In this article, we investigate the many ways in which information and communication technology (ICT) has impacted library and information services. We investigate the challenges that these institutions have encountered as well as the revolutionary potential that technology offers to them. With the introduction of information and communication technology, libraries, which have historically been considered stores of knowledge and guardians of information, have experienced a paradigm change. The digitalization of information has fundamentally changed the nature of libraries, posing a challenge to the traditional roles and approaches that libraries have traditionally used. One of the most significant issues that information and communication technology (ICT) presents is the quick speed of technical changes, which requires libraries to continually adapt to maintain their relevance. Because of the rapid advancement of technology, libraries are faced with challenges such as limited financial resources, the need to teach their personnel, and the construction of infrastructure to successfully incorporate the most recent tools and systems. Furthermore, the proliferation of digital material has given rise to worries about the overload of information as well as the capacity of libraries to filter and offer meaningful access to resources that are pertinent to the subject matter. It is difficult for libraries to maintain a curated collection that caters to the varied

requirements of their patrons because of the vast amount of information that is accessible online. When it comes to navigating this huge digital terrain, information literacy becomes an essential ability, and libraries have a responsibility to play an active role in promoting these abilities among their customers.

Not only does the influence of information and communications technology (ICT) on library and information services extend beyond the issues that it presents, but it also offers up new opportunities for the improvement of information accessibility and dissemination. Users now have the opportunity to explore a large variety of materials without having to leave the comfort of their own homes thanks to the proliferation of online databases and virtual libraries, which have significantly democratized access to information by removing geographical obstacles along the way. For libraries to maintain their relevance in the digital environment, they will need to rethink their physical locations and the services they provide to accommodate this transition toward virtual places. As an additional benefit, the incorporation of information and communications technology has made it easier to create cutting-edge tools and platforms that improve the overall user experience inside libraries. A few examples of how technology may increase efficiency and simplify procedures are automated cataloging systems, self-checkout stations, and virtual reference services. Also included in this category are virtual reference services. However, the application of these technologies is not without its problems, which include budgetary limits, technical infrastructure, and opposition to change from both the personnel of the library and the consumers of the library. Other notable effects of information and communications technology on libraries include the development of digital preservation and archiving. Even though digital formats provide previously unimaginable possibilities for the preservation and dissemination of knowledge, they also present the problem of assuring the accessibility and sustainability of digital collections over the long term. To preserve the authenticity of their digital archives, libraries are required to deal with several challenges, including the management of digital rights, the obsolescence of formats, and the ongoing need for software and hardware changes.

External pressures, which are caused by social trends and changing user expectations, are a difficulty that libraries confront in addition to the ones they face internally. There has been a significant shift in the way consumers seek and consume information because of the proliferation of mobile devices and internet connectivity. Libraries must modify their services to satisfy the need for user interfaces that are compatible with mobile devices, individualized content suggestions, and seamless interaction with social media platforms. A further emphasis has been placed on the need for libraries to adopt

digital technologies that facilitate virtual collaboration and remote access to materials as a result of the trend toward online learning and distant work. These obstacles may seem to be insurmountable; yet, they also highlight the revolutionary potential of information and communication technology in redefining the role that libraries play. Not only does the digitalization of collections make them more accessible, but it also makes it possible for libraries to interact with clients from all over the world. Libraries now have the opportunity to exchange resources, knowledge, and best practices on a scale that was previously impossible thanks to the proliferation of collaborative digital platforms. Through the interconnection that is made possible by information and communication technology (ICT), libraries are encouraged to work together, which helps to cultivate a feeling of community and a shared sense of responsibility for the preservation and distribution of knowledge. On top of that, information and communications technology makes it possible for libraries to interact with developing technologies like artificial intelligence (AI) and machine learning. By enhancing information retrieval, automating repetitive operations, and providing consumers with individualized services, these technologies have the potential to improve services. On the other hand, the incorporation of AI brings up several ethical problems, including worries about privacy and the possibility of prejudice in the decisions that are carried out by algorithms. To enhance their services and provide better user experiences, libraries need to negotiate these ethical problems while also embracing the potential of artificial intelligence.

REVIEW OF LITERATURE

Dhokare, Satish & Gaikwad, Arun. (2020). Computing technology, communication technology, and mass storage technology are some of the sectors that are continuously developing and reshaping how libraries provide users access to information, retrieve information, store information, alter information, and distribute information to users. This is notably true in the form of library collection growth methods, library construction, and consortia. Information and communications technology has influenced every aspect of academic library activity. Information and Communication Technology (ICT) has brought unprecedented changes and transformation to academic library and information services, conventional LIS such as OPAC, user services, reference service, bibliographic services, current awareness services, document delivery, interlibrary loan, audio visual services, and customer relations can be provided more efficiently and effectively using ICT, as they offer convenient time, place, cost-effectiveness, faster and most-up-to-date dissemination and end users involvement in the library and information services process. The influence of information and communications technology on information services is defined by changes in the arrangement,

content, and technique of the creation of information products, as well as their distribution. INTRODUCTION: The operations of libraries and information services have been profoundly impacted by information technology, and this has also had a significant influence on the education and training of users on a variety of different levels. All of these advancements and innovations have made it easier for various adjustments to be made to the curriculum that is being taught in institutions that specialize in library and information studies. There has been a significant amount of progress made in the subject of Library and Information Science as a direct result of the rapid advancement of technology. In the most recent few decades, the activity of the library has grown very rapidly as a result of the utilization of the internet and technology. Speed and accuracy are the two most critical dimensions to consider while trying to fulfill the requirements of library patrons. To put it simply, information and communication technology (ICT) improves the workflow of the library, which in turn helps reduce the amount of human labor required. As a result, it increases the number of services offered by the library. ICT's ability to deliver information services that are based on ICT to fulfill the requirements of users is one of the most significant benefits of ICT. Since the advent of new information and communication technologies, conventional libraries have been transformed into knowledge centers, and librarians increasingly perform duties akin to consulting information engineers or knowledge managers. Several parts of library administration have undergone significant transformations as a result of the introduction of contemporary technology.

Khan, Javed. (2016). Computing technology, communication technology, and mass storage technology are some of the sectors that are continuously developing and reshaping how libraries provide users access to information, retrieve information, store information, alter information, and distribute information to users. This is notably true in the form of library collection growth methods, library construction, and consortia. Information and communications technology has influenced every aspect of academic library activity. Information and Communication Technology (ICT) has brought unprecedented changes and transformation to academic library and information services, conventional LIS such as OPAC, user services, reference service, bibliographic services, current awareness services, document delivery, interlibrary loan, audio visual services, and customer relations can be provided more efficiently and effectively using ICT, as they offer convenient time, place, cost-effectiveness, faster and most-up-to-date dissemination and end users involvement in the library and information services process. The influence of information and communications technology on information services is defined by changes in the arrangement, content, and technique of the creation of information products, as well as their distribution.

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Parmar, Shamji. (2015). ICT, which stands for information and communication technology, has a significant influence on libraries and information centers all over the globe. Technology has not only left a significant mark on human existence, but it has also had an impact on every aspect of the knowledge domain. In the 21st century, it is anticipated that the whole landscape of library and information science will transform. The most recent advancements in information and communications technology have provided novel approaches to the creation, management, and transmission of information. ICT is a wonderful boon for professionals working in libraries and LIS, and they should be prepared to continually develop new technical skills and make appropriate use of contemporary technology. Because information and communications technology (ICT) provides gateway access to worldwide resources, libraries are required to offer user services that are creative and focused on user needs, as well as to increase user happiness, to obtain employer recognition and user respect. The value, prestige, and image of the library, as well as the work happiness of library employees, may all be improved with the use of information and communication technology.

Rathnabahu, R.M.Nadeeka. (2015). When it comes to the use of information and communication technologies (ICTs) in University Libraries (UL) and Special Libraries (SL) in Sri Lanka, the primary purpose of this research was to identify the most significant problems that are encountered. Out of a total of 36 and 76 libraries, respectively, twenty-nine (29) Main & Faculty UL and thirty-eight (38) SL were chosen for the selection process. To choose the sample, a method known as random sampling was used. To gather primary data, a questionnaire was created. Only 22 UL and 28 SL answered to the survey out of the total. According to the findings of the data analysis, it was discovered that the majority of the UL (79.55%) encountered the difficulty of inadequate money allocations to acquire appropriate information and communication technology (ICT) equipment, while the majority of the SL (73.21%) faced the challenge of a lack of a distribution network that was applicable over the whole island. Next, 78.41% of the UL were similarly confronted with the difficulty of a lack of a distribution network that served the whole island, and 66.07% of the SL were consistently confronted with delays in the acquisition of computers and other information and communication technology (ICT) equipment. In addition, laws and regulations that govern the acquisition and upkeep of information and communication technology tools in the UL (77.27%) and SL (65.18%) were regarded as key obstacles. It is suggested that to overcome the challenges mentioned above in UL and SL in Sri Lanka, some of the recommendations that are suggested here include the provision of sufficient fund allocations for information and communication technology (ICT), the necessity of inculcating skills and knowledge regarding ICT activities for administrative staff, and the implementation of high-quality training programs for library staff both in-service and outdoor.

Verma, Manoj. (2014). The environment of the web, the progression of technology, the variety of sources, the forms of information, and the flow of information all have a significant influence on the function that libraries play as well as the one that library professionals play. It creates a great deal of difficulties for library professionals, and library professionals are compelled to alter the method in which they operate to fulfill the information requirements of customers. Skills and experience in information and communications technology were necessary for these new professions. In this study, we explored information and communication technology (ICT) and its influence on library professionals. Additionally, we highlighted the ICT skill requirements that library and information science (LIS) professionals must meet. In the beginning: In today's world, information that is pertinent to the growth of society and libraries is of the utmost importance. Furthermore, it is necessary to maintain and prevent very effectively the pertinent information. There is a widespread

consensus that libraries are the guardians of books, information, and knowledge. To better equip themselves for the fruitful pursuit of their various jobs, individuals such as researchers, instructors, students, administrators, industrial and company managers, artisans, farmers, and others are required to have access to more knowledge. They are relying on the library as their primary source of information. At this point, we are living in an information society, where information and communication technology have altered how information is transmitted and the dimensions it takes. There have been dramatic changes brought about in library operations and librarianship as a result of rapid advancements in information and communication technology (ICT). As a result of these developments, the position of library professionals shifted from that of librarians who kept library books to that of information solution providers and knowledge managers. Library professionals are the most important factor in determining whether or not a library will be successful in implementing information and communication technology (ICT). This is because library professionals are the key to successfully using any new technology in a library. Technology has a significant influence on librarianship as well as the expectations of library patrons. The complexity of society is increasing, and it is becoming more reliant on science and technology (S&T). Daily, there is an ever-increasing need for rapid organization, communication, and the transmission of information. The importance of information as a resource for speeding up national development is being acknowledged. We are living in an era that is characterized by rapid technical advancements and an explosion of information. Since the 1980s, there has been an increasing interest and concern in India over the modernization of library operations and services.

RESEARCH METHODOLOGY

For this research, the investigator collected data via the use of the questionnaire technique. For the objective of gathering information on the infrastructure that is accessible at college libraries for accessing information and communication technology applications, a self-structured questionnaire was developed. The individuals who responded to the questionnaire were librarians or in charge of the college libraries that were researched. Personal interviews will also be conducted with professionals in the field of library and information science in order to get insight into the challenges that are associated with the use of information and communication technology by the faculty members. To gather information about the use of social media, a primary survey will be carried out.

DATA ANALYSIS AND INTERPRETATION**Table 1: Is ICT part of library tools to provide more user-friendly services?**

| ICT in library | % |
|----------------|------------|
| Yes | 40 |
| No | 60 |
| Total | 100 |

A distribution of replies about the implementation of information and communication technology (ICT) in a library environment is shown in the table below. There were a total of sixty percent of respondents who indicated a negative opinion, indicating a reluctance or lack of ICT implementation. Forty percent of the respondents stated a favorable position, confirming the incorporation of information and communication technology (ICT) in libraries. This research highlights a significant divergence in viewpoints on the use and significance of technology in library services, with the majority of respondents adopting a strategy that does not include information and communication technology (ICT). According to the results, there are possible areas that might be explored and improved upon to better connect technology improvements with the requirements and preferences of library patrons.

Table 2: Barriers related to the use of ICT in Academic Libraries

| Serial Number | Challenges in ICT Application | Rank | % |
|---------------|---|------|------|
| 1 | Lack of trained Staff in ICT | 1 | 58.0 |
| 2 | Low level of ICT skills among library users | 2 | 57.0 |
| 3 | Unawareness of potential benefits of ICT | 3 | 57.0 |
| 4 | Lack of fund for ICT | 4 | 60.0 |
| 5 | Inadequate ICT infrastructure | 5 | 65.0 |
| 6 | Resistance of library staff to use ICT | 6 | 50.0 |
| 7 | Lack of updated ICT policy or strategy | 7 | 40.0 |

The following table provides a list of the numerous obstacles that are linked to the use of information and communication technology (ICT) in a library setting. The table also includes the serial numbers of each difficulty as well as the proportion of respondents who rated each respective issue. It is the "Lack of trained Staff in ICT" that comes out on top of the list, with a rating of 1 and a percentage of 58.0%, which brings to light the significant problem of inadequately competent workers. Immediately following closely behind are difficulties such as "Low level of ICT skills among library users" and "Unawareness of potential benefits of ICT," both of which were listed at number two with a percentage of 57.0%. For example, "Lack of funds for ICT" (ranked number four, sixty percent), "Inadequate ICT infrastructure" (ranked number five, sixty-five percent), "Resistance of library staff to use ICT" (ranked number six, fifty percent), and "Lack of updated ICT policy or strategy" (ranked number seven, forty percent) are all further obstacles. In light of these results, the various problems that are preventing the efficient deployment of information and communication technology in libraries are brought to light. These challenges include concerns about people training, user skills, awareness, financial resources, infrastructure, and organizational policies. The effective incorporation of information and communication technology (ICT) into library services is dependent on addressing several problems.

Table 3: Satisfaction with the present status of ICT support at libraries

| Satisfaction with available Support at college libraries | Yes (%) | No (%) | Total % |
|--|---------|--------|---------|
| Are you satisfied with the present status of ICT support available at college libraries? | 70 | 30 | 100 |

Feedback about the level of satisfaction with the existing information and communication technology (ICT) assistance that is offered at college libraries is shown in the table below. Seventy percent of those who participated in the survey have expressed satisfaction with the current level of information and communication technology (ICT) assistance, which indicates that they have a favorable impression of the services that are being offered. On the other hand, thirty percent of respondents are dissatisfied with the current state of information and communication technology (ICT) assistance in college libraries. According to these findings, even if a sizeable proportion of users are content with the help that is offered, there is still a sizeable part of users who believe that there is space for development. To improve the general satisfaction and efficacy of information and communication

technology (ICT) services in college libraries, it may be beneficial to investigate the problems of the unsatisfied group and to address those concerns.

Table 4: Reasons for dissatisfaction with the provision of ICT at college libraries

| Reasons of dissatisfaction | % |
|---------------------------------|----|
| Lack of technical manpower | 15 |
| Lack of training/ skills | 25 |
| Services to be based on charges | 10 |
| Poor infrastructure | 50 |

The following table provides a breakdown of the reasons why respondents are dissatisfied with the assistance that college libraries provide for information and communication technology (ICT), along with the percentage distribution for each of the factors. The most common reason for unhappiness is referred to as "poor infrastructure," and a sizeable fifty percent of those who participated in the survey attributed their displeasure to the lack of suitable technical facilities. Immediately following closely behind is the problem of "Lack of training/skills," which accounts for 25% of the total. This indicates that a quarter of the respondents are unsatisfied because the library personnel does not possess adequate knowledge or competence. It is stated that "lack of technical manpower" is a significant problem, and fifteen percent of respondents have expressed unhappiness due to a lack of skilled professionals working in the organization. Last but not least, "Services to be based on charges" is a worry indicated by ten percent of respondents, which suggests that the imposition of costs for information and communication technology services may be a cause of displeasure. These results bring to light certain areas that need to be addressed and improved to solve the many issues that users have and to increase student satisfaction with information and communication technology (ICT) assistance in college libraries.

Table 5: Impact of ICT on library services

| As per your opinion, please indicate the impact of ICT applications on library services. | % |
|--|-----|
| Increase in use/ demand of e-resources | 29 |
| Increase in demand of web-based services | 11 |
| Decrease in use of print resources | 28 |
| Decrease of library visitors (physically) | 32 |
| Total % | 100 |

Percentage distribution of the perceived influence that applications of information and communication technology (ICT) have had on library services is shown in the table below. The most noteworthy consequence is the "Decrease in library visitors (physically)," which accounts for 32 percent of the total respondents. The fact that this is the case indicates that there has been a significant change toward virtual interaction and a decreasing physical presence in libraries, which may be owing to the convenience that online resources provide. Additionally, there is a large "Decrease in the use of print resources," with 28% showing a drop in the dependence on conventional printed materials, which reflects a shift towards digital alternatives. This is a major trend. On the other hand, 29% of respondents have reported an "Increase in use/demand of e-resources," which highlights an increasing preference for electronic media. An increase in the dependence on online platforms for a variety of library services is shown by the fact that 11% of respondents recognized an "increase in demand for web-based services". A substantial shift toward digital resources and virtual interaction is shown by these results, which combined highlight the revolutionary influence that information and communication technology applications have had on library use patterns.

CONCLUSION

As a result of the difficulties and effects that information and communication technology has had on library and information services, the landscape has become more complicated. The revolutionary potential of information and communication technology is readily apparent, even though libraries are struggling with difficulties such as information overload, digital preservation, and adjusting to fast emerging technologies. In addition to facilitating worldwide cooperation and increasing accessibility, the digitalization of collections also paves the way for the development of new technologies such as artificial intelligence. To successfully navigate these issues, strategic planning, coordination across libraries, and a dedication to ethical concerns are all required. As the digital age continues to expand, the capacity of libraries to adapt and make use of information and communication technology will decide whether or not they continue to be relevant in meeting the varied information demands of society.

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