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AN ASSESSMENT OF ICT AWARENESS, ADOPTION, AND UTILIZATION AMONG LIBRARY PROFESSIONALS IN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Information and Communication Technology (ICT) has become an essential component of modern academic libraries, transforming traditional information management practices and service delivery systems. The present study examines the level of ICT awareness, adoption, and utilization among library professionals working in higher education institutions. It focuses on the availability of technological infrastructure, professional competencies, digital information resources, institutional support, and challenges associated with ICT implementation. The study also highlights the role of ICT in improving information retrieval, cataloguing, circulation, digital resource management, and user-oriented library services. Particular attention is given to the importance of continuous professional development and technological training in strengthening librarians' capabilities. Furthermore, the study emphasizes the relationship between ICT integration and the effectiveness of academic library operations. It concludes that systematic technological investment, institutional encouragement, and regular skill development are essential for developing efficient, accessible, and technologically advanced higher education libraries.

Keywords: Information and Communication Technology, Library Professionals, ICT Awareness,

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ICT Adoption, Higher Education, Digital Libraries, Library Automation.

I. INTRODUCTION

The development of Information and Communication Technology (ICT) has significantly transformed the functioning of academic libraries across the world. Traditionally, libraries were primarily responsible for collecting, organizing, preserving, and distributing printed information resources. However, the increasing availability of computers, internet facilities, digital databases, electronic journals, and automated library management systems has changed the nature of library operations. Modern academic libraries are gradually shifting from conventional information centres towards technology-driven knowledge and learning environments. ICT has enabled librarians to perform various professional activities more efficiently, including cataloguing, classification, circulation, reference services, information retrieval, and digital resource management. Consequently, technological awareness and competency have become essential professional requirements for library personnel working in higher education institutions.

Library professionals occupy an important position in the effective implementation and utilization of ICT-based services. Their responsibilities are no longer restricted to the maintenance of books and printed documents but also include managing electronic information resources, assisting users with online databases, operating institutional repositories, and providing digital information literacy support. The ability of librarians to understand and apply technological tools directly influences the quality and accessibility of library services. ICT awareness helps professionals recognize the benefits of emerging technologies, while ICT adoption represents the institutional and individual acceptance of these technologies in routine library activities. Effective utilization further ensures that available technological facilities are employed productively to improve information access, organizational efficiency, and academic support services.

Higher education institutions increasingly depend on digital information systems to support teaching, research, and learning activities. Universities and colleges are investing in library automation software, institutional repositories, online public access catalogues (OPACs), electronic databases, and digital library platforms. These developments have created opportunities for improving the speed, accuracy, and accessibility of information services. Nevertheless, the successful implementation of ICT depends on several factors, including financial resources, infrastructure, internet connectivity, technical assistance, institutional policies, and the technological competencies of library professionals. In many institutions, particularly those with

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limited resources, inadequate training, insufficient equipment, and resistance to technological change continue to restrict the effective application of ICT in library operations.

The present study examines ICT awareness, adoption, and utilization among library professionals working in higher education institutions. It aims to understand their familiarity with technological applications, the extent to which ICT facilities are incorporated into routine professional responsibilities, and the difficulties experienced during technological implementation. The study also considers the importance of training programmes, institutional support, professional development, and infrastructure improvement in strengthening ICT-based library services. Understanding these dimensions is important for identifying existing weaknesses and developing appropriate strategies for technological advancement. The findings and discussions are expected to provide useful insights for librarians, academic administrators, policymakers, and library management authorities seeking to improve the effectiveness and quality of higher education library services through ICT integration.

II. ICT AWARENESS AND TECHNOLOGICAL COMPETENCIES AMONG LIBRARY PROFESSIONALS

Information and Communication Technology awareness represents the understanding and familiarity of library professionals with digital tools, technological applications, and electronic information systems used in contemporary library environments. It includes knowledge of computers, internet applications, library automation software, electronic databases, digital repositories, networking systems, and online information retrieval techniques. Awareness is an important foundation for the successful adoption of technology because professionals must understand the purpose, functions, and advantages of different ICT applications before incorporating them into their regular activities. In higher education institutions, librarians are increasingly expected to possess technological knowledge alongside traditional library management skills. Their awareness influences their ability to provide effective information services and respond to the changing requirements of students, researchers, and teaching professionals.

Technological competencies involve the practical abilities required to operate ICT-based systems and perform library-related tasks efficiently. These competencies include computer operation, database searching, digital cataloguing, electronic circulation, internet browsing, information evaluation, and the management of electronic resources. Library professionals with adequate

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technological skills can retrieve information quickly, organize digital collections systematically, and assist users in accessing scholarly materials. Knowledge of integrated library management systems also enables librarians to coordinate acquisition, cataloguing, circulation, serial control, and reporting activities through a centralized technological platform. Furthermore, familiarity with digital communication tools improves interaction between library staff and users, particularly when information services are delivered through electronic channels.

The increasing importance of digital scholarship has expanded the technological responsibilities of library professionals. Modern librarians are expected to guide users in accessing academic databases, identifying reliable electronic publications, using online citation tools, and locating open-access research materials. They must also understand digital preservation, copyright regulations, intellectual property rights, and responsible information use. Awareness of institutional repositories and research information management systems has become particularly important because universities increasingly seek to preserve and disseminate scholarly output through digital platforms. These responsibilities require continuous learning because technological applications, information formats, and research communication practices continue to evolve.

Despite the growing importance of ICT competencies, library professionals may experience differences in technological awareness depending on educational qualifications, professional experience, institutional facilities, and opportunities for training. Professionals who have received formal technological education or participated in specialized workshops may demonstrate greater confidence in operating digital systems. Conversely, librarians who have limited exposure to computers, databases, or automation software may experience difficulties in adapting to new technological environments. Institutional differences also influence awareness because well-equipped universities generally provide greater opportunities for practical technological learning than institutions with inadequate resources. Therefore, assessing ICT awareness requires consideration of both individual capabilities and the professional environment in which librarians work.

Training and professional development programmes are essential for improving technological awareness and practical competencies. Universities, library associations, and professional development organizations can organize workshops, seminars, refresher courses, and hands-on training sessions covering library automation, digital resource management, information literacy, and emerging technologies. Online learning programmes can provide additional opportunities for librarians to develop technical knowledge without geographical restrictions. Regular training is

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particularly necessary when institutions introduce new software, upgrade existing systems, or expand electronic information services. Such initiatives can reduce technological hesitation and improve the confidence of library professionals in handling digital responsibilities.

The development of ICT awareness should therefore be treated as a continuous institutional responsibility rather than an occasional professional activity. Library authorities need to identify competency gaps, evaluate training requirements, and provide opportunities for practical learning. A systematic approach to technological education can improve the professional effectiveness of librarians and strengthen the overall quality of academic library services. Greater ICT awareness also enables library professionals to participate more actively in institutional digital transformation initiatives and contribute to the development of technology-oriented educational environments.

III. ADOPTION AND IMPLEMENTATION OF ICT IN HIGHER EDUCATION INSTITUTION LIBRARIES

ICT adoption refers to the acceptance and incorporation of technological tools into the organizational and professional activities of academic libraries. It represents an important transition from traditional manual operations towards computerized and digitally integrated systems. Higher education institutions adopt various technological applications to improve the management of library collections, simplify administrative procedures, and expand access to academic information. Library automation software, electronic catalogues, digital repositories, barcode-based circulation, RFID systems, and online databases are among the major technologies used in contemporary academic libraries. Their implementation helps institutions manage increasing quantities of information while providing users with faster and more convenient access to educational resources.

The adoption of integrated library management systems has become particularly important for improving the efficiency of routine library operations. These systems combine different activities, including acquisition, cataloguing, classification, circulation, serial management, and report generation. Computerized procedures reduce repetitive manual work and improve the accuracy of library records. Online public access catalogues allow students and researchers to search library collections without physically examining catalogue cards or consulting staff members. Automated circulation systems also simplify book issue, return, renewal, and reservation activities. Consequently, ICT adoption contributes to better resource management, improved staff productivity, and more organized library administration.

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Institutional readiness plays a significant role in determining the success of ICT adoption. The availability of computers, servers, networking facilities, reliable internet connections, licensed software, and technical support influences the extent to which technological applications can be implemented. Financial investment is equally important because ICT infrastructure requires regular maintenance, software updates, equipment replacement, and cybersecurity protection. Institutions must therefore develop appropriate budgets and long-term technological policies to support sustainable digital library operations. Without sufficient financial and administrative commitment, the adoption of ICT may remain limited to basic computerization rather than developing into a comprehensive digital service environment.

The acceptance of technological change among library professionals is another important factor influencing ICT implementation. Some professionals may readily adopt digital applications because they recognize their advantages in improving efficiency and service quality. Others may experience difficulties due to inadequate training, unfamiliarity with software, concerns regarding additional responsibilities, or preference for established manual procedures. Such differences indicate that successful adoption requires both technological investment and organizational change management. Library administrators should involve employees in planning, provide practical demonstrations, and communicate the expected benefits of technological transformation. Participatory implementation can reduce resistance and encourage greater professional involvement in digital initiatives.

ICT adoption also supports collaboration and resource sharing among higher education institutions. Digital networking enables libraries to connect with external databases, academic consortia, electronic journal platforms, and interlibrary loan services. Through such arrangements, institutions can provide access to a wider range of scholarly information than would be possible through individually maintained collections. Shared digital platforms can reduce duplication of resources and support cooperative academic research. However, institutions must address issues related to subscription costs, licensing conditions, access authentication, and technical compatibility to ensure that collaborative systems function effectively.

The long-term success of ICT adoption depends on continuous evaluation and technological improvement. Library authorities should periodically assess system performance, user satisfaction, infrastructure adequacy, and employee competencies. Feedback from library professionals and users can help identify technical difficulties and areas requiring improvement. Institutions should also monitor developments in cloud computing, artificial intelligence, mobile library applications,

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and digital preservation to determine their relevance to academic library services. A planned and inclusive adoption strategy can strengthen institutional capabilities, improve professional performance, and support the development of efficient and accessible higher education libraries.

IV. UTILIZATION OF ICT AND CHALLENGES FACED BY LIBRARY PROFESSIONALS

ICT utilization refers to the actual application of technological resources in performing library functions and delivering information services. Although many higher education institutions have introduced computerized facilities, the effectiveness of ICT depends on the frequency, quality, and appropriateness of their use. Library professionals utilize technology for cataloguing, classification, circulation, database searching, digital reference services, electronic resource management, and institutional repository administration. These applications reduce the time required to complete routine activities and improve the accuracy of information processing. Effective utilization also enables librarians to handle larger collections and respond more efficiently to the information requirements of students, researchers, and academic staff.

One of the major areas of ICT utilization is the management and dissemination of electronic information resources. Academic libraries increasingly provide access to electronic books, scholarly journals, research databases, theses, dissertations, and open educational resources. Library professionals help users identify appropriate databases, develop effective search strategies, and retrieve relevant academic materials. Online reference services and electronic communication platforms further improve interaction between librarians and users. Through these services, information assistance can be provided beyond conventional library working hours and physical locations. Digital access is particularly beneficial for researchers who require timely information from national and international scholarly publications.

ICT also contributes to improved information organization and institutional knowledge management. Digital cataloguing systems facilitate the systematic description and retrieval of library materials, while institutional repositories preserve research publications, dissertations, conference papers, and other scholarly contributions. Barcode and RFID technologies support efficient circulation and inventory management. Cloud-based applications can provide remote access to selected library services and reduce dependence on locally maintained technological infrastructure. The effective use of these applications strengthens administrative efficiency and helps academic libraries develop more flexible information delivery systems.

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Despite these advantages, several challenges restrict the effective utilization of ICT among library professionals. Inadequate technological infrastructure remains a major concern, particularly in institutions where computers, servers, networking equipment, and internet connectivity are insufficient. Limited financial resources may prevent libraries from purchasing licensed databases, upgrading software, or maintaining modern equipment. Another important challenge is the shortage of technical support personnel who can resolve hardware, software, networking, and cybersecurity problems. Such limitations can interrupt routine operations and reduce the confidence of library professionals in using technology for important administrative and information services.

Insufficient training and the continuous emergence of new technologies also create difficulties for library personnel. Professionals who lack adequate exposure to digital applications may experience problems in managing electronic resources, operating automation systems, and assisting users with advanced information searches. Resistance to technological change may further restrict the adoption of innovative practices. In addition, digital libraries face concerns relating to data security, privacy, copyright protection, software compatibility, and long-term preservation of electronic information. Institutions must establish appropriate policies and provide technical guidance to ensure that digital resources are managed responsibly and securely.

Addressing these challenges requires coordinated action from institutional administrators, library authorities, and professional development organizations. Regular ICT training, improved internet connectivity, adequate financial allocation, reliable technical assistance, and updated technological infrastructure can strengthen the utilization of digital systems. Libraries should also establish performance evaluation mechanisms to assess the usefulness of ICT applications and identify areas requiring improvement. Encouraging collaboration, sharing technological experiences, and adopting user-oriented service models can further improve the practical application of digital resources. Effective ICT utilization ultimately depends on combining technological facilities with professional competencies, institutional commitment, and a continuous improvement approach.

V. CONCLUSION

Information and Communication Technology has become an essential element in the modernization of higher education institution libraries. Its influence extends beyond the computerization of traditional library activities and includes the development of digital information services, electronic resource management, online communication, and institutional

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knowledge-sharing systems. The present study highlights the importance of ICT awareness, adoption, and utilization among library professionals as interconnected dimensions of academic library development. Technological awareness provides the necessary understanding of digital applications, adoption facilitates their integration into professional activities, and effective utilization ensures that available resources contribute meaningfully to institutional objectives. Together, these dimensions support the transformation of conventional libraries into modern information and learning centres.

The professional competencies of librarians play a central role in determining the effectiveness of ICT-based services. Knowledge of library automation, electronic databases, digital repositories, online catalogues, and information retrieval systems enables professionals to manage academic information more efficiently. However, technological awareness and practical skills cannot remain static because digital platforms and information management practices continue to change. Regular training, workshops, refresher programmes, and opportunities for practical learning are therefore essential for maintaining professional competence. Higher education institutions should encourage library personnel to participate in continuous professional development activities and develop the confidence required to handle emerging technologies.

The study also emphasizes that ICT adoption and utilization depend on institutional readiness and adequate technological infrastructure. Reliable internet connectivity, modern computer facilities, appropriate software, financial investment, and technical support are necessary for sustainable implementation. Inadequate infrastructure, limited budgets, insufficient training, and resistance to technological change can reduce the effectiveness of digital initiatives. These difficulties require systematic planning and institutional commitment. Library administrators should develop clear ICT policies, allocate sufficient resources, encourage employee participation, and periodically assess the performance of technological systems. Such measures can improve operational efficiency and strengthen the accessibility of academic information resources.

Finally, the successful integration of ICT requires a balanced approach that combines technology, professional development, and user-oriented service delivery. Higher education libraries should continuously explore appropriate digital innovations while ensuring information security, accessibility, copyright compliance, and long-term preservation. Strengthening ICT competencies among library professionals will contribute to improved research support, teaching effectiveness, and academic communication. Future institutional initiatives should focus on developing technologically skilled library personnel and creating sustainable digital information

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environments. Therefore, ICT awareness, adoption, and utilization should be recognized as essential priorities for improving the quality, relevance, and effectiveness of higher education institution libraries.

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