

## Enhancing Library Services in Universities through Information and Communication Technology: A Comparative Study

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### ABSTRACT

This research examines the integration of ICT in academic libraries concentrating on Amity University Haryana and Sushant University Gurugram. This highlights the important role of ICT in enhancing library services, improving user access to resources and facilitating efficient information retrieval. It also explores the methods of ICT usage; how effective digital services are and challenges that arise in the process of implementing them. Research indicates that through detailed surveys, ICT has enabled access to resources and service delivery become more efficient. The study found out key points such as utilizing computers for better library management which include faster information search, improved users' satisfaction. Nevertheless, difficulties like low infrastructure facilities, scarcity of financial resources and lack of necessary skills among employees hindered the implementation process. Lastly it ends with recommendations for improved ICT based library services, these are continuous training programs; enhanced budgets and proper technological infrastructure. This paper therefore advocates for the position that ICT plays a significant role in modernizing libraries operations to meet contemporary readership demands.

**Keywords:** Information and Communication Technology, academic libraries, digital services, resource accessibility, library operations, user satisfaction, Amity University Gurugram, Sushant University, challenges in ICT implementation, library staff training, digital resources utilization..

### INTRODUCTION

Information technology (IT) has greatly enhanced Libraries and Information Centres. It embraces cataloguing and classification activities as well as circulation control systems acquisitions and serial control systems. Digital libraries are supported by ICT which makes them available through various electronic channels. It is now easier for people to search using online catalogs or discovery tools. Staff can communicate with stakeholders through email, messaging, social media or collaboration platforms. Remote access services are also offered by ICT besides user education and customized experience. It maintains library operations data, user statistics, and resource usage to help with performance metrics. Moreover, ICT is also engaged with preservation and archiving by using long term access and digitization techniques while ensuring security and privacy. The user experience is enriched by new technologies such as AI, blockchain, and VR/AR. Ensuring everyone has access to ICT, managing costs and providing continuous training for library staff are some of the challenges.

## LITERATURE REVIEW

**Anene & Nancy, (2024)** point out that academic libraries in South-East Nigeria need to use ICTs because it is important for enhancing services and providing wider access to information. However, issues such as inadequate power supply, paucity of funds and lack of infrastructure for ICT acts as a barrier towards smooth sharing of resources. For example, Southeast Federal University Library Connect has shown how ICT can be used to enhance resource sharing and meet users' needs. Further research and practical steps are crucial for academic libraries to effectively utilize technology in enhancing access to resources and quality of services in the digital age. **Khan & Khayal, (2024)** conducted a study on the usage of ICT based services in academic libraries in Arunachal Pradesh, India. This research aimed at determining user satisfaction, benefit derived from these services and areas that needs improvement. The researchers distributed questionnaires which were answered by 76.10% respondents. The results of this study showed that there were challenges facing users like inadequate ICT resources and staff. The possible recommendations included organizing workshops or trainings sessions for the stakeholders involved with the dissemination of these digital materials to show them ways they could improve on their methods. The importance of ICT in improving library service provision and education was further highlighted by this study. They also cited other works done about how information communication technologies have been implemented into libraries thus giving insights. **Shrivastava et al., (2023)** learners, instructors, libraries, and scholars had a high requirement for ICT resources such as eJournals, eBooks, online video lectures and plagiarism tools during the pandemic. The purpose of this study is to discuss how Learning Resource Centres utilized Information and Communication Technology (ICT) in delivering education during the Covid-19 health crisis. There are also problems like lack of skills in ICTs, finances and poor infrastructure that are highlighted in this article. On the other hand, webinars have been used by these libraries to improve their services while repositories on digital platform like Shodhganga were launched. The authors argue that there should be continuous upgrade up-gradation of ICT services with respect to the changing needs of users. **Verma et al., (2022)** focuses on academic library services in Central University Libraries in India which were adversely affected by covid 19 pandemic. They describe approaches taken when online platforms replaced physical spaces for running library activities, evaluate how well designed library websites are in terms of user friendliness and discuss unevenness in availability of services across colleges. For instance Aligarh Muslim University and Central University of Orissa do not share same experience due to good website maintenance during the time it should be noted that while some institution did not take advantage of COVID 19 period to improve their websites others did. All universities have found themselves having no option but maintaining a good website management as they go through COVID-19 challenges. **Singh & Kumar, (2022)** study the impact of electronic resources on structure and services in technical university libraries. They note how the physical is being replaced by electronic information sources like internet. The shift in this direction shows that information value is changing and reflects the global spread of digital libraries. The focal point of the research encompasses reputable sources contributing to knowledge as well as demonstrates how to maximize potential, benefits from online resources. It also has recommendations for future developments aimed at addressing customers' needs accordingly. In general, the paper highlights how e-resources are transforming access to, and use of information within scientific university libraries.

## OBJECTIVES OF THE STUDY

The purpose of this study is:

To examine the existing ICT resources and infrastructure in AU Libraries at Amity University (AU) Gurugram as well as SU Libraries at Sushant University (SU), Gurugram.

To determine how students use these services as well as faculty members who need to search for other materials online.

To ascertain whether or not technological advancement in digital libraries has improved student learning and research outputs.

To identify the challenges faced when accessing or using these resources for academic purposes that are ICT based on their library settings

## METHODOLOGY

The study used a survey method with a structured questionnaire given to the Librarian. This questionnaire aimed to collect information on how ICT-based resources and services are currently used at Amity University and Sushant University. A cover letter was also included to explain the importance of the study and how the results would be used. The study focused only on ICT-based resources and services at these two universities.

## UNIVERSITY PROFILE

Amity University Gurugram, part of the Amity Group with campuses in India and abroad, was founded in 2010. This private university has an A Grade accreditation from NAAC and is a member of the Association of Indian Universities. It offers a variety of undergraduate, postgraduate, PhD, and other courses through its 16 schools and colleges, covering fields like Engineering, Management, Law, and Design.

The library at Amity University Gurugram is a comprehensive Knowledge Resource Centre with a large collection of books, magazines, Indian and international journals, online journals, and other digital resources to support study and research. Besides the main Central Library, which is a key resource hub for students and faculty, there are several institutional libraries. These libraries comprise of Reference Sections, Circulation Sections, Audio-Visual Sections, Periodical Sections, and Digital Libraries. Students can access books on various subjects easily through a well-managed database created by the automated system.

Formerly known as Ansal University, Sushant University was established in 2012 under the Haryana Private Universities Act of 2006. Located in Gurugram which is one of the major hubs for national and Fortune 500 companies; it has eight schools offering diverse programs such as Architecture; Design; Law; Management; Hospitality; Engineering; Health Sciences; Planning & Development.

The Library Resource Centre (LRC) at Sushant University supports academic and research activities. It includes three fully equipped libraries covering over 11,634 square meters, with space for more than 225 readers at a time. The LRC serves students, research scholars, and faculty with a wide range of publications in fields like Computer Science, Engineering, Law, Pharmacy, and Humanities. The library uses an open shelf system, allowing users to browse freely. It subscribes to over 114 national and international journals and magazines and provides access to digital resources like e-books and databases such as DELNET and the National Digital Library of India. The library also offers user education programs to help users make the most of its resources.

## DATA ANALYSIS

### Library Staff and Timings

Table 1 While Amity University's library is open every day, allowing users access to the libraries' resources continuously, Sushant University's library closes one day a week and might, to some extent, limit its access to users. However, the Amity University library runs for 12 hours each day, which provides extended access for students and faculty that may be able to fit into other schedules and offer more flexibility. While the Sushant University library has fewer hours of opening every day, it still remains open long enough to give its users sufficient time to receive services and access materials of all types. Both universities close their libraries on gazetted holidays, ensuring they follow official public holiday schedules.

Table 1 Library Staff and Timings

Period	Amity University	Sushant University
Working Days	7	6
Working Hours	12 Hrs	8 Hrs
Holiday	Gazetted	Gazetted

### Library Users

Table 2 shows that Amity University has a significantly larger student population utilizing the library compared to Sushant University. With 4956 students at Amity University versus 1700 at Sushant University, the difference is substantial. This disparity could be attributed to the overall student enrollment numbers at the respective universities or the accessibility and appeal of the library facilities. The number of research scholars using the library at Amity University (285) far exceeds that at Sushant University (11). This suggests a more robust research culture at Amity University, possibly indicating better research facilities, more research programs, or a larger number of enrolled research scholars. The teaching faculty category shows Amity University with 383 faculty members utilizing the library compared to 150 at Sushant University. This shows that faculty at Amity University use the library more, possibly because there are more faculty members or because library resources are more integrated into their teaching.

Table 2 Library Users

Category of members	Amity University	Sushant University
Student	4956	1700
Research Scholar	285	11
Teaching Faculty	383	150
<b>Total</b>	<b>5624</b>	<b>1861</b>

### Library Resources

The library collection includes all the materials a library has. Table 3 shows that Amity University (AU) has a slightly larger collection of books than Sushant University (SU), offering more reading materials for students and faculty. Amity University also has many more journals, providing a wider range of periodicals for research and academic work. Additionally, Amity University offers more magazines, which are useful for current events and general reading. Amity University subscribed 5 Newspapers whereas Sushant University subscribed 6 newspapers. Amity University has a larger collection of theses and dissertations, reflecting more postgraduate and doctoral research. However, Sushant University has more project reports, indicating a strong focus on project-based learning and research. Amity University provides access to more handbooks and manuals, which are essential for practical and technical reference, while Sushant University has 10 handbooks and manuals. Amity University also has a much larger collection of back volumes of journals, useful for historical research and accessing past studies.

Amity University subscribes to more e-databases, offering broader access to digital resources and online research tools. Sushant University has a large e-book collection, enhancing access to a wide range of books. Data for Amity University's e-book collection is not provided. Sushant University provides access to 5 e-magazines. This is beneficial for users who prefer digital reading formats. The number of e-theses and dissertations is consistent with the print collections, reflecting the universities' efforts to digitize their academic research outputs. Sushant University has a significant collection of e-project reports, which is an extension of their emphasis on project-based learning. Data for Amity University's e-project reports is not provided. Sushant University holds a large collection of audio and video cassettes, offering a diverse range of multimedia resources. Data for Amity University's audio/video collection is not provided.

Table 3 Library Collection

<b>Print Collection</b>			
<b>S.N.</b>	<b>Library Collection</b>	<b>Amity University</b>	<b>Sushant University</b>
1	Books	56,290	54,182
2	Journals	170	36
3	Magazines	15	5
4	News Paper	5	6
5	Thesis & Dissertations	212	59
6	Project Reports	2000	3200
7	Handbooks and Manuals	Yes	10
8	Back Volumes of Journals	2000	300
<b>E-Collection</b>			
1	No. of E-books	0	10,00,000
2	E-Magazines	0	5
3	No. of E-Databases	7	3
4	Thesis & Dissertations	212	59
5	Project Reports	0	2600
6	Audio/ Video Cassettes	0	3500

Amity University leads in most print collection categories, including books, journals, magazines, and back volumes of journals, reflecting a strong emphasis on traditional library resources. Sushant University, on the other hand, excels in project reports and has a more extensive e-collection, particularly in e-books and audio/video cassettes, highlighting its focus on digital and multimedia resources. This analysis provides insights into the strengths and focus areas of each university's library collection.

**Library ICT Infrastructure**

Table 4 ICT Infrastructure

<b>Sr. N.</b>	<b>Component</b>	<b>Amity University</b>	<b>Sushant University</b>
	Computerization	Fully	Partially
	Library Management Software	KOHA	TCS
	Number of Computers	30	30
	Internet Connectivity	✓	✓

	Remote Access Tool	✓	✓
	Use of Digital Resources	✓	✓
	Digital Library	✓	✓
	Membership of Library Networks	✓	✓
	E-books Database	✓	✓
	ICT-based Security System	✓	✓
	Online Book Reservation Facility	✓	✓
	Online Books Renewal Facility	✓	✓
	Books Overdue Reminder Notices	✓	✓
	OPAC System Link up with University's Main Website	✓	✓
	Self-Check-in and Self-Check-out System	✓	✓
	Online Resource-Sharing Facility	✓	✓
	Institutional Repository (IR) System	✓	✓
	Electronic Thesis & Dissertation (ETD)	✓	✓
	Member of UGC-Shodhganga	✓	✓
	Library Registered in the NDLI-Club Portal	✓	✓
	Video Conferencing Facility	✓	✓

Table 4 shows that Amity University has fully computerized its library, making it easy to manage and access resources. Sushant University is still working towards full computerization. Each university uses different software for managing their libraries: Amity uses KOHA, an open-source system, while Sushant uses TCS, a customized solution. Both libraries have the same number of computers, providing similar computer access to users. They also offer internet connectivity allowing access to online resources and digital databases.

Amity University provides a remote access tool (Refread) that lets users access library resources from anywhere, which Sushant University does not offer. Which is limiting off-campus access. Both universities use digital resources to support academic and research needs and have digital libraries with lots of digital content. They are part of library networks, which help them share resources and collaborate with other libraries. Both libraries also have e-book databases to enhance their digital collections and use ICT-based security systems to protect their resources and ensure a safe environment.

Both universities let users reserve books online and renew them for convenience. They also send reminders for overdue books to help users avoid fines. Their Online Public Access Catalog (OPAC) systems are linked to their main websites, making it easy to access library catalogs. Amity University offers self-check-in and self-check-out systems, which Sushant University does not have.

Both universities support online resource sharing, allowing access to a wider range of materials. They have institutional repositories to preserve and provide access to academic works and research outputs, and electronic thesis and dissertation systems for digital access to scholarly works. Both libraries are members of UGC-Shodhganga, a repository of Indian theses and dissertations, and are registered with the National Digital Library of India (NDLI) Club Portal, promoting digital learning and resource sharing. Additionally, both universities offer video conferencing facilities for virtual meetings, lectures, and collaborations.

**Library Serveries**

**Traditional Services**

Table 5 shows the traditional library services at Amity University and Sushant University. Both universities offer a wide range of services to support academic and research activities. They provide circulation services, allowing users to borrow and return books and other materials. They also offer book reservation services, so users can reserve popular materials that are currently checked out. Both universities have inter-library loan services, which let users borrow materials from other libraries, giving access to more specialized resources. Additionally, reference services at both universities help users find information and use library resources effectively, which is important for research and academic work.

Both universities offer indexing services to help users quickly find information in books, journals, and other resources. They also provide abstracting services, which summarize documents so users can easily see if they are relevant. Bibliography services help users create lists of sources on specific topics, which is important for research and writing. Current Awareness Service (CAS) and Selective Dissemination of Information (SDI) keep users updated on new publications and developments in their fields. Additionally, both universities offer reprography services like photocopying, scanning, and printing, making it easier for users to duplicate and access materials. These traditional library services show that Amity University and Sushant University are dedicated to supporting the academic and research needs of their users, improving the overall library experience.

Table 5 Traditional Services

Name of the Service	Amity University	Sushant University
Circulation	✓	✓
Book Reservation Service	✓	✓
Inter Library Loan	✓	✓
Reference Service	✓	✓
Indexing Service	✓	✓
Abstracting	✓	✓
Bibliography	✓	✓
CAS (Current Awareness Service)	✓	✓
SDI (Selective Dissemination Service)	✓	✓
Reprography	✓	✓

**ICT-Based Library Services**

Table 6 ICT-Based Library Services

Name of the Service	Amity University	Sushant University
Internet Access Services	✓	✓
E-Books Access Services	✓	✓
E-Journals Access Services	✓	✓

Online Access Database	✓	✓
CD-ROM Access Services	✓	✓
OPAC	✓	✓
Web OPAC	✓	✓
Institutional Repository	✓	✓
Remote access services	✓	✓

Table 6 shows the ICT-based library services at Amity University and Sushant University. Both universities offer a variety of digital services to support academic needs. They provide internet access in the library, allowing users to connect to online resources. Both universities have extensive collections of e-books and e-journals, letting users read and download digital books and academic articles. They also offer access to online databases, which are important for thorough research.

Although less common now, both universities still provide CD-ROM access for older or specialized resources. They have Online Public Access Catalog (OPAC) systems, so users can search the library catalog online. The Web OPAC service allows users to access the catalog from any location via the internet.

Both universities maintain institutional repositories to store and provide access to academic and research outputs, preserving scholarly work. They also offer remote access services, enabling users to access library resources from off-campus, which is especially useful for distance learners and faculty who need flexible access.

#### Technological Competency Among Library Personnel

Table 7 shows that Amity University and Sushant University are dedicated to improving their library services by enhancing the ICT skills of their staff. They organize special programs like orientation courses, workshops, and special lectures to boost these skills. Amity University offers a variety of these programs, while Sushant University also includes short-term courses and conferences. Both universities encourage and support their library staff to attend various ICT skill development programs, such as short-term courses, workshops, and refresher courses. During the COVID-19 pandemic, both universities provided remote access services, ensuring uninterrupted access to essential library resources. This demonstrates the effectiveness of their ICT infrastructure and the competence of their library staff.

Table 7 Technological Competency Among Library Personnel

Questions	Amity University	Sushant University
The library has sufficient staff who have ICT skills	✓	✓
Organize special programs for the library staff to the enhancement of ICT Based library services	✓	✓
Provide Programs	Orientation Courses, Workshops, and Special lectures	Orientation Courses, Short-term courses, Workshops, Conferences and Special lectures

The library team attended the Short-term courses/ Orientation program/ Workshops/ Refresher courses to update their ICT skills	✓	✓
Remote access services provided during COVID-19	✓	✓

**Opinion for ICT Applications**

Table 8 Opinion for ICT Applications

S.N .	Librarian’s Perspective on ICT Applications	AU	SU
1	Improvement in the services of the library through ICT	Strongly Agree	Strongly Agree
2	ICT applications improve the quality of the library	Strongly Agree	Strongly Agree
3	The efficiency of the library has been improved through ICT applications	Strongly Agree	Strongly Agree
4	The time of users can be saved through ICT applications while searching for any required information	Strongly Agree	Strongly Agree
5	ICT applications help to find the right information at the right time to the users and as well as library staff	Strongly Agree	Strongly Agree
6	ICT reduced the workload of library staff	Agree	Strongly Agree
7	To handling of information in the library, ICT brought marvelous changes from traditional to upgrading	Strongly Agree	Strongly Agree
8	The significance of the library will be improved by the ICT applications	Strongly Agree	Strongly Agree
9	ICT applications in the library create incorporation within the organization	Strongly Agree	Strongly Agree
10	The Users are provided easy and quick access of information through ICT	Strongly Agree	Strongly Agree

Table 8 shows the views of librarians from AU and SU on how ICT (Information and Communication Technology) impacts library services. Both sets of librarians strongly agree that ICT has greatly improved library services, indicating a shared belief in the positive effects of technology on service delivery. They also agree that ICT has enhanced the quality of library services, suggesting that technology has likely made library operations more accurate, reliable, and of a higher standard.

The librarians also strongly agree that ICT has improved efficiency, which could mean faster processing times, smoother workflows, and better resource management. They believe that ICT saves users’ time when searching for information, implying that digital catalogs, search tools, and online databases make information retrieval much quicker and more user-friendly. Additionally, they agree that ICT helps both users and staff find the right information at the right time, indicating that the search functions and database

systems provided by ICT are very effective. AU librarians agree, while SU librarians strongly agree. This difference might be due to different levels of ICT use or varying workloads before ICT was adopted. However, both agree that ICT has positively impacted reducing staff workload.

Both sets of librarians strongly agree that ICT has brought significant changes, moving from traditional methods to modern ones. This likely includes digitizing records, using automated systems, and integrating digital tools. They also strongly agree that ICT will continue to enhance the library’s importance, showing optimism about technology’s future role in keeping libraries relevant.

Strong agreement from both groups highlights that ICT improves organizational integration, meaning better communication, coordination, and collaboration within the library and possibly with other departments. Both sets of librarians also strongly agree that ICT makes accessing information quick and easy, which is crucial for meeting user needs efficiently.

**Obstacles to ICT Implementation**

Table 9 Obstacles to ICT Implementation

<b>Librarian’s Perspective on Obstacles to ICT Implementation</b>	<b>AU</b>	<b>SU</b>
Insufficient financial aid for the library	Agree	Agree
Shortage of trained library staff related to ICT applications	Agree	Agree
Library professionals do not show an interest in enhancing ICT skills	Disagree	Disagree
Insufficient ICT infrastructure in the library	Agree	Agree
Fear of accepting modern techniques among library staff may reduce the ICT application in the library	Disagree	Disagree
Lack of support from the management	Agree	Disagree
Insufficient technical support to resolve the problem of ICT application in the library	Agree	Disagree
Shortage of awareness towards the benefits of ICT applications in the library	Agree	Agree
Users of the library may not be familiar with ICT applications in the library	Disagree	Agree

Table 9 shows the opinions of librarians from AU and SU on the barriers to using ICT in libraries. Both groups agree that not enough financial aid is a major barrier, indicating that money issues make it hard for libraries to adopt and maintain ICT. They also agree that there is a shortage of trained staff, highlighting the need for specialized training and professional development to equip library staff with ICT skills.

Both groups disagree with the idea that library professionals are not interested in improving their ICT skills. This suggests that librarians are generally motivated to enhance their ICT abilities if they have access to proper training. Lastly, both groups agree that insufficient ICT infrastructure is a barrier, pointing to the need for more investment in technology to support effective ICT use in libraries.

The two groups of librarians have divergent views on the assertion that the fear of modern techniques among staff reduces ICT use. This means library workers are more likely to adopt new technologies, and the real concerns lie in training and infrastructure improvements. One group disagrees about whether their managers support them or not: According to AU librarians, they do not receive any encouragement while SU librarians oppose this. This might be due to differing management strategies at both institutions. When it comes to

inadequate technical support, it is true for SU librarians but false for AU ones. It implies that there could be different levels of technical support or expectations between those two universities. Both groups believe there exists lack of knowledge about the benefits of ICTs. This demonstrates a need for programs that can educate library personnel and users about how ICT can improve library services.

### **Recommendations**

Given this study on ICT use in library services, here are some recommendations:

Hold regular sessions, workshops and orientations to improve the staff's information and communication literacy level.

Request for more financial support in the budget for upgraded ITC infrastructure.

Run programs to train librarians and users about information technology applications

Set up a dedicated technical support team to minimize downtime, improve the quality of digital services.

Encourage team work between library staff and other departments for better cohesiveness in ICTs.

Develop strategies that assist users in achieving maximum utilization of ICT resources.

Conduct regular assessments on ICT services and collect appraisals for their improvement.

Upgrade the library's ICT infrastructure to support more digital services such as remote access.

Implementing these recommendations can enhance the delivery of ICT-based services, increase user satisfaction, and make library operations more efficient.

### **Conclusions**

Information and communication technology (ICT) integration in academic libraries at both Amity University Haryana and Sushant University Gurugram has been a very important factor in improving service delivery and user satisfaction. The research shows that though both universities have made immense steps in embracing ICT based resources, it still faces challenges posed by a shortage of infrastructure, technical staff, and enough training among others for the staff and the patrons. These are challenges that need to be addressed to achieve the fullest potential of ICT in library services. The universities can improve their ICT by setting up specialized training, seeking more funds for technology innovation, and increasing collaboration between library staff and other departments. Ultimately, strategic integration of ICT will be very critical to ensuring increased accessibility and quality of library services and enhancing the overall academic success of library users. That will need constant investment in technologies and users' education to keep pace with changes in access scenarios and see libraries retaining a relevance in the digital age.

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