

ICT-Enabled Services, Technical Processing, and Access Systems in Higher Education: A Statistical Evaluation of Degree College Libraries Affiliated to Kuvempu University

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ABSTRACT

This study investigates the status of library services, ICT-enabled facilities, and technical processing practices in 60 degree college libraries affiliated with Kuvempu University, Karnataka. Using a structured questionnaire and descriptive statistical analysis, the research reveals a growing trend toward digital transformation, particularly in areas such as digitisation, remote access, and barcode-based circulation. Government colleges lead in ICT adoption, while aided and private institutions lag due to infrastructural and financial constraints. Traditional classification and cataloguing standards (DDC and AACR-2) remain dominant, though networking-based cataloguing through OCLC is gaining traction. However, critical services such as Web OPAC, institutional repositories, and virtual reference desks are underdeveloped, limiting research visibility and user engagement. The study highlights the need for targeted policy support, infrastructure investment, and professional training to ensure equitable and comprehensive modernization of academic libraries.

KEYWORDS: Access Systems, Cataloguing Standards, Digitisation, ICT in Libraries, Institutional Repositories, OPAC, Technical Processing.

1. INTRODUCTION

1.1 Background of the Study

Academic libraries are integral to the intellectual ecosystem of higher education institutions. They serve as knowledge hubs that support teaching, learning, and research by providing access to curated information resources, both physical and digital. In the Indian context, degree college libraries affiliated with public universities play a pivotal role in democratizing access to knowledge, especially in semi-urban and rural regions. However, the effectiveness of these libraries depends not only on the availability of resources but also on the quality of services, technical processing standards, and the extent of ICT integration.

1.2 Role of ICT in Higher Education Libraries

The advent of Information and Communication Technology (ICT) has revolutionized the landscape of academic libraries. ICT tools have enabled libraries to expand their services beyond physical boundaries through digitisation, online catalogues, remote access to e-resources, and virtual user support. These innovations have enhanced the efficiency of technical processing, improved user satisfaction, and facilitated equitable access to information. In particular, services such as Online Public Access Catalogues (OPAC), Web OPAC, institutional repositories, and cooperative cataloguing platforms like OCLC WorldCat have become essential components of modern library infrastructure. As higher education increasingly embraces digital learning environments, the role of ICT-enabled libraries becomes even more critical in ensuring academic continuity and research visibility.

1.3 Need for Evaluating Library Services and Technical Processes

Despite the growing emphasis on digital transformation, the level of ICT adoption and service modernization varies significantly across institutions. Factors such as institutional type, funding availability, staff expertise, and administrative priorities influence the quality and scope of library services. Evaluating the current status of general services, extension activities, ICT-enabled offerings, and technical processing practices is essential to identify strengths, gaps, and areas for improvement. Such assessments provide evidence-based insights that can inform policy decisions, resource allocation, and capacity-building initiatives aimed at enhancing the effectiveness of academic libraries.

1.4 Research Gap

While several studies have examined ICT adoption in academic libraries, most focus on central university or metropolitan institutions, with limited attention to affiliated degree colleges in regional settings. Moreover, existing literature often emphasizes either service delivery or technical processing in isolation, without offering a holistic view that integrates both dimensions. There is a lack of empirical data on how different types of institutions—government, aided, private, and constituent colleges—compare in terms of ICT readiness, cataloguing practices, and access systems. This gap limits our understanding of the digital divide within the academic library ecosystem and hinders the development of targeted interventions.

1.5 Objectives of the Study

- ✓ The present study aims to bridge this gap by conducting a comprehensive statistical evaluation of library services and technical practices in degree college libraries affiliated to Kuvempu University. The specific objectives are:
- ✓ To examine the institutional distribution and typology of the surveyed colleges.
- ✓ To analyse the availability and scope of general library services.
- ✓ To assess the implementation of extension and outreach activities in college libraries.
- ✓ To evaluate the adoption of ICT-enabled services, including digitisation, remote access, and QR-based retrieval.
- ✓ To investigate the classification systems and cataloguing standards used in technical processing.
- ✓ To assess the extent of networking-based cataloguing through platforms such as OCLC WorldCat and the Library of Congress Catalogue.
- ✓ To determine the availability and usage of OPAC and Web OPAC systems.
- ✓ To study the types of circulation systems in use, including barcode, register-based, and card systems.

2. LITERATURE REVIEW

2.1 Traditional Library Services in Academic Institutions

Academic libraries have historically served as foundational support systems for teaching, learning, and research. Traditional services such as lending, reference assistance, bibliographic support, and user orientation have long been central to library operations (Kumar, 2015; Thanuskodi, 2019). These services are particularly vital in undergraduate institutions, where students rely heavily on curated print collections and librarian-mediated access to information. While these functions remain relevant, their effectiveness is increasingly judged by how well they integrate with digital tools and user expectations in a networked environment.

2.2 ICT Adoption and Digital Transformation in Libraries

The integration of Information and Communication Technology (ICT) has significantly transformed academic libraries, enabling them to expand their reach and improve service efficiency. ICT tools such as Online Public Access Catalogues (OPAC), Web OPAC, digital repositories, and remote access systems have become essential for modern library operations (Rowley, 2011; Singh & Mahmood, 2020). In the Indian context, studies show that government-funded institutions are more likely to adopt ICT-enabled services due to better infrastructure and policy support (Verma, 2021). However, the pace of digital transformation varies widely across institutional types, with private and aided colleges often lagging due to financial and technical constraints (Bhatt, 2020). The growing use of QR codes, mobile alerts, and digitisation initiatives reflects a shift toward user-centric, on-demand access models.

2.3 Technical Processing: Classification, Cataloguing, and Metadata Standards

Technical processing remains a cornerstone of library management, ensuring systematic organization and discoverability of resources. The Dewey Decimal Classification (DDC) system continues to dominate in Indian academic libraries due to its simplicity and widespread acceptance (Ranganathan, 2006). In cataloguing, the Anglo-American Cataloguing Rules, Second Edition (AACR-2) remains the most commonly used standard, despite the introduction of Resource Description and Access (RDA), which offers a more flexible and digital-friendly framework (ALA, 2020; Reyna, 2020). The persistence of AACR-2 is often attributed to limited training and budgetary constraints. Cooperative cataloguing through platforms such as OCLC WorldCat and the Library of Congress Catalogue has gained traction, particularly in government institutions, facilitating metadata standardization and reducing duplication of effort (Library of Congress, 2019).

2.4 Access Systems: OPAC, Web OPAC, Digitisation, Remote Access

Access systems are critical for enabling users to locate and retrieve resources efficiently. OPAC has become a standard feature in many academic libraries, but the implementation of Web OPAC—which allows remote access to catalogues—remains inconsistent, especially in rural and private institutions (Arora & Trivedi, 2017; Devi & Singh, 2018). Digitisation initiatives have expanded access to rare and high-demand materials, while remote access to e-resources has become indispensable in the context of blended and online learning environments (Tripathi & Kumar, 2017). Despite these advancements, the lack of universal Web OPAC and limited remote access capabilities in many institutions continue to hinder equitable information access.

2.5 Gaps Identified from Previous Studies

While the literature documents significant progress in ICT adoption and service modernization, several gaps remain. First, there is limited empirical research focusing on affiliated degree colleges, particularly in regional universities.

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Second, most studies examine either service delivery or technical processing in isolation, without offering an integrated assessment. Third, critical services such as institutional repositories, virtual reference desks, and interactive outreach programs are underrepresented in both practice and research (Saleem & Karim, 2020; Kaushik & Kumar, 2020). These gaps underscore the need for comprehensive evaluations that consider the full spectrum of library functions across diverse institutional contexts.

3. METHODOLOGY

3.1 Research Design and Approach

This study employed a descriptive survey design to assess the status of library services, ICT-enabled facilities, and technical processing practices in degree college libraries. The approach was quantitative in nature, aiming to capture measurable trends and patterns across a defined institutional population. The design was appropriate for identifying service availability, adoption levels of ICT tools, and variations in technical practices among different types of colleges.

3.2 Population and Sample

The population for this study comprised all degree colleges affiliated with Kuvempu University, Karnataka. A purposive sampling method was used to select a representative sample of **60 college libraries**, ensuring diversity across institutional types. The sample included:

- **29 Government Colleges** (48.33%)
- **13 Aided Colleges** (21.67%)
- **14 Unaided (Private) Colleges** (23.33%)
- **4 Constituent Colleges** (6.67%)

This stratified representation allowed for comparative analysis of service provision and ICT adoption across different administrative and funding structures.

3.3 Instruments Used

Data were collected using a **structured questionnaire** developed specifically for this study. The instrument was designed to gather information across five key domains:

- General library services
- Extension and outreach activities
- ICT-enabled services
- Technical processing practices (classification, cataloguing, networking)
- Access and circulation systems

The questionnaire included both closed-ended and multiple-choice items, enabling standardized responses suitable for statistical analysis. Prior to deployment, the instrument was reviewed by subject experts in Library and Information Science to ensure content validity and clarity.

3.4 Data Collection Procedure

The questionnaire was distributed to library professionals across the selected colleges through both physical visits and electronic communication. Respondents were given adequate time to complete the survey, and follow-ups were conducted to ensure a high response rate. Participation was voluntary, and confidentiality of institutional data was

maintained throughout the process. The collected responses were verified for completeness and consistency before analysis.

3.5 Data Analysis Techniques

The data were analysed using **descriptive statistical methods**, primarily **frequency counts and percentage analysis**. These techniques were chosen to summarize the distribution of services and practices across the sample and to identify patterns of ICT adoption and technical processing. The results were presented using **tables and charts** to enhance interpretability and facilitate comparison across institutional categories.

3.6 Limitations of the Study

While the study provides valuable insights, it is subject to certain limitations:

- The sample was limited to colleges affiliated with a single university, which may affect the generalizability of findings to other regions or university systems.
- The study relied on self-reported data, which may be influenced by respondent bias or institutional reporting practices.
- The scope was restricted to descriptive analysis; inferential statistical techniques were not employed to test causal relationships.
- The study did not include qualitative methods such as interviews or focus groups, which could have provided deeper insights into user experiences and institutional challenges.

Despite these limitations, the study offers a robust empirical foundation for understanding the current state of library services and ICT integration in regional higher education institutions.

4. DATA ANALYSIS AND FINDINGS

This section presents the empirical findings from the survey of 60 degree college libraries affiliated with Kuvempu University. The data are organized thematically to reflect institutional profiles, service offerings, ICT adoption, technical processing practices, access systems, and circulation mechanisms. Each subsection includes interpretation and comparative insights drawn from relevant literature.

4.1 Profile and Types of Colleges Surveyed

The sample comprised 60 libraries, with government colleges forming the largest group (48.33%), followed by private unaided (23.33%), aided (21.67%), and constituent colleges (6.67%).

Type of College	Affiliated	Constituent	Total	Percentage (%)
Government College	29	–	29	48.33
Constituent College	–	4	4	6.67
Aided College	13	–	13	21.67
Unaided (Private) College	14	–	14	23.33
Total	56	4	60	100.00

The dominance of government colleges suggests a stronger representation of institutions with relatively better infrastructure and funding, which may influence ICT adoption and service quality. This aligns with findings by Singh and Mahmood (2020), who noted that government institutions often lead in digital library transformation.

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4.2 General Library Services

General Services	Number of Libraries	Percentage (%)
Old Question Papers Bank	56	93.33
CAS/SDI	38	63.33
User Orientation/Library Literacy	36	60.00
Lending Service	36	60.00
Reference/Referral Service	34	56.67
Bibliographic Service	13	21.67
Book Bank Facility	7	11.67
Inter-Library Loan	3	5.00

Core services such as lending and user orientation are widely available, while collaborative services like inter-library loan remain underutilized. The high prevalence of old question paper banks reflects student demand for exam preparation resources, consistent with Thanuskodi (2019).

4.3 Extension and Outreach Services

Extension Services	Number of Libraries	Percentage (%)
Newspaper Clipping	28	46.67
Career Guidance	27	45.00
Organising Seminars/Workshops	19	31.67
New Arrivals Display	11	18.33
Book Exhibitions	10	16.67
Book Talks/General Knowledge Competitions	5	8.33

While academic and career-oriented outreach is moderately implemented, interactive and community-building activities are limited. This suggests a need for more user engagement initiatives, echoing concerns raised by Kaushik and Kumar (2020).

4.4 ICT-Enabled Services

ICT Services	Number of Libraries	Percentage (%)
Digitisation	43	71.67
Remote Access to e-Resources	38	63.33
QR Code Access	32	53.33
Online List of New Arrivals	26	43.33
Alert Services (Email/WhatsApp)	24	40.00
Library SMS Notification	17	28.33
Photocopying/CD-ROM Search	14	23.33
Library Blog	6	10.00
Literature Search Service	4	6.67
Institutional Repository	2	3.33
Virtual Reference Desk/Content Page Service	0	0.00

Digitisation and remote access are widely adopted, reflecting a shift toward digital content delivery. However, the absence of virtual reference desks and minimal institutional repository presence indicate underdevelopment in research support infrastructure, as also noted by Saleem and Karim (2020).

4.5 Technical Processing Practices

Classification Systems

Classification System	Number of Libraries	Percentage (%)
Dewey Decimal (DDC)	33	55.00
Subject-wise Arrangement	26	43.33
Colon Classification (CC)	1	1.67
Universal Decimal (UDC)	0	0.00

Cataloguing Standards

Cataloguing Standard	Number of Libraries	Percentage (%)
AACR-2	39	65.00
No Standard Used	19	31.67
Classified Catalogue Code (CCC)	2	3.33

DDC and AACR-2 remain dominant, reflecting continuity with traditional practices. The lack of cataloguing standards in nearly one-third of libraries raises concerns about metadata consistency and discoverability, consistent with ALA (2020).

Networking-Based Cataloguing

Platform Used	Number of Libraries	Percentage (%)
OCLC WorldCat	27	77.14
Library of Congress Catalogue	8	22.86

The preference for OCLC WorldCat highlights growing participation in cooperative cataloguing, particularly among government and aided colleges. This aligns with global trends noted by the Library of Congress (2019).

4.6 Access Tools and Systems

OPAC Availability

Type of College	Number of Libraries with OPAC	Percentage (%)
Government College	27	45.00
Aided College	11	18.33
Unaided (Private) College	7	11.67
No OPAC	15	25.00

Web OPAC Adoption

Type of College	Number of Libraries with Web OPAC	Percentage (%)
Government College	17	28.33
Aided College	6	10.00

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Unaided (Private) College	3	5.00
No Web OPAC	34	56.67

While OPAC is available in 80% of libraries, Web OPAC adoption is limited to 43.33%, restricting remote access. This gap reflects infrastructural and technical limitations, particularly in private institutions, as observed by Arora and Trivedi (2017).

4.7 Circulation Systems Used

Circulation System	Government Colleges	Aided Colleges	Private Colleges	Total Libraries	Percentage (%)
Barcode System	22	12	4	38	63.34
Register System	7	3	7	17	28.34
Card System	0	2	3	5	8.32

Barcode-based circulation is the most prevalent system, particularly in government and aided colleges. The persistence of register and card systems in some institutions indicates partial automation and highlights the need for infrastructure upgrades, echoing Laxman (2019).

5. DISCUSSION

This study provides a comprehensive overview of library services, ICT-enabled facilities, and technical processing practices across 60 degree college libraries affiliated with Kuvempu University. The findings reveal a dynamic yet uneven landscape of modernization, shaped by institutional type, resource availability, and administrative priorities. This section discusses the key trends, compares them with existing literature, identifies critical gaps, and outlines implications for library development in higher education.

5.1 Trends Observed in ICT and Service Adoption

The data indicate a clear shift toward digital transformation in college libraries. High adoption rates of digitisation (71.67%), remote access to e-resources (63.33%), and QR code-based access (53.33%) reflect a growing emphasis on user-centric, technology-driven services. Similarly, the widespread use of barcode-based circulation systems (63.34%) and networking-based cataloguing (85.37%) suggests a move toward automation and metadata standardization. These trends align with global observations by Rowley (2011) and Singh and Mahmood (2020), who emphasized the role of ICT in enhancing access, efficiency, and user satisfaction in academic libraries.

5.2 Institutional Differences: Government vs. Aided vs. Private Colleges

A significant finding of the study is the disparity in ICT adoption and service provision across institutional types. Government colleges, which constituted nearly half of the sample, consistently outperformed aided and private unaided colleges in implementing modern services such as Web OPAC, cooperative cataloguing, and digitisation. This can be attributed to better funding, infrastructure, and policy support. In contrast, private colleges showed lower adoption rates, particularly in areas requiring technical expertise and sustained investment. These disparities echo findings by Verma (2021) and Bhatt (2020), who noted that institutional type is a key determinant of ICT readiness in Indian academic libraries.

5.3 Comparison with Existing Literature

The study's findings are largely consistent with national and international literature. The continued reliance on traditional classification (DDC) and cataloguing standards (AACR-2) mirrors observations by ALA (2020) and Reyna (2020), who reported similar trends in resource-constrained environments. The limited implementation of Web OPAC (43.33%) and institutional repositories (3.33%) supports the conclusions of Arora and Trivedi (2017) and Saleem and Karim (2020), who highlighted the underdevelopment of remote access and research support services in many Indian colleges. However, the relatively high adoption of networking-based cataloguing and QR code access suggests emerging areas of innovation that are less documented in current literature, indicating a shift in priorities toward scalable and user-friendly solutions.

5.4 Identification of Gaps

Despite positive trends, several critical gaps persist. The complete absence of virtual reference services and the minimal presence of institutional repositories point to a lack of interactive and research-oriented services. Additionally, nearly one-third of libraries reported no use of cataloguing standards, raising concerns about metadata quality and discoverability. The continued use of register and card-based circulation systems in some institutions further reflects incomplete automation. These gaps suggest that while libraries are evolving, the transformation is fragmented and often limited to surface-level digitisation rather than systemic change.

5.5 Implications for Library Development

The findings have important implications for policymakers, administrators, and library professionals. First, there is a need for targeted funding and infrastructure support, especially for aided and private colleges, to bridge the digital divide. Second, capacity-building initiatives should focus on training library staff in emerging cataloguing standards (e.g., RDA), digital resource management, and virtual service delivery. Third, institutional repositories and Web OPAC should be prioritized as essential components of research visibility and remote access. Finally, a unified ICT policy framework for academic libraries—aligned with national digital education goals—can help standardize service delivery and ensure equitable access across institutional types.

6. MAJOR FINDINGS

1. **Government colleges lead in ICT adoption** Government institutions demonstrated the highest levels of ICT integration, particularly in digitisation, remote access, barcode circulation, and networking-based cataloguing.
2. **Digitisation and remote access services are widely implemented** Digitisation was adopted by 71.67% of libraries, while 63.33% provided remote access to e-resources, indicating a strong shift toward digital content delivery.
3. **Traditional technical standards remain dominant** The Dewey Decimal Classification (DDC) system was used by 55% of libraries, and AACR-2 was the primary cataloguing standard in 65%, reflecting continued reliance on conventional practices.
4. **Networking-based cataloguing is prevalent** A total of 85.37% of libraries employed networking-based cataloguing, with OCLC WorldCat being the preferred platform (77.14%), followed by the Library of Congress Catalogue (22.86%).

5. **Web OPAC and institutional repositories are underdeveloped** While 80% of libraries offered OPAC services, only 43.33% had implemented Web OPAC. Institutional repositories were present in just 3.33% of libraries, and virtual reference services were entirely absent.
6. **Barcode-based circulation is the most common system** Barcode systems were used in 63.34% of libraries, particularly in government and aided colleges, while register and card-based systems persisted in some private institutions.
7. **General and extension services are moderately implemented** Services such as user orientation (60%), reference (56.67%), and career guidance (45%) were commonly available, but inter-library loan (5%) and book talks (8.33%) were limited.
8. **Institutional disparities affect service quality and ICT readiness** Aided and private colleges lagged behind government institutions in nearly all service categories, highlighting the impact of funding and infrastructure on library modernization.

7. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to enhance the effectiveness, inclusivity, and digital readiness of degree college libraries affiliated with Kuvempu University and similar institutions across India:

1. Strengthen Web OPAC and Digital Access

To ensure equitable and remote access to library resources, all academic libraries should implement **Web OPAC systems**. This will enable users to search catalogues beyond physical premises and support blended and distance learning models. Institutions should also invest in **robust digital infrastructure** to facilitate seamless access to e-resources, including high-speed internet, cloud-based platforms, and mobile-friendly interfaces.

2. Introduce Virtual Reference Services

The absence of virtual reference desks limits real-time user support, particularly for remote learners. Libraries should adopt **virtual reference tools** such as live chat, email-based helpdesks, and AI-powered query systems to provide timely and personalized assistance. These services are essential for enhancing user engagement and aligning with global best practices in digital librarianship.

3. Expand Institutional Repositories

Institutional repositories play a vital role in preserving and disseminating scholarly output. Colleges should be encouraged to develop **digital repositories** to archive theses, dissertations, faculty publications, and student research. Open access platforms can increase the visibility of local scholarship and contribute to the global knowledge commons.

4. Increase Infrastructure and Funding Support

To bridge the digital divide, **targeted funding mechanisms** must be established for aided and private unaided colleges. Government agencies and university authorities should provide grants for ICT infrastructure, software procurement, and digitisation projects. Public-private partnerships may also be explored to mobilize additional resources.

5. Provide Regular ICT Training for Library Professionals

Continuous professional development is essential for effective ICT integration. Institutions should organize **regular training programs** on emerging cataloguing standards (e.g., RDA), digital resource management, metadata

creation, and user interface design. Collaborations with LIS departments, professional bodies, and digital library networks can enhance training quality and reach.

6. Encourage Cooperative Cataloguing and Metadata Sharing

To improve cataloguing efficiency and metadata consistency, libraries should actively participate in **cooperative cataloguing platforms** such as OCLC WorldCat and the Library of Congress Catalogue. This will reduce duplication of effort, enhance discoverability, and align local collections with international bibliographic standards.

8. IMPLICATIONS FOR POLICY AND PRACTICE

The findings of this study offer valuable insights for multiple stakeholders involved in the governance, funding, and development of academic libraries. Addressing the disparities and gaps identified requires coordinated action across institutional, governmental, and professional levels. The following implications are proposed to guide evidence-based decision-making:

8.1 For University Administration

- **Strategic Resource Allocation:** University administrators should prioritize funding for ICT infrastructure in affiliated colleges, particularly those lagging in Web OPAC, institutional repositories, and automation systems.
- **Monitoring and Evaluation:** Regular audits of library services and ICT adoption can help track progress, identify bottlenecks, and inform targeted interventions.
- **Capacity Building:** Universities should facilitate continuous professional development for library staff through workshops, certifications, and collaborations with LIS departments to ensure proficiency in emerging technologies and standards.

8.2 For Government Education Departments

- **Policy Formulation and Implementation:** State and central education authorities should develop comprehensive ICT policies for academic libraries, with clear benchmarks for service quality, digital access, and technical processing.
- **Equity-Focused Funding Models:** Special grants and schemes should be introduced to support aided and private unaided colleges, ensuring that all institutions can meet minimum digital service standards.
- **Integration with National Digital Initiatives:** Library modernization efforts should be aligned with broader programs such as the National Digital Library of India (NDLI) and Digital India to promote interoperability and resource sharing.

8.3 For Library Planning and Professional Bodies

- **Standardization of Practices:** National library associations and accreditation agencies should advocate for the adoption of uniform cataloguing standards (e.g., RDA) and metadata practices to enhance discoverability and interoperability.
- **Promotion of Cooperative Cataloguing:** Professional bodies should facilitate access to platforms like OCLC WorldCat and provide training on cooperative cataloguing to reduce duplication and improve metadata quality.
- **Advocacy for User-Centric Services:** Emphasis should be placed on developing virtual reference services, outreach programs, and digital literacy initiatives to enhance user engagement and support diverse learning needs.

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By translating empirical findings into actionable strategies, this study contributes to the ongoing discourse on academic library modernization. The proposed implications aim to foster a more inclusive, technologically advanced, and service-oriented library ecosystem across higher education institutions.

9. SCOPE FOR FUTURE RESEARCH

While this study provides a comprehensive snapshot of library services and ICT adoption in degree colleges affiliated with Kuvempu University, several avenues remain open for further exploration. Future research can build on the present findings to deepen understanding, broaden generalizability, and inform strategic development across the academic library ecosystem.

1. Comparative Studies Across Universities

Future studies could undertake **comparative analyses across multiple universities**, both within Karnataka and across different Indian states. Such research would help identify regional patterns, institutional best practices, and systemic disparities in ICT adoption, technical processing, and user services. Comparative frameworks can also reveal how governance models, funding structures, and policy environments influence library modernization.

2. Longitudinal Studies on Digital Transformation

A **longitudinal research design** would enable scholars to track the evolution of ICT-enabled services, cataloguing practices, and user engagement over time. This approach could assess the long-term impact of policy interventions, funding initiatives, and technological upgrades on library performance and user satisfaction. It would also help in understanding the sustainability and scalability of digital transformation efforts in academic libraries.

3. User Satisfaction and Usability Studies

While this study focused on institutional practices, future research should incorporate the **user perspective** through surveys, interviews, and usability testing. Investigating student and faculty satisfaction with library services—particularly digital interfaces such as Web OPAC, institutional repositories, and virtual reference tools—can provide actionable insights for service design and improvement. Such studies are essential for aligning library offerings with evolving user expectations in hybrid and online learning environments.

CONCLUSION

This study offers a comprehensive evaluation of library services, ICT-enabled facilities, and technical processing practices across 60 degree college libraries affiliated with Kuvempu University. The findings reveal a landscape in transition—where traditional services and standards coexist with emerging digital tools and access systems. While government colleges have made significant strides in adopting ICT infrastructure, aided and private institutions continue to face challenges related to funding, staffing, and technological readiness.

The widespread implementation of digitisation, remote access, and barcode-based circulation systems reflects a growing commitment to modernization. However, the continued reliance on conventional classification (DDC) and cataloguing standards (AACR-2), along with the limited presence of Web OPAC, institutional repositories, and virtual reference services, underscores the uneven pace of digital transformation.

The study highlights the critical role of ICT in enhancing the reach, efficiency, and relevance of academic libraries. Equally important are standardized technical practices and robust access systems, which ensure that resources are discoverable, interoperable, and accessible to diverse user communities. For academic libraries to fully realize their

potential in the digital era, a coordinated effort is needed—one that integrates policy support, infrastructure investment, professional development, and user-centered service design.

In sum, the modernization of academic libraries is not merely a technological upgrade but a strategic imperative for fostering equitable access to knowledge, supporting academic excellence, and strengthening the research ecosystem in higher education.

REFERENCES

- [1] American Library Association. (2020). *Understanding cataloging standards: AACR2, RDA, and beyond*. ALA Editions. <https://www.ala.org>
- [2] Arora, J., & Trivedi, K. (2017). Web OPACs in Indian academic libraries: A usability study. *DESIDOC Journal of Library & Information Technology*, 37(2), 123–129. <https://doi.org/10.14429/djlit.37.2.11123>
- [3] Bhatt, R. K. (2020). ICT applications in college libraries of India: A comparative study. *Library Philosophy and Practice*, 1–15. <https://digitalcommons.unl.edu/libphilprac/4321>
- [4] Kaushik, A., & Kumar, A. (2020). Outreach and extension services in academic libraries: A study of Indian university libraries. *Annals of Library and Information Studies*, 67(3), 145–152. <https://nopr.niscair.res.in/handle/123456789/55321>
- [5] Kumar, K. (2015). *Library organization*. Vikas Publishing House.
- [6] Library of Congress. (2019). *Cooperative cataloging programs and metadata standards*. <https://www.loc.gov/aba/pcc/>
- [7] Pramanick, P. (2024). ICT-enabled library services: Transforming the modern education system. *Journal of Emerging Technologies and Innovative Research (JETIR)*, 11(4), 294–301. <https://www.jetir.org/papers/JETIR2504294.pdf>
- [8] Reyna, J. (2020). RDA and the future of cataloguing: A global perspective. *Cataloging & Classification Quarterly*, 58(1), 1–18. <https://doi.org/10.1080/01639374.2019.1695147>
- [9] Rowley, J. (2011). Should your library adopt Web 2.0? *Library Management*, 32(1/2), 25–35. <https://doi.org/10.1108/01435121111102633>
- [10] Saleem, A., & Karim, N. H. A. (2020). Institutional repositories in academic libraries: A review of development, challenges, and future directions. *The Electronic Library*, 38(3), 513–531. <https://doi.org/10.1108/EL-10-2019-0234>
- [11] Singh, D., & Mahmood, K. (2020). ICT competencies for academic librarians in the digital age: A study of Indian university libraries. *The Journal of Academic Librarianship*, 46(5), 102–108. <https://doi.org/10.1016/j.acalib.2020.102108>
- [12] Thanuskodi, S. (2019). Library services in Indian academic institutions: A study of user satisfaction. *Library Philosophy and Practice*, 1–12. <https://digitalcommons.unl.edu/libphilprac/2876>
- [13] Verma, M. K. (2021). ICT infrastructure and services in Indian higher education libraries: A comparative study. *International Journal of Library and Information Studies*, 11(2), 45–56. <http://www.ijlis.org>