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K N LAKSHMIPATHI

St. Joseph's College of Commerce (Autonomous), pathi78@gmail.com

R Senthilkumar Dr

Kongunadu Arts and Science College, kasclibrary@yahoo.com

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Availability and usage of digital infrastructure services and facilities in University Libraries of Karnataka and Andhra Pradesh: A Comparative Study

Mr. K. N. Lakshmipathi,

Researcher Scholar, Dept. of LIS, Bharathiar University, Coimbatore – 641 046. &
Librarian, St. Joseph's College of Commerce (Autonomous), Bangalore – 560025.

Dr. R. Senthil Kumar

Research Supervisor, Librarian (SG) & Head (Research), Dept. of LIS, Kongunadu Arts and Science College, Coimbatore-641029.

Abstract

Advanced ICT applications have been proven to be the major driver of knowledge, learning, teaching, research, interaction, collaboration, innovation, and initiations in order to enrich and empower variables of the present information/knowledge society and its human lives. Information Technology is being interconnected with different hardware, software, networking/internet transmission, and broadcasting devices peripheral equipment that is programmed for convenience of information dissemination to different user communities. It is very obvious that the use and adoption of ICT in all areas of human endeavor are now known and widely acceptable and adaptable. In this study, the researchers made an attempt to examine the status of library automation and its usage in university libraries of Karnataka and Andhra Pradesh states in India. Relevant data for the study was collected from a well-structured questionnaire designed and distributed both to librarians and users of BU, Bangalore, UoM, Mysore, AU, Vishakapatnam and SVU, Tirupathi University libraries of Karnataka and Andhra Pradesh states in India. A survey method was adopted in this study and the study samples were selected by deploying random sampling technique parameters. One –Way ANOVA statistical tool was used to find out the relationship between the variables. The collected data has been analyzed by applying appropriate statistical tools and the analyzed results are presented in tables and figures.

Keywords: Library infrastructure, Library resources, Library automation, Automated activities, ICT Infrastructure, Automated services, University Libraries, Andhra Pradesh, Karnataka

1. Introduction

ICT and its applications such as web-enabled services and facilities are widely used today to search and gathering of various types information and knowledge sharing through various networking platforms and communication devices. Digital platforms and devices such as

computer hardware facilities, software accessibilities, phonic conversations, television transmissions, social media, projector presentations, radio listening, satellite communication systems, etc. These digital platforms and devices are associated with existing library and information for better enforcement of library services, facilities, and activities can transform any society and accelerate sustainable development. Nowadays, the majority of the libraries are willing to use IT-enabled apps, applications, tools, and techniques for easy to manage library routine services, facilities, functions, and activities. Digital technologies have made easy routine functions such as acquisition, subscription of databases, technical processing of documents, serial control of journals and magazines, cataloging and classification of documents, user education, library collaboration, Online Public Access Catalogue (OPAC), and creation of in-house databases. It facilitated users to search and retrieve required information in 24*7 priorities. Also, these digital devices and gadgets are used to acquire, process, organize, preserve, retrieve, and sharing or transmission of information for the purpose of teaching, learning, research and also get together with coordinate or subordinate colleagues, friends, and other equal minded professionals through various social or integrated online connecting platforms. Hence, all academic libraries, especially university libraries should think about restructure, update, up-gradation, and modernize their university library functions, operations, and services by adopting existing quicker, freely, and less costly available web-enabled conceived computerized assets and make a library in better use. The advanced and smart technologies such as,

- | | |
|-----------------------------|--|
| a) Automated technology | k) Transmission technology |
| b) Animation technology | l) Software technology |
| c) Bar-code technology | m) Printing technology |
| d) RFID technology | n) Hardware technology |
| e) Remote access technology | o) Storage technology |
| f) Networking technology | p) Communication technology |
| g) Repository technology | q) Mobile technology |
| h) Startup technology | r) Media technology |
| i) Web 3.0 technology | s) Information technology |
| j) Cloud technology | t) Research and educational technology |

Other technological innovations have been impacting on libraries to effective re-set of the library functionalities and provide quality services to different user communities in this changing context.

2. Technological advancements in university libraries

The advances in science and technology, especially information technology influences all activities of the present society. Due to revolution in the field of information technology, the demand and consumption of information has increased. The librarians face numerous challenges in managing massive volume of information for storage, process, retrieval, and dissemination of information in libraries. The modern technology has made the management of this explosive growth of information effective. Information technologies today are characterized by their very dynamic development and increasing complexity. Information technology application in library and information field has made remarkable progress in the world. Information technology not only affects the technical services of libraries but also shapes the library services that are being offered to the public. Worldwide libraries have been exploring new technologies for providing better and faster access to vast information resources and efficient information services to their users. Information technology has offered better solutions to achieve greater level of efficiency, productivity and excellence in the services offered by libraries. Latest achievements in the field of information technology have compelled library to embrace automation and go beyond traditional practices.

In the last four decades, libraries used card catalogue, typewriters, and manual due date slips. Library automation is a current system to support libraries and its patrons to meritoriously use library resources, it is now rationalized because of integrated library management system. In libraries, automation refers to the process of in-house functions such as circulation, cataloguing, acquisition, serial controls, member management, setup & security, in-out management etc. Automation is a technique to perform the different routines, repetitive and clerical jobs involved in-house functions and services of the library with the support of machines.

Now, university libraries are playing a crucial role in the educational, industrial, and technological progress of a country. Progress of the nation depends upon advanced knowledge gained by educationists, technologists, engineers, and scientists of the country. Hence the role of libraries in universities and then educational institutions is to ensure the free flow of information from the point of generation to the point of utilization in an efficient manner. The present educational policy emphasizes self-study, experiments, field study, and research rather

than classroom study. Therefore, libraries need to respond proactively to these challenges and play a vital role in higher education to meet user requirements.

In this aspect, India has made great developments in information communication technology. It has recognized the possibility of automation for bibliographical information work and monotonous library housekeeping procedures. The computer is used in libraries to increase the efficiency and effectiveness of their operations and services; they have also provided information management for taking effective decisions. Development and use of information and communication technology (ICT) enable the libraries not only to offer their clientele the appropriate information available within their libraries but also gain access to catalogue of local, national and international libraries.

3. Review of Literature (RoL)

There have been numerous case studies, surveys, thesis and dissertations, minor and major research projects conducted by researchers of the developed and under developing countries on assessing the awareness, acquisition, adoption, and making use of available resources and adaptability of ICT and its applications in public, academic, research and development, private and corporate libraries. Some of such good research studies were found in various journals, conference, thesis, and dissertations and has been reviewed and presented below by this researcher.

A study on status of automation, digitization and services offered by the libraries of Agriculture Universities in North Indian region was reported by **Lata & Kumar (2020)**. The study found that university libraries should enrich resources to provide timely information for their users with using emerging ICT applications, tools and techniques and libraries should improve automated, digital archives and create in-house database and offer web-based services to provide quality information to their users. A foreign study founded by **Anene & et al (2020)** analyzed use of ICT applications to create user awareness by the user of Federal university libraries in South East Nigeria. It is revealed, most of the libraries are being create user awareness through various formal and informal information channels i.e., seminar, workshops, lectures, demonstration, virtual tour and awareness cum orientation etc., user education methods. The ICTs applications are contributing to a very great extent in effectively conduct user assistance and user education programme in the libraries, especial university libraries academic communities.

Another study investigated by **Subba & Das (2019)** assessed use of information communication technology (ICT) by twenty (20) degree college libraries in Darjeeling District, India by investigating the ICT infrastructure, current status of library automation, barriers to implementation of library automation. The findings from the study had revealed that most of the college libraries lacked sufficient hardware and software facilities and did not have sufficient internet nodes and bandwidth.

A comparative study was done by **Venkatesha & Sarasvathy (2018)** to examine the status of automation process and progress in university libraries of Karnataka and Tamil Nadu states. The study results showed that most of the university libraries in Karnataka mostly preferred the open source (OS) software for automation, but commercial softwares were most preferred by the Tamil Nadu university libraries and circulation and OPAC services are commonly provided by both states university libraries. Most of the university libraries have not shown the completeness of the automation process and effectively use automation utilities in libraries.

The study on adoption of technology at selected NIT Libraries of Northern India was done by **Arora & Sharm (2017)**. The study determines the perceived advantages and disadvantages of the technology as well as barrier factors which affects the adoption of technology at NIT Libraries. The result showed that the librarians are inclined towards technology and it is imperative to embrace change. However, hurdles like reliability of technology, unskilled staff and lack of adequate budget are making the delays in technology adoption in NIT Libraries. A similarity study was conducted by **Choudhary & Sarmah (2017)** to know the availability of ICT infrastructure facilities and application of modern technologies in selected college libraries of Cachar district, Assam. The findings of the study reveal that most of the surveyed college libraries are presently in developing stage in terms of ICT implementation. It also indicates that financial constraints and lack of ICT skilled staff are the main hurdles which are impeding the proper implementation of ICT in the college libraries under the study.

Then, the **Jebaraj & Babu (2016)** study made an attempt to examine the availability and use of information communication technology (ICT) facilities by the higher education institutional libraries in Trichy region of Tamil Nadu. It assessed the various ICT components, i.e., availability of basic ICT infrastructure for library perspective, status of library automation, area of automation, available hardware and software facilities access to library resource, service and library functional perspectives.

Further, a study on information technology as a major priority to build an emerging global economy and construct swift changes in an information society was demonstrated by **Janakiraman & Subramanian (2015)**. In this study, the researcher had analysed the use and implementation of IT applications by the research and development (R & D) libraries in Chennai of Tamil Nadu. A user perspective study was carried by **Poormousa & Viswa (2015)**. Their research study showed that web-based resources were provided through user-centric services by the central university libraries in Hyderabad. A well-structured questionnaire was framed and relevant data collected from all eight (8) central university libraries through the survey method. It presented the origin of libraries, library collections both print as well as electronic, i.e., softcopy of CD-ROM's, DVD player, open access resources are made available for user with create user awareness about these kind of resources by these central libraries to render information service to their user communities.

3. Objectives of the study

Major objectives of the study are:

1. To examine the availability of library infrastructure & resources in selected university libraries of Karnataka and Andhra Pradesh.
2. To know the status of functional activities of library automation in selected university libraries.
3. To assess the availability of digital infrastructure facilities in Karnataka and Andhra Pradesh state university libraries.
4. To analyze the automated services offered by the university libraries of Karnataka and Andhra Pradesh.
5. To find use of automated services by the users of university libraries in Karnataka and Andhra Pradesh region.

4. Research Methodology

In this study, the researcher gathered the required data from the respective library heads as well as users of selected university libraries such as Bangalore University (BU) Library, Bangalore, University of Mysore (UoML) Library, Mysore of Karnataka and Andhra University (AU) Library, Visakhapatnam and S.V.University (SVU) Library, Tirupathi of Andhra Pradesh. A well-structured questionnaire was used to collect feedback from the library heads and users, i.e., faculty members, research scholars and students of selected university libraries. Along

with that the researcher thoroughly searched, retrieved and analyzed data which was available in the form of documentary and non-documentary sources. A survey method was adopted and random sampling technique was used in the selection of samples of libraries and users for the study. The collected data was analysed by using one –Way ANOVA test to find out the relationship between gender and various Automated Library Services of the sample units.

5. Scope of the study

The present study examines the status of availability of infrastructure for automation aspects and level of usage analysis of automated services offered by the Bangalore University (BU) Library, Bangalore, University of Mysore (UoM) Library, Mysore of Karnataka and Dr. V.S. Krishna (DVS) Library, Visakhapatnam and S.V.University (SVU) Library, Tirupathi of Andhra Pradesh states in India. However, these universities improve their ICT infrastructure facilities for disseminating information in order to meet information needs and expectation of users and best practices to increase usage of library.

6. Data Analysis and interpretation

Required data for the study was collected by distributing a well-designed questionnaire for library heads as well as users and the one –Way ANOVA statistical tool was used to find correlation between the respondent variables. The analyzed data is presented in the following tables and figures.

Table - 01: Library Infrastructure & resources available in University Libraries of Karnataka and Andhra Pradesh

About library	Name of University Libraries			
	BU Library	UoM Library	AU Library	SVU Library
Location	Bangalore, Karnataka	Mysore, Karnataka	Visakhapatnam Andhra Pradesh	Tirupathi, Andhra Pradesh
Year of establishment	1966	1916	1926	1955
Students	7066	4925	8411	3200
Research scholars	1015	785	1781	505
Faculty members	300	292	738	541
Library resources	371475	482820	520502	3,76,315
Electronic Resources	40,000	34,511	10,437+	8,000+
Operating System	UNIX	LINUX	Windows	Windows
Library automation	Fully Automated	Fully Automated	Fully Automated	Partially Automated
Software Used	KOHA	KOHA	SOUL	SOUL
Internet connectivity	Yes	Yes	Yes	Yes
Bandwidth Used	1 GBPS	1 GBPS	1 GBPS	1 GBPS

Computers in the library	150	350	100	150
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It is found from above table 01 is demonstrate and presented the different university and library aspects, i.e.,

- **Location:** the selected sample universities of Karnataka is located in Mysore and the other one is located in Bangalore, which is the capital city of Karnataka and same university libraries of Andhra Pradesh is located in Visakhapatnam and the other one has located in Tirupathi.
- **Year of establishment:** A look at the establishment year of the universities: The University of Mysore (UoM) is considered one of an oldest university in India was established in 1916 by the Maharaja of Mysore during the British rule in India.
- **Students:** it is found that the highest i.e., 8411 post-graduation students were enrolled to Andhra University (AU), Visakhapatnam followed by Bangalore University which had enrolled 7066 post-graduation students during the study period.
- **Scholars:** further it also found that highest research scholars were registered to full-time as well as part-time PhD in Andhra University (AU), Visakhapatnam and the Bangalore University has more than 1015 researchers pursuing their doctoral research in different disciplines.
- **Faculty members:** it is found from observation, the Andhra University (AU) has sanctioned the highest 738 teaching positions and the S.V University had sanctioned the second highest 541 teaching positions, but Bangalore University had only 300 teaching positions for more than 40+ departments.
- **Library resources:** in physical holdings of library aspect also, the Andhra University (AU) Library has the highest, i.e., 5,20,502 lakhs of physical holdings which includes collection of books, journals, back volumes, thesis & dissertations, reports and other reading materials. University of Mysore Library has 4,82,820 lakhs of physical holdings of reading materials. The Bangalore and the S.V University library have more than 3 ½ lakhs physical holdings of records.
- **Electronic Resources:** in electronic collection aspect, the Bangalore University Library has subscribed highest, i.e., 40,000 electronic documents made available for users by OPAC and remote access EzProxy platforms. The S.V University Library has only 8,000+ digital or electronic documents.
- **Operating System:** two university libraries of Andhra Pradesh preferred the 'Windows' based Operating System and the Bangalore and Mysore university libraries respectively

preferred the UNIX and LINUX operating system for installation or operation of ICT peripherals.

- ▢ **Library automation:** It is found from observation, the Bangalore, Mysore and Andhra University Libraries had fully automated the daily routines and functions of their libraries and the S.V University Library has partially automated their activities.
- ▢ **Software Used:** it is noticed that the university libraries of Karnataka prefer to use the Koha software and university libraries of Andhra Pradesh use SOUL software to automate library functions and activities.
- ▢ **Used Internet connectivity:** all university libraries have internet connectivity services while accessing digital or electronic databases which are available in subscription or open access mode.
- ▢ **Bandwidth Used:** all university libraries are providing unique 1 GBPS internet bandwidth to fulfill the information needs of users.
- ▢ **Computers in the library:** all university libraries are good with computer terminals which are required to access the subscription or open access electronic information.

Table-02: Status of functional activities of library automation in selected libraries

In-house activities as Automation Modules	BU	UoM	AU	SVU
ACQUISITION				
Pre-Order Search Vender listing	✘	✘	✘	✘
Placing Order	✘	✘	✘	✘
Receipt of library materials	✓	✓	✓	✘
Payment	✘	✘	✘	✘
Management of the Budget	✘	✓	✘	✘
Cataloguing of various types of materials on receipt	✘	✘	✘	✘
CATALOGUING				
Cataloguing of various types of materials	✓	✓	✓	✓
Data input and retrieval	✓	✓	✓	✓
Outputs can be obtained in any desired format	✓	✓	✘	✘
Import/export of bibliographic data	✓	✓	✓	✓
Interlinking with external databases	✘	✓	✘	✘
Barcode Generation for library articles	✓	✓	✓	✓
SERIAL CONTROL				
Acquisition of serials	✓	✓	✓	✓
Receipt and control	✘	✘	✘	✘
Generate of receivable	✓	✓	✓	✓

Reminders for missing issues	✓	✓	✓	✓
Circulation and routing of loose issues	✓	✓	✓	✓
Renewal of subscription	✗	✗	✗	✗
Reports for receivable and received	✓	✓	✓	✓
Indexing articles	✗	✗	✗	✗
Interface with union list and union catalogue	✗	✓	✗	✗
PATRON MEMBERSHIP				
Members or patrons import	✓	✓	✓	✓
Mass photo upload	✓	✓	✓	✓
Member promotion	✓	✓	✓	✓
ID Card generation	✓	✓	✓	✓
CIRCULATION				
Book on Loan (ILL)	✓	✓	✓	✗
Overdue reminders to members	✗	✓	✗	✗
Warning letter for long overdue documents	✗	✗	✗	✗
Notice or popup for reserve items	✗	✗	✗	✗
Document recall letter	✓	✓	✗	✗
Long Term Issue/Transfer	✓	✓	✓	✓
Short Term Issue/Transfer	✓	✓	✓	✓
Reservation on Issued Documents	✓	✓	✗	✗
Recall of document	✗	✗	✗	✗
SETUP & SECURITY				
Module & Menu wise setups	✓	✓	✓	✓
Automatic back-up of database	✗	✗	✗	✗
User wise privileges	✓	✓	✓	✓
Database restore	✗	✓	✗	✗
Compact/repair of database	✓	✓	✗	✗
IN-OUT MANAGEMENT				
In-Out Register	✓	✓	✓	✓
Statistical reports for members	✓	✓	✓	✓
Day/Month/year wise reports	✓	✓	✓	✓

Above table 02 determined that the status of following functional activities of library automation process and progress in selected university libraries, such as

- **Acquisition:** The Koha and SOUL acquisition sub-modules such as Pre-Order Search Vender listing, Placing Order, Payment and Cataloguing of various types of materials

activities are not yet automated by any university library, only the Bangalore, Mysore and Andhra University Libraries are facilitated system to provide receipt of library materials and university of Mysore practice the Management of the Budget by using the Koha and SOUL acquisition module.

- **Cataloguing:** all university libraries mostly used the Koha and SOUL Cataloguing module for the purpose of cataloguing of various types of materials, Data input and retrieval, Import/export of bibliographic data and Generation for library articles. It is clearly noted that the university libraries of Karnataka had offering additional automated services than the Andhra Pradesh libraries.
- **Serial control:** all university libraries are customizing the serial control module to automate the activities of Acquisition of serials, generate of receivable, Reminders for missing issues, Circulation and routing of loose issues, Reports for receivable and received. But they have not yet automated the Interface with union list and union catalogue, Renewal of subscription, Receipt and control activities and Indexing articles.
- **Patron membership:** all university libraries are customizing and practicing membership activities such as Member Import, Mass photo upload, Member promotion and ID card generation through Koha and SOUL software's.
- **Circulation:** it is analyzed that except the SVU library, remaining all libraries are providing circulation related service, i.e., Book on Loan (ILL), Long Term Issue/Transfer, Short Term Issue/Transfer. The Karnataka University Libraries has made provisions of Reservation on Issued Documents and Document recall letter to users.
- **Setup & security:** all university libraries have uniquely integrated the module & menu wise setups and user wise privileges security system for safety measures of the library, but the Automatic back-up of database system is not yet integrated by any library.
- **In-out management:** all university libraries are maintaining the In-Out Register, Statistical reports for members and Day/Month/year wise reports for which date was extracted from Koha and SOUL automation softwares.

Table-03: Availability of digital infrastructure facilities in University Libraries

Computer peripherals	Name of University Libraries				Total
	BU	UoM	AU	SVU	
Computers	150	350	71	100	671
Server Systems	2	1	1	1	5
Printers	5	6	2	3	16
Scanner for Digitization	6	8	2	2	18

RFID Tag Scanner	2	4	0	0	6
RFID Tag Printer	2	4	0	0	6
Self-service kiosk	4	5	0	0	9
LCD Projector	2	2	1	2	7
Fax	1	1	1	1	4
Web Camera	1	1	0	1	3
UPS	2	2	1	2	7
Identity Card Printer	2	2	1	1	6
Modem / Network Switches	6	8	4	4	22
Cloud Server	0	1	0	1	2
Total	185	395	84	118	782

Table 03 examines the availability of digital infrastructure facilities in University Libraries of Karnataka and Andhra Pradesh states. It is found that except the Andhra University Library, remaining all libraries have good position in infrastructure facilities, i.e., Computers, Server Systems, Printers, Scanner for Digitization, RFID Tag Scanner, RFID Tag Printer, Self-service kiosk, LCD Projector, Fax, Web Camera, UPS, Identity Card Printer, Modem / Network, Switches and Cloud Server to automated library functions, creation of in-house databases, disseminate digital information, give faster services, extend library services especial for remote area users and increase usage and image of library. But compared to other libraries, the University of Mysore Library has good position in acquiring digital infrastructure facilities to provide effective library services in different ways. The Self-service kiosk, RFID Tag Printer and RFID Tag Scanner facilities has been executed by Karnataka University libraries, but the Andhra University libraries have not yet integrated this automated system in their libraries.

Table-04: Automated services provides Karnataka and Andhra Pradesh Libraries

Automated Services	BU	UoM	AU	SVU
Referral Service	✓	✓	✓	✓
Bibliographic Service	✓	✓	✓	✓
New Arrival alert service	✓	✓	✓	✓
Interlibrary Loan service	✓	✓	✓	✗
User education service	✓	✓	✓	✓
CAS / SDI services	✓	✓	✓	✓
Indexing and abstracting service	✓	✓	✓	✓
Ask a Librarian	✗	✓	✗	✓
Online Book Reservation/Renew	✗	✓	✗	✗
Document Delivery Service	✓	✓	✓	✗

Newspaper clipping service	✓	✓	✓	✓
Web-OPAC service	✓	✓	✓	✓

Observation found from above table 04 shows the automated or digital services offered by the selected state university libraries of Karnataka and Andhra Pradesh. Library services such as referral service, bibliographic service, new arrival list, user education, CAS / SDI, indexing and abstracting, newspaper clipping and Web-OPAC services were found as commonly provided library services by the Bangalore, Mysore, Andhra and S.V. University Libraries. Additionally, the University of Mysore Library is providing the Ask a Librarian and Online Book Reservation/Renew service in their library.

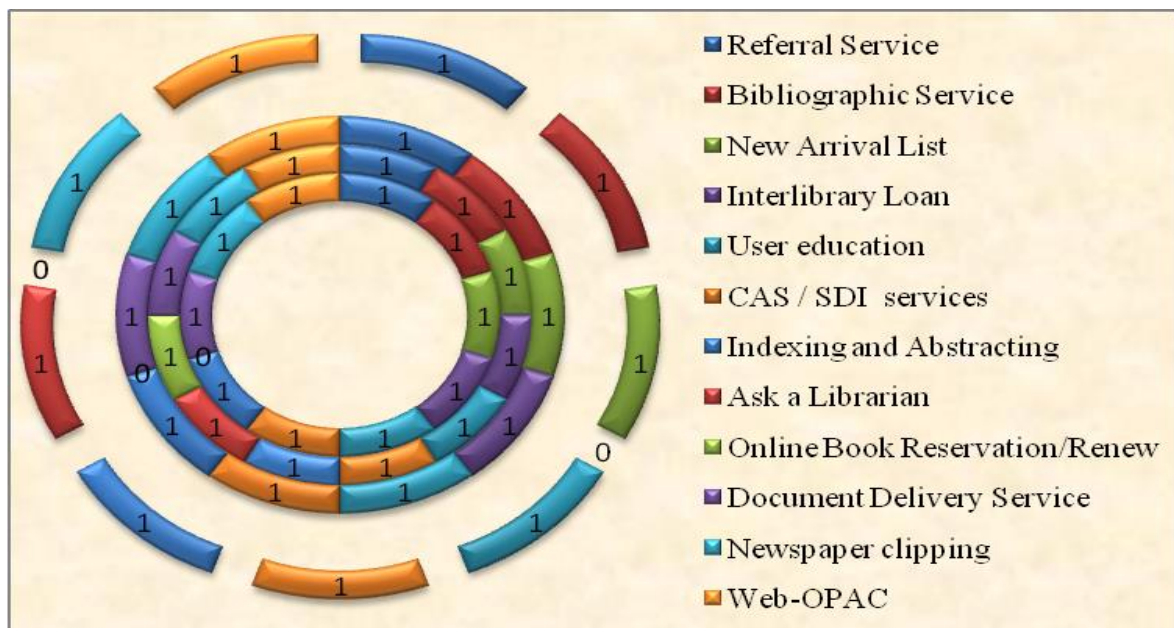


Figure-01: Automated library services offered by the university libraries

Further, Figure-01 indicates that the document delivery service and interlibrary loan service is offered by the Bangalore and Andhra University libraries. It is clearly indicating that the University of Mysore Library provides all types of library services available during the period of study.

6.1. User analysis

In following section of the study, the analysis of user attitude towards awareness and use of automated services offered by Karnataka and Andhra Pradesh university libraries is demonstrated. The collected responses of the respondents have been analyzed and presented below

Table-05: Gender wise respondents

Gender	Freq.	%
Male	141	53.41%
Female	123	46.59%
Total	264	100.00%

In this study, totally 264 questionnaires were distributed to students, researchers and faculty members to selected Bangalore, Mysore, Andhra and Venkateshwara University Libraries of Karnataka and Andhra Pradesh. Out of which, there are 141(53.41%) male and 123 (46.59%) female respondents who participated in this study. It is clearly noticed that male respondents are dominating over on female respondents were founded in under table 05.

Table-06: Distribution of Respondents according to Age

Age	University Libraries				Total
	BU	UoM	AU	SVU	
Below 30years	22	27	21	23	93
31-40 years	27	32	18	17	94
41-50 years	10	14	13	11	48
Above 50years	9	6	8	6	29
Total	68	79	60	57	264

Table 06 shows that the age of participated respondents in this study. It is revealed that majority of respondents, i.e., 94 and 93 respondents are fallen under the age group between 31-40 years and below 30years age group.

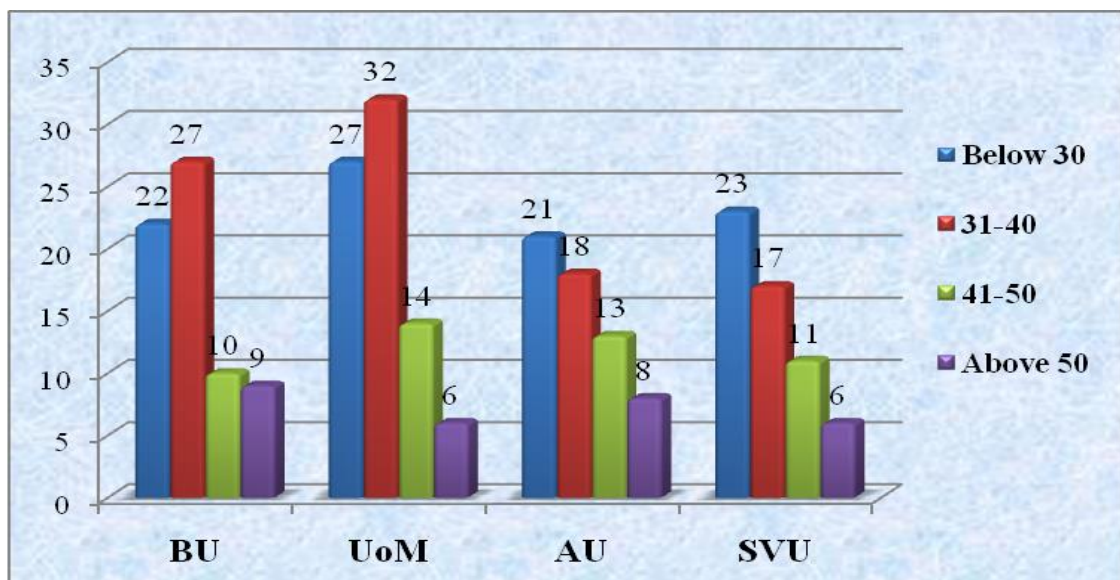


Figure-02: Age wise distribution of Respondents

Figure 02 shows that the remaining 48 number of respondents fall under the age of group of 41-50 years, followed by 29 numbers of respondents' age has crossed above 50years

Table-7: Use of Automated Services by the Respondents (Multiple)

Automated Library Services	Freq.	%
Referral Service	165	62.5
Bibliographic Service	103	39.02
New Arrival alert service	186	70.45
Interlibrary Loan service	68	25.76
User education service	209	79.17
CAS / SDI services	160	60.61
Indexing and abstracting service	154	58.33
Ask a Librarian	89	33.71
Online Book Reservation/Renew	51	19.32
Document Delivery Service	93	35.23
Newspaper clipping service	137	51.89
Web-OPAC service	228	86.36

Observation found from above table 07 shows the use of automated library services by the users of Karnataka and Andhra Pradesh University Libraries. Results found from the table had showed that the highest 228(86.36%) of library users are aware and use Web-OPAC service hosted by their libraries, followed by 209(79.17%) of respondents have benefited from the user education service through seminars, workshops, awareness programmes and other continuous education programmes and then, 186(70.45%) of respondents have used the New Arrival List service provided by the libraries.

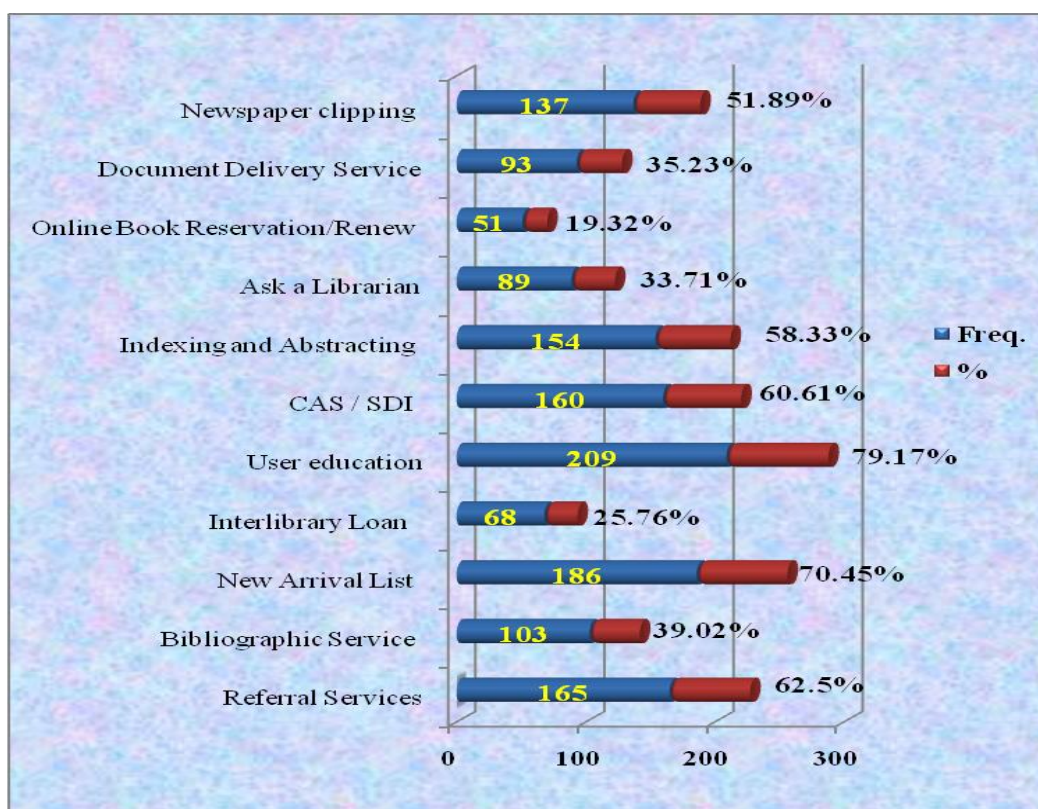


Figure-03: Use of automated Services offered by University Libraries

Also, the figure -03 shows that most of the respondents (62.5%, 60.61%, 58.33% and 51.89%) are aware and use referral service, CAS / SDI services, indexing and abstracting service and newspaper clipping services offered by the university libraries in Karnataka and Andhra. Below 35% average of respondents use the bibliographic service (39.02%), document delivery service (35.23%), ask a librarian (33.71%), interlibrary loan (25.76%) and online book reservation/renew (19.32%) services. It is clearly indicates that, among all the listed library services by the researchers, the Web OPAC service was found as a most preferred and used library service by the users of university libraries in Karnataka and Andhra state region and remaining services are used for information needs and requirement of the users.

Table-08: ANOVA test for University-wise Respondents: Automated Library Services

Source of Variance	DoF	Sum of Squares	Mean Square	F-Stat	P Value	F Crit
Between Groups	4	615.4	258.2	0.3792	0.6923	3.89
Within Groups	11	8369.9787	680.8324			
Total	15	8988.3787				

Table 8 shows how the one way ANOVA statistical tool was applied to find significant relation between university libraries in order to provide automated library service and facilities to their user communities. The computed ANOVA value is 0.3792, which is less than its p-value 0.6923 is found above 0.05> of significant value. The found p-value 0.6923 signifies that there is no significant relation between university libraries regarding awareness and use of automated library service and facilities as reported by the respondents.

Further, the study had applied One –Way ANOVA statistical tool to find co-relation between the gender and automated library services provided by the libraries.

- **H1:** There is a significant difference between the use of automated library service among the male and female user communities in University libraries.

***Significance Level: $p < 0.05$ (significant) & $p > 0.05$ (no significant)**

An independent sample t-test was applied to find the negative or positive correlation between use of automated library service among the male and female user communities in University libraries. The test p values were found between < 0.05 or > 0.05 and shows **no significant relation between the variables**, i.e., Referral Services (t-value: 0.251, $p > 0.05$), Bibliographic Service (t-value: 0.066, $p > 0.05$), New Arrival List (t-value: 0.058, $p > 0.05$), Interlibrary Loan (t-value: 0.532, $p > 0.05$), User education (t-value: 0.829, $p > 0.05$) and **significant relation between the variables**, i.e., CAS / SDI service (t-value: 0.012, $p < 0.05$), Indexing and Abstracting (t-value: 0.009, $p < 0.05$), Ask a Librarian (t-value: 0.009, $p < 0.05$), Online

*Book Reservation/Renew (t-value: 0.007, p - <0.05), Document Delivery Service (t-value: 0.007, p - <0.05), Newspaper clipping (t-value: 0.007, p - <0.05) and Web-OPAC (t-value: 0.005, p - <0.05) variables significant values respectively signify that **we fail to reject or accept the null or alternative hypothesis**. Therefore, we can fairly conclude that 'There is or neither there is no significant difference between use of automated library service among the male and female user communities in University libraries.*

7. Major findings

Based on the observation from both library and user data analysis in this study, the researchers noticed some major findings or outcomes of the study and is demonstrated as follow.

- It is found that among the selected universities, the University of Mysore (UoM) is considered one of an oldest university in India and was established in 1916 by the Maharaja of Mysore.
- The study noticed that the highest i.e., 8411 post-graduation students were enrolled to Andhra University (AU), Visakhapatnam followed by Bangalore University.
- It is identified that the Andhra University (AU) has sanctioned the highest 738 teaching positions to effectively carry the teaching as well as research activities in the university.
- It is discovered that the Andhra University (AU) Library has the highest, i.e., 5,20,502 lakhs of physical holdings collection of books, journals, back volumes, thesis & dissertations, reports and other reading materials and the University of Mysore Library has 4,82,820 lakhs of physical holdings of reading materials.
- It is indicating that the Bangalore University Library has subscribed highest, i.e., 40,000 electronic documents made available for users through remote access by using EzProxy platform and the S.V University Library has lowest electronic documents.
- It is presented that the university libraries of Andhra preferred the 'Windows' based Operating System.
- The study results had determined that the Bangalore, Mysore and Andhra University Libraries were fully automated the daily routines and functions of their libraries.
- It is observed from the study results that the university libraries of Andhra Pradesh use 'Software for University Libraries (SOUL)' and the university libraries of Karnataka use 'Koha' software to automate routines and functions of library.
- It is discovered from the study that the Koha and SOUL software modules such as Acquisition, Cataloguing, Serial control, Patron membership, Circulation, Setup &

security and In-out management and its sub-modules are fully or partially automated by the libraries.

- It is found that the Self-service kiosk, RFID Tag Printer and RFID Tag Scanner facilities was implemented by the University libraries of Karnataka to make easy transaction of library functionalities, but the Andhra University libraries had not yet integrated this automated system in their libraries.
- The study results indicates that the University of Mysore Library has good position with 395 items of digital infrastructure facilities and service facilitated access to information and the Andhra University Library has lowest 84 items of digital infrastructure facilities.
- It is observed from the study that the referral service, bibliographic service, new arrival list, user education, CAS / SDI, indexing and abstracting, newspaper clipping and Web-OPAC services was commonly provided library services by the university libraries.
- Results from the study showed that the highest 228(86.36%) of library users are aware and use Web-OPAC service hosted by their libraries and 209(79.17%) of respondents benefited from the user education service through seminars, workshops, awareness programmes and other continuous education programmes.
- It is analyzed that two formulated hypothesis shows the positive and also negative correlation between the tested variables.

But, the positive or negative outcomes of the research is not universally accepted or rejected. The opinion, feedback and views of the respondents can or may change, if the existing system has been changed or improved.

8. Conclusion

In the smart technology era of the 21st century, automation and digitization are becoming the most essential and crucial technological components for all types of libraries and the digital infrastructure gives backbone for the library. Based on the cost-effectiveness, the libraries use automation and digitization tools and applications to create more user awareness and promote the usage of library products and services provided by the libraries. Nowadays most academic libraries, especially university libraries mostly prefer open-source software for automation as well as digitization due to various internal and external factors and also because of user interface and user-friendliness features of open-source software. Also, the libraries have become more technologically equipped by consistent administrative and management support. Due to the impact of ICT, nowadays the users also are much more aware of digital applications which are associated with their learning, teaching, and research. But the technological

obsolescence has forced the libraries as well as library professionals to keep on assisting the users about innovative things and practices happening in the library. Thus, the university libraries should operate in the wake-up mode about technological advancement in library developments and adopting the same in the library. Both library and library professionals should create user awareness about innovative and best practices followed in libraries and encourage them to use the library resources and services to the maximum. Also, the government should give the necessary support for university libraries by providing additional financial assistance to carry innovative developmental initiatives in libraries which can become one of the best to meet user's needs and expectations.

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