

# Marching Beyond the Libraries

## *Leadership, Creativity, and Innovation*

Editors

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## STATUS OF LIBRARY AUTOMATION AMONG GOVERNMENT AUTONOMOUS COLLEGE LIBRARIES IN ODISHA: CHALLENGES AND OPPORTUNITIES

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### ABSTRACT

The study investigates the current status, challenges, and opportunities associated with library automation in Government Autonomous College libraries in Odisha. With a focus on understanding the level of automation, available infrastructure, and adoption barriers, the research aims to provide a comprehensive overview of libraries embracing digital transformation. Data were collected through structured questionnaires filled by library professionals across various colleges, analysing factors such as software use, staff training, budget constraints, and user engagement. The findings indicate significant variability in automation levels, influenced by institutional priorities, funding, and administrative support. Despite challenges, including limited resources and technical expertise, there are substantial opportunities for growth through targeted investments in software, training, and network infrastructure. The study concludes with recommendations for enhancing library automation to improve accessibility, efficiency, and resource-sharing across the academic network in Odisha.

**Keywords:** Library Automation, Government Autonomous Colleges, Odisha, Digital Transformation, Library Management system

### INTRODUCTION

Libraries and information centres are not only the custodians of cultural heritage but also repositories of knowledge and information (Lakpathi, 2014). The rise of information technologies has driven transformative changes across society, particularly in education, learning, and research, shaping our collective future by progressively adapting to new advancements (Babu and Krishnamurthy, 2013). The current age of Information and Communication Technology (ICT) has transformed the conventional service model of Library and Information Centres. Primarily, it greatly impacts the operation of libraries and user services. Library automation services started in India all through the 1980s. Many types of libraries, including academic and special libraries, are using automation to efficiently satisfy user demands. Currently, the institutions are focusing on

the automation of libraries. As the Information Technology environment develops, multiple new services are included within the library. The library for academic institutions is essential in providing extensive library and information services to users.

## CONCEPT OF LIBRARY AUTOMATION

Webster's Third New International Dictionary of English Language defines automation as "automatically controlled operation of an apparatus, process or system by mechanical or electronic device that takes place of human organs of observation, effort and decision" (Gove, 1966). The Encyclopaedia of Library and Information Science defines automation as "the technology concerned with the design and development of processes and systems that minimize the necessity of human intervention in operation" (Kent, 1977). The term "automation" comes from the Greek word "automose," meaning spontaneous movement. D.S. Harder, a US General Motors employee, invented "automation" in 1936. He meant automation as automated component handling between manufacturing processes.

The Encyclopaedia of Library and Information Sciences defines "Library Automation" as the use of automated and semi-automatic data processing equipment to execute traditional library functions such as acquisitions, cataloguing, and circulation. Library automation refers to the use of computers and computer-based goods and services to perform various library operations and tasks, facilitating the supply of diverse services and the creation of output products (Paul, 2023).

## SCOPE AND LIMITATION

The current research survey is based upon the survey undertaken among the Government Autonomous Colleges in the Jurisdiction of Odisha state. The main intention of the study is to find out the current situation/ status of Library Automation among the above institutions. Google forms were shared among the respondents of the concerned colleges and data were extracted from the result outputs. There are about 13 (Thirteen) Government Autonomous Degree Colleges in Odisha. The respondent includes Junior Librarian, Asst. Librarian etc. All of them received questionnaires and their response rate was 100%. This survey is only limited to Government Autonomous Degree colleges of Odisha & does not include the Aided Autonomous Colleges of Odisha. However, the study is limited to Government Autonomous College libraries in Odisha, so the findings may not be generalizable to aided or private autonomous or non-autonomous institutions. The accuracy of data relies on the responses provided by the library professionals.

## OBJECTIVES

The principal aim of the study is to determine the present status of Automation in Government Autonomous College Libraries in Odisha. The other objectives also include:

- To examine the current status of library automation in Government Autonomous College libraries in Odisha.
- To identify the challenges faced by these libraries in implementing and maintaining automation systems.
- To explore the opportunities for enhancing automation and adopting new technologies.
- To assess the level of staff training and awareness regarding automation tools.
- To provide recommendations for improving the automation process.

## REVIEW OF LITERATURE

Library automation indicates the use of technology and software for managing library operations like cataloguing, circulation, acquisitions, and inventory management. It helps libraries to optimize operations, better resource management, and improve user services by replacing manual procedures with technological advances. According to Ashikuzzaman (2022), Automation streamlines and simplifies library operations, improving efficiency and customer service. Previously, libraries catalogue, library items loans, acquisitions, and maintained records were managed manually. With automation, specialized software systems execute these duties, saving time and effort for everyday operations.

## OVERVIEW OF LIBRARY AUTOMATION

Dr. H.P. Luhn organized computerized indexes in 1950s computers, which gained a position in American libraries. In the 1960s, the cost of hardware decreased, and significant efforts were made to produce library application packages. In April 1960, the American Chemical Society disseminated its chemical titles using computer technology. In 1963, W. K. Gilbert prepared a study on the computerization of the Library of Congress. Following this study, the MARC I project began in 1966, leading to the development and completion of the Library of Congress catalogue in machine-readable catalogue (MARC) format. The Indian Statistical Institute in Calcutta was the first institution in India to build a computer system in 1955 and to construct an indigenous computer in 1964. Computers were originally used in library operations in India, likely by INSDOC, to compile a list of Indian scientific and technical translators using computer technology. (Muniraja, 2021).

## TECHNOLOGICAL AVANCEMENTS IN ACADEMIC LIBRARIES

In the 1960s, only a limited number of libraries started utilizing computers for collection management. The priority used to be on effectively automating cataloguing and circulation operations. The integrated library systems (ILS) of the 1980s and 1990s merged several library functions into a single program, serving as a single centre for library management activities. As the internet expands globally, ILS oversees cataloguing, circulation, and patron services, often including digital resources and online catalogues (Anil & Kamlesh, 2023). Bayani, M. et al. (2018) describe a technique for converting conventional library systems into intelligent online library systems via the use of the Internet of Things. The Internet of Things enables the connection of physical objects, such as books or other text types, to real-time communication technology via the use of tiny sensors and RFID tags. The incorporation of computer automation technology into library resource management is essential for automating library classification and information organization, thus enabling the digitization and dissemination of resources (Mohapatra & Das, 2017).

## STUDIES ON AUTOMATION IN ODISHA'S LIBRARIES

Mallik & Majhi (2019) have done research on awareness of Library Automation among Library Professional Trainees in Odisha where they mentioned that Maximum Library Professional Trainees were aware of the library automation systems and Automationsoftware. In some particular organization, the trainees were getting the facility to learn about the installation and customization of some particular Library automation software. Batav& Modak (2018) have studied Library Automation in Orissa University of Agricultural and Technology Library. In their investigation, they discovered that Library Automation is playing an important role in the promotion, assistance, and

leading of automation and networking in the process of accessing digital resources. Singh et al. (2017) given their review in their study that library automation has emerged as a prominent term in the library profession and is now an essential need for all libraries. They have a study on an Odisha based university library automation where they mentioned "the success of any library automation programme depends upon its proper planning and execution".

## **METHODOLOGY**

### **Research Design**

This research is based on both Quantitative & Qualitative. Where the quantitative approach is required to gather measurable data on the current status of automation and the extent of its use in libraries, on the other hand, a qualitative approach is also required to explore challenges and opportunities through detailed responses from library professionals and stakeholders. A structured questionnaire was prepared with both closed-ended and open-ended questions like:

- General information about the library (size, collection, staff strength).
- Type and extent of automation (modules like circulation, cataloguing, OPAC, etc.).
- Challenges in implementing automation (technical, financial, infrastructure etc.).
- Opportunities and future plans for enhancing automation.
- Level of staff training in automation software and tools.

### **Population and Sample**

The study was to target Government Autonomous Degree College Libraries in Odisha. However, the scope of this study is based on 13 colleges only, hence it was a census study, and the entire population was taken as a sample.

### **Data Collection Methods**

However this is a survey study, a structured questionnaire was developed to gather quantitative data from Librarians, Asst. Librarians, Jr. Librarians, library staffs. This included questions on the type of automation software used, level of automation, challenges faced, and perceived benefits. Three types of questions (i.e. multiple choice, checkbox, rating, end user) were set up in the questionnaire & were distributed to respondents online via google form.

### **Data Analysis Techniques**

Descriptive statistics (percentages, frequencies, means) was used to analyze the extent of automation, types of software used, and other related data for quantitative data analysis. For analysis of the qualitative data, Thematic analysis was conducted on open-end responses to identify key challenges, opportunities, and recommendations. Ms-Excel was used for analysis of tabular data and the creation of graphs.

## **Status of Library Automation in Odisha's Autonomous Degree College Libraries**

### **Current Status of Automation**

Table 1: Current Status of Automation

Sl. No	Name of the College	Automated Status (Yes/No)	ILMS Type	Library Modules Automated (Yes/ No)				
				Circulation	Cataloguing (OPAC)	Acquisition	RFID Technology	Digital Resource Management
1	B.J.B Auto. College, Bhubaneswar	Y	F	Y	N	N	N	N
2	Bhadrak Auto. College, Bhadrak	N	NA	NA	NA	NA	NA	NA
3	Dhenkanal Auto. College, Dhenkanal	Y	C	N	N	Y	N	N
4	Fakir Mohan Auto. College, Balasore	N	NA	NA	NA	NA	NA	NA
5	Govt. Auto. College, Angul	Y	C	Y	Y	Y	N	N
6	Govt. Auto. College, Phulbani	Y	C	Y	Y	Y	N	N
7	Govt. Auto. College, Rourkela	Y	I	Y	N	N	N	N
8	MPC Auto. College, Baripada	Y	C	Y	Y	N	N	N
9	N.C Auto. College, Jajpur	Y	C	N	N	N	N	N
10	S. C. S. Auto. College, Puri	Y	C	Y	N	N	N	N
11	SB Women's Auto. College, Cuttack	Y	C	Y	Y	Y	N	N
12	SBR Govt. Auto. Women's college, Berhampur	Y	C	Y	N	N	N	N
13	SKCG Auto. College, Par-lakhemundi	Y	C	Y	Y	N	N	N

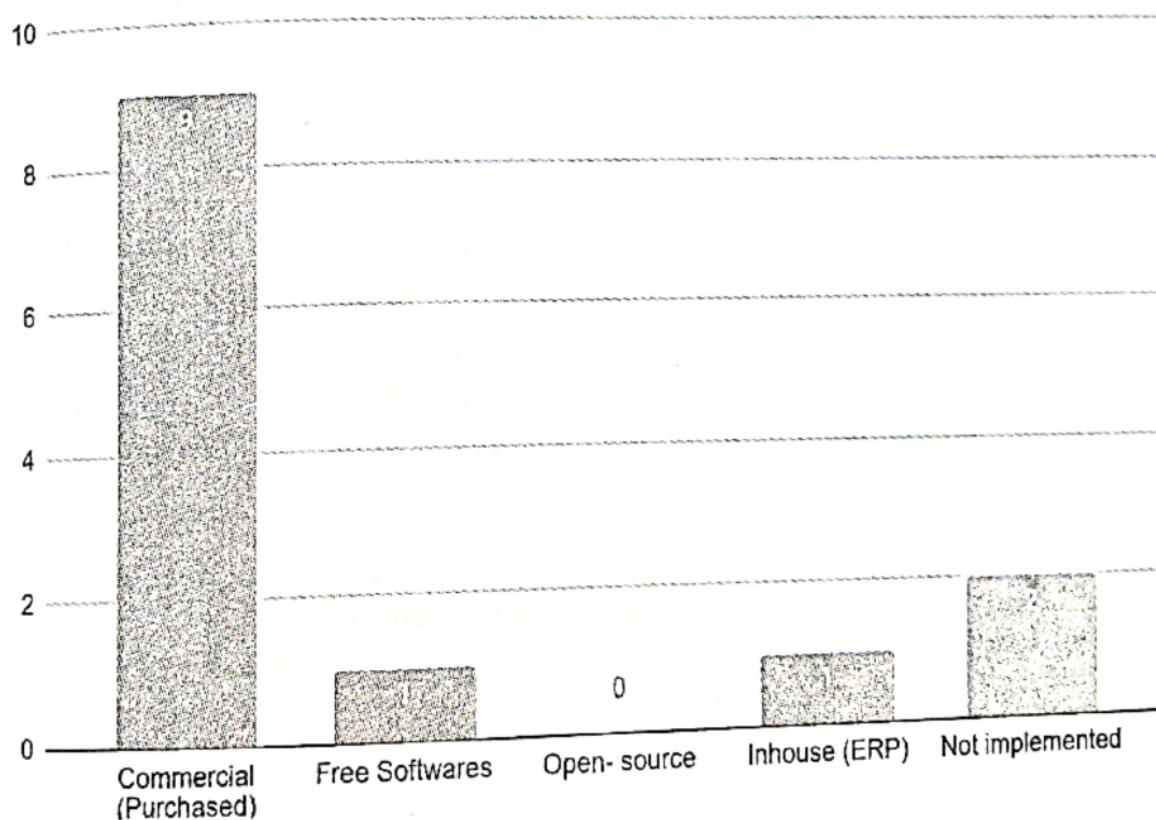
(\*C- Commercial {Purchased}, F- Free Software, O- Open Source, I- Inhouse)

Table No.1 shows that 11 libraries (84.61%) are in the process of automation i.e. fully/ partially automated. Two libraries (15.38%) are not automated yet. Most of the automated libraries are using Commercial software.

### Types of Automation Systems Implemented

**Table 2: Type of Library automation software implemented**

Type of Software	No. of Libraries implemented	Percentage (%)
Commercial (Purchased)	9	69.23%
Free Software	1	7.69%
Open- source	0	0
Inhouse (ERP)	1	7.69%
Not implemented	2	15.38%
Total	13	



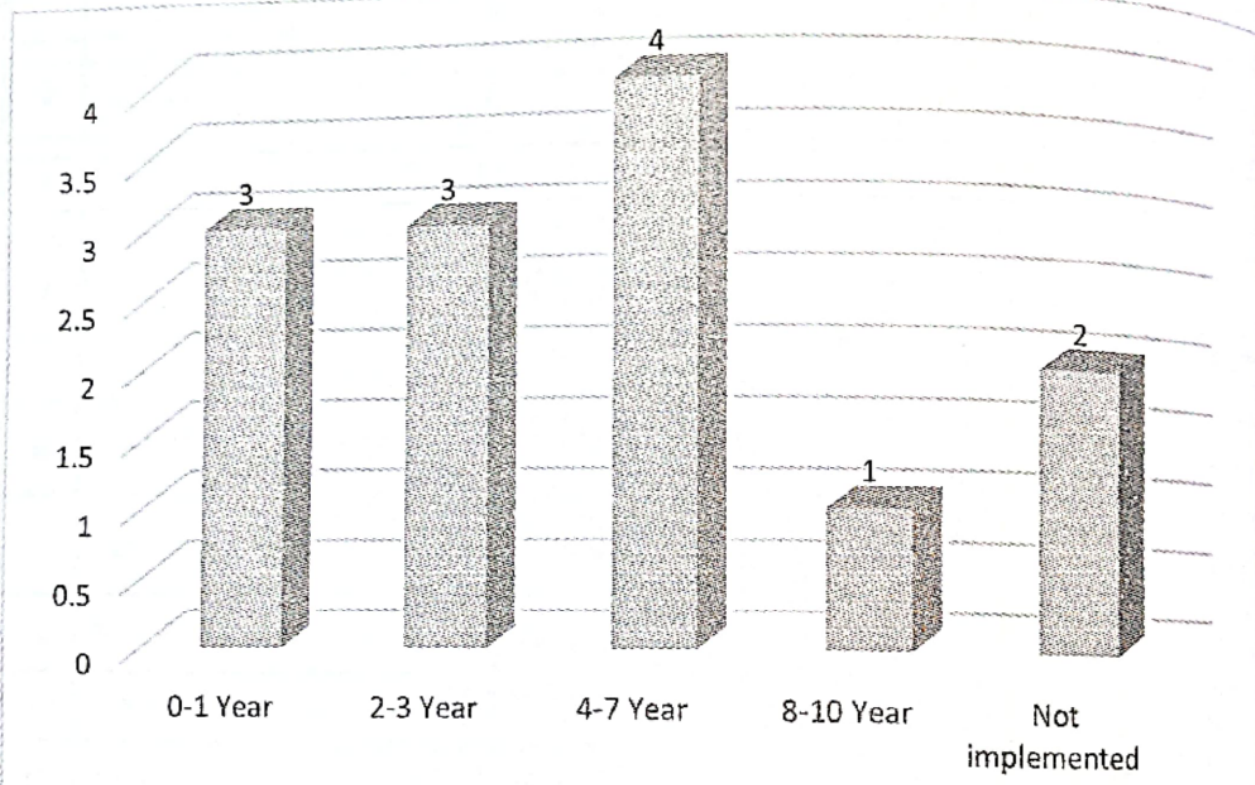
**Figure 1: Type of Library automation software implemented**

From table no. 2, it is clearly shows that Out of 11 automated libraries nine libraries (69.23%) libraries are using commercial software followed by one library (7.69%) & zero libraries are using free software, inhouse software and open-source software respectively. In other hand, two libraries (15.38%) are not implemented automation software in their libraries.

**Library Automation**

**Table 3: Library Automation systems**

Response Factor (in years)	No. of Responses	Percentage
0-1	3	23%
2-3	3	23%
4-7	4	31%
8-10	1	8%
Not implemented	2	15%



**Figure 2: How old is your Library Automation system?**

Table 3 shows that time duration/age of automation systems implemented in their respective libraries in which four libraries (31%) are of (4-7) years old followed by three libraries (23%) are of (0-1) year & (2-3) years old each and only one library (8%) is of (8-10) years old. Besides it, two libraries (15%) have not implemented any automation system in their libraries yet.

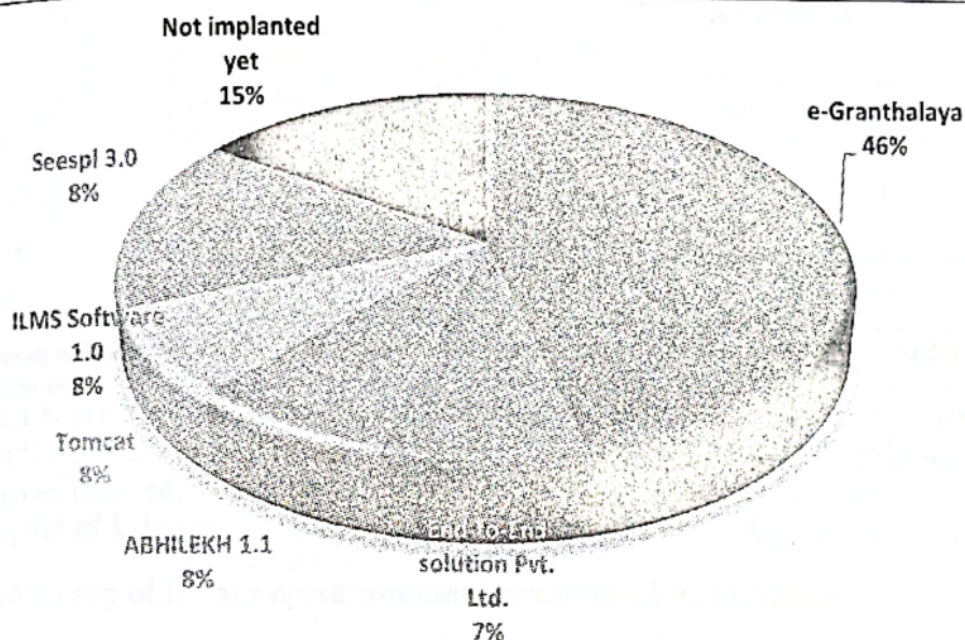
**Software used for Automation in Libraries**

**Table 4: software used for Automation in Libraries**

Name of the Software	No. of Libraries implemented	Percentage (%)
e-Granthalaya	6	46.15%
End-to-End solution Pvt. Ltd.	1	7.69%



ABHILEKH 1.1	1	7.69%
Tomcat	1	7.69%
ILMS Software 1.0	1	7.69%
Seespl 3.0	1	7.69%
Not implanted yet	2	15.38%



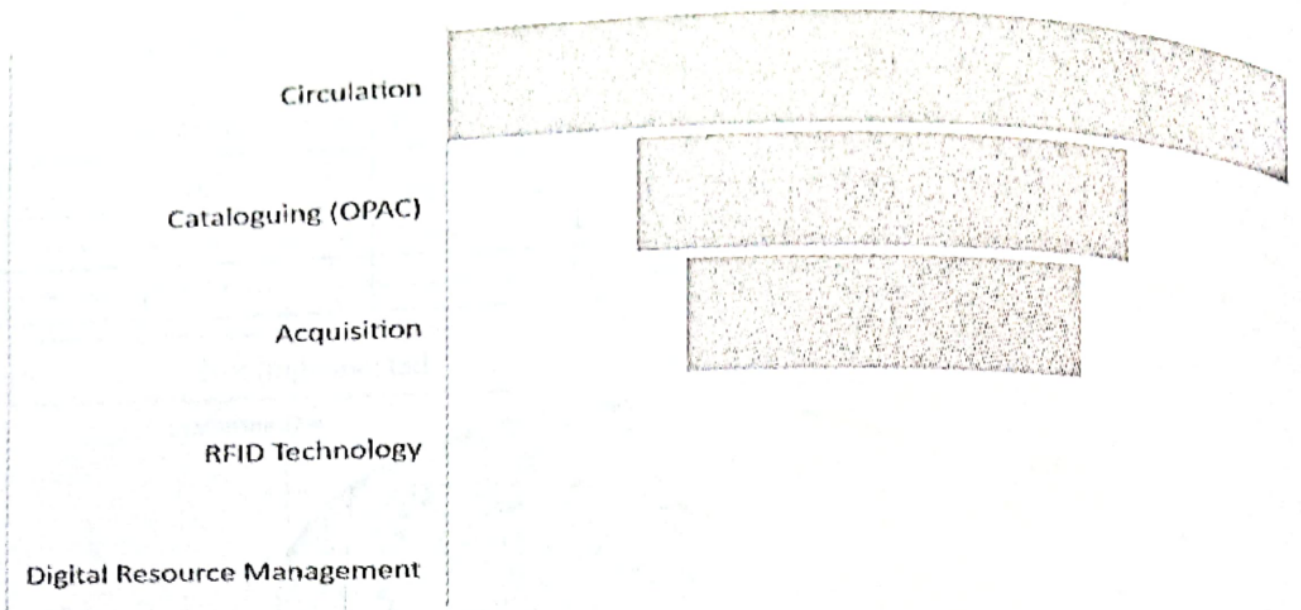
**Figure 3: Software Used for Automation**

Table 4 depicts that maximum no. of libraries (six no. of libraries-46.15%) have implanted e-granthalaya in their libraries followed by one library (7.69%) has implanted End-to-End solution Pvt. Ltd., ABHILEKH 1.1, Tomcat, ILMS Software 1.0, Seespl 3.0 software each. Besides it, two libraries (15%) have not implemented any automation system in their libraries yet.

**Types of Automation system implemented based on Modules**

**Table 5: Type of Automation system implemented based on Modules**

Automated Modules	No. of systems implemented	Percentage
Circulation	9	69.23%
Cataloguing (OPAC)	5	38.46%
Acquisition	4	30.76%
RFID Technology	0	0
Digital Resource Management	0	0



**Figure 4: Type of Automation system implemented based on Modules**

Table 5 shows that maximum libraries have automated circulation modules (nine no. of libraries -69.23%) followed by five no. of libraries (38.46%) and four no. of libraries (30.76%) have implanted cataloguing & acquisition modules in their libraries respectively. None of the libraries have implanted RFID technology and Digital Resource Management modules.

**Impact of Library automation on Libraries and users**

**Table 6: Impact of Library automation on different aspects**

Impact factor	Efficiency of library operations		User satisfaction		Access to library services		Time spent on routine tasks		Accuracy of records and data	
	No. of resp.	Per. (%)	No. of resp.	Per. (%)	No. of resp.	Per. (%)	No. of resp.	Per. (%)	No. of resp.	Per. (%)
No impact	1	7.69	1	7.69	0	0	2	15.38	0	0
Slight impact	2	15.38	1	7.69	1	7.69	2	15.38	1	7.69
Moderate impact	3	23.07	3	23.07	4	30.76	2	15.38	4	30.76
Significant impact	7	53.84	8	61.53	8	61.53	7	53.84	8	61.53

What impact has library automation had on the following aspects of library services? (1 = No impact, 2 = Slight impact, 3 = Moderate impact, 4 = Significant impact)

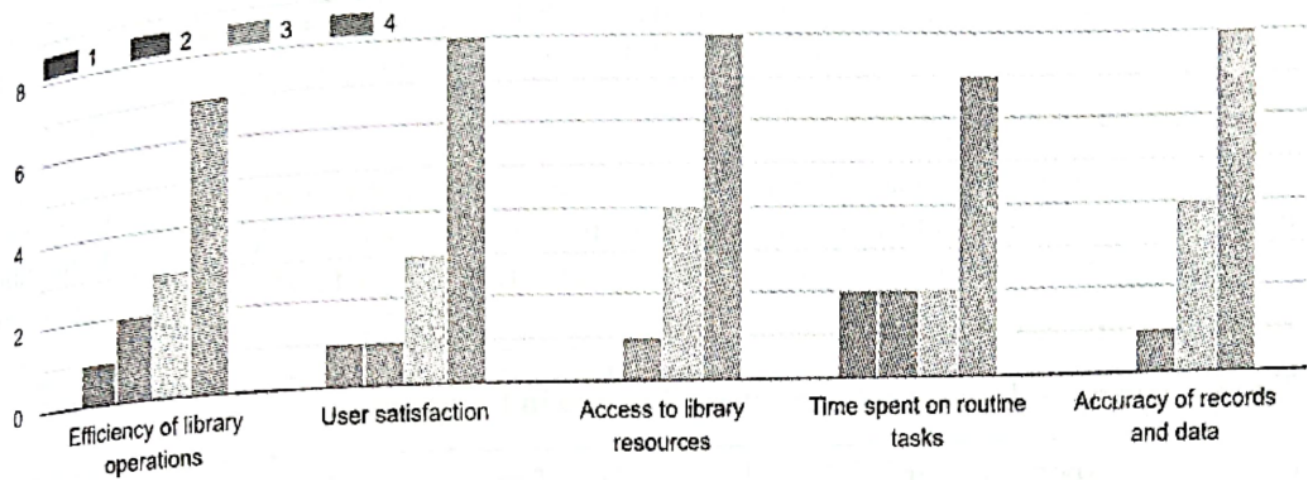


Figure 5: Impact of Library automation on different aspects

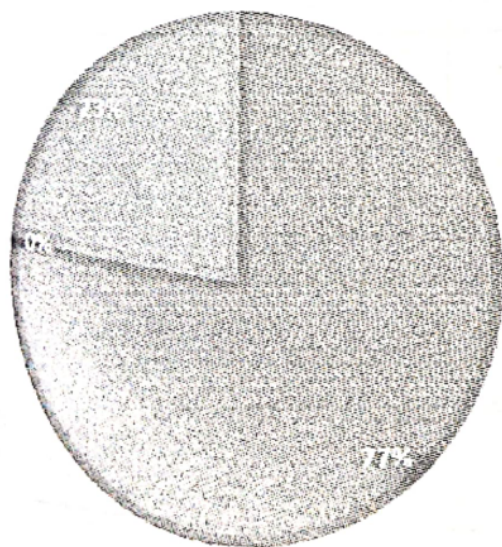
**Impact on efficiency of library operations**

Table no. 6 depicts the impact of library automation on efficiency of library operation where seven libraries (53.84%) have significant impact followed by three libraries (23.07%) as moderate impact, two libraries (15.38%) as slight impact and one library as no impact (7.69%).

**Impact on User satisfaction**

Table no. 6 shows the impact of library automation on user satisfaction where 8 libraries (61.53%) have significant impact followed by three libraries (23.07%) as moderate impact, one library (7.69%) as slight impact and one library (7.69%) as no impact.

**Impact on Access to Library services**



■ Yes ■ No ■ Not sure

Figure 6: Impact of Library automation on increase in library usage

Table no. 6 depicts the impact of library automation on access to library services where eight libraries (61.53%) respond as significant impact followed by four libraries (30.76%) as moderate impact, one library (7.69%) as slight impact and zero library as no impact.

### Impact on Time spent on routine tasks

Table no. 6 shows the impact of library automation on time spent on routine tasks where seven libraries (53.84%) respond as significant impact with highest response followed by two libraries (15.38%) responding as moderate impact, slightly impact and no impact each.

### Impact on Accuracy of records and data

Table no. 6 depicts the impact of library automation on accuracy of record and data where eight libraries (61.53%) respond as significant impact followed by four libraries (30.76%), one library (7.69%) and zero library respond as moderate impact, slightly impact and no impact respectively.

### Impact on increase in library usage

Table 7: Impact of Library automation on increase in library usage

Response factor	No. of resp.	Per. (%)
Yes	10	76.92%
No	0	0%
Not sure	3	23.07%

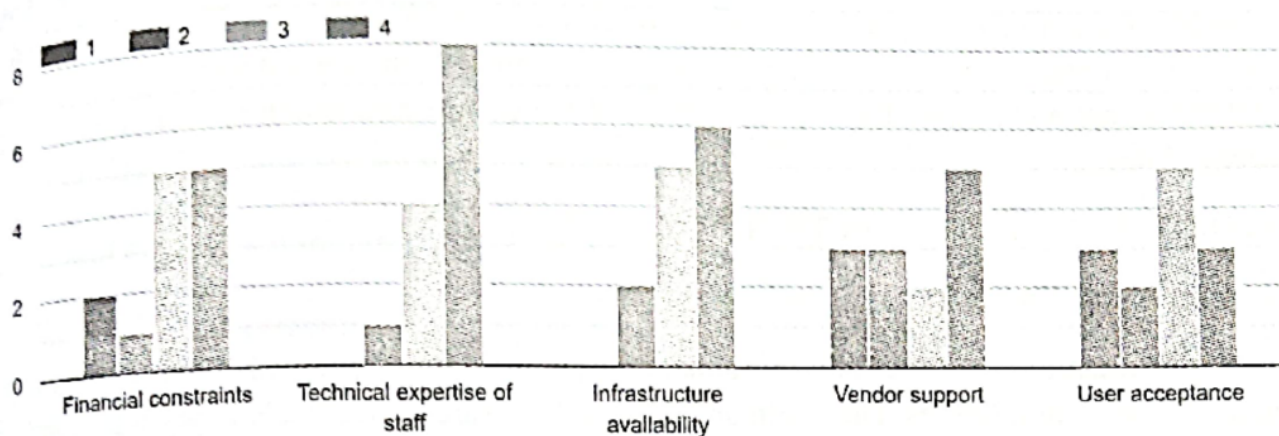
Table 7 implies that library automation has a great impact on library usage with ten responses (76.92%) followed by three responders (23.07%) are not sure about any impact and none has responded with non-impact.

### Challenges Faced in Implementing Automation in Libraries

Table 8: Challenges Faced in Implementing Automation

Response factor	Financial Con-straints		Tech-nical expertise of staff		Infra-structure availabil-ity		Vendor support		User ac-ceptance	
	No. of resp.	Per. (%)	No. of resp.	Per. (%)	No. of resp.	Per. (%)	No. of resp.	Per. (%)	No. of resp.	Per. (%)
Not a challenge	2	15.38	0	0	0	0	3	23.07	3	23.07
Minor challenge	1	7.6	1	7.69	2	15.38	3	23.07	2	15.38
Moderate chal- lenge	5	38.46	4	30.76	5	38.46	2	15.38	5	38.46
Major challenge	5	38.46	8	61.53	6	46.15	5	38.46	3	23.07

How would you rate the following aspects as challenges in implementing library automation? (1 = Not a challenge, 2 = Minor challenge, 3 = Moderate challenge, 4 = Major challenge)



**Figure 7: Challenges Faced in Implementing Automation**

### Financial Constraints

Table 8 shows that five number of respondents (38.46%) each response as financial constraints is a major challenge as well as moderate challenges whereas one library (7.69%) and two libraries (15.38%) respond as financial constraints is a minor challenge and not a challenge respectively for implementation of library automation in government autonomous degree institutions in Odisha.

### Technical expertise of staff

Table 8 depicts that technical expertise of staff as a challenge faced in implementing automation in libraries where eight libraries (61.53%) respond as major challenge followed by four libraries (30.76%), one library (7.69%) and zero library respond as moderate challenges, minor challenges and not a challenge respectively.

### Infrastructure availability

From Table.8, majority of libraries (46.15%) respond as infrastructure availability is a major challenge in implementation of library automation in Government colleges followed by five responses (38.46%) as moderate challenge, two responses (15.38%) as minor challenges and zero responses as not a challenge.

### Vendor support

Table No. 8 depicts that vendor support is a challenge faced in implementation of library automation system where five nos. of libraries (38.46%) respond as major challenge, followed by two libraries (15.38%), three libraries (23.07%) and three libraries (23.07%) responded as moderate challenge,

minor challenge and not a challenge respectively for the said factor for implementation of the library automation in Government Autonomous Degree Colleges in Odisha.

### **User acceptance**

Table 8 data shows that three libraries (23.07%) respond that user acceptance is a major challenge in implementation of library automation in libraries whereas five libraries (38.46%) respond as moderate challenge, two libraries (15.38%) respond as minor challenge and three libraries respond (23.07%) as not a challenge for implementation of the library automation system in government college libraries.

## **OPPORTUNITIES AND DIRECTION**

### **Scope for Upgrading Infrastructure**

ICT based Infrastructure is one of the most important parameters for upgradation and development of automation work in Libraries. The minimum essential hardware devices include desktop computers, general printer, scanner (general & digitisation purposes), barcode printer & backup devices. Besides it, a high-speed internet connection and suitable LMS software are also mandatory requirements for smooth operation of Library automation services. With upgradation of infrastructure like cluster network, online repository system, online database, RFID Technology etc., the libraries can deliver more user centric services through automated library management services.

### **Role of Government and Institutional Support**

Due to rapid change in this era of information, new changes and developments are also happening in the library automation systems. The support from institutional as well as government includes financial support, technical support, policy making support and user awareness programs for multilevel development of automation services in libraries. However the importance of Library automation as mandatory requirement for the NAAC accreditation in Degree colleges, Govt. and institutional support should be necessary for automation of the libraries of the colleges.

### **Importance of Training Programs for Library Staff**

Training programs for Library staff are one of the most important aspects in Library automation services. The staff must be trained with changes and development of new modules, categories, service patterns of Library automation software. Feedback sessions, multi-language training, discussion sessions are also helpful for enhancement of services.

### **Collaborative Efforts for Resource Sharing**

Resource sharing services like inter library loan (ILL), document delivery services (DDS), consortium, management of databases, union catalogue, reference services, training can be managed through automation software. Through these collaborative efforts, maximum utilisation of resources can be done.

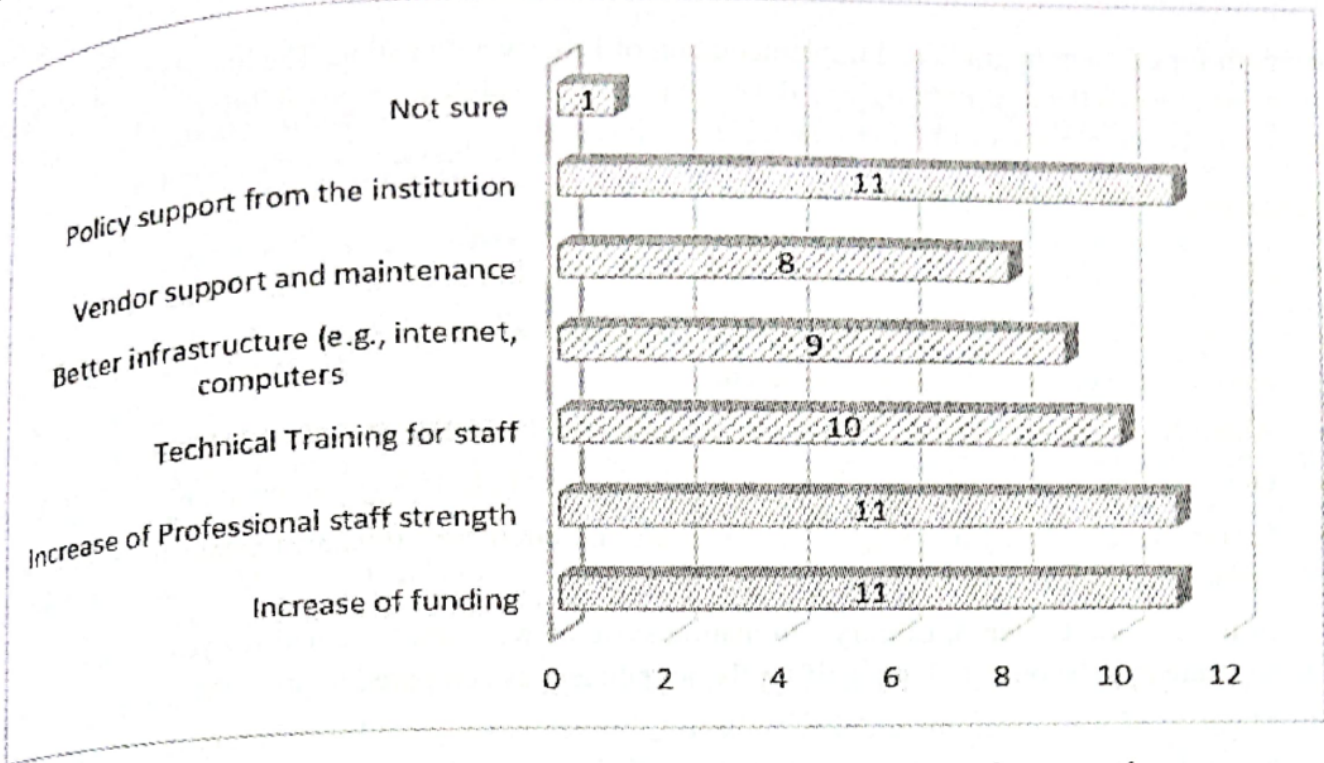


Fig 8: Recommendations of Libraries for Successful Implementation of automation

### Emerging Technologies and Trends in Library Automation

With the digital transformation of libraries various services like Electronic Resource Management, automating processes through Artificial Intelligence (AI) & Machine Learning (ML), personalising user experience, virtual tour, mobile library, plagiarism checker can be managed through various automation processes of the library.

### RECOMMENDATIONS FOR SUCCESSFUL IMPLEMENTATION

Table 9: Recommendations of Libraries for Successful Implementation of automation

Response factor	No. of Resp.	Per. (%)
Increase of funding	11	84.61%
Increase of Professional staff strength	11	84.61%
Technical Training for staff	10	76.92%
Better infrastructure (e.g., internet, computers)	9	69.23%
Vendor support and maintenance	8	61.53%
Policy support from the institution	11	84.61%
Not sure	1	7.69%

Through the above responses, it is clearly noted that most libraries are recommending for more funds, policy support, technical training, better infrastructure and increase of professional staff

strength for efficient upgrade and implementation of Library automation. The library needs special attention towards the new upbringings, development and revolutionary possibilities with the help of digital tools, mobile apps and other new technologies.

## FINDINGS AND DISCUSSION

### Key Findings of the Study

- Except two College Libraries, all other Government Autonomous Libraries are in the process of automation i.e. fully/ partially automated.
- About Nine Libraries (69.23 %) are using Commercial (Purchased) software for automation.
- Out of which e-Granthalaya by NIC, GOI is highly used (46.15%) as automation software.
- Libraries are basically focusing on three modules i.e. circulation (69.23%), cataloguing (38.46%) and acquisition (30.76%).
- In most of the Colleges, Library automation systems were implemented few years ago, but this software may be outdated or significantly not efficient as compared to present service demands.
- Majority of the Government Auto. College Libraries have quoted that library automation has a significant impact on various aspects like efficiency of library operations, User satisfaction, Access to Library services, Time spent on routine tasks, Accuracy of records and data, increase in library usage.
- Most of the Libraries suggested that financial constraints, technical expertise of staff, Infrastructure availability, Vendor support, User acceptance are major challenges in implementation of automation systems in Government Auto. College Libraries.
- Maximum College Libraries have suggested for Increase of funding, Increase of Professional staff strength, technical Training for staff, better infrastructure (e.g., internet, computers), Vendor support and maintenance, Policy support from the institutions are the minimum requirement for successful implementation of Library automation in colleges.

## RECOMMENDATIONS

- **Increased Funding:** Allocate dedicated funds for infrastructure and software to enable comprehensive automation.
- **Increase of Staff strength:** To recruit trained full time technical staff for optimum use of resources and provide better services to the user.
- **Staff Training and Development:** Conduct regular workshops to build technical skills among library staff and management.
- **Improved Collaboration:** Foster partnerships with other libraries and institutions to share resources and best practices in automation.
- **Policy Support:** Formulate policies encouraging automation and digital resource integration in all government college libraries.
- **User Awareness Programs:** Educate library users about digital resources to maximize usage and user engagement with automated services.



## CONCLUSION

The study reveals that while several Government Autonomous College libraries in Odisha have initiated steps toward library automation, significant gaps persist in implementation and adoption. Challenges include limited funding, insufficient technical infrastructure, and a lack of trained staff. Despite these obstacles, the libraries have a strong potential for growth in automation, which can improve access, efficiency, and service quality. Opportunities for progress lie in focused training programs, infrastructure upgrades, and strategic funding initiatives to support automation efforts.

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