

THE IMPACT OF ICT ON LIBRARIES IN ARTS AND COMMERCE COLLEGES IN MADHYA PRADESH

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Abstract :

This study assesses the extent of library automation in Government First Grade Colleges in Madhya Pradesh. It found that a significant portion of librarians (57.91%) have less than 10 years of experience, suggesting a need for enhanced training programs [1]. Additionally, the study identified varying levels of hardware and software infrastructure across the colleges, with many lacking specialized software for efficient library management. While automation is ongoing, only 39.05% of the libraries are fully automated, indicating that progress is still in its early stages. Regional disparities were also evident, with rural colleges showing more advanced automation than their urban counterparts. Furthermore, the size of book collections was found to influence the level of automation, as colleges with larger collections tended to have more automation. The study highlighted that priority has been given to automating core modules such as Acquisition, Circulation, and OPAC, but comprehensive automation remains a challenge. The findings underscore the importance of investigating the barriers to automation, including financial, technical, and resource-related challenges, and suggest the need for a more cohesive, region-specific approach to library automation. Addressing these challenges will be crucial for improving the overall library management systems and making them more efficient and user-friendly.

Keywords: *Automation Progress, Specialized Software, Book Collections, Library Management Systems, College Libraries.*

1. Introduction

Library automation plays a crucial role in improving the efficiency and accessibility of library services, particularly in academic institutions. This study focuses on assessing the level of library automation in Government First Grade Colleges in Madhya Pradesh, examining key factors such as infrastructure, experience of librarians, and the regional

variations in automation progress [2]. With the increasing demand for efficient library management, the need to adopt automation technologies has become more pronounced. However, the findings of this study indicate that many libraries are still in the early stages of automation. A significant portion of librarians (57.91%) has less than 10 years of experience, which points to a potential gap in expertise that may hinder the automation process. Furthermore, the study reveals that the hardware and software infrastructure varies across colleges, with a noticeable lack of specialized software for library management. Although automation efforts are underway, only 39.05% of the libraries have achieved full automation. The study also highlights regional disparities, with rural colleges displaying more advanced automation than urban counterparts. Additionally, the size of book collections was found to influence automation levels, with larger collections being more automated. The findings suggest a need for enhanced training, better resource allocation, and a region-specific approach to overcome existing challenges and further advance automation in these institutions.

2. Literature Review

The integration of Information and Communication Technology (ICT) has revolutionized the functioning of libraries, particularly in academic institutions. This literature review examines the impact of ICT on libraries in Arts and Commerce colleges in Madhya Pradesh. With the growing need for efficient library management, ICT tools are being increasingly adopted to enhance library services, resource accessibility, and user experience. The review explores existing studies on the use of ICT in library operations, highlighting challenges, benefits, and the role of technology in improving library services within the specific context of Madhya Pradesh educational institutions.

Summary of Literature Review

Author's	Work Done	Findings
Kumar, V. (2024)	Review of technological advancements in library services in Indian Arts and Commerce colleges.	Identified key advancements in ICT in libraries, with a focus on how these technologies have transformed library management and services in academic institutions.
Patel, P. (2023)	Study assessing the role of ICT in academic libraries of Madhya Pradesh's Arts and Commerce institutions.	Found that ICT adoption varies significantly among institutions, with some colleges having limited digital resources and infrastructure.



Naik, S. (2022)	Explored the adoption of digital libraries in Madhya Pradesh's Arts and Commerce colleges, examining challenges and opportunities.	Highlighted barriers like lack of funding, infrastructure, and trained staff, but also pointed to opportunities for improving service delivery and access.
Thakur, N. (2021)	Case study on the impact of ICT integration in libraries of Madhya Pradesh colleges.	Concluded that ICT integration has led to enhanced library efficiency and user satisfaction, though full automation remains a challenge.
Singh, A. (2021)	Comparative analysis of ICT and library management practices in Madhya Pradesh's Arts and Commerce colleges.	Found that larger institutions had better infrastructure and resources, leading to more successful ICT adoption, while smaller colleges lagged.
Jain, P. (2020)	Survey of current trends in ICT use in Arts and Commerce college libraries in Madhya Pradesh.	Noted that while ICT usage is increasing, many libraries still rely on traditional methods, with a significant gap in digital infrastructure and training.
Yadav, M. (2020)	Studied the digital transformation of libraries in Madhya Pradesh's Arts and Commerce colleges.	Found that digital transformation was progressing but noted disparities between rural and urban colleges, with rural colleges showing more rapid adoption.
Rajput, H. (2019)	Explored the impact of ICT on library services in educational institutions across Madhya Pradesh.	Highlighted the transformative effects of ICT on user services, with improvements in accessibility, efficiency, and resource availability.
Dubey, S. (2018)	Case study on library automation and ICT adoption in Arts and Commerce colleges in Madhya Pradesh.	Found that library automation is still in early stages, with many colleges focusing on core services such as cataloging and circulation.
Sharma, V. (2018)	Study on ICT integration in academic libraries of Madhya Pradesh's Arts and Commerce colleges.	Found mixed results in terms of successful ICT integration, with larger colleges achieving better outcomes due to higher investments in infrastructure.

Research Gap

Despite the progress in library automation, there are several research gaps that need further exploration. First, there is limited research on the specific barriers to automation in government colleges, particularly related to financial constraints, technical limitations, and the expertise of library staff. Additionally, there is a lack of studies focusing on the regional disparities in automation progress, particularly the differences between rural and urban institutions. Further research is also needed to assess the impact of automation on overall library efficiency and user satisfaction.

3. Methodology

To achieve the specific objectives of this study, a questionnaire-based survey was conducted. The questionnaire included both open-ended and closed-ended questions, and was distributed through surface mail, email, and face-to-face interviews [3]. The study also employed the observation method for data collection. Descriptive statistics were used to analyze the data, with frequency and percentage calculations serving as the primary statistical tools. The collected responses were analyzed, tabulated, and interpreted using SPSS software. The data was further analyzed using the Chi-Square Test to evaluate the results.

4. Result & Discussion

Table 1 Total Number of Respondents

No. of Questionnaires Distributed	No. of Responses Received	Percentage of Response
411	315	76.64%

To obtain accurate responses, the investigator visited several libraries, distributed questionnaires via post, conducted telephone interviews, and utilized a web survey tool. The collected data is represented, analyzed, and interpreted in the form of tables and graphs.

1. **Experience of Librarians:** Professional experience plays a crucial role in any profession, helping organizations grow stronger and more effective while also contributing to individual self-growth. It provides valuable lessons for planning, designing, and executing ideas efficiently [4]. In the context of library management, the experience of librarians is essential. Therefore, the distribution of librarians' experience was considered for this study, with a particular focus on their experience with library automation. The data is presented in the following tables and figures.

Table 2 Experience of Librarians

Experience	No. of Librarians (N=259)	Percentage
< 10 Years	150	57.91
11 - 20 Years	74	28.57
21 - 30 Years	29	11.20
> 30 Years	6	2.32

For data tabulation purposes, the experience of librarians was categorized as follows: less than 10 years, followed by blocks of 10 years each. The data is presented in Table-2.

Among the librarians, only 6 (2.32%) have 30 years or more of experience, while 29 (11.2%) have between 21 and 30 years of experience. A larger group of 74 (28.57%) have 11 to 20 years of experience. The majority, however, consists of 150 (57.91%) librarians with less than 10 years of experience in the field of Library and Information Science. This indicates



that most librarians working in the Government First Grade Colleges in Madhya Pradesh are relatively new to the profession [5].

2 Distribution of Hardware Infrastructure in Libraries:

Table 3 Distribution of Hardware Infrastructure in Libraries

Hardware Infrastructure	Numbers	Per-Head (Colleges)
Computers	774	2.46
Printers	257	0.82
Scanners	223	0.71
Bar Code Accessories	184	0.58
UPS	152	0.48
Photocopiers	75	0.24
LCD Projection	63	0.20
Servers	61	0.19
Others	24	0.076
OHP	12	0.076
RFID Facilities	0	0

The overall infrastructure across the 315 Government First Grade Colleges was assessed based on the availability of computer hardware per college. On average, there are 2.46 computers available per college. However, the availability of other hardware facilities is less than one item per college. The availability of hardware seems to be influenced by the implementation of library automation, and therefore, it is not yet possible to determine whether the hardware resources are adequate for the libraries at this stage.

3 Distribution of software:

Table 4 Distribution of software tools and facilities in libraries

Software Tools and Facilities	Number	Per Capita (College)
Operating System 1	237	0.75
Acrobat Reader	143	0.45
Office Utilities	113	0.36
Audio, Video and Graphic	83	0.26
Digital Library SW	45	0.14
Operating System 2	38	0.12
E-Learning	26	0.082
Others	7	-
Content Management	5	-

In this study, the per capita availability of software per college was also considered. While the software tools and facilities available across the 315 Government First Grade Colleges are noted, it is difficult to assess whether the software availability is adequate. It is likely that the software is acquired by the colleges for shared use across various departments. However, certain software, such as Digital Library Software and Integrated Library Management Software, are essential and exclusive for library purposes. The availability of these

specialized software tools will be examined in detail later when the data on library automation is analyzed [6].

This study also evaluates the steps taken by libraries to assess the extent of automation in Government First Grade Colleges in Madhya Pradesh. The details of library automation are presented in the figure below.

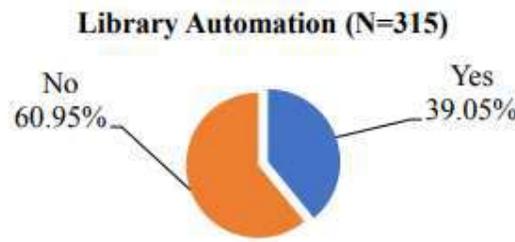


Figure 1 Library Automation is done or not.

The figure above indicates that only 123 (39.05%) of the Government First Grade Colleges in Madhya Pradesh have initiated library automation, while the remaining 192 (60.95%) colleges have not yet started the automation process. Although this is not a positive indicator for the progress of automation, it would be valuable to explore the reasons behind this delay and any initiatives being undertaken to address it. It is discouraging to note that, despite having access to essential resources such as computer hardware, software, ILMS packages, and support from both national and international sources, these libraries have not yet embarked on the automation journey. Additionally, as noted in the previous section, 57.5% of libraries have received funding from INFLIBNET to support automation efforts [7]. Therefore, it is crucial to investigate the underlying reasons for this lack of progress, which may be numerous, some of which are still unknown, and await solutions in the near future.

The status and extent of library automation reflect whether the libraries are fully or partially automated or if automation is still in progress. The following data, presented in Table-5, discusses the progress and status of library automation in the 123 libraries that have already initiated the process.

4 Status of Library Automation

Table 5 Status of Library Automation

Status of Library Automation	No. of Libraries	Percentage
Fully	44	35.77
Partially Automated	57	46.34
In Progress	22	17.89
Total	123	100



Among the 123 Government First Grade College libraries that have initiated the automation process, 44 (35.77%) are fully automated, while 22 (17.89%) are still in the process of automation. Additionally, 57 (46%) libraries have achieved partial automation [8].

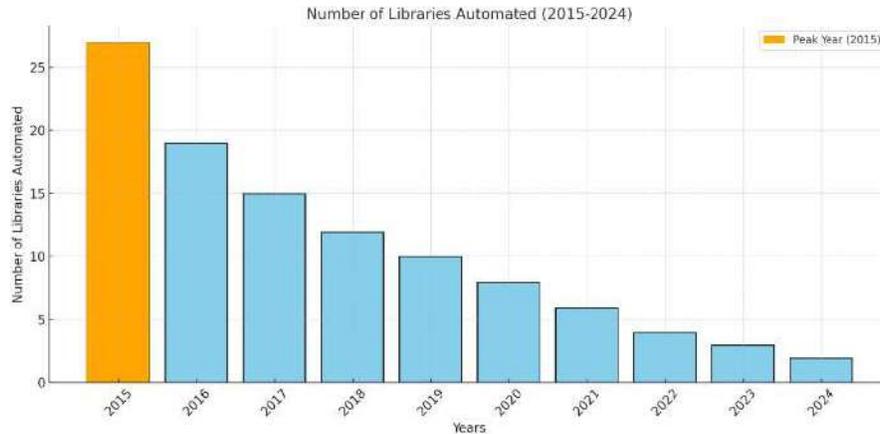


Figure 2 Year wise Automated.

The chart depicts the annual trends in library automation from 2015 to 2024. Automation peaked in 2015, with 27 libraries automated, indicating a strong focus and investment in technological upgrades during this period. However, after 2015, a gradual decline is evident, with 19 libraries automated in 2016 and fewer in subsequent years. By 2024, only 2 libraries were automated, suggesting that either most libraries had completed the process or remaining ones faced challenges such as funding or technical constraints. This trend reflects an initial surge in adoption, followed by a stabilization as automation efforts reached saturation.

A comparison is also made between the urban, rural and semi-rural Regions of the Colleges and the status of Library Automation in them. Table-6 show the details of responses.

5 Region-Wise

Table 6 Region-Wise Comparison of Automated College Libraries.

Rural		Urban		Semi-Rural	
Automation		Automation		Automation	
Y	N	Y	N	Y	N
56	107	44	63	23	21

It is noteworthy that a greater number of colleges in the rural and semi-rural regions—56 and 23, respectively—have automated their libraries. In comparison, 44 college libraries in the urban region have been automated [9]. This presents an interesting scenario that warrants further investigation through an in-depth field study, including gathering insights from library professionals working in these areas. However, it is also observed that the rural region has twice as many non-automated libraries compared to the automated ones. In contrast, the

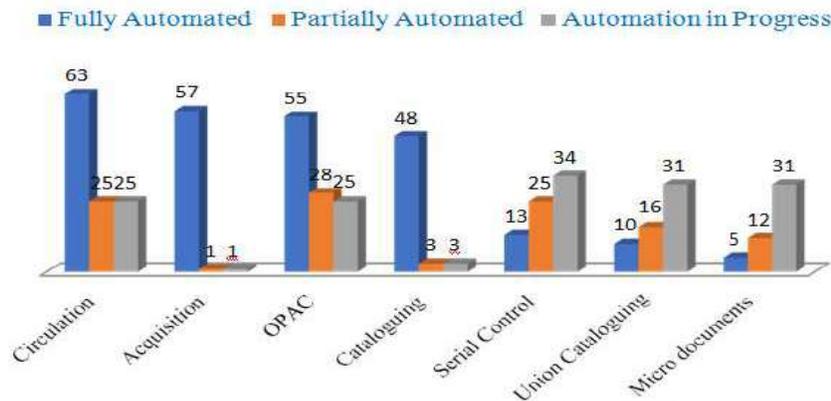
semi-urban region has more automated libraries than non-automated ones, although the difference is minimal. It is important to note that the rural areas have a larger number of colleges, and thus a greater allocation of funding, which likely contributes to the higher number of automated libraries. This can be further verified by examining the budgetary allocations to colleges in rural areas.

6. Automated Libraries and Book Collection

Table 7 Automated Libraries and Book Collection per College.

Collection of books per college	Automated Libraries	Non-Automated Libraries	Percentage of Automated Libraries
Less than 20000 (N=212)	61	151	28.77
More than 20000 (N=103)	62	41	60.19

To further explain this observation, it is important to define larger collections. The aggregate collection of books in the libraries of 315 Government First Grade Colleges in Madhya Pradesh is found to be close to 20,000. The data from the survey is presented in Table 7. Among the colleges with a total book collection of 20,000 or fewer, 61 (28.77%) libraries are automated. In contrast, colleges with collections exceeding 20,000 books have 62 (60.19%) automated libraries. It can be inferred that library professionals may consider smaller collections easier to manage manually, making automation less desirable in such cases. This can be further compared with student strength and the volume of book circulation, as both smaller collections and circulations may not justify the cost-effectiveness of automation. While library automation software packages can handle a range of operations, from acquisition to circulation and more, many libraries have automated only the essential functions. For instance, the acquisition and management of serials and periodicals in college libraries is minimal, so libraries may choose not to automate the serials control modules. In this context, the distribution of automated modules is detailed here. Library automation in academic libraries aims to enhance services, improve user satisfaction, and streamline information delivery. Core operations like acquisition, cataloging, circulation, serial control, OPAC, microform management, and union catalog creation are essential for smooth library functioning, and automating these modules is crucial for efficient library operations. The extent of automation in these modules is presented in Figure 3 [11].

Status of Distribution of Automated Modules**Figure 3 Automated Library Modules.**

Among the libraries that have already undergone automation, it is observed that the Circulation module is fully automated in 63 libraries, with 25 libraries reporting partial automation and 25 more in progress. In comparison, the Acquisition and Cataloguing modules are fully automated in 57 and 48 libraries, respectively, with only 1 and 3 libraries reporting partial automation or automation in progress for these modules. Interestingly, the Micro Documents module has the lowest rate of full automation, with only 5 libraries adopting it. However, Union Catalogue preparation has seen better implementation than Micro Documents. The data also indicates that many libraries do not subscribe to periodicals; nevertheless, the Serials Control module is automated in a significant number of libraries, including those that are fully, partially, or in progress. OPAC is also available in many libraries, although its functionality often depends on the availability of LAN or Intranet for the colleges or an in-house OPAC system. When cataloguing and OPAC are combined, the results and responses show a more positive trend [12].

8 Priority of Library Automation Modules: When libraries first begin the automation process, they typically prioritize certain modules to minimize disruption to regular library operations and ensure a smooth transition from manual to automated systems. The priority order for automating various modules is presented in Figure 4.

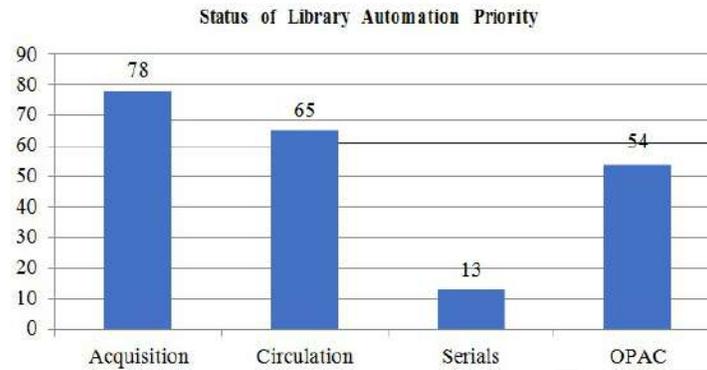


Figure 4 Status of Library Automation Priority.

Among colleges that have implemented library automation, 78 (63.41%) prioritized the Acquisition module, followed by Circulation (65 colleges, 52.85%) and OPAC (54 colleges, 43.9%). The Serials module, with only 13 colleges automating it (10.57%), received the least attention. Surprisingly, many libraries have automated Serials despite its lower priority. The focus on Acquisition is due to its role in creating machine-readable bibliographic databases, ensuring smooth cataloguing and circulation. Complete bibliographic details are essential for managing lost books and unreturned items, and NAAC and AICTE approve machine-generated accession listings for stock-taking.

The following are some likely reasons why library automation prioritizes the Acquisition section, with Circulation and OPAC following as the next priorities.

9. Usefulness of Library Automation in Operations: Library automation has significantly transformed daily operations in most libraries. Automated libraries now perform tasks such as Acquisition, Circulation, Cataloging, Serial Control, Holdings Information, Administration, Report Generation, Vendor Support, Information Retrieval, Web OPAC, Stock Verification, Bar Code and RFID Support, e-Mail Notifications, Network Support, and Mobile/WhatsApp integration. This study evaluates the usefulness of these operations through library automation, with the responses categorized into Functions and Services, as shown in Table – 8 [13].

Table 8 Library operation and Usefulness.

Library Operation	Percentage of usefulness
Functions	
Acquisition	92.4
Circulation	95
Cataloging	90.6
Serial control	66.6
Report generation	85.2
Vendor Support	66

Stock Verification	79.8
Bar Code Enabled	83.2
RFID Support	38.8
Network Support	62
Services	
Holdings Information	79.8
Administration	79.8
Support catalogue Standards	66.4
Information Retrieval	74.8
Web OPAC	77
e-Mail Notification	63.2
Mobile/ Whatsapp enabled	47.4

Among the functions, Circulation is rated as the most useful, with 95% of responses. This is understandable, as it is the most visible function where users frequently interact. The next most useful functions are Acquisition and Cataloguing. As previously mentioned, Report Generation is also highly valued, with 85.2% of responses, followed by the use of Bar Codes, which has simplified the lending and returning of books.

10. Experience of Library Staff in Automation: The familiarity and experience of library staff with automation, particularly software, is crucial. The expertise of library professionals plays a significant role in the successful implementation and ongoing maintenance of the automation process.

Library Automation Experience of Library Staff

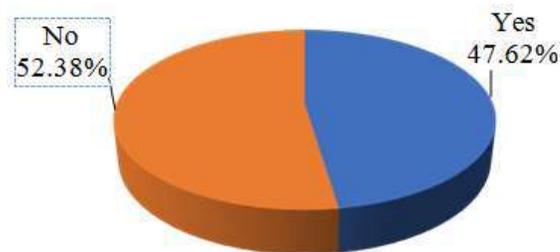


Figure 5 Library Automation Experience of Library Staff.

The data from the study of 315 Government First Grade College Libraries in Madhya Pradesh reveals that 150 (47.62%) of the colleges have librarians with experience in library automation and the use of related software. However, the remaining 165 (52.38%) colleges have staff with no experience in automating the library or using automation software.

11. Problems Faced in Library Automation: This study examines the challenges faced by libraries during the automation process. Common issues reported by library staff include a lack of knowledge about the benefits of automation, insufficient funding, lack of management

support, limited ICT skills among staff, low interest in automation, inadequate staff to manage the automation process, and the belief that manual systems are more effective than automated ones. A summary of the responses regarding these issues is presented in Figure 6.

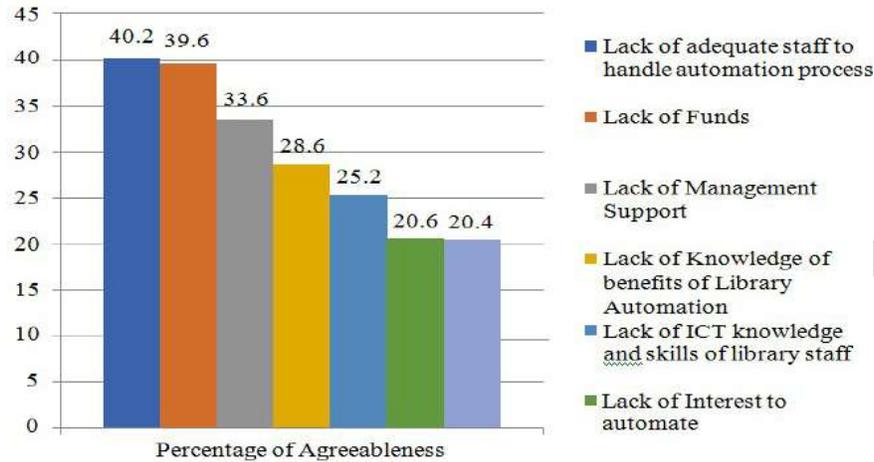


Figure 6 Challenges Faced by Government First Grade College Libraries in Madhya Pradesh During the Automation Process.

Based on the data presented in the above figure, it can be inferred that while most libraries are satisfied with the library automation software and its operations, a significant number of issues still arise during the initial and ongoing automation processes. These challenges can be mitigated with proper implementation of the library automation project. According to the study, the primary issue identified by 40.2% of respondents is the "lack of adequate staff" to manage the automation process. The second major concern, highlighted by 39.6%, is the "lack of funds" available for automation. Additionally, 33.6% of respondents cite the "lack of management support" as a barrier. Other challenges include the "lack of knowledge regarding the benefits of library automation" (28.6%) and the "lack of ICT skills and knowledge" among staff (25.2%). Fewer respondents (20.6%) believe that "lack of interest in automation" by library staff is an issue, and 20.4% consider that library staff perceive "manual systems as better than automated ones." These figures indicate a generally positive attitude towards automation, suggesting that the challenges faced are not due to resistance from library staff, but rather logistical and resource-based issues.

12. Reasons for Not Automating Libraries: While a significant number of libraries have successfully automated, approximately 40% of college libraries remain non-automated. The study also explores the reasons behind this delay in automation. The table below outlines the key factors contributing to the lack of automation in Government First Grade College



Libraries in Madhya Pradesh. Among the least cited reasons are: "library professionals' lack of interest in adopting IT" (7.29%), "fear that modern IT techniques could replace or reduce the role of library professionals" (4.68%), "lack of professional recognition by the authorities" (7.81%), and "inaccurate expectations about the benefits of IT" (10.93%). These responses suggest that the barriers to automation are not due to a lack of enthusiasm or knowledge among library professionals, but rather stem from other institutional or logistical challenges.

Table 9 Reason for not automating.

Reasons for No Automation	Number	Percentage
The library has insufficient funds	162	84.38
Lack of adequate trained staff in IT application	125	65.10
Lack of coordination in the Authorities of the Institution	118	61.46
Lack of cooperation and coordination among the staff	95	49.48
No full support from higher authorities for IT application in Library	60	31.25
Inaccurate expectations of Information Technology	21	10.94
Lack of Professional recognition by the Authority of the Library	15	7.81
Library professionals are not interested in IT adoption to the Library	14	7.29
A fear of modern IT Techniques could reduce/replace the Library Professionals	9	4.69

The main reason cited for the lack of automation in libraries is the insufficient funding, with 162 (84.37%) colleges reporting this as a key barrier [14]. This is followed by a lack of adequately trained staff in IT applications (125, 65.10%), poor coordination among institutional authorities to initiate the automation process (95, 49.47%), and a lack of full support from higher authorities for IT applications in libraries (60, 31.25%).

Findings

The study reveals that only 39.05% (123 out of 315) of Government First Grade Colleges in Madhya Pradesh have initiated library automation, while the majority, 60.95% (192 colleges), have not yet started the process. This is a significant finding, indicating that more than 60% of these colleges still lack automated library systems.

1. Among the 123 colleges that have begun the automation process, only 36% (44 colleges) are fully automated, 18% (22 colleges) are still in progress, and 46% (57 colleges) are partially automated. This suggests that despite the available resources, many Government Colleges have yet to fully automate their libraries.

2. There are more non-automated libraries in both urban (N=108) and rural (N=163) regions of Madhya Pradesh compared to those that are automated.
3. Among the 13 colleges established between 1911 and 1960, 84.62% (11 libraries) have automated, whereas only 37.09% (112 libraries) of the colleges established between 1961 and 2024 have automated their libraries.
4. Of the colleges with a book collection of 20,000 or fewer (212 colleges), 28.77% (61 libraries) have automated their libraries. In contrast, 60.19% (62 libraries) of colleges with a collection of more than 20,000 books (103 colleges) have automated libraries.

Among the libraries that have automated, the Circulation module is fully automated in most libraries (63), with 25 libraries partially automated and 25 still in progress. Notably, the Acquisition (57 libraries) and Cataloguing (48 libraries) modules are fully automated in all cases, with only 1 and 3 libraries, respectively, reporting partial automation or ongoing progress.

5. Conclusion

In conclusion, this study aimed to assess the extent of library automation in Government First Grade Colleges in Madhya Pradesh. The results showed that a significant portion of librarians are relatively inexperienced, with 57.91% having less than 10 years of experience. The study also revealed varying levels of hardware and software infrastructure across the colleges, with a notable lack of specialized software for library management. Automation efforts are still in progress in many colleges, with only 39.05% fully automated. Regional disparities were observed, with rural areas showing more automated libraries than urban ones. Automation progress is influenced by the size of book collections, with larger collections having higher automation rates. Priority was given to automating core modules like Acquisition, Circulation, and OPAC. The findings highlight the need for further investigation into the barriers to automation and the development of a more cohesive approach to library automation in the region.

Future Scope

- Enhance technical skills and automation knowledge for less experienced librarians.
- Upgrade hardware and adopt specialized library management software.
- Expand full automation beyond 39.05%, focusing on core services.
- Investigate and reduce automation gaps between rural and urban colleges.

- Develop cost-effective automation models for libraries of all sizes.

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