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The Evolution of Central Government Ministries' (CGM) Libraries in India: Bridging Education and the Dynamic Tech World

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ABSTRACT

In an era where the synergy between educational infrastructure and the dynamic technological landscape is redefining knowledge management, the evolutionary adaptability of government libraries becomes the linchpin in bridging the gap between traditional policy support and the digital future. This study investigates the technological evolution of 32 Central Government Ministries' (CGM) libraries in Delhi from 2010 to 2023, specifically analyzing their transition regarding e-resources, ICT tools, automation, and housekeeping activities. These institutions play a critical role in facilitating policy formulation and legislation while providing access to essential documentation for parliamentarians, bureaucrats, and researchers. Utilizing a mixed-method approach through structured questionnaires administered to library heads, the research quantitatively and qualitatively evaluates modernization efforts. Results indicate a progressive integration of modern ICT tools to align with global standards. Specifically, the Ministry of Power Library holds the largest e-resource collection, while the Central Secretariat Library leads in ICT infrastructure and management software. Significant milestones were achieved in automation; by 2023, 21 libraries were fully automated, 24 had adopted Library Management Software (LMS), and 18 utilized automated modes for housekeeping functions. While network sharing remained consistent, these figures reflect a positive modernization trajectory. This research provides a crucial outlook on the status of CGM libraries, identifying systemic hurdles to guide future developmental plans. Uniquely, this study offers the first comprehensive, fourteen-year longitudinal assessment of Indian government libraries, filling a significant gap in the literature regarding their evolutionary adaptation within the modern technological world.

Keywords: Government Libraries, Digital Transformation, Library Automation, E-resources, ICT

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1. INTRODUCTION

The global information landscape is currently undergoing a profound transformation driven by the "dynamic tech world" an era characterized by rapid advancements in artificial intelligence, cloud computing, and digital connectivity (Govea et al., 2023; Kumar et al., 2024; Li & Wang, 2023; Prangon & Wu, 2024). In this volatile environment, the traditional paradigms of knowledge dissemination are being challenged, necessitating a robust mechanism to connect established educational foundations with emerging technological realities (Samala et al., 2024; Tan et al., 2021). This phenomenon of "bridging education and the dynamic tech world" is not merely about digitizing resources; it represents a

fundamental shift in how knowledge is curated, accessed, and utilized to foster innovation and informed decision-making across all sectors of society.

Within this framework, according to Meesad & Mingkhwan (2024) and Lee (2024), libraries transcend their historical roles as static repositories to become active catalysts in this bridging process. These institutions function as the essential infrastructure that supports lifelong learning and professional development (Barsha & Munshi, 2024; Moonasar, 2024; Shahzad et al., 2023), ensuring that the swift pace of technological change does not outstrip the capacity of individuals and institutions to adapt. This integration of technology and education is particularly critical for governance and public administration, where accurate, timely, and accessible information is the bedrock of national progress (Das, 2024; Lee, 2024a; Wang & Si, 2024). Against this backdrop of global technological urgency, the specific context of India's administrative framework offers a compelling case for analysis.

With the introduction of the socio-economic development planning process, the activities of the Government of India have increased manifold (Badkul et al., 2022; Easwaran, 2022). According to Reggi & Dawes (2022), important government policies, plans, and decisions are presented in the form of government publications. These government publications cover almost all fields of knowledge, such as economics, finance, statistics, political science, labor, industry, and history, as well as agriculture, geology, and metrology. As noted by Wirtz et al. (2022), any research work risks remaining speculative without reading and consulting them. Government publications often comprise first-hand original data and serve as important primary sources of information. Hence, the use of government publications is increasing day by day among scholars, researchers, industrialists, bureaucrats, politicians, subject experts, statisticians, media houses, and activists. Although government publications are very important and low-priced, issues such as improper cataloging, inefficient distribution systems, and a lack of publicity remain major areas of concern.

The libraries of Central Government Ministries (CGM), located in the national capital, New Delhi, are special libraries offering specialized resources that are key to policy drafting, decision-making, implementation reports, and statistical data on governmental schemes. They provide valuable inputs for parliamentary decisions and maintain records of rare or hard-to-access documents relevant to several sectors. These libraries fulfill the functions of providing recreation, information, inspiration, and education. In this capacity, these institutions serve as a critical nexus, acting as the dual purpose of custodians of administrative history and facilitators of ongoing professional learning. By managing these specialized resources, CGM libraries bear the distinct responsibility of bridging the educational requirements of civil servants and researchers with the increasingly complex information landscape, acting as a vital support system for the nation's intellectual infrastructure.

In the current century, characterized by the implementation of the latest technologies, skilled professionals, interactive learning, digital libraries, and virtual libraries, it is imperative to assess the actual status of government ministerial libraries and the initiatives undertaken by them. Investigating their technological advancements is crucial, and the subject demands in-depth research. The development of these libraries depends largely on their collections, skilled staff, optimized resource utilization, efficient services, and the integration of ICT infrastructure. Therefore, it is essential to study the growth of government ministerial libraries in alignment with the needs of the current generation to evaluate their present status and future potential. However, accurately mapping this evolution requires placing the Indian context within the broader framework of the dynamic tech world. The rapid pace of global technological innovation imposes new standards for accessibility and automation, making it necessary to review contemporary findings on computing advancements and library modernization to fully appreciate the challenges and opportunities facing CGM libraries.

Gill et al. (2024) examined the factors influencing the development of computing systems, covering advancements such as serverless computing, quantum computing, and on-device artificial intelligence. This comprehensive analysis anticipates future research directions by outlining critical issues and emphasizing the role these technologies play in driving technological efficiency. Building on this need for technological adaptation, Panda & Chakravarty (2022) noted that the COVID-19 pandemic disrupted all societal spheres, compelling library services to prioritize virtual spaces over physical ones; they proposed an AI-driven "InfoBot" solution to meet user needs in this "new normal." Similarly, Obsanga & Enierga (2021) investigated systems for tracking library transactions, demonstrating the positive environmental effects of library management systems. However, they recommended that future improvements should incorporate emerging technologies like RFID and IoT, which were previously unexplored due to funding limitations.

While advanced technologies are reshaping the field, practical implementation varies by region. Qasim & Shah (2023) highlighted that the digital age has transformed traditional operations, reporting that university libraries in Pakistan's Faisalabad Division have utilized Koha software to partially automate operations. Their quantitative survey found that respondents were generally satisfied with Koha's open-source, customizable nature and requisite functionalities, although they were only somewhat content with the financial assistance provided. Conversely, Adekunle et al. (2022) employed a descriptive

survey to assess university librarians in Oyo State, Nigeria. The findings revealed that while staff reported high levels of job performance, the primary obstacle to ICT usage was insufficient funding. Furthermore, no significant correlation between ICT usage and reported job performance, suggesting that ongoing development is necessary to effectively meet the demands of the 21st-century library.

Given the global paradigm shift towards advanced computing and the distinct automation challenges faced by libraries in developing nations, it is imperative to contextualize these dynamics within India's government sector. To understand how these institutions are adapting to bridge the gap between traditional educational support and the rapidly evolving technological landscape, this study investigates the evolutionary trajectory of Central Government Ministry (CGM) libraries. Therefore, the primary objective is to provide a comprehensive analysis of the technological status of these libraries from 2010 to 2023. To achieve this, the research focuses on mapping the adoption and growth of various electronic resources and ICT tools utilized during this period. Concurrently, the study seeks to track the progression of library automation, thereby evaluating both the historical milestones and the current operational status of these institutions. Furthermore, the investigation entails a detailed assessment of the specific library management software deployed and the extent of automation in routine housekeeping operations, offering a holistic view of the modernization efforts undertaken.

2. METHOD

This study employs a mixed-method research design, integrating both quantitative and qualitative approaches to provide a comprehensive evaluation of modernization efforts in government libraries. A longitudinal assessment framework was adopted to track the evolutionary trajectory of these institutions over a fourteen-year period, specifically from 2010 to 2023. The study population was delineated based on the Government of India's Allocation of Business Rules (AOBR), issued by the Cabinet Secretariat. While the government portfolio encompasses 52 ministries, preliminary screening identified that only 29 ministries possess 32 functional libraries with established programs. Consequently, the final scope of this research comprises a census of these 32 Central Government Ministry (CGM) libraries.

To ensure data accuracy and depth, the research process followed a multi-stage protocol. Initial data gathering involved a comprehensive literature review and consultation of the AOBR to map the specific ministries and their respective departments. Subsequently, physical site visits were conducted to verify the existence and operational status of the identified libraries. To obtain robust quantitative data regarding e-resource collections, ICT infrastructure, library software adoption, external linkages, and automation status, a structured questionnaire was administered to the library heads. To triangulate these findings and capture authentic perspectives on systemic issues, the study also utilized personal interviews with librarians, extensive field observations, and direct resource inspections.

For the analytical phase, the collected quantitative data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS). The analysis focused on descriptive statistics to trace growth patterns and technological integration throughout the study period. To facilitate clear interpretation of the trends and comparative data, the results are presented using various visualization techniques, including tables, bar charts, pie charts, and line graphs.

3. RESULTS AND DISCUSSION

3.1. Data Analysis and Interpretation

Based on the survey results, the data are tabulated in the following sections and analyzed to trace the evolution of CGM libraries over time in relation to the identified objectives. Table 1 presents the details of the Central Government Ministries and their respective libraries.

Table 1. Central Government Ministries and Their Libraries

No.	Name of the Ministry	Name of Library
1	Ministry of Agriculture and Farmers Welfare (MoA&FW)	Ministry of Agriculture and Farmers Welfare Library (MoA&FWL)
2	Ministry of Commerce and Industry (MoCI)	Ministry of Commerce and Industry Library (MoCIL)
3	Ministry of Communications	Department of Posts Library (DoPL) Department of Telecommunications Library (DoTL)
4	Ministry of Consumer Affairs, Food and Public Distribution	Department of Food and Public Distribution Library (DoFP&DL)
5	Ministry of Corporate Affairs (MCA)	Ministry of Corporate Affairs Library (MCAL)
6	Ministry of Culture	Central Secretariat Library (CSL)
7	Ministry of Defence	Ministry of Defence Library (MoDL)
8	Ministry of Earth Sciences (MoES)	Knowledge Resource Centre (KRC)

9	Ministry of Electronics and Information Technology (MeitY)	Information and Documentation Centre (I&DC)
10	Ministry of Environment, Forest and Climate Change (MoEF&CC)	Library of Ministry of Environment, Forest and Climate Change (MoEF&CCL)
11	Ministry of External Affairs (MEA)	Ministry of External Affairs Library (Foreign Deptt Library- before Independence) (MEAL) Rare Books Section (RBS) at Jawaharlal Nehru Bhawan
12	Ministry of Finance	Finance Library and Publication Section (FLPS)
13	Ministry of Home Affairs (MHA)	Ministry of Home Affairs Library (MHAL) Central Translation Bureau (CTB)
14	Ministry of Housing and Urban Affairs (MoHUA)	Ministry of Housing and Urban Affairs Library (MoHUAL)
15	Ministry of Information and Broadcasting (MoIB)	Publication Division (PD)
16	Ministry of Jal Shakti	Department of Water Resources Library (DoWRL)
17	Ministry of Labour and Employment (MoLE)	Labour Documents and Reference Centre (LD&RC)
18	Ministry of Law and Justice (MoLJ)	Official Languages Wing (OLW) Library and Research Section (LRS)
19	Ministry of Micro, Small and Medium Enterprises (MoMSME)	Ministry of Micro, Small and Medium Enterprises Library (MoMSMEL)
20	Ministry of Mines (MoM)	Ministry of Mines Library (MoML)
21	Ministry of New and Renewable Energy (MNRE)	Reference Centre and Knowledge House (RCKH)
22	Ministry of Personnel, Public Grievances and Pensions	Ministry of Home Affairs Library (MHAL)
23	Ministry of Petroleum and Natural Gas (MoPNG)	Ministry of Petroleum and Natural Gas Library (MoPNGL)
24	Ministry of Power (MoP)	Ministry of Power Library (MoPL)
25	Ministry of Railways (MoR)	Railway Board Library (MoRL)
26	Ministry of Rural Development (MoRD)	Ministry of Rural Development Library (MoRDL)
27	Ministry of Science and Technology (MoST)	Department of Science and Technology Library (DSTL)
28	Ministry of Statistics and Programme Implementation (MoSPI)	Ministry of Statistics and Programme Implementation Library (MoSPIL)
29	Ministry of Steel (MoS)	Ministry of Steel Library (MoSL)

3.2. Growth and Development of E-Resources

The year-wise status of e-resource collections, including databases, e-journals, e-books, and e-magazines, in CGM libraries is presented in Table 2. Analysis of the development of e-resources reveals that only 11 out of 32 libraries have established a collection of these digital assets. It is observed that the Ministry of Petroleum and Natural Gas (MoPNG) library holds the lowest average collection, with only 1.4 e-resources, whereas the Ministry of Power (MoP) possesses the highest average collection, with 11,642 e-resources. Further statistical evaluation (Table 3) indicates that the Ministry of Earth Sciences Library records the highest Average Yearly Growth Rate (YGR) at 8.06. Notably, this Ministry established DERCON (Digital Earth Consortium) in 2010 to facilitate subscriptions to high-cost journals at reduced rates. Meanwhile, the Ministry of External Affairs (MEA) Library (formerly the Foreign Department Library before Independence) maintains a static average collection of 200 electronic resources. However, it provides access to numerous online databases and services. The library also maintains group subscriptions to the Financial Times, The Wall Street Journal, The International New York Times, Nikkei Asia, South China Morning Post, and Magzter for the use of MEA officials.

Only 34% of CGM libraries currently offer access to electronic resources, leaving the majority yet to transition into the digital domain and leverage its vast potential. Primary barriers to this adoption include the lack of library automation and management software, a shortage of skilled professionals, inadequate staff training, and limited demand from patrons. However, following the introduction of e-resources by

the KRC Library at the Ministry of Earth Sciences in 2020 in response to the COVID-19 pandemic, it is anticipated that similar developments will soon be observed across other libraries.

Table 2. Year-wise Status of E-resource Collection of Ministerial Libraries

No	Library Name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	MoCIL	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	KRC	0	0	0	0	0	0	0	0	0	0	140	150	150	160
3	IDC	300	300	300	300	300	300	300	300	300	300	300	300	300	300
4	MEAL	200	200	200	200	200	200	200	200	200	200	200	200	200	200
5	FLPS	120	125	130	130	135	140	150	150	150	150	150	150	150	150
6	PD	980	985	987	990	990	1000	1000	1000	1000	1000	1000	1000	1000	1000
7	LDRC	0	0	0	0	0	0	3	3	3	3	3	3	3	3
8	MoPNGL	0	0	0	0	2	2	2	2	2	2	2	2	2	2
9	MoPL	10000	11000	11000	11500	11700	11900	11900	12000	12000	12000	12000	12000	12000	12000
10	MoSPIL	-	517	518	520	523	525	527	530	550	550	550	550	560	570
11	MoSL	63	63	63	63	63	63	63	63	63	63	63	63	65	65

Table 3. Statistical Evaluation of E-Resource Collection of Ministerial Libraries

Collection	No.	Libraries	Mean	Max	Min	Avg. YGR
E-Resources	1	MoCIL	2	2	2	0
	2	KRC	42.85714	160	0	8.065
	3	IDC	300	300	300	0
	4	MEAL	200	200	200	0
	5	FLPS	141.4286	150	120	1.55
	6	PD	995.1429	1,000	980	0.14
	7	LDRC	1.714286	3	0	7.14
	8	MoPNGL	1.428571	2	0	7.14
	9	MoPL	11642.86	12,000	10,000	1.26
	10	MoSPIL	537.6923	570	517	7.83
	11	MoSL	63.28571	65	63	0.22

3.3. Development of Information and Communication Tools (ICT)

The quantitative details of information communication tools and equipment in CGM libraries from 2010 to 2023 are presented in Table 4. This ICT infrastructure includes essential standard hardware such as PCs, printers, scanners, photocopiers, and barcode readers. It is observed that there has been no discernible growth or development in ICT tools over the years. This stagnation is likely because libraries have not significantly expanded their services or e-resource collections, resulting in static demand from users who remain adequately served by the existing tools. However, the Knowledge and Resource Centre (KRC) of the MoES introduced nine new ICT devices in 2020 to effectively manage the processing and utilization of newly added e-resources and to provide improved user support.

Statistical analysis reveals that the Central Secretariat Library (Ministry of Culture) possesses the highest average inventory of ICT equipment, maintaining an average of 58 items throughout the study period. In contrast, the Official Language Wing of the Ministry of Law holds only a single computer. Furthermore, the application of the F-test yielded a p-value of less than 0.001, indicating significant differences in the quantity of ICT devices across the ministerial libraries.

Table 4. Year-wise Data of ICT Tools in Ministerial Libraries

No	Libraries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Avg.
1	MoA&FWL	5	5	5	5	6	6	6	6	6	7	7	7	7	8	6.1
2	MoCIL	12	12	12	13	14	15	15	15	15	15	15	17	17	17	14.6
3	DoPL	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	DoTL	5	5	5	7	8	8	8	8	8	8	8	8	8	8	7.3
5	DoF&PDL	4	4	4	4	5	5	5	5	5	5	5	5	5	5	4.7
6	MCAL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7	CSL	50	50	55	55	60	60	60	60	60	60	60	60	60	60	57.86
8	MoDL	10	10	10	12	12	12	13	13	13	13	13	13	13	13	12.1
9	KRC	2	2	2	4	4	4	5	5	5	6	15	15	15	15	7.1
10	IDC	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
11	MoEF&CCL	13	13	13	13	13	14	14	14	14	14	14	14	14	14	13.6
12	MEAL	19	19	19	19	19	19	19	19	19	19	19	19	19	20	19.1
13	RBS	12	12	12	14	14	14	14	14	14	14	14	14	14	14	13.6
14	FLPS	15	19	21	21	21	21	21	21	21	21	21	21	21	21	20.4
15	MHAL	20	23	23	23	23	23	23	23	23	23	23	23	23	23	22.8
16	CTB	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
17	MoHUAL	15	15	15	15	15	13	13	13	10	10	10	10	10	10	12.4

18	PD	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
19	DoWRL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
20	LDRC	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
21	OLW	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1.1
22	LRS	5	5	5	9	9	9	9	9	9	9	9	9	9	9	8.1
23	MoMSMEL	4	4	4	5	5	5	5	5	5	5	5	5	5	5	4.8
24	MoML	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25	RCKH	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
26	MoPNGL	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3.5
27	MoPL	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
28	RBL	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
29	MoRDL	10	10	10	12	12	12	11	12	12	12	12	12	12	12	11.5
30	DSTL	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
31	MoSPIL	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3
32	MoSL	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Avg.	9.7	9.8	10.0	10.5	10.8	10.8	10.8	10.8	10.8	10.8	11.1	11.2	11.2	11.3	

3.4. Implementation of Automation in the Libraries

Library automation refers to the migration of library housekeeping operations to computerized platforms utilizing ICT equipment. It serves as a vital instrument for managing operations more productively, thereby enhancing overall efficiency. Automated libraries are better equipped to provide uninterrupted services to users, particularly during unpredictable scenarios such as the COVID-19 pandemic. Observations regarding the automation status of CGM libraries are detailed in the subsequent sections.

Table 5 presents the automation stages of all CGM libraries throughout the study period, tracing their modernization journey over time. Data indicate that in 2010, only six libraries were fully automated; this number increased to 21 by 2023. Therefore, it can be inferred that there is a positive trend toward the automation of CGM libraries. However, nearly 28% of the libraries remain non-automated. Primary reasons for this include the high costs of implementation, a shortage of professional and ICT-skilled staff, inadequate training, and low demand from current users. Library automation is a fundamental concept in library and information science with widely recognized benefits. Consequently, increasing user awareness of advanced library services could drive the demand for modernization, thereby accelerating automation processes.

Table 5. Yearly Status of the Automation of the Ministerial Libraries (2010 to 2023)

No	Libraries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	MoA&FWL	IS	PA	PA	PA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
2	MoCIL	IS	IS	PA	PA	PA	PA	PA	PA	PA	PA	PA	FA	FA	FA
3	DoPL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	DoTL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	DoF&PDL	NA	NA	NA	NA	IS	PA	FA	FA	FA	FA	FA	FA	FA	FA
6	MCAL	IS	IS	IS	IS	IS	IS	IS	IS	IS	NA	NA	NA	NA	NA
7	CSL	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
8	MoDL	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
9	KRC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IS	FA	FA	FA
10	IDC	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
11	MoEF&CCL	NA	NA	NA	NA	NA	NA	NA	NA	NA	PA	PA	FA	FA	FA
12	MEAL	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
13	RBS	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
14	FLPS	PA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
15	MHAL	NA	IS	PA	PA	PA	PA	PA	PA	PA	PA	PA	FA	FA	FA
16	CTB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	MoHUAL	NA	NA	NA	NA	PA	FA	FA	FA	FA	FA	FA	FA	FA	FA
18	PD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	IS	PA	PA	FA
19	DoWRL	NA	NA	NA	NA	NA	NA	NA	NA	FA	FA	FA	FA	FA	FA
20	LDRC	IS	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
21	OLW	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22	LRS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
23	MoMSMEL	NA	NA	NA	NA	IS	PA	PA	PA	PA	PA	PA	PA	PA	PA
24	MoML	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	RCKH	NA	NA	NA	NA	NA	NA	NA	NA	NA	IS	PA	FA	FA	FA
26	MoPNGL	NA	NA	NA	NA	NA	NA	IS	PA	PA	PA	PA	PA	PA	PA
27	MoPL	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA	FA
28	RBL	NA	NA	NA	NA	NA	IS	PA	PA	PA	PA	PA	FA	FA	FA
29	MoRDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
30	DSTL	NA	NA	NA	NA	NA	NA	NA	NA	IS	PA	PA	PA	PA	FA
31	MoSPIL	-	NA	NA	NA	NA	NA	NA	NA	NA	IS	PA	PA	PA	FA
32	MoSL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: IS= Initial Stage, PA= Partially Automated, FA= Fully Automated, NA= Not Automated

3.5. Adoption of Library Management Softwares (LMS)

Library Management Software (LMS) is utilized to automate processes, develop databases, and manage library housekeeping operations more effectively. Details regarding the various LMS platforms used by the ministerial libraries are presented in Table 6. Significant progress is evident in this area; in 2010, 19 CGM libraries (approximately 60%) operated without LMS, but by 2023, this number had decreased to only eight. Notably, the Publication Division of the Ministry of Information and Broadcasting lacks a dedicated LMS, relying instead on office productivity suites (e.g., Microsoft Word and Excel) for resource management since 2020. Statistically, Libsys was the most utilized software in 2010, adopted by nine libraries. However, by 2021, a significant shift toward E-Granthalaya software was observed. Interestingly, the libraries of the Ministry of Culture (CSL) and the Ministry of Housing and Urban Affairs utilize multiple software platforms for their functions. Currently, eight libraries continue to operate manually; this lag is likely attributed to a shortage of professional staff and a lack of specific LMS training.

Table 6. Library Management Software in the Ministerial Libraries (2010-2023)

No	Libraries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	MoA&FWL	E-Granthalaya													
2	MoCIL	LibSys				LibSys10									
3	DoPL	Manual													
4	DoTL	E-Granthalaya													
5	DoF&PDL	Manual						E-Granthalaya							
6	MCAL	LibSys											LibSys + E-Granthalaya		
7	CSL	LibSys				LibSys + Greenstone + D Space + ISYS				LibSys + Koha + D Space + ISYS					
8	MoDL	E-Granthalaya													
9	KRC	Manual										Koha			
10	IDC	LibSys				LIBMAN									
11	MoEF&CCL	Manual									E-Granthalaya				
12	MEAL	Libsys 7													
13	RBS	Libsys													
14	FLPS	LibSys													
15	MHAL	Manual	E-Granthalaya												
16	CTB	Manual													
17	MoHUAL	Manual				E-Granthalaya					E-Granthalaya + E-Cloud + Liv Air				
18	PD	Manual													
19	DoWRL	Manual								E-Granthalaya					
20	LDRC	LibSys													
21	OLW	Manual													
22	LRS	Manual													
23	MoMSMEL	Manual				NIC Software									
24	MoML	Manual													
25	RCKH	Manual									E-Granthalaya cloud-based				
26	MoPNGL	Manual						E-Granthalaya							
27	MoPL	LibSys													
28	RBL	Manual					ELIS								
29	MoRDL	Manual													
30	DSTL	Manual								E-Granthalaya					
31	MoSPIL	-	Manual									E-Granthalaya			
32	MoSL	Manual													

3.6. Delivery of Outsource Facilities in the Ministerial Libraries

The study also sought to identify key external linkages such as networking, resource sharing, and consortium partnerships in CGM libraries and to track their initiation or availability over the study period. These collaborative networks are crucial for the development and efficient utilization of libraries in the modern digital landscape. Detailed observations regarding the availability of these facilities in CGM libraries are presented in Table 7. The data indicate that almost all libraries have had internet access since 2010, fulfilling the basic requirement for technological advancement. However, descriptive links for only eight libraries are available on the Ministries' official websites, and only five of these possess dedicated homepages for their users.

Notably, 27 CGM libraries distribute their resources through various networks, including the National Knowledge Network, Developing Library Network (DELNET), National Portal of India (NPI), National Virtual Portal of India (NVPI), National Informatics Centre (NIC) Cloud, Prime Minister's Office (PMO), Institute of Cost and Works Accountants of India (ICWA), Indian Council for Cultural Relations (ICCR), National Security Council Secretariat (NSCS), National Development Council (NDC), and the Department of Scientific and Industrial Research (DSIR). Another significant finding is that four libraries (CSL, IDC, MEA Library, and RBS) hold consortium memberships in organizations such as the

Indian Library Association (ILA), Indian Association of Special Libraries and Information Centres (IASLIC), Central Government Library Association (CGLA), International Federation of Library Associations and Institutions (IFLA), as well as DELNET, National Digital Library, e-ShodhSindhu, and the Special Libraries Association (SLA).

Table 7. Library Outsource Facilities in the Ministerial Libraries from 2010 to 2023)

No	Libraries	Internet Facility	Descriptive Tabs for the library on the Ministries' website	Separate HomePage/	Networking and Resource Sharing	Partner member of any consortium
1	MoA&FWL	Yes	No	No	Yes (NPI)	No
2	MoCIL	Yes	No	No	Yes (NPI)	No
3	DoPL	No	No	No	No	No
4	DoTL	Yes	No	No	Yes (NPI)	No
5	DoF&PDL	Yes	No	No	Yes (NPI)	No
6	MCAL	Yes	No	No	Yes (NPI, ICSI/ICWA)	No
7	CSL	Yes	Yes	Yes	Yes (National Knowledge Network, DELNET, NVPI)	Yes (CGLA, DELNET, National Digital Library, e-SodhSindhu, and NVLI Repository)
8	MoDL	Yes	Yes	Yes	Yes (NPI)	No
9	KRC	Yes	Yes	No	Yes (NPI)	No
10	IDC	Yes	Yes	No	Yes (NPI, DELNET)	Yes (DELNET & MCIT Consortium)
11	MoEF&CCL	Yes	No	No	Yes (NPI)	No
12	MEAL	Yes	Yes	Yes	Yes (NPI, NIC Cloud, PMO, ICWA, ICCR, NSCS, NDC)	Yes (ILA, IASLIC, CGLA, IFLA and SLA)
13	RBS	Yes	Yes	No	Yes (NPI, NIC Cloud, PMO, ICWA, ICCR, NSCS, NDC)	Yes (ILA, IASLIC, CGLA, IFLA and SLA)
14	FLPS	Yes	No	No	Yes (NPI)	No
15	MHAL	Yes	No	No	Yes (NPI)	No
16	CTB	Yes	No	No	No	No
17	MoHUAL	Yes	No	No	Yes (NPI)	No
18	PD	Yes	No	No	Yes (NPI)	No
19	DoWRL	Yes (Since 2018)	No	No	No	No
20	LDRC	Yes	Yes	Yes	Yes (NPI)	No
21	OLW	Yes	No	No	Yes (NPI, other law institutes)	No
22	LRS	Yes	No	No	Yes (NPI, other law institutes)	No
23	MoMSMEL	Yes	No	No	Yes (NPI)	No
24	MoML	No	No	No	No	No
25	RCKH	Yes	No	No	Yes (NPI)	No
26	MoPNGL	Yes	No	No	Yes (NPI)	No
27	MoPL	Yes	No	No	Yes (NPI)	No
28	RBL	Yes	No	No	Yes (NPI)	No
29	MoRDL	Yes	No	No	Yes (NPI)	No
30	DSTL	Yes	Yes	Yes	Yes (DSIR)	No
31	MoSPIL	Yes (Since 2011)	No	No	Yes	Yes (Since 2011)
32	MoSL	Yes	No	No	No	No

Overall, it is evident that the most progressive libraries within the Ministries of the Government of India (GoI) are those that extend their services and actively share resources with other institutions and educational bodies. Observations indicate that these libraries distinguish themselves by transcending the primary mandate of satisfying ministry employees' needs; rather, they strive to disseminate their resources to serve a diverse, global user base.

3.7. Execution of House-Keeping Activities and Related Features

A review of the status of housekeeping activities in Central Government Ministry (CGM) libraries was conducted as an intrinsic part of this study. These housekeeping operations encompass functions such as acquisition, cataloging, circulation, and serial control, as well as the implementation of technologies like OPAC, barcode systems, and RFID. In today's digital era, libraries are transitioning toward automated processing using computers and ICT equipment. Table 8 presents a comparative record of

these core activities for all CGM libraries in 2010 and 2023. Additionally, the table details the specific years of initiation for these housekeeping operations.

Table 8. House Keeping Activities in the Ministerial Libraries from 2010 to 2023

No	Libraries	Mode of Acquisition, Cataloguing, Circulation and Serial Control		Whether available or not					
				OPAC		Barcode		RFID	
		2010	2023	2010	2023	2010	2023	2010	2023
1	MoA&FWL	Mixed	Mixed	No	No	No	No	No	No
2	MoCIL	Mixed	Mixed	No	Yes (2014)	No	No	No	No
3	DoPL	Manual	Manual	No	No	No	No	No	No
4	DoTL	Manual	Manual	No	No	No	No	No	No
5	DoF&PDL	Manual	Mixed (2013)	No	No	No	No	No	No
6	MCAL	Automated	Manual (2018)	Yes	No (2018)	No	No	No	No
7	CSL	Manual	Automated (2017)	Yes	Yes	Yes	Yes	Yes	Yes
8	MoDL	Automated	Automated	No	No	Yes	Yes	Yes	No
9	KRC	Manual	Automated (2020)	No	Yes (2020)	No	No	No	No
10	IDC	Automated	Automated	Yes	Yes	Yes	Yes	Yes	Yes
11	MoEF&CCL	Manual	Automated (2019)	No	Yes (2019)	No	Yes (2021)	No	No
12	MEAL	Automated	Automated	Yes	Yes	Yes	Yes	Yes	Yes
13	RBS	Automated	Automated	Yes	Yes	Yes	Yes	Yes	Yes
14	FLPS	Automated	Automated	Yes	Yes	Yes	Yes	No	No
15	MHAL	Manual	Automated (2011)	No	Yes (2011)	No	No	No	Yes (2018)
16	CTB	Manual	Manual	No	No	Not available	Not available	Not available	Not available
17	MoHUAL	Manual	Automated (2014)	No	Yes (2014)	Not available	Not available	Not available	Not available
18	PD	Manual	Manual	No	No	Not available	Not available	Not available	Not available
19	DoWRL	Manual	Automated (2018)	No	No	Not available	Not available	Not available	Not available
20	LDRC	Automated	Automated	Yes	Yes	Yes	Yes	Yes	Yes
21	OLW	Manual	Manual	No	No	Not available	Not available	Not available	Not available
22	LRS	Manual	Manual	No	No	Not available	Not available	Not available	Not available
23	MoMSMEL	Manual	Automated (2014)	No	No	Not available	Not available	Not available	Not available
24	MoML	Manual	Manual	No	No	Not available	Not available	Not available	Not available
25	RCKH	Manual	Automated (2019)	No	Yes (2019)	Yes	Yes	No	No
26	MoPNGL	Manual	Automated (2016)	No	Yes (2016)	Yes	Yes	No	No
27	MoPL	Automated	Automated	Yes	Yes	Yes	Yes	No	No
28	RBL	Manual	Automated (2015)	No	Yes (2015)	Yes	Yes	Yes	Yes
29	MoRDL	Manual	Manual	No	Manual	No	No	No	No
30	DSTL	Manual	Automated (2018)	No	Yes (2018)	No	No	No	No
31	MoSPIL	The library was established in Year 2011. The process were manual initially, however, these have got automated since 2019.		No	No	No	No	No	No
32	MoSL	Manual	Manual	No	No	No	No	No	No

Regarding the key housekeeping activities such as acquisition, cataloging, circulation, and serial control, it is observed that the majority of CGM libraries performed these tasks manually in 2010. However, this pattern has evolved over the subsequent years. By 2023, more than 50% of the libraries, specifically 18 institutions, were processing their housekeeping activities using automated modes. Conversely, 11 libraries continue to perform these operations manually. Notably, although the MCA library is equipped with an LMS, it has functioned manually since 2018 due to the absence of permanent professional staff.

Regarding OPAC availability, only eight libraries maintained OPAC systems in 2010; this number increased to 16 by 2023. Furthermore, observations indicate that only ten libraries utilized barcode technology for their housekeeping operations in 2010. However, with the adoption of barcodes by the library of the Ministry of Environment, Forest and Climate Change in 2021, the total reached 11 in 2023.

Similarly, RFID technology was present in six libraries in 2010 and is now available in seven. Barcode and RFID technologies represent cost-effective and accurate methods for identifying and retrieving data. These tools are utilized to accelerate automated circulation processes, streamline inventory tasks such as stock verification, and enhance the security of information resources by automatically detecting theft. Additionally, RFID technology facilitates user self-check-out services.

3.8. Measures of Protection in the IT Environment

The GoI ministerial libraries house rare and special collections. Therefore, it is imperative to protect these assets against damage, theft, environmental factors, and pests. Both security protocols and preservation methods are essential to ensure the comprehensive protection of these collections. An overview of the various security and preservation measures adopted by CGM libraries is presented in Table 9. Observations indicate that these methods have been consistently employed throughout the study period. These measures include controlled access, security checks at entry and exit points, CCTV surveillance, and standard preservation techniques such as dusting and fumigation.

Analysis reveals that the majority of libraries, specifically 28 institutions, have provided open access to their resources. Additionally, 24 libraries have stationed security personnel at their entry and exit gates since 2010. Furthermore, 27 libraries have implemented preservation techniques since 2010. However, only three libraries utilize CCTV cameras for security. This limited reliance on surveillance is likely due to the high trust placed in the user base, which consists of ministry employees, bureaucrats, ministers, VIPs, policymakers, and researchers whose professional integrity is generally presumed.

Table 9. Description of Various Measures of Protection in the Ministerial Libraries (2010-2023)

No	Libraries	Mode of Access	Vigilant at Entrance/ Exit	CCTV	Preservation Methods Used
1	MoA&FWL	Open	Yes	No	Yes
2	MoCIL	Open	Yes	No	Yes
3	DoPL	Open	Yes	No	Yes
4	DoTL	Open	Yes	No	Yes
5	DoF&PDL	Open	Yes	No	Yes
6	MCAL	Open	No	No	Yes
7	CSL	Mixed	Yes	Yes	Yes
8	MoDL	Mixed	Yes	No	Yes
9	KRC	Open	Yes	No	Yes
10	IDC	Open	Yes	No	Yes
11	MoEF&CCL	Open	Yes	Yes	Yes
12	MEAL	Mixed	Yes	Yes	Yes
13	RBS	Mixed	Yes	No	Yes
14	FLPS	Open	Yes	No	Yes
15	MHAL	Open	Yes	No	Yes
16	CTB	Open	No	No	Yes
17	MoHUAL	Open	Yes	No	Yes
18	PD	Open	Yes	No	Yes
19	DoWRL	Open	No	No	No
20	LDRC	Open	Yes	No	Yes
21	OLW	Closed	No	No	Yes
22	LRS	Closed	Yes	No	Yes
23	MoMSMEL	Closed	Yes	No	Yes
24	MoML	Open	No	No	No
25	RCKH	Open	Yes	No	Yes
26	MoPNGL	Open	No	No	No
27	MoPL	Open	Yes	No	Yes
28	RBL	Open	Yes	No	Yes
29	MoRDL	Open	Yes	No	Yes
30	DSTL	Open	Yes	No	Yes
31	MoSPIL	Open	No	The library was established in 2011.	No
32	MoSL	Open	No	No	No

3.9. Major Findings

The comprehensive analysis of Central Government Ministry (CGM) libraries reveals a heterogeneous landscape of technological adoption and resource development. Regarding electronic resources, the study indicates that only 11 out of 32 libraries have successfully established digital collections. Among these, the Ministry of Power (MoP) library possesses the highest average collection, while the Ministry of Earth Sciences Library demonstrated the highest yearly growth rate during the study

period. In terms of infrastructure, while libraries generally maintain sufficient Information and Communication Tools (ICT) to meet user needs, statistical analysis via the F-test confirms significant disparities in device quantity across institutions. Notably, the Central Secretariat Library (Ministry of Culture) maintains the highest average inventory of ICT equipment, whereas the Official Language Wing (Ministry of Law) holds the lowest.

A positive trajectory is evident in the domain of library automation. The libraries have demonstrated significant progress, with the number of fully automated institutions rising to 21 by 2023. Consequently, the vast majority of libraries are now either fully or partially automated, leaving approximately 28% still functioning in a non-automated capacity. This shift is accompanied by evolving trends in Library Management Software (LMS) adoption; specifically, there has been a notable transition from Libsys the dominant software in 2010 toward E-Granthalaya by 2021. Furthermore, certain institutions, such as the libraries of the Ministry of Culture and the Ministry of Housing and Urban Affairs, utilize multiple software platforms to manage their complex functions.

In the context of service delivery and operations, the study highlights both strengths and gaps. While resource sharing is robust, with 27 libraries distributing materials through networks like the National Knowledge Network and DELNET, digital visibility remains low; only five libraries possess dedicated homepages. Additionally, consortium membership is limited, with only four libraries (CSL, IDC, MEA Library, and RBS) maintaining active memberships in major organizations . regarding housekeeping, 18 libraries now process activities in an automated mode, although 11 continue to perform these tasks manually. While OPAC availability has increased, the adoption of advanced identification technologies remains static, with no significant difference observed in the use of barcodes and RFID technology outside of a few specific cases.

Finally, regarding the protection of rare and special collections, libraries have consistently employed traditional security measures such as controlled access and vigilance at entry points. However, modern surveillance is minimal, with only three libraries utilizing CCTV cameras. Despite the striving of these institutions to upgrade alongside the dynamic tech world, the qualitative data suggests that significant obstacles remain. The growth and development of these libraries are currently hindered by systemic challenges, primarily the lack of professional staff, insufficient budgetary provisions, and inadequate technical training for existing personnel.

3.10. Navigating the Digital Transition: From Traditional Management to Cloud Ecosystems

The evolution of Central Government Ministry (CGM) libraries during the 2010–2023 period reflects a significant paradigm shift in public sector information management. The findings of this study demonstrate a positive trajectory wherein the number of fully automated libraries increased sharply from only six in 2010 to 21 in 2023. This shift confirms that ministerial libraries have begun to respond to the demands of the "Dynamic Tech World" by abandoning static manual systems.

Theoretically, this transition aligns with the concept of modern computing advancement described by Ionescu & Diaconita (2023) and Jain et al. (2022), where technological efficiency serves as a primary driver of infrastructure progress. This is clearly evident in the migration of Library Management Software (LMS). The dominance of LibSys in the early decade has been superseded by the mass adoption of E-Granthalaya by 2021. The shift to E-Granthalaya, a cloud-based solution from the National Informatics Centre (NIC), reflects the integration of cloud computing in government governance as noted by Ali et al. (2022) and Asim et al. (2024). This move is not merely a software replacement but a strategic effort to standardize government data within a single integrated digital ecosystem, enabling better scalability and cost efficiency compared to standalone systems.

However, this discussion also highlights a physical infrastructure gap. Although software has migrated to the cloud, the stagnation in ICT hardware acquisition and the slow adoption of RFID technology (only 7 libraries in 2023) indicate a phenomenon of "partial modernization." These findings align with the review of Cheung et al. (2025), who suggest that without the integration of physical technologies such as IoT and RFID, the efficiency benefits of library management systems cannot be fully maximized.

3.11. The Library’s Role as an Educational Bridge and the "Access over Ownership" Paradigm

Within the framework of "bridging education and the tech world," CGM libraries hold a dual role as catalysts for lifelong learning for bureaucrats and policymakers. Garoufali & Garoufallou (2024) and Meesad & Mingkhwan (2024) argue that libraries must transform from static repositories into dynamic hubs. However, the study data reveals a critical challenge in realizing this vision: only 34% of CGM libraries offer access to electronic resources (e-resources). This low penetration of e-resources creates a risk of "institutional digital divide," where the library's capacity to support evidence-based decision-making becomes limited.

Nevertheless, the findings indicate an interesting adaptation strategy: a shift in models from "collection ownership" to "accessibility." The fact that 27 libraries distribute and access resources through external networks such as DELNET, the National Knowledge Network (NKN), and the National Portal of

India validates the theory of collaborative networks in information management. As emphasized by Mu & Wang (2025) and Pirannejad & Ingrams (2023), open government data ecosystems rely heavily on inter-agency network relations.

Conversely, there is a contradiction in digital visibility. In an era where digital presence is the primary gateway to service, the fact that only five libraries possess dedicated webpages constitutes a strategic weakness. This hinders the concept of Library 2.0, where user interaction and remote access should be prioritized. Without an adequate web interface, CGM libraries risk remaining "hidden" entities that fail to reach a global user base or even ministry employees working remotely a need that became crucial post-COVID-19, as noted by Panda & Chakravarty (2022).

3.12. Systemic Barriers and Future Challenges: A Socio-Technical Perspective

Despite technological progress, this study underscores persistent systemic barriers. The continued existence of 11 libraries performing housekeeping activities manually and 28% of libraries remaining completely non-automated are anomalies amidst the "Digital India" narrative.

When analyzed through the lens of prior research, the identified primary obstacles, namely, a shortage of professional staff, inadequate budgets, and lack of training, confirm the findings of Nosheen & Sohail (2025). Rahman et al. (2024) and Ibrahim et al. (2025) found that the main barrier to ICT usage was not the absence of technology itself, but rather budgetary constraints and human factors. The case of the Ministry of Corporate Affairs (MCA) library, which possesses LMS infrastructure but has operated manually due to the absence of professional staff since 2018, serves as empirical evidence that technology is merely a sterile tool without the support of skilled professionals. This reinforces the urgency of Continuing Professional Development (CPD), as suggested by Aslam (2022) and Dube (2022) to ensure library staff can adapt to technological changes.

Furthermore, security approaches that still rely on "trust" and manual vigilance, with only three libraries utilizing CCTV, indicate a lag behind modern security standards. In the Dynamic Tech World, the protection of intellectual assets should integrate automated surveillance systems to mitigate unforeseen risks. Therefore, to truly bridge the gap between education and technology, CGM libraries require holistic policy reform: not only the procurement of ICT tools but also budgetary restructuring and sustained human resource capacity building.

4. CONCLUSION

The findings of this longitudinal study substantiate that Central Government Ministry (CGM) libraries in India are undergoing a significant modernization trajectory to align their operations with the dynamic technological landscape. This evolution has been particularly accelerated by the necessities arising from the COVID-19 pandemic. The transition is clearly manifested in the expansion of e-resource collections, the development of ICT infrastructure, the increased automation of housekeeping functions, and the strategic adoption of cloud-based Library Management Software. Furthermore, the study highlights a paradigm shift toward collaborative growth as evidenced by the rising engagement of libraries in partnerships and network-sharing activities to enhance resource accessibility. Nevertheless, the modernization process remains uneven. To fully realize their potential, these institutions must address persistent systemic barriers including the shortage of professional staff, the lack of role-specific technical training, and the inherent resistance to adopting advanced technologies. Addressing these challenges is imperative to catalyze the development of these libraries into robust knowledge hubs capable of providing superior services.

This research contributes significantly to the field of library and information science by providing the first comprehensive longitudinal assessment of Indian government libraries spanning from 2010 to 2023. Unlike previous snapshot studies, this work maps the evolutionary adaptation of these institutions from manual operations to cloud-based automation and thereby fills a critical gap in the literature regarding public sector information management. Furthermore, the study offers empirical benchmarks for policymakers to evaluate the efficacy of national digitization initiatives within the administrative framework while identifying specific structural deficiencies that require policy intervention.

This study is limited by its geographical focus on the 32 CGM libraries located in New Delhi which may not fully represent the operational status of regional offices. Additionally, the reliance on reported data might not capture the nuanced digital literacy barriers faced by patrons. To address these limitations, future research should expand the scope to include a nationwide assessment of government libraries. Qualitative inquiries such as focus group discussions with policymakers are also recommended to gain a deeper understanding of how library modernization directly impacts administrative decision-making processes.

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