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Evaluating Cloud-based Solution for Kerala Government Engineering College Resource Centers

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Abstract

In the digital transformation era, library users are increasingly proficient with technology, making it essential for learning resource centres to offer 24/7 access to technology-driven services. Cloud-based solutions have become a prominent solution within information systems, significantly influencing the services rendered by academic libraries. This study investigates the implementation of cloud-based technologies within the libraries of Kerala's Government Engineering Colleges. This study utilized a descriptive survey approach, collecting data via structured questionnaires, website information, and literature reviews. Participants included all librarians from the Government Engineering Colleges. Fundamental statistical techniques were employed to interpret the data. The study's findings reveal that all nine Government Engineering College resource centers are fully automated, with digital information managed and disseminated through the Learning Resource Centre. The libraries utilize the Knimbus digital library platform for organizing, storing, and sharing e-resources. However, challenges such as insufficient staff training and the need to maintain and upgrade digital infrastructure were identified as barriers to adopting newer technologies. This research highlights that technological advancements simplify library operations. Kerala Government Engineering College Resource Centers are entering a new era of IT integration, utilizing web-based applications for routine library tasks.

Keywords: Cloud Computing, Cloud Library Services, Government Engineering College resource Centers, Web OPAC, Learning Resource Centre, Knimbus

1. Introduction

Cloud computing is a transformative technology that harnesses the internet to provide shared virtual servers, delivering infrastructure, platforms, software, and other resources as services on a pay-per-use basis. In the IT industry, cloud computing represents a major advancement, following earlier innovations like the Personal Computer (PC) and the Internet (Sahu, 2015). The concept of "cloud computing" is an evolution of earlier technologies such as "Parallel," "Distributed," "Grid," and "Utility Computing" (Gosavi, Shinde, and Dhakulkar, 2012). Cloud computing applications and scope have expanded significantly in recent years. A well-developed library system and effective services are crucial to an institution's academic success and reputation. OCLC research report "Reordering Ranganathan: Shifting User Behaviors, Shifting Priorities" underscores the importance of integrating library services into users' existing workflows, highlighting the landscape of library services is shifting from physical to virtual, embracing modern digital technologies. Libraries are increasingly adopting contemporary technologies to fulfill the evolving needs of their patrons. Innovations such as library automation, digital libraries, internet usage, social media applications, web tools for libraries, and consortium practices are driving this transformation. Library IT innovations include cloud technologies, artificial intelligence,

and augmented reality. "Cloud computing" refers to configurations that share resources and enable scalable, on-demand network access. It is a platform for managing, storing, and processing data online. The library sector has witnessed a paradigmatic shift in infrastructure deployment, driven by the widespread adoption of cloud technologies, offering cost-effective and efficient solutions for routine library tasks. College libraries play a critical role in the learning process, providing essential information resources in higher education. Libraries must adapt to the growing emphasis on learning over teaching. Academic libraries primarily serve two functions: providing research-specific information and supporting the curriculum. Engineering college libraries are pivotal in training future scientists and technologists, necessitating cutting-edge technologies. Kerala's academic libraries have been at the forefront of embracing cutting-edge technologies to cater to the evolving information requirements of their patrons. The state's nine government engineering colleges, overseen by the Directorate of Technical Education, have implemented cloud-based technologies, which are vital for their libraries' operation and growth.

Table -1: Government Engineering Colleges in Kerala

S.no	College	Abbreviated as	URL	Years of Starting
1.	College of Engineering Thiruvananthapuram	CET Thiruvananthapuram	https://www.cet.ac.in/	1939
2.	Govt. Engineering College Thrissur	GEC Thrissur	https://gectcr.ac.in/	1957
3.	Govt. College of Engineering Kannur	GCE Kannur	https://www.gcek.ac.in/	1986
4.	Rajiv Gandhi Institute of Technology Kottayam	RIT Kottayam	https://www.rit.ac.in/	1991
5.	Govt. Engineering College Barton Hill	GEC Barton Hill	https://www.gecbh.ac.in/	1999
6.	Government Engineering College Kozhikode	GEC Kozhikode	https://geckkd.ac.in/	1999
7.	Govt. Engineering College Palakkad	GECSKP	https://www.gecskp.ac.in/	1999
8.	Govt. Engineering College Wayanad	GEC Wayanad	https://www.gecwyd.ac.in/	1999
9.	Govt. Engineering College Idukki	GEC Idukki	https://www.gecidukki.ac.in/	2000

2. Review of Literature

Suman, A. K., Patel, M., & Vijesh, P. V. (2023) highlight in their study The Efficacy of Cloud technologies and Its Application in Libraries that "one of the primary benefits of cloud computing is the reduced cost associated with acquiring hardware, software, and licenses". However, concerns about data privacy, security, and reliability persist. Despite these challenges, the popularity of Web 2.0 and social networking continues to grow, attracting more users.

Shaw and Sarkar (2020) explored a cloud-based solution to library management for college libraries, aiming to enhance web-based library services using an affordable virtualization model on cloud computing. Their study focused on the automation status of college libraries at the time, illustrating how libraries could be connected online through cloud-based management systems. They found that a cloud-based consortium approach could reduce the costs associated with setting up infrastructure and purchasing hardware, free up staff with additional IT skills, foster a shared environment, and minimize duplication in resource subscriptions.

Balram, Yadav, and Singh (2018) examined the implementation of cloud technologies in library services, intending to outline the benefits and drawbacks of cloud-based technologies in libraries. The results show that using the cloud can markedly elevate and improve the quality of college libraries' services.

Biradar and Swapna (2017) discussed the various aspects of cloud platforms in libraries, aiming to categorize and describe the attributes of cloud technology. Their paper covers cloud computing initiatives in libraries and provides an overview of key service providers in this domain.

Alotaibi (2013) conducted a theoretical study on the Deployment of cloud infrastructure in libraries and information centers, focusing on its application in higher education libraries. The study found that the two greatest benefits of moving to a cloud environment are the ability to test new software without purchasing hardware and the ability to scale computing power to meet user demand. However, privacy and data security remain significant obstacles.

Gul and Wani (2009) studied web-based knowledge management systems in university libraries, aiming to develop a system that would facilitate the creation, organization, archiving, sharing, and use of digital knowledge resources. The study concluded that web-based information management systems effectively meet users' needs in today's digital environment.

3. Cloud Computing Meaning

According to the National Institute of Standards and Technology (NIST), a branch of the US Department of Commerce, cloud computing is a model that provides extensive, flexible, and on-demand access to a vast pool of customizable computing resources, including networks, servers, storage, applications, and services. These resources can be quickly scaled up or down with minimal administrative effort or provider involvement (NIST, 2011). Meanwhile, Forrester describes cloud computing as a dynamic, virtualized, and managed infrastructure designed to support a wide range of end-user applications, with costs tied to actual usage levels.

4. Investigation Goal

The main purposes and Investigation goals are:

1. To evaluate the present status of Cloud-based technologies in Engineering College libraries.
2. Examining the imperative need for cloud-enabled applications in library services
3. To observe the requirements needed in the implementation of new technologies.

5. Limitations

The study is limited to Government Engineering College Resource centers in Kerala under the Directorate of Technical Education. The study does not cover Government Aided/ Government Self-Financing/CAPE /Private Self-Financing Colleges.

6. Methodology

A questionnaire method, along with a comprehensive literature review, is used to collect data and meet the study's specific objectives. Structured questions were created and distributed to librarians via Google Forms. The questionnaires were designed to gather overviews of the facilities and services offered by Government Engineering College resource Centres in Kerala. The difficulties encountered in integrating new technologies, and the best ways to utilize these technologies for everyday library operations. Previous research outcomes and Website Information. Nine Government Engineering Colleges under the Directorate of Technical Education are included in the study. These Nine engineering college librarians responded to the questionnaire and sent it via a Google form. Acceto analyze the data and conclude.

7. Results and Discussion

The major findings related to this study are-:

7.1 Current Status of Library Automation in Government Engineering College Libraries in Kerala

Libraries are about to become automated because of the advent of computers and IT tools. All nine Engineering college libraries are Fully automated using open-source software Koha. The below table 2 shows the status of library automation among the Government engineering college libraries in Kerala.

Table -2: Automation Status

Name of Colleges	Automation Status
CET Trivandrum	Fully Automated

GEC Thrissur	Fully Automated
GCE Kannur	Fully Automated
RIT Kottayam	Fully Automated
GECSKP	Fully Automated
GEC Kozhikode	Fully Automated
GEC Barton	Fully Automated
GEC Wayanad	Fully Automated
GEC Idukki	Fully Automated

7.2 Availability of Learning Resource Centre

The learning resource centre (LRC) is an additional educational tool. LRC centres serve as digital libraries in engineering college libraries. Through the LRC centre, all digital assets are stored and disseminated. The below Table.3 describes the availability of the Learning Resource Centre. There is no LRC facility available for GEC Idukki and GEC Palakkad to share their desktop, laptop, and mobile devices. The remaining seven college libraries are equipped with LRC facilities.

Table 1 Availability of Learning Resource Centre

Name of Colleges	**LRC Facility**
CET Trivandrum	Yes
GEC Thrissur	Yes
GCE Kannur	Yes
RIT Kottayam	Yes
GECSKP	Yes
GEC Kozhikode	Yes
GEC Barton	Yes
GEC Wayanad	Yes
GEC Idukki	No

7.3 Web OPAC Service

A web-based interface known as an online public access catalog (Web OPAC) enables people to search and browse library catalogs with remote access. Web OPAC is mainly an integrated system. Figure 1.1 shows the usage of Web OPAC in different Government engineering college libraries in Kerala. Only 44.4% of libraries use the Web OPAC facility. 55.6% of the College of Engineering Thiruvananthapuram, GEC Thrissur, GEC Kozhikode, and RIT Kottayam these college libraries have Web OPAC facilities. GEC Palakkad, GEC Wayanad, GEC Barton Hill, GEC Idukki, and GEC Kannur they only OPAC facilities.

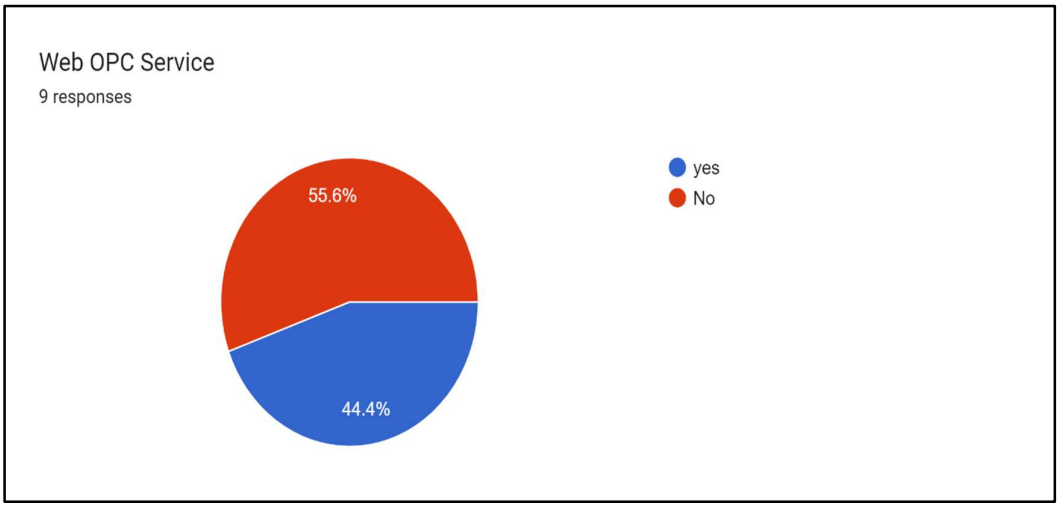

Figure 1 Web OPC Service

7.4 Cloud-Based Applications are Used in Libraries

Figure 1.2 below shows the Knimbus and Google Drive libraries. Knimbus is a software-as-service (SaaS) Cloud platform. DTE Kerala Digital Library Consortium purchased Knimbus for Nine Government Engineering Colleges in Kerala. By providing access to hundreds of e-books, theses, and foreign course materials, Knimbus aims to give students cutting-edge information that goes beyond their curriculum. Users can access over a billion pieces of content on Knimbus through a single search window that is continuously searched and evaluated.

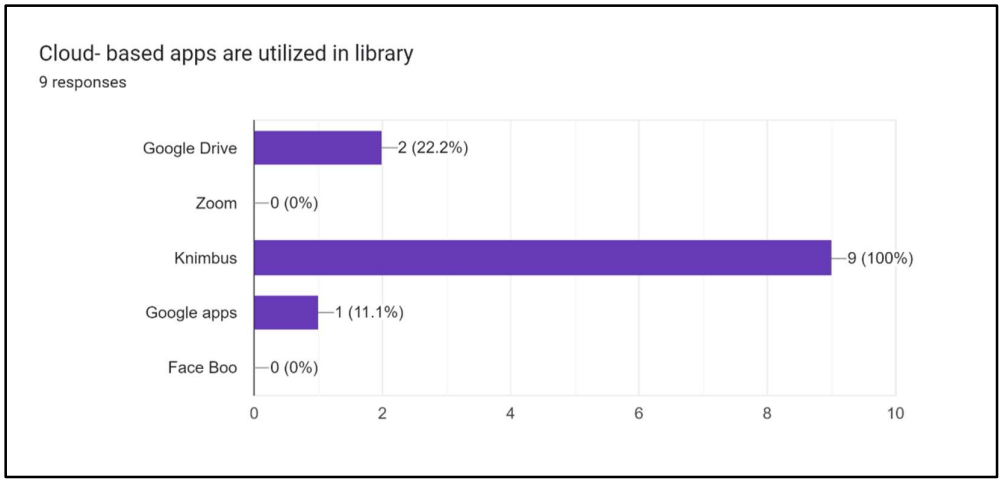

Figure-1.2: Cloud-Based Apps are Utilized in Library 6.5

7.5 Reason for using a cloud-based library solution

Figure 1.3 below reveals that cloud-based apps are mainly used for searching scholarly materials, creating institutional repositories, storing documents, and browsing library data.

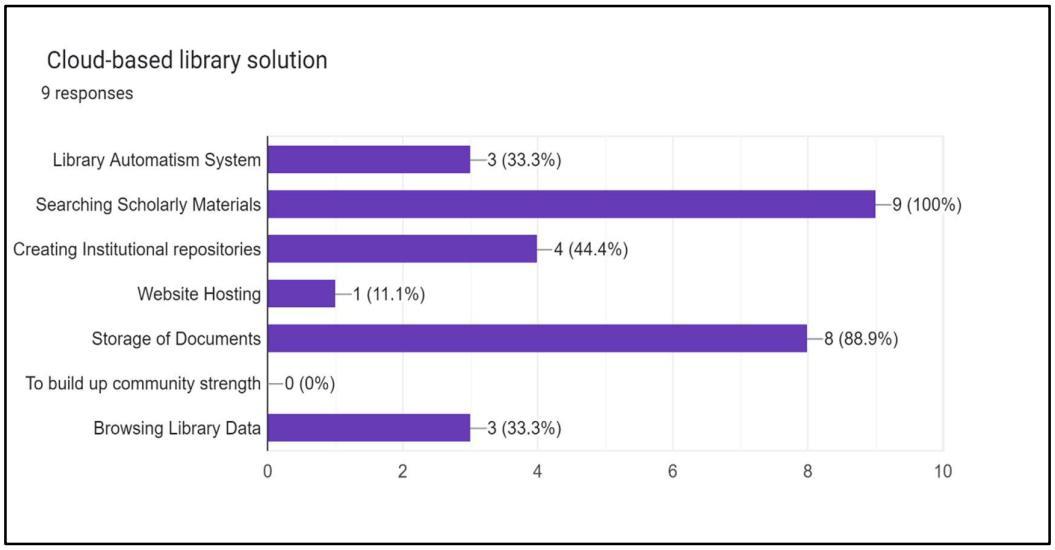

Figure-1.3: Cloud-Based Library Solutions

6.6 Barriers to implementing new IT technologies in libraries.

Maintaining and updating digital infrastructure and providing library personnel use of contemporary tools are the greatest obstacles to the implementation of new technologies in libraries. Towards Cloud-Based Technologies in Government Engineering College Libraries in Kerala Interdisciplinary Collaboration and Opportunities: Social Science, STEM, and Information 366 6.4 Cloud-Based Applications are used in Libraries The below Figure 1.2 shows that Knimbus and Google Drive commonly used Cloud-based applications in libraries. Knimbus is the software as service (SaaS) Cloud platform. DTE Kerala Digital Library Consortium purchased Knimbus for Nine Government Engineering Colleges in Kerala. Through the books, theses, and foreign course materials, Knimbus aims to give edge information that goes beyond their curriculum. Users can access over a billion pieces of content on Knimbus through a single search window that is continuously searched and evaluated.. 1.2: Cloud-Based Apps are Utilized in Library. Library solution apps are mainly used for searching scholarly materials, Institutional Repositories, storage of documents, and browsing library data. 1.3: Cloud-Based Library Solutions 6.6 Barriers to implementing new IT technologies in libraries. Maintaining and updating digital infrastructure and providing library personnel with sufficient training to use contemporary tools are the greatest obstacles to the implementation of new technologies in libraries.

7. Necessity of Cloud-Based applications in libraries.

a) The shift towards a paperless society reflects a growing preference for electronic information due to its convenience, accessibility, and environmental considerations. This evolution makes knowledge sharing easier and more accessible anytime and anywhere. b) Libraries' document delivery service has been made easier by Web OPAC. Users can look up the status of a document's availability, and reserve and renew a specific document worldwide and at any time. c) Resource-sharing service is important due to the information explosion, high cost of electronic resources, and lack of availability of needed information.

8. Conclusion

This paper highlights the current state of web applications in the Government Engineering College Libraries in this paper. Step by step, all nine Government engineering libraries are moving toward cloud-based services. The government engineering college libraries now have new infrastructure through the Knimbus digital library platform. The Learning Resources Centre and Web OPAC facilitate these services that will fulfill the information needs of future technologists.

References

1. Alotaibi, Mishan S (2013). “Utilization of Cloud Computing in Library and Information Centres: A theoretical study.” Available at: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=c47317203e24adfce77df45c220fb0d575f4a816

2. Balram, Sandeepa Yadav and Singh, KK (2018). "Application of Cloud Computing in Library Service." Available at: https://www.researchgate.net/publication/328244528_Application_of_Cloud_Computing_In_Library_ Services
3. Borah, Dipankar, and Borah, Mondita (2014). "Online Collaborative Research Platform: A Tool to scholars with a Special study on Research Scholars of Gauhati University". Available at: https://ir.inflibnet.ac.in/bitstream/1944/1800/1/15.pdf
4. http://www.gecbh.ac.in/campus/facilities/library
5. http://www.rit.ac.in/centrallib.php
6. https://gecskp.ac.in/library
7. https://gectcr.ac.in/world-class-library/
8. https://www.cet.ac.in/technical-library/
9. https://www.dtekerala.gov.in/institutiondetail/1/
10. https://www.gcek.ac.in/library.php Step Towards a Cloud-Based Technologies in Government Engineering College Libraries in Kerala Interdisciplinary Collaboration and Opportunities: Social Science, STEM, and Information Science by SPC with SJSU & SALIS 368
11. https://www.gecidukki.ac.in/Library
12. https://www.geckkd.ac.in/library.php
13. https://www.gecwyd.ac.in/facilities/central-library/
14. https://www.lisedunetwork.com/web-opac/
15. https://www.oclc.org/content/dam/research/publications/library/2014/oclcresearch-reorderingranganathan-2014.pdf
16. https://youtu.be/36zducUX16w?si=nBDD2zpR2BFD1IOY
17. Rah, J.A., Gul, S. and Ashraf Wani, Z. (2010). "University libraries: a step towards a web-based knowledge management system", VINE, Vol. 40 No. 1, pp. 24-38.
18. Sahu, Rekhraj, Cloud Computing: An Innovative Tool for Library Services (August 27, 2015). ISBN 1-63102-455-8, 2015, Available at SSRN: https://ssrn.com/abstract=3620868 or http://dx.doi.org/10.2139/ssrn.3620868
19. Shaw, J.N. and De Sarkar, T. (2021), "A cloud-based approach to library management solution for college libraries", Information Discovery and Delivery, Vol. 49 No. 4, pp. 308- 318. https://doi.org/10.1108/IDD-10-2019-0076
20. Suman, A. K., Patel, M., & Vijesh, P. V. (2023). An Efficacy of Cloud Computing and Its Application in Libraries. *International Journal of Research and Analysis in Science and Engineering*, *3*(3), 50-64.
21. Usmankoya,PT ,Gopakumar,V and Sebitha V P(2018). "ICT infrastructure and Electronic Resource services in CAPE Engineering College Libraries of Kerala; A Survey". Available at:http://www.klibjlis.com/5.2.17.pd