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Cloud Computing Applications: Digital Agenda for Automation and Networking of Libraries in Karnataka

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ABSTRACT

This paper envisioned to convey a study of government first grade college libraries that have automated their day-to-day services and activities. The main purpose of the study is to offer a significant view of the proficient practices of the government first grade college librarians in automating their house keeping processes. The study is been carried out using the survey method by collecting the data among 432 Government colleges across Karnataka state using online structured questionnaire and received 345 (79.86 %) responses. Some of the key findings of the study are, among these colleges out of which 68.2 % (295) college libraries were completely automated using e-Granthalaya, KOHA, NewGenlib, Libsoft, SLIM[++], Easylib software. Many of these libraries were using cloud applications as an integrated library management system and for some reasons which various from library to library such as lack of computer facility, economic problems, lack of qualified and skilled professionals and insufficient collections in the libraries and sufficient infrastructure libraries were not automated. The study was limited to the automated libraries in Karnataka which gives a standing view of the cloud applications used by diverse libraries and the view of the library professionals about the performance of the software they use. And this paper is an attempt to expose the details involved in cloud computing applications and its advantages in effective applications in higher education institutions which is emphasised in this paper. This paper is also been attempt to explore how cloud computing applications can extend library and information services for improved sustainability. It is observed from the study that majority of the surveyed colleges i.e., 203 (58.84 %) were using e-Granthalaya 4.0 cloud version ILMS out of 345 libraries. Implication of cloud computing can benefit libraries in streamlining information services like acquisitions, cataloguing, service flow, discovery and retrieval of information. It also helps in augmenting the economy of libraries and evades repetition of library acquisitions.

Keywords: Cloud computing; Automation; Networking; College library; Karnataka

1. INTRODUCTION

Cloud computing is an online application where collective data, information, resources, and applications are provided to the group of computers and other devices on request using web-based technologies. Cloud computing mainly works on the internet; generally, the internet is envisaged as a cloud to store and operate remotely. This uniqueness of linking all stuffs on to the web permits executing a web based online library supply chain, collaborate it with diverse types of the technological advancements such as Wi-Fi and Internet based technologies, database management, acquisition of data and cloud computing systems. Through the incorporation of these stated systems, many online services can be offered and delivered.

Cloud computing applications are a technological expertise that allows us to share the pool of services and resources on the network instead of owning these resources and facilities on local servers, nodes or private devices. This Cloud computing framework allows us to have data access as long as associates in harbouring devices that has permission to the online and these types of systems licenses library professionals to symbolise remotely.

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1.1 Government First Grade Colleges in Karnataka

Karnataka state has a strong network system of government funded undergraduate colleges, offering a excellent system of education to learners across the state. These higher education institutes play a significant role in offering available and inexpensive higher education facility, exclusively for the students who are from disadvantaged and deprived experiences.

Here's a transitory outline of their significant landscapes, Inexpensive: Government institutions are acknowledged for their reasonable fee structure when related to privately funded colleges, offering higher education accessible

to a all students. Offering Different Courses: These institutions offers various selection of undergraduate courses, including humanities, science, commerce, and management programs. Qualified and competent faculty: They appoint experienced and competent teaching faculties who are dedicated in delivering excellence teaching. Organisation Structure: While few colleges have basic substructure, many are established with well equipped with libraries, laboratories, and other infrastructural amenities to enhance student learning environment. Government Funding: As government-run institutions, they receive funds from the state government, guaranteeing their monetary constancy and sustained process. Monetary accessibility: Affordability makes higher education achievable for students from various socio-economic backgrounds. Excellence Education: Government funded colleges uphold high values of education and deliver a solid basis for forthcoming professions. (DCE, Karnataka)

While government colleges in Karnataka come across few challenges in terms of infrastructure and financial resources, they continue to showcase a vital role in providing value based and sustainable education, empowering students and contributing in building a well-developed nation.

Libraries of Government funded colleges in Karnataka plays a significant role in pillarising the instructive voyage of variety of learners. While knowledge resources may differ dependent on the college and its setting, these library and information centres usually offer core purposes., Extensive Collection: Housing a diverse collection of books, journals, and other learning materials covering various subjects, catering to the academic needs of students across disciplines. Digital Resources: Offering access to online resources, e-journals, and e-books, escalating the teaching and learning horizons of students beyond conventional print materials. Reference Services: Assisting students with research, bibliographical information, and other referral queries, addressing them towards appropriate knowledge resources. Learner Space: Providing a favourable learning environment for attentive study and self-regulating learning, creating the easy way of learning.

The college libraries are the most significant adjunct of all colleges, needs and requirements of the students and faculties in complementing the education and research programmes of the institutions and assistance to conserve and dissemination of knowledge. It aims at understanding of organisational objectives. Library and information centers represent communities and they empower by adapting latest ICT's that has perceived a significant renovation in building a very good collection development policies and practices of the availability of ICT's

2. LITERATURE REVIEW

"Now days most of the university and college libraries are going for virtual servers, in collaboration with other academic institutions by saving financial burden and professionals time."

Wada, I[1] (2018) in this study proposes a compelling argument for the adoption of cloud computing in libraries, highlighting its potential to transform them into "smart institutions" within the burgeoning Internet of Things (IOT) landscape. The Autor outlines a compelling case for cloud adoption, emphasising its cost-effectiveness, energy, efficiency and ability to enhance library services and global reach and it also identifies key benefits of cloud computing for libraries.

Panda, Subhajit and Chakravarty. Rupak[2] (2021) explores the growing interest in cloud computing as a solution for modernising library management systems. It highlights several advantages of cloud-based solutions, including reduced data redundancy, improved resource accessibility, scalability, and simplified maintenance. The focus is on the implementation of cloud-based library management systems in India, particularly government initiatives like the NIC National Cloud, Meghraj, and e-Granthalaya. This study suggests a growing trend towards cloud adoption in libraries, while acknowledging the need for further research into addressing the challenges and ensuring successful integration and implementation.

Lazarus C. Njoku & Eucharia Ken-Agbiriogu[3] (2021) The study looked at how libraries in a few university libraries in Imo State, Nigeria, were using and understanding cloud computing. The rise of cloud computing and its acceptance in academic libraries is one of the other ways that libraries can adapt and win back the hearts of their patrons. The use of cloud computing in libraries is a progressive response by librarians to an evolving information landscape and the need to stay relevant in the fast-paced, information-driven world of today.

Swaminathan[4] (2020). A basic overview of cloud computing and its use in academic libraries is given in this study. We have nearly unlimited on-demand computing resources due to cloud computing. This paper offers some fundamental guidance on selecting and assessing cloud services for academic libraries. Cloud computing enables libraries to provide their resources, services, and knowledge to users when they need them, in a way that accommodates their needs and is easy for them to understand. A wide range of practical web-based library services can be obtained using cloud computing, which can also significantly reduce library expenses. The fundamental characteristics and unique opportunities make it inevitable.

Sivankalai[5] (2021). The article contains suggestions on how to get the best use of cloud computing resources for university libraries and professional librarians worldwide. The creation of cloud-based services for university libraries might benefit from this article. According to the article, increased Internet bandwidth, quick information transfer, and high-quality cloud providers should all help to enhance academic library services in the future. Both academic libraries and the current information innovation depend upon the use of cloud computing.

Ekhaguosa, Otote, Irughe, Egharevba, & Akporhonor[6], (2022). A case study of university librarians in the Niger Delta region using cloud computing to access

digital resources. Overview The current research looked into the way librarians in academic libraries in the Niger Delta Region of Nigeria used cloud computing applications to access electronic resources. Data for this study were gathered using a self-structured questionnaire consisting of forty-three items, using the descriptive research method. The researcher employed the stratified random sample technique in the process of choosing the university libraries. Establishing a digital library, storing files, developing community, and increasing library automation are all made possible by cloud computing. The implementation of cloud computing technology in university libraries yields several advantages, including enhanced computational efficiency, expanded storage capacity, global library material accessibility, and potential cost savings on information technology investments.

3. OBJECTIVES OF THE STUDY

In terms of ascertaining the cloud computing applications with reference to the present status of library network initiated by the government first grade colleges in Karnataka. Some of the main objectives of the current study are as follows:

- To identify the implementation of cloud computing applications in terms of Integrated Library Management Software (ILMS) packages in their libraries.
- To categorise the influencing factor for the selection of ILMS.
- To find out what software's are being used in Automated Libraries in Bengaluru city
- To identify the explanations for not implementing cloud applications in computerising library.
- To know the computing applications of different modules & functionalities for which they are being implemented and practised.
- To investigate the insights of the library personnel and users about the cloud computing applications in library in general and e-Granthalaya in particular

4. METHODOLOGY

The study was carried out by using survey method which is supported by personal and telephonic interviews using online questionnaire and also by visiting personally. The views of Library professionals regarding ILMS were collected by means of a designed questionnaire. Personal interview was also conducted on the base of the survey questionnaire. Views on ILMS selection, modules automated and various issues related to the in-house keeping processes of the library amongst the librarian respondents were obtained. The survey questionnaires were distributed thorough online link using personal e-mail id's and were also mailed through the professional what's app group to 432 Government First Grade College (GFGC) librarians across the state, out of which 79.86 % (345) responses were received appropriately completed with the entire suitable evidences demanded in the questionnaire. Study seeks the responses from the respondents regarding the status of automation, ILMS used, application modules and the challenges they are facing during the implementation. The Current study is restricted to the government first grade college libraries of Karnataka state only.

5. DATA ANALYSIS AND DISCUSSION

The present study acknowledged 345 completed responses from library professionals of GFGC's in Karnataka, which institutes the prime facts for the examination and explanation.

Below Table 1 shows the distribution of survey responses. Data collected through the questionnaires was analysed with the help of tables, and interpretation of data is been worked out by keeping the main objectives of the study. Numerous queries were entreated in connection with the cloud computing applications in automating and networking of the library and information centers and in contrast to this the responses acknowledged from the professional librarians are charted and presented in the below tables with appropriate findings of the study.

Above Table 1 shows that responses of 345 (79.86 %) out of 432 government colleges were received among the librarians. The study was confined to Government colleges only.

Table 1. Particulars of questionnaires distributed to library professionals

S.No.	Source college	No. of questionnaires distributed	No. of questionn-aires received	% of responses
1	Government First Grade Colleges, Karnataka	432	345	79.86%

5.1 Library Automation Status Among Government First Grade College Libraries in Karnataka State

Library Automation shall try to deliver the information resources to their user community by offering innovative enhanced knowledge services. Computerised library in-housekeeping operations includes the process of acquisition, cataloguing, classification, subject headings, circulation, periodical control, payment gateway, bills processing, report generation budget allocation, reminders, group reminders, reference services, membership management OPAC. The present status of implementation of ILMS among GFGC's of Karnataka is shown in Table2.

It is known from the above table 2 that, the automation

Table 2. Stauts of library automation

S.No.	Automation status	Frequency N	Percentage (%)
1	Completely Automated	203	58.85%
2	Partially Automated	122	35.36%
3	Automated Initiated	20	5.79%

status among the 345 GFGC libraries that were surveyed under the research, 203 (58.85 %) were completely automated and 122 (35.36 %) were partially automated and remaining 20 (5.79 %) were in the initial stage of automating their libraries. The study found that majority of the libraries was fully automated by means of both paid exclusively and open-source software's depending on their financial and individual needs and necessities.

5.2 Types of Cloud Computing ILMS Used

It is very much essential for any library automation to use cloud version of ILMS that accomplishes the desirable functions in mechanising the library and information services effectively. The kind of ILMS depends based on the necessities and it may be as modest as to achieve the doings of acquisition, organisation, cataloguing, and circulation and in integrating the library management software that can achieve the facilities of collection, cataloguing, circulation, serials control, micro documents maintenance and other activities. The libraries that are using different types of software either open source, free or proprietary are congregated and signified in the below table 3.

It is known from the study that 50 (14.49 %) of the libraries were using Open-source software, and most of libraries were using paid software 295 (85.50 %). This is mostly because of the hands-on training support both online and offline and additionally technically supporting including maintenance offered by the vendors.

Table 3. Type of cloud computing ILMS

Type of the software	Frequency N	Percentage
Open-Source software	50	14.49%
Paid Software	295	85.50%

5.3 Integrated Library Management Software (ILMS) Implemented

An Integrated Library Management System (ILMS) is a software package that benefits and assists all library and information centers and manages all the acquisitions and processes more proficiently. The implementation of ILMS makes the effective use of library and information resources effectively by the user community, and also it avoids the repetition of workflow for the librarians.

Implementation of ILMS by the library professionals is been portrayed in the above Table 4. It is observed that 203 (58.84 %) of libraries have implemented e-Granthalaya, followed by 41 (11.88 %) of libraries have installed Easylib, 32 (9.27 %) have installed KOHA open-source software and 18 (5.21%) libraries have installed NewGenlib in their libraries. Remaining 51 (14.78%) libraries were not using cloud version software as they were using Library Manager, Libsoft, SLIM and few inbuilt software's.

Table 4. Intergrated library management software(ILMS) implemented

S. No.	ILMS implemented	No. of colleges	Percentage
1	e-Granthalaya	203	58.84%
2	EasyLib	41	11.88%
3	KOHA	32	9.27%
4	NewGenlib	18	5.21%
5	Others	51	14.78%

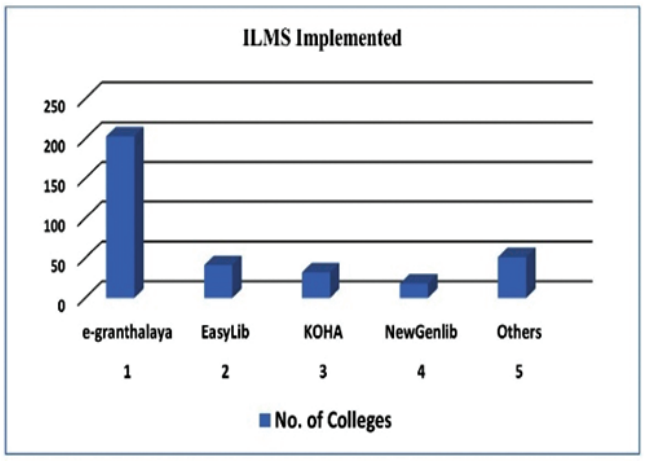

Figure 1. ILMS implemented.

5.4 Integrated Library Management System (ILMS)

Integrated Library Management Systems (ILMS) are very much active and multipurpose solutions that empowers library and information centers to acclimatize to the ever-changing digital phase. They automate, modernise, and augments many library processes, permitting libraries to deliver effective information services to their clienteles and retain the momentum with the dynamic landscapes of library management. As information centers endure to advance, the characteristic feature of ILMS in determining the future of these knowledge hubs remains dominant. Some of the well-known popular ILMS packages available are LIBSYS, EasyLib, e-Granthalaya, SLIM, KOHA, NewGenlib, Library Manager, Libsoft, Libero.

5.5 Why Cloud Version e-Granthalaya?

It is a most reliable and all-time access for various searches and accomplishes databases on a modest processor configuration. The facilities are of nominal and quality-oriented substitute. The only thing we need to have systems with high-speed Internet connection with the browsers permitted. National Informatics Centre (NIC), New Delhi will provide the database with the nominal fee of Rs 21000 for government institutions. Anyone can make use of this E-Granthalaya software, the best-in-class bibliographic search & retrieval package that delivers the access to catalogues through web search services, that grants classy online searching like auto-indexes, multiple document presentation, programmed searching of several forms and formats.

Various modules were automated using ILMS in

Table 5. Modules implemented in library operations through ILMS

S.No.	Modules in the software	No. of libraries (Frequency N)	Percentage (%)
1	Administration	296	85.79%
2	Acquisition	214	62.02%
3	Cataloguing	318	92.17%
4	Circulation	325	94.20%
5	Serials Control	177	51.30%
6	Digital Library/ Micro Documents	68	19.71%
7	Reports Generation	326	94.49%
8	Article Indexing	68	19.71%
9	Multilingual	168	48.69%
10	Web OPAC	318	92.17%

the First Grade College libraries have been summarised in the above Table-5 and the data depicts that 296 (85.79 %) libraries have been using administration module, 214 (62.02 %) libraries been used acquisition module, 318 (92.17 %), librarians were using cataloguing module, 325 (94.20 %) library professionals have been using circulation module as this is one of the most wanted and much needed module for any library as this module gives the data about the usage of library collections by its users. In this module all the ILMS had the easy gateway of issue, return and renewal of documents both book and non-book materials. Incorporation of Barcode, RFID and Dropbox compatibility were found in all these packages. And this module offers us the facilities of reserving and renewing features and also has the in-built SMS, e-mail and payment gateways. It offers many customised reports and also gives us the detailed customised data reports.

The results of the study shows that 177 (51.30 %) libraries have been automated their serials control, 68 (19.71 %) have the digital library and micro documents maintenance facilities, 326 (94.49 %) have the reports generation utility, 68 (19.71 %) have indeed their documents using automated module, 168 (48.69 %) have the facility of entering the data in multilingual mode, and lastly majority of the packages have the web OPAC facility, Ability to access Easylib Cloud from anywhere there is Internet. All the packages mentioned above hosts the database on cloud and maintain it and assures approximately 24x7 hours of accessibility with ease and convenience. All these ILMS gets us the complete features of the package deprived of having to finance on a big server and its preservation and much more inexpensive also.

It is known from the study that most of the libraries have been implemented cloud computing applications by utilising most of the modules available in the ILMS in one or the other way. Cloud computing applications as a digital platform for automating the library housekeeping operations as well as membership services and networking for the purpose of sharing the knowledge resources. This cloud computing platform offers us a comprehensive technological solution with an integrated management of library services and support. It's a valuable component in transforming conventional libraries to a virtual with digital library component providing number of online membership facilities by a unique platform access system. All these packages have the "Cloud Ready" applications providing the web enabled services in an enterprise mode with the centralised database systems.

Cataloguing module (92.4 %) implemented by the

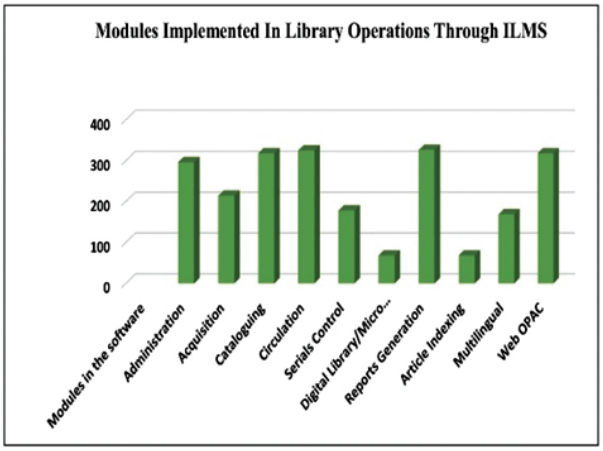

Fig. 2 Modules implemented in library operations thorugh ILMS.

libraries using ILMS enabled competent library professionals in creating and managing bibliographic archives for print books, periodicals and other resources. This module supported them to automate several aspects of the cataloguing process, making it quicker and more precise.

Circulation module (99.5 %) of an ILMS holds visitors' check-ins and check-outs, issues/returns, and renewals of library materials. With an ILMS, librarians can track who has borrowed that material, its due date, reminders and whether it has been returned on time.

Acquisitions module (92.81 %) of an ILMS accomplishes the purchasing and receiving new resources. With an ILMS, librarians can generate acquisition orders, track the position of orders, and manage demands and payments. This is helping all librarians stay on topmost of their finance and make sure they have the funds to aid their user community.

Reporting and Analysis (88.6 %) of an ILMS often offers modules in reporting and analysing, that allows librarians to keep track of usage patterns of various user's community, identifies common materials, and make data-driven decisions about collection development and other library services. This data is helping very much to all librarians understanding which resources are in high demand, which materials may need to be rearranged, and which items need to be extended or purchased.

User Management (95.5 %) of an ILMS among the surveyed colleges offers a user management module that empowers librarians to achieve various user accounts, including communication information, details of individual and group borrowings, and fines. This segment can also generate reports on user activities, serving librarians

understand how their users use their library and information resources.

5.6 Impact and Application of Cloud Computing Applications in Libraries

Huge amount of data and information can be operated with very much comfort and accurateness Easy in operation, with minimum manpower, saving the lot of time allowing both user and professionals in avoiding or eliminating repetition of labour by enhancing the customer gratification. Functions at an excessive rapidity and timeliness. All the above factors. It also cut down the financial crunch by cooperative collection of documents on a single platform in terms of a cloud and also the libraries under the cloud can be connected through network meeting the dedicated user community demands.

6. FINDINGS AND DISCUSSION

Some of the major findings of the study are:

1. Majority of the libraries is been automated using cloud application
2. Most of the Libraries have been using all the available modules in their day-to-day activities
3. The study results show that only 50 (14.49 %) are using open-source cloud computing application software for automating the library in-house keeping operations.
4. E-Granthalaya 203 (58.84 %) is the highly used paid cloud computing software.
5. Cataloguing, Circulation and OPAC are the highly used modules when Compared to other modules.
6. Cloud computing applications inspires higher education institutions augmenting calibration of assessment norms and processes so that the many fragments of the cloud computing models that can execute appropriately and competently.
7. A cloud computing application offers tools and techniques to examine our information excellence and aptitude to precise the bulk information.
8. These application offers capability to apprehend wide-ranging particulars of our library membership data that includes customising the data fields, importing the membership data, mass updating and generation of report and statistics.
9. Library members can also create their own profiles and allowing the integration with institution Enterprise Resource Planning (ERP) software, either externally or one provided with the ILMS.
10. E-books lending service, union and shared catalogue, document downloading services, digital preservation and scanning services, current awareness service by document sharing including bulletin board services and social interactions with the user community with social interactions among the users are some of the major findings found among the colleges during the study.

7. CHALLENGES AND LIMITATIONS

1. Preparation and executing the high-quality library and information services in the ever shifting dynamic societal and scientific settings.
2. Establishing library and information networks to assist the user community efficiently.
3. Design and development of knowledge systems that meets the user requirements of library and information centers.
4. Successful integration of ICT, artistically and efficiently into library and information services.
5. And some other major challenges might be deficiency in financial aspects for upgrading the status and hands on training, software and hardware compatibility, librarian competitiveness.
6. It's very much big concern that there are issues related to privacy and security of data. Network connectivity and bandwidth with respect to speed is also a concern.

Teaching and learning in Indian higher education institutions and the education system is the world's largest schooling system with a greater number of institutions across the country. The challenges modelled by the increasing demands for academic necessities are enormous. Cloud computing applications streamlines organisation of cooperative information and knowledge resources usage, distant access for multiple users Excellency, offering the essential tools at some instances of the exercising technique. Knowledge resource collections are also retrieved through "Software as Services (SaaS)". The academic library resources for e-Learning schemes are frequently made available any time to several teaching learning institutions through cloud. LaaS is undoubtedly going to take a paradigm shift in e-Learning. Academic institutes can customise the cloud based open source ILMS which will lead to heaps of financial savings.

When the libraries working with their own arrangement's association among the libraries by networking is very much tough and expensive too. A library and information center collect and maintains the data which is scattered in various scattered structures, subsequent in library's feeble network existence. Knowledge explorers working in shared network settings and in scattered arrangements find it very much difficult to access the information resources due to their inattentive on the web. By moving in to cloud in-house or by taking the services of Cloud Service Provider, the above cited issues can be fixed. Once moving on to cloud the library presence could be much visualised through the network across the globe. Integration of information resources and sharing of knowledge resources becomes very much simple when it is on the cloud. It will be benefit and cost effective to smaller and medium sized institutions.

Information resources can be shared and distributed between the networked cloud users and it can be done very much faster in the scattered networked environment. Having shared infrastructure, it makes sure to work professionally and competently with several users and various applications. As the infrastructure is provided by the third party, users can operate it from any part of the world simply through the internet. As the servers on

cloud are available 24*7, it is very much reliable and there is a least chance of cloud burst or infrastructure failure. As it is very much cost efficient, scalability is very much high and with greater security and accessibility, portability with adjustable storage capacity with unlimited storage. With backup and recovery automatic updates facility is also available.

However, Libraries can overcome economic limitations and also be able to address the competent professionals' issues by, Getting financial assistance and support by the State governments and college development authorities can provide monetary funding to libraries. And also, by seeking the support of Alumni's, Philanthropists of the institution.

Training staffs of library and information centers can offer skill-based training programmes to library professionals on innovativeness planning of resources and ILMS. Libraries can provide online instructions to personnels, so that they can acquire and augment their technical skills although they are working.

Utilising institutional workshops for libraries that are part of a bigger institutions and universities can take benefits of in-house programmes for technical assistance, software's, client service, and other issues.

7.1 Advantages of Cloud-Based ILMS

Cloud-based LMS have numerous advantages, such as:

- Minimum expenses: Cloud-based LMSs can avoid setup expenses and advance financial distribution.
- Easier to install and use with not much time consuming
- Enhanced accessibility: Cloud-based LMSs cost effective, ease of access, can be retrieved anywhere/ anytime remotely having access with many connections and networks and devices.
- Improved security: Cloud-based LMSs can enhance the assurance of thew security of data.
- Easy maintenance: These Cloud-based LMSs are very much easier in maintaining and operation.
- Storage Capacity: All of our data, with lots of imageries and contented data, will be uploaded directly to the cloud LMS, freeing up memory space on our hard disks and drives with lesser or least management of space.
- Customisation: Cloud-based LMSs convenient and customisable for both the user community and library professionals.

7.2 Looking Beyond Four Walls of Libraries with Automation and Artificial Intelligence: Scope for Further Research

Automation of Libraries with cloud computing ILMS, libraries can now restructure many of the manual and laborious processes such as cataloguing, record management, article indexing, and reference services. Artificial intelligence lets libraries to proficiently accomplish collection management, circulations, answering user queries and cataloguing of books while providing AI-powered references and interpretation of suggestions to the users. When shared with AI, automation tools can pointedly boosts efficiency, enables informal access to the information systems and augment working competence. Based on this study, library and information science we try to derive how future libraries will function in the era of automation and artificial intelligence.

8. CONCLUSION

The study results found that the ILMS augmented the excellence of employability, competence of library personnel with the enhanced professional gratification, user relations, self-esteem, work pace and the regulation of higher education institutions. Results of the study shows that 58.85 % colleges were completely automated out of which E-Granthalaya 203 (58.84 %) was one of main ILMS used among the libraries, it was also found that 85.50 % were using paid ILMS. Cataloguing module (92.4 %), circulation module (99.5 %), acquisitions module (92.81 %), reporting and analysis (88.6 %), user management (95.5 %) are some of the major outcomes of the study, where cloud computing ILMS has played a major role in augmenting effective delivery of library and information services. In addition to these issues like professional connection among the librarians in the implementing these cloud applications, involvement in hands on training, and attitudes and competitiveness of library personnel towards the shift established a positive response. Cloud computing applications are very much simple in acquiring and implementing, libraries financial environment is augmenting across the state. As the cloud computing technology is already out there and our library and information centers need to start think rationally about how they may have to regulate their services in order to efficiently acclimatize to how user community are associating with it. Cloud computing applications in terms of library automation has transformed and redefined the description of the library professionals. However, many radical changes have been happening in the field of library and information centres in the rouse of swift developments in ICT and of knowledge explosion, GFGC's are moving a step ahead to accomplish the innovative prospects through the execution of the cloud computation and networking of library and information centres across Karnataka. As the higher education institutions have been facing lots of complications due to economic crisis the application of cloud is one of the feasible opportunities as moving to cloud the academic institutions can now move on to focus on their essential activities of teaching, learning and research.

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His contribution to the current study is conceptualisation of ideas by developing the framework, preparing the draft of the paper, completing the initial draft including data interpretation and analysis and revising the manuscript.

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