

Impact of Cloud Computing on Information Storage and Retrieval in Selected Judicial Libraries in Bauchi State

Musa Mu' Azu Salihu

National Judicial Institute, Abuja

email: mmdanmage@gmail.com

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Abstract: *This study surveyed the Impact of Cloud Computing on Information Storage and Retrieval in the selected judicial libraries in Bauchi state. Four objectives were set to guide the study which include: Determining the current state of adopting cloud computing in the selected judicial libraries in Bauchi state; Determining the effect of cloud computing on information storage in selected judicial libraries in Bauchi state; Determining the effect of cloud computing on information sharing in selected judicial libraries in Bauchi state, and Determine the challenges associated with cloud computing in selected judicial libraries in Bauchi state. In line with the objectives, four research questions were answered. The study adopted the survey research design. Forty sets of questionnaires were administered to forty selected judicial library staff in Bauchi state using a random sampling technique. The data collected was analyzed using descriptive statistics of mean and standard deviation. Decisions were taken when the mean is less than 2.50 as not significant and anything above 2.50 as significant. The study found that: The study found that: the current state of adopting cloud computing in the selected judicial libraries in Bauchi state for information management as indicated by the cluster mean of 3.20 ± 72 was to a high extent; There was a high impact of cloud computing on information resource management in the library since the cluster mean is 3.44 ± 61 . The impact of cloud computing on information sharing was to high extent since it cluster mean is 3.35 ± 94 ; and The identified challenges above are affecting the adoption cloud computing in the library studied thereby hindering effective cloud computing 3.29 ± 62 . Amongst other recommendations suggested was that, there is the need for the library management to strategize effort on ensuring effective use of cloud computing for information management in the library.*

Keywords: impact, cloud computing, information, storage, resource sharing, judicial libraries

INTRODUCTION

Judicial libraries since inception have been dedicated to producing, processing, preserving, and disseminating recorded information of the past and the present to address the immediate information requirements of society without which, there will be no sound judgement. Owing to their relevance in information provision, judicial libraries are sometimes referred to as the "heart" or "nerve center" of the judicial institutions in which they are housed, implying that the libraries serve as the hub for all judicial activities. As a result, they have a difficult time keeping up with the information needs of society coupled with the frustratingly fast-moving developments in information technology (IT) that have been introduced into the information industry. Librarians no longer have a complete grip on the information and the judicial staff are equally having problems in having access to the right information resources/sources.

The concept of cloud computing is viewed as a source of knowledge that gathers, holds onto, distributes, and makes use of data to aid in scholarly communication, teaching, learning, research, and user community services. They are there for the benefit of clientele whose primary concerns revolve around making sure that the desired information items are easily available when needed and in a suitable format. They are service sectors that help clientele by acquiring, processing, preserving, marketing, and offering information services. It is interesting to note that libraries routinely provide access to information resources outside the actual structure using technology advancements like social computing, mobile devices, and internet services.

Cloud computing means different things to scholars depending on the method of approach adopted. It is in recognition of this that Joshi (2023) described cloud computing as a type of computer technology that makes it easier to share resources and services over the internet as opposed to having them on local servers/nodes or personal devices. In the opinions of Mona and Sharma (2014), cloud computing refers to the broader context, or, more specifically, the general idea of leveraging the network to give judicial staff access to innovative services. Information seekers of various disciplines and purposes rely on knowledge management through cloud computing solutions which comprise platforms, software, and infrastructure as services. This development of knowledge management processes is consistent with the existence of cloud computing. This is because it allows for the storage and retrieval of knowledge independent of geographic locations so long as knowledge searchers and providers are present. It is obvious that the issue of information storage will be addressed with the use of cloud computing.

Most of the reasons why libraries should adopt cloud computing according to Maina and Muthee (2020) is due to cost-effectiveness, storage facility, ease-to-use, flexibility and scalability, time-saving, lack of in-house skill set, and ubiquitous nature of the technologies. Libraries should thoroughly review and understand the security features the cloud service provides and work to establish a comprehensive security policy aligned with industry best practices to ease plan for data migration: Data migration is critical in transitioning to a cloud-based library system. Subba and

Kumar (2019) called on libraries to harness the power of the cloud, they gain unparalleled advantages in scalability, accessibility, and collaboration. Cloud-based library services facilitate seamless resource-sharing among institutions, breaking geographical barriers and fostering a global knowledge exchange network. ICT infrastructure has enabled legal institutions to easily provide teaching, learning, and research services to a growing number of students in every institution by overcoming barriers such as time, space, and cost.

Adopting cloud computing for information storage and resource sharing decreases and frees up storage space as your computer's limiting storage capacity is no longer a barrier to your freedom (Mamza, 2020). What library staff needs to do is simply store your data in the cloud, and then log in to view and change it as necessary. The adoption of cloud-based services eliminates the need for judicial staff to purchase expensive software and hardware or to be subjected to ongoing upgrade cycles. The user end usually needs a system that can run a web browser. Daud and Rahman (2017) also concurred, pointing out that. It aids in lowering the expense of managing and maintaining an IT system for a business or library. Rather than just spending money on expensive machinery and applications, libraries can make use of cloud resources for service provision. It is also assumed that cloud computing can solve the problem experienced in information sharing.

One of the greatest goals of embracing cloud computing is to make it possible for people to effectively share resources whether they are a person or a group. According to Bruque, Moyano, and Maqueira (2023), the core of cloud computing is beneficial to both individuals and businesses in terms of how they handle and access information, and at the same time, the availability of cloud computing makes it possible to foster supply chain integration and create mutually beneficial cross-firm relationships. According to Lloyd and Sloan (2011), the use of cloud computing can reduce platform compatibility issues while simultaneously fostering fundamental changes in both internal and external communication. One of the best advantages of cloud computing, according to Daud and Rahman (2017), is that it allows judicial staff to share complete files in addition to individual files.

Judicial libraries are by nature, the collections of information resources in a small building that must have been organized by individuals who are familiar with the arrangements for easy retrieval. This signifies that space and sharing of information is a battle to face but not with the latest developments in information management using cloud computing. Given the above assertion, this study is posed to assess the impact of cloud computing on information storage and retrieval in the selected judicial libraries In Bauchi state.

Statement of the Problem

Legal information is as important as history because there cannot be sound civil right without referring back to laws. Moreover, judicial matters needs to be referred to every moment for reference purposes in the administration of justice which have been made accessible using the information communication technology using the cloud computing. Consequently, the providers of cloud computing services charge consumers on a pay-as-you-consume basis rather than buying

the entire hardware or the physical infrastructure and libraries need not invest much to actualize the process of applying cloud computing. Interestingly, cloud computing gives IT teams in libraries the chance to help patrons take advantage of innovative cloud-based products and services thereby reducing the burden of space and time to retrieve information by the library staff and judicial staff can access them from afar. This study aims to determine whether library staff in the selected judicial libraries in In Bauchi state have adopted cloud computing for information storage and resource sharing to ensure effective record management.

Objectives of the Study

The general objective of the study is to determine the Impact of Cloud Computing on information storage and retrieval in selected judicial libraries in In Bauchi state while the specific objectives are to:

1. Determine the current state of adopting cloud computing in the selected judicial libraries in Bauchi state.
2. Determine the effect of cloud computing on information storage in the selected judicial libraries in Bauchi state.
3. Determine the effect of cloud computing on information sharing in the selected judicial libraries in Bauchi state
4. Determine the challenges associated with cloud computing in the selected judicial libraries in Bauchi state

Research Questions

1. What is the current state of adopting cloud computing in the selected judicial libraries in Bauchi state?
2. To what extent is cloud computing effective on information storage in the selected judicial libraries in Bauchi state?
3. To what extent is cloud computing effective on information sharing in the selected judicial libraries in Bauchi state?
4. What are the challenges associated with cloud computing in the selected judicial libraries in Bauchi state?

LITERATURE REVIEW

Cloud computing level of preparedness assessment that was done in most judicial libraries according to Maina and Muthee (2020) based on identified technological capabilities which include the IT infrastructure, human resource deals with skills and attitude, and external capabilities which include security, policies, and regulations as key factors aspects of preparedness of cloud computing. Subba and Kumar (2019) added that to implement access controls and permissions: defining and implementing access controls and permissions is crucial for maintaining the integrity and security of a cloud-based library system. Libraries should establish roles and responsibilities for staff members, assigning appropriate levels of access based on job responsibilities and requirements.

In a separate remark, Workineh, Garcia, and Midekso (2017) noted that the paucity of resources and IT capabilities are key impediments to institutions toward successful adoption of cloud computing. Institutions of higher learning in developing countries have more interest in adopting cloud technologies. A technology readiness index helps institutions assess their readiness to adopt cloud-based services by determining the infrastructural capability of the institution to adopt new technologies. The index checks the availability of computers, the internet, and information communication skills available by staff (Karim & Rampersad, 2017) (Lee et al., 2018). Judicial libraries remain a great facility that should not lag in the adoption of ICT technologies that will transform their services.

The resurfacing of cloud computing is seen as the latest problem-solving technology because it is a collaborative collection of resources comprising networks, computer processing capabilities, business and user applications, digital storage capacity, and systems. Cloud computing enables the effective and efficient use and sharing of telecommunications services in contemporary libraries and information centers. In libraries and information centers, this computer model is growing more and more popular. Cloud computing is not magic, but rather a network of Internet-based connectivity where essentially shared computers offer judicial staff software, infrastructure, platforms, devices, and other resources on a pay-per-use basis. Cloud computing provides a flexible online environment that promotes the ability to store information and manage an increased amount of work without hindering the framework's performance.

There is no doubt that cloud computing does not only cover effective storage of information but it goes beyond. According to Nasser and Afzal (2007) further back up every piece of information gathered and stored: The use of cloud computing is beneficial in the area of backup. Backup in this scenario takes into account major catastrophes and virus-infected hardware eventualities. Cloud storage is also not restricted to a single location or piece of technology to operate and it enables them to forgo substantial capital expenditures. Interestingly, cloud computing gives IT teams in libraries the chance to help patrons take advantage of innovative cloud-based products and services (Kumutai & Muli 2023).

While stressing the usefulness of cloud computing in the area of information sharing, Mamza (2020) noted that it is one of the best developments so far developed in an effective and efficient information-sharing interface that can be accessed without much difficulty. He further argued that both library staff and judicial staff have no regret in adopting cloud computing in their respective libraries. In the words of Abidi and Abidi (2022) and Agu (2014), even with the advancements in technology developments being used in the dissemination, acquisition, organizing, retrieval, and sharing of knowledge and intellectual records in libraries, they have introduced new and creative methods that library staff still have to contend with to ensure effective information dissemination around the clock until the emergence of cloud computing where much improved have been recorded.

The usage of cloud computing has made it possible for library patrons to access resources with positive service perceptions that go beyond what library employees could have imagined. One of the best advantages of cloud computing, according to Daud and Rahman (2017), is that it allows judicial staff to share complete files in addition to individual files. Teleconferencing and file-sharing capabilities will be made possible via cloud computing (Oyelude, 2023). According to these claims, the benefits of cloud computing would make it easier for judicial staff to share knowledge and for individuals to express their thoughts and knowledge to others. The mobility of information resources is another advantage of integrating cloud computing into information management as noted by Mohamed and Pillutla (2014) that increases access to information sources from any location and eliminates the need to sit down at a single computer.

Cloud computing as a new technology is indeed a breakthrough in information management but not without shortcomings. According to Mamza (2020) can be sure of avoiding cyber security. It will be difficult to have techniques and strategies for securing information against unauthorized access, misappropriation, change, or destruction; and ensuring continuous access to the information. Since cloud computing is entirely Internet-based and all cloud-based computing consumers save data utilizing the same network, it is susceptible to hacker attacks. It is significant to remember that information security largely consists of two forms of security, that is, user privacy security and network security against both internal and external incursion.

In cloud computing due to readers' lack of awareness that duplicating a pool of information without obviously lowering the pool's accessibility according to Dut (2023), other subscribers can conceivably be regarded as a violation of property rights as protecting intellectual property rights is becoming more challenging in the technological environment. Another submission by Agu (2014) on the adoption of cloud computing noted that virtual network globalization has made the situation more challenging for judicial staff since there will be a continued lack of a universal legal system that can be used to enforce intellectual property rights anywhere around the globe. Another setback in a cloud computing storage system is the automated administration system of the library stores judicial staff' names, addresses, website logs, email logs, etc (Nasser & Afzal, 2017). This information may be accessed by unauthorized individuals in cases of privacy violations or may be given by library employees to an outside official. This applies to maintaining data integrity within the library's network as well as protecting the network from outside incursions that could compromise user information.

METHODOLOGY

The study adopted the descriptive research design as suggested by Ali (2006), the survey research design is a descriptive study that seeks or uses sample data of an investigation to document, describe, and explain what is existent or non-existent on the present status of a phenomenon being investigated. A self-designed questionnaire was administered to forty (40) selected judicial library staff in the population of the study using a random sampling technique. Data collected was

analyzed using descriptive statistics of mean and standard deviation. Decisions on the analysis were when the mean is below 2.50 as not adequate and anything above 2.50 is rated as adequate.

| s/n | Items Statement | N | Mean | Std | Rank | Dec |
|---------------------|---|----|-------------|------------|-----------------|-----------|
| 1 | I am aware of the concept of cloud computing in libraries | 37 | 3.56 | .63 | 1 st | HE |
| 2 | I am aware of the benefits of cloud computing in managing library resources | 37 | 3.55 | .56 | 2 nd | HE |
| 3 | I'm aware of the challenges in adopting cloud computing | 37 | 3.54 | .64 | 3 rd | HE |
| 4 | I'm aware of the use of optical character recognition (OCR) for cloud computing | 37 | 3.33 | .64 | 4 th | LE |
| 5 | I'm aware of digital preservation technique for long term access in cloud computing | 37 | 3.19 | .67 | 5 th | LE |
| 6 | I'm aware of financial cost associated with cloud computing projects | 37 | 3.08 | .60 | 6 th | LE |
| 7 | My institution has provided enough awareness program on cloud computing | 37 | 2.95 | .82 | 7 th | LE |
| 8 | I actually seek for information about tools to enable cloud computing management | 37 | 2.90 | .90 | 8 th | LE |
| 9 | I'm aware of cloud storage solution used for digital library | 37 | 2.77 | 1.03 | 9 th | LE |
| Cluster Mean | | | 3.20 | .72 | | HE |

RESULT AND PRESENTATION

Out of the forty questionnaires administered to the respondents in the library, thirty-seven representing 92.5% were retrieved, found properly filled, and were used for the analysis.

Research Question One: What is the current state of adopting cloud computing in the selected judicial libraries In Bauchi state?

Table 1: Mean and Standard Deviation Ratings on the level of current state of adopting cloud computing in the selected judicial libraries

VHE=Very high extent, HE= High extent, LE= low extent, VLE= very low extent

Table 1 shows the result of the current state of adopting cloud computing in the selected judicial libraries In Bauchi state to a high extent since the cluster mean is $3.20 \pm .72$. The results showed that: the awareness of the concept of cloud computing in libraries; aware of the benefits of cloud computing in managing library resources, and awareness of the challenges in adopting cloud computing were to high extent since the mean ratings ranges from 3. 54 to 3.56 about the current state of adopting cloud computing in selected judicial libraries In Bauchi state. Others like: aware

of the use of optical character recognition (OCR) for cloud computing; aware of digital preservation techniques for long-term access in cloud computing; aware of financial cost associated with cloud computing projects; Institutions have provided enough awareness programs on cloud computing, and aware of cloud storage solution used for digital library were to low extent since the mean rating ranges from 2. 77 to 3.38. This concludes that the current state of adopting cloud computing in the selected judicial libraries In Bauchi state for information management as indicated by the cluster mean of $3.20 \pm .72$ was to a high extent.

| s/n | Item Statement | N | Mean | Std | Rank | Dec |
|---------------------|---|----|-------------|------------|-----------------|-----------|
| 1 | It helps in preserving current information resources | 37 | 3.64 | .48 | 1st | VHE |
| 2 | It helps in minimizing space for information storage in the library | 37 | 3.56 | .54 | 2 nd | VHE |
| 3 | Selective Dissemination of Information (SDI) can be accessed easily | 37 | 3.56 | .56 | 2 nd | VHE |
| 4 | Preservation measures costs less in information resources storage | 37 | 3.66 | .63 | 3 rd | VHE |
| 5 | Problem of loaning out information resources is addressed | 37 | 3.44 | .64 | 4 th | HE |
| 6 | Literature search services are made easily accessible | 37 | 3.39 | .62 | 5 th | HE |
| 7 | Building expenses can be minimized | 37 | 3.38 | .66 | 6 th | HE |
| 8 | Giving of personal assistance costs less | 37 | 3.33 | .72 | 7 th | HE |
| 9 | Information Services can be circulated easily | 37 | 3.27 | .70 | 8 th | HE |
| Cluster Mean | | | 3.44 | .61 | | HE |

Research Question Two: The effect of cloud computing on information storage in the selected judicial libraries In Bauchi state?

Table 2: Mean and Standard Deviation Ratings on the effect of cloud computing on information storage in selected judicial libraries

VHE=Very high extent, HE= High extent, LE= low extent, VLE= very low extent

Table 2 shows the result of the effect of cloud computing on information storage in the selected judicial libraries In Bauchi state to a high extent since the cluster mean is 3.44. However, the finding reveals that: cloud computing helps in preserving current information resources; helps in minimizing space for information storage in the library; helps in ensuring that Selective Dissemination of Information (SDI) can be accessed easily; and information resources storage and preservation made easier indicated by very high effect as their mean ratings ranging from 3.56 to 3.66. Furthermore, it was also revealed that the problem of loaning out information resources is addressed; Literature search services are made easily accessible and at will; Information Services can be circulated easily; and giving personal assistance costs less had a high effect on information

management in selected judicial libraries In Bauchi state. This can be concluded that there was a high impact of cloud computing on information resource management in the library since the cluster mean is $3.44 \pm .61$.

| s/n | Intermediate ICT Literacy Skills | N | Mean | Std | Rank | Dec |
|---------------------|---|----|-------------|------------|-----------------|-----------|
| 1 | Cloud computing improves accessibility to library resources | 37 | 3.76 | .70 | 1 st | VGL |
| 2 | Cloud computing enhances the efficiency in resource sharing | 37 | 3.71 | .70 | 2 nd | VGL |
| 3 | It provide better information sharing system than traditional libraries | 37 | 3.63 | .83 | 3 rd | VGL |
| 4 | Cloud computing improves research and learning in an institution | 37 | 3.51 | .76 | 4 th | VGL |
| 5 | The use of cloud based resources minimize the burden of physical library visits | 37 | 3.33 | .72 | 5 th | GL |
| 6 | Cloud computing aids in preserving historical and rare legal documents | 37 | 3.28 | .78 | 6 th | GL |
| 7 | Cloud computing ensures better organization of resources | 37 | 3.27 | .85 | 7 th | GL |
| 8 | It enhances collaboration and knowledge sharing among judicial staff | 37 | 3.26 | .86 | 8 th | GL |
| 9 | Its archives reduce the risk of losing valuable legal information | 37 | 3.19 | .92 | 9 th | GL |
| Cluster Mean | | | 3.35 | .94 | | GL |

Research Question Three: To what extent is cloud computing effective in information sharing in the selected judicial libraries In Bauchi state?

Table 3: Mean and Standard Deviation Ratings on the extent to which cloud computing is effective on information sharing in selected judicial libraries

VGL = Very Great Level, GL = Great Level, LL= Low Level, VLL= Very Low Level

Table 3 presents the results of the extent to which cloud computing affects information sharing in federal high court libraries. Based on the findings, cloud computing improves accessibility to library resources; Cloud computing enhances the efficiency in resource sharing; provides a better information sharing system than traditional libraries; and Cloud computing improves research and learning in an institution to a very high extent since their mean rating ranges from 3.51 to 3.76. Similarly, it was found that options like: The use of cloud-based resources minimize the burden of physical library visits; Cloud computing aids in preserving historical and rare legal documents; Cloud computing ensures better organization of resources; It enhances collaboration and knowledge sharing among judicial staff; and Its archives reduce the risk of losing valuable legal

information shows high extent as their mean ratings range from 3.19 to 3.33 respectively. This concludes that the impact of cloud computing on information sharing was to a high extent since its cluster mean is $3.35 \pm .94$.

| s/n | Items Statement | N | Mean | Std | Rank | Dec |
|---------------------|---|-----|-------------|------------|-----------------|----------|
| 1 | Insufficiency of available ICT facilities | 231 | 3.56 | .63 | 1 st | SA |
| 2 | Outdated ICT facilities in the libraries | 231 | 3.55 | .56 | 2 nd | SA |
| 3 | Poor state of library ICT network connectivity | 231 | 3.54 | .64 | 3 rd | SA |
| 4 | Irregular power supply | 231 | 3.33 | .64 | 4 th | A |
| 5 | Poor ICT training programmes for the library staff | 231 | 3.19 | .67 | 5 th | A |
| 6 | Poor retrospective conversion practices from manual forms to digital formats | 231 | 3.08 | .60 | 6 th | A |
| 7 | Uncooperative attitude of library staff towards ICT skills acquisition | 231 | 2.95 | .82 | 7 th | A |
| 8 | Poor maintenance culture leading to government property is no body's property | 231 | 2.90 | .90 | 8 th | A |
| 9 | Lack of support from management as a result of budget constraints | 231 | 2.77 | 1.03 | 9 th | A |
| Cluster Mean | | | 3.29 | .62 | | A |

Research Question Four: What are the challenges associated with cloud computing in the selected judicial libraries In Bauchi state?

Table 4: Mean and Standard Deviation Ratings on the Challenges associated with cloud computing in selected judicial libraries

SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

Table 4 shows the result of the challenges associated with cloud computing in the selected judicial libraries. The results showed that insufficiency of available ICT facilities, outdated ICT facilities in the library, and poor state of library ICT network connectivity, were strongly agreed as challenges associated with cloud computing. The other challenges such as irregular power supply, ICT training programs for the library staff, poor retrospective conversion practices, and uncooperative attitude of library staff towards ICT skills acquisition were rated agreed upon. The cluster mean of $3.29 \pm .62$ indicates that the identified challenges affect the cloud computing in the library studied thereby hindering effective cloud computing. The standard deviation scores range from 1.03 to .56 showing high response variation among the library judicial staff.

Summary of Major Findings

Based on the data collected and having passed through critical analysis, the following are the findings of the study:

1. The current state of adopting cloud computing in the selected judicial libraries In Bauchi state for information management as indicated by the cluster mean of $3.20 \pm .72$ was to a high extent;
2. There was a high impact of cloud computing on information resource management in the library since the cluster mean is $3.44 \pm .61$.
3. The impact of cloud computing on information sharing was to a high extent since its cluster mean is $3.35 \pm .94$.
4. The identified challenges above are affecting the adoption of cloud computing in the library studied thereby hindering effective cloud computing $3.29 \pm .62$.

CONCLUSION AND RECOMMENDATIONS

It has been established that cloud computing is one of the largest computer-related revolutions that have been successful in altering the methods used to store and distribute information services and such development has made libraries strongly foster their relationships. Well-meaning organizations view it as a breakthrough in the field of information and data management. It has been successful in making library operations such as information storage and resource sharing much simpler for library workers and has kept on assisting in bridging the gap between the information sources and the user community. Judicial libraries would be unable to answer their names as the century's most concentrated information distribution centers without cloud computing. Cloud computing is not application-oriented but rather service-oriented and provides on-demand virtualized resources as quantifiable and billable utilities thus, it is cost-effective.

However, of all the advantages that judicial libraries stand to gain, some areas need to be discovered to strategies on how to address the drawbacks associated with employing cloud computing based on the findings of the study:

1. There is a need for library management to strategize efforts to ensure the effective use of cloud computing for information management in the library.
2. There must be an unrelenting effort on the part of the service providers to ensure the privacy of information that would be classically accessed. This will encourage those who wish to store their information since it is easy to use or patronize.
3. There is a need for proper orientation to the user community on the usefulness of cloud computing in sharing information so that people can patronize it more. Ignorance has been one of the challenges faced in information management thereby making things more difficult and costly to manage and retrieve information and many others.
4. There must be adequate provision of the security of information saved on the cloud, judicially the codes should be very unique such that intruders cannot break through and gain access to it.

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