THE PERCEPTION OF LIBRARIANS ON CLOUD COMPUTING TECHNOLOGY FOR LIBRARY SERVICE DELIVERY IN PUBLIC UNIVERSITIES IN EKITI STATE, NIGERIA

ABSTRACT

*The study examined the perception of librarians on cloud computing technology for library service delivery in public universities in Ekiti State, Nigeria. The population of the study comprised of all librarians from the three public universities in the state (*27*). Descriptive research design of the survey type was used while total enumeration sampling technique was adopted to select all the librarians in the study area as respondents. Self-designed questionnaire was used as the research instrument. Face and contact validity of the instrument was carried out while the reliability yielded coefficient of 0.89 at 0.05 level of significance. Data were analyzed using descriptive and inferential statistics. The study found that librarians generally had positive perception of the advantages of cloud computing technology for library service delivery, including its potential to improve user experience and facilitate collaboration and resource sharing among libraries. The study concluded that though librarians perceived advantages of the technology to be enormous, yet there were concerns about the risks and challenges associated with cloud computing adoption, such as data security and privacy issues. The study recommended among others that libraries should develop adequate policies and strategies to mitigate these risks and enhance cloud computing adoption.*

Keyword*:*Librarians, Cloud Computing, Public Universities, Resource Sharing, Data Security, Library Service Delivery

Introduction

"University Libraries are established to play strategic role in complementing vision and mission of its parent body that has the prime objective of providing world-class environment for learning, research and community service. Performance management in university libraries is seen as all-encompassing involving the interplay of various approaches to ensure that the library attains a high level of effectiveness and efficiency in fulfilling the objectives and mission for which they are established. Library service delivery involves certain processes and activities deployed by university libraries to deliver information services and resources to their clientele, with the aim of enhancing the activities and productivity of library users" [2,3]. Agoh and Omekwu (2021) described"the two basic areas of library service delivery to be technical services

and users services. Technical services are concerned with the acquisition, processing and cataloguing of library information resources while users' services are concerned with the loan service delivery, selective dissemination of information (SDI) delivery, current awareness services (CAS) delivery". Other core library services designed to help users to derive maximum benefit from the library as submitted by Ajegbomogun (2018) also include "Statistical Data Analysis (SDA), word processing, internet/e-mail services, facsimile, translation, photocopying, referral, bindery, abstracting, and indexing, CD-ROM database, searching, documentary delivery/loan, and microfilming". Ayim (2020) reported that, "libraries strive to adopt several performance management approaches that lead to effective service delivery. They provide information resources in different formats and disseminate to its users to meet their information needs". In the realization of good library service delivery,the survival of libraries according to Ireona, Tijani and Bakare (2018) now solidly depend on their creative abilities to remain relevant in the 21st centuryandfor this survival to subsist, libraries must repackage their services, enhance the skills of the staff and leverage on technology for improved services for them to reclaim the glory days.

"A critical task that faces libraries across the world is to be able to support its users through various media and the advent of information and communication technology (ICT) and use in library services has transformed their service delivery from traditional methods of ineffective means of creating and managing information to library users in this 21st century. This situation has made it a necessity to adopt and utilize other means of communication, information networking, and knowledge sharing as well asinformation storage.The advent of computers and other communication technologies therefore, has led to major transformations in the way library services are rendered and the profession practiced. The libraries have been automated, networked, and are now moving towards paperless or virtual libraries" [3,4].

"The emergence and application of cloud computing in library services has made the role of librarians and other information professionals to be more practical and pragmatic to the service they provide to information users on daily basis. This is assumed would make libraries to witness a rapid transformation from conventional libraries to digital and virtual libraries, thus adopting cloud corrupting model to redesign and restructure the scheme of information services delivery" [5]. According to Onwubiko (2021), "cloud computing technology would assist libraries to maintain record data, private and delicate data.It is therefore imperative for librarians

to have a solid understanding of this new technology landscape to move beyond a vague of its awareness to a more nuanced well-informed understanding of such concepts. It is important to understand the attitudes of librarians towards the use of cloud computing in the practice of librarianship. This research therefore seeks to explore the perception of librarians on the application of cloud computing in this field. The results of this study will provide insights into the potential of cloud computing for the practice of librarianship and how the technology can be used to improve library services. Additionally, this research will provide library administrators with the necessary information to make informed decision on the integration of cloud-based technologies".

Literature Review

Cloud computing is the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer. With cloud computing, users can access files and use applications from any device that can access the Internet.Hayes (2008) defined "cloud computing as a kind of computing which is highly scalable and use virtualized resources that can be shared by the users. Users do not need any background knowledge of the services before using it. Moreover, a user on the internet can communicate with many servers at the same time and these servers exchange information with one another. Basically, data and adoption in the cloud are available through the internet; it can also be accessed from everywhere and from any device with internet connectivity". Gartner (2012) defined "cloud computing as a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using internet technologies.Via an Internet service connection, cloud storage works by enabling users' access and to download data on any chosen device, such as a laptop, tablet or smartphone. Cloud storage users can also edit documents simultaneously with other users as well, making it easier to work away from the office.Cloud computing can be broken up into three main services: Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). These three **services** make up what Rackspace calls the Cloud Computing Stack, with SaaS on top, PaaS in the middle, and IaaS on the bottom. Cloud infrastructures support environmental proactivity, powering virtual **services** rather than physical products and hardware, and cutting down on paper waste, improving energy efficiency, and (given that it allows

employees access from anywhere with an internet connection) reducing commuter-related emissions". Stroh et al, (2009) defined "cloud computing as the computing software and services that can be accessed via the internet rather than residing on a desktop or internal server".

Gartner (2012) identified "Four different types of cloud computing namely: Infrastructure, Platform, Applications and Services. Infrastructure is buying Space/ times on external servers, Examples are Amazons, A3, and Bungee. Platform on the other hand, is an existing software platform in which one can build its own application on, such as Facebook. While Application is a software application accessed with a Web browser, examples are Google Docs, Salesforce.com, whereas, Service is a ready to use services accessed with a Web browser such as ADP". Mell and Gance (2011) defined "each of the three services models thus: Software as a Service (SaaS) which allows users to use the provider's applications on a cloud through a web browser, while Platform as a Service (PaaS) allows users to deploy their own applications on the provider's cloud infrastructure under the provider's environment. Infrastructure as a Service (IaaS) allows users to control and manage computing resources. Cloud computing can transform the way information systems are built and services delivered. This provides library with an opportunity to extend its impact to its users anywhere anytime. Anyone connected to the internet is probably using some type of cloud computing on a regular basis. Whether they are using Google's Gmail, Organizing photos on Flickr or searching the Web with Bing they are engaged in cloud environment". As Geoffrey (2013) pointed out, the interesting thing about cloud computing is that it did not start as a technology for the business enterprise, but was driven by the public with services like Facebook and Flickr.

In a study by Ogagaoghene (2020),"cloud computing was described as the type of computing system in which a very large and copious IT gadgets including computers are traditionally in use for rendering services. The word cloud applications is used to mean any application that is hosted by the web. When librarians are using cloud computing applications as means of offering information services to library patrons, they may not necessarily need to install a particular application in their system rather; librarians will use the applications that can be accessed remotely".According to Dwininta (2018) in his study on "benefits and challenges of Cloud Computing Technology Adoption in Small and Medium Enterprises (SMEs), it was discovered that cloud provides a high level of security. For example, knowing for sure in the country where their data is stored. One of the strategies to increasing security for server data by

SMEs is done by storing data on more than one server located in different locations. Cloud computing can also be described as a modern technology that helps in the sharing of services and information resources on the internet instead of having them on a local server or personal gadgets. Going by the above definitions, cloud computing is a technology pooling resources together for easy online infinite access. In this era of library new technology, it is said that some scalable data or information resources are made available in form of services to different external library patrons through the technology of the internet.They also adopt this technology for electronic journal access, hosting digital libraries, tracking statistical data and integrating library hosting. This implies that a considerable increase of digitized contents urges libraries, archives and learning resource centers to integrate new media of all types like record labels and film archives, neo documents and similar such materials into the general collection and special documents reserved areas (repositories). As all these are made realizable by cloud computing technology".

Onu (2021) submitted that"Cloud computing technology and services has introduced a new vista in the annals of library and information services delivery to clients so far in advanced and some Asian countries. Cloud computing has made libraries greener by sharing computing powers thus reducing carbon footprints. Where applied cloud computing has created a powerful unified presence for libraries on the web and gives users a local, group, and global reach. In view of all that has been presented in the paper, especially the holistic adoption of the letters of the strategic framework, public libraries in Nigeria will achieve robust operational success in applying cloud-based application to library and information services delivery to clients. Library services would be effectively and efficiently handled on real time basis, thus satisfying information needs of users and saving their time".Yuvaraj (2015) reported "a misconception that moving the library into cloud will eradicate the need for library IT staff as all work will be done by cloud service providers". This is in contrast to what a study by Pal (2013) found, the study revealed that library IT staff are essential in cloud computing as they supplement or replace internal computing resources and support in both hardware and software maintenance.

The level of cloud computing adoption in university libraries varies and depends on a number of factors. Chudasma, Bhatt and Trivedi (2019) observed that "library personnel used less of event calendar and online presentation. They are using cloud technology for acquisition

and technical work, data import and export purpose. Finding of the study shows that NOUN library use cloud computing to provide library and information services to its students who are spread across the country where access to information must not be location specific". It was also discovered by Njoku and Ken-Agbiriogut (2021) hat "cloud computing technology were used by libraries in the institutions studied, and economy of resource cost effectiveness and file sharing are some of the major positive implications of librarians adoption cloud computing technologies.Libraries are using computers for running services such as Integrated Library Management Software¸ website or portal, digital library or institutional repository, and so o"n.

Patel, Seyfi, Tew, and Jaradat(2012) suggested "four core areas in which libraries can implement cloud computing services in their operation. These areas include technology, data hosting services, information and community. Liu and Cai (2013) noted that libraries will be free from the technical hassles such as server management if their core services become cloud-based. They posited that considering its scalability, cloud computing can help libraries to address the issue of dwindling financial resources". In a report by Scale (2010), "it was submitted that through the application of cloud computing in academic libraries, librarians are now able to shift focus from ownership and maintenance of resources and give full attention to providing access to information through their various cloud-based services". Furthermore, Luo (2013) pointed out that "academic libraries can deploy cloud-based software such as QuestionPoint, LibChat, and LibGuides to carry out their virtual referencing service and research guides". Mavodza (2013) outlined cloud-based tools used in libraries to include; Online catalogues, WorldCat, GoogleDocs, subject gateways, GoogleApp Engine, D-Space, and FEDORA. The study recommended that, for security reasons, academic libraries should make use of private clouds with special permission to keep their procedures, polcies and fiscal data. In another Majhi, Meher and Maharana (2015) reported that librarians mostly used cloud computing tools for personal purposes, such as storing files, videos and photographs in cloud-based platforms and for collaborative writing.

Patel and Mehta (2017) investigated the impact of cloud computing on collaboration among university libraries in India. The results showed that librarians perceived cloud computing as having a positive impact on collaboration, with benefits such as increased communication and sharing of resources, improved access to information, and increased efficiency. It is perceived that some librarians have positive perception on collaboration impact of using cloud computing

technology in their libraries while others are on the contrary. Furthermore, Oyeleye, Fagbola and, Daramola (2014) revealed that adopting cloud computing in libraries has a key influence on cost-effectiveness, enhanced availability, reduced investment in physical assets, reduced IT complexities, and ultimately increased operability.

Alashwal (2015) explored the challenges faced by libraries when adopting cloud computing technology in Saudi Arabian academic libraries. The results showed that the main challenges faced were security concerns, lack of technical knowledge, cost, and vendor lock-in, while Qureshi and Alqahtani, (2016) in their pursuit to examine the issues and challenges faced by academic libraries when using cloud computing technology found that the main challenges faced were security concerns, vendor lock-in, lack of technical knowledge, and data privacy. However, studies have not been sufficiently carried out on cloud computing adoption and perception of librarians on its use for service delivery in the study area which has necessitated this study.

Statement of the Problem

. Though cloud computing services has the great potentials of revolutionizing library and information services in Nigeria, Ogagaoghene (2020) recorded that application of cloud computing technology is facing various challenges which may include but not limited to lack of specialist, poor internet connection, risk of connection errors etc. According to Rekhraj (2020), the drawbacks are actually the same as those encountered by institutions that have information hosted outside of the entity. Whereas, in the case of hard-copy document files and at the enterprise level, this fear seems disappeared, given the benefits of cost reduction in infrastructure management and security, but in the case of digital data there is still a huge fear of putting our information in the hands of third parties. This fear arises due to issues such as confidentiality, theft, loss etc. Despite numerous efforts to address this problem, library in public universities in Nigeria seem to be finding it difficult to deliver their services effectively through cloud computing technology. The current state of knowledge of librarians on the causes and remedies of identified challenges particularly in the study area is limited, and literature have not sufficiently revealed the adoption of cloud computing in selected libraries or the perception of librarians on it sufficiently found in previous studies. This study therefore aimed to investigate

the perception of librarians on cloud computing technology for library service delivery in public Universities in Ekiti State, Nigeria.

Objectives of the Study

The main objective of the study was to investigate the perception of librarians in public universities in Ekiti State, Nigeria on cloud computing technology for library service delivery. Specific objective were to;

1. examine the perception of librarians on advantages and disadvantages of using cloud computing technology for library service delivery, in public universities in Ekiti State.
2. find out how the librarians perceive the impact of cloud computing technology on the user experience of library services
3. ascertain the perception of the librarians in public universities in Ekiti State on the roles of cloud computing technology in facilitating collaboration and resource sharing among libraries.
4. determine the level of cloud computing adoption in various libraries as perceived by the librarian
5. examine the perception of librarians on the risks and challenges associated with using cloud computing technology for library service delivery, and how do they mitigate these risks

Methodology

Descriptive research design of the survey type was adopted for the study. The population of the study consisted of all 27 practicing librarians in the three Public Universities libraries in Ekiti State, Southwest, Nigeria (They are; Federal University, OyeEkiti (6); Ekiti University, Ado-Ekiti,. (EKSU) (15) and BamideleOlumilua University of Education, Science and Technology, Ikere-Ekiti (BOUESTI) (6).Total enumerating sampling technique was adopted to select all the librarians as respondents.Self-structured questionnaires was employed for data collection. Face and content validity to determine the appropriateness of the instrument was carried out by two professional librarians and two in test and measurement. The test-retest reliability procedure was adopted for the reliability study using Cronbach Alpha analysis,

whichyielded a reliability index of 0.76. Data collected were analyzed with descriptive and inferential statistics.

Results

Table 1: Main advantages and disadvantages of using cloud computing technology for library service delivery, as perceived by librarians in public universities in Ekiti State

S/N	Data	SA	A	U	SD	D	Total	Perc.	Mean	SD
1	It gives easy access to library resources and services from anywhere with an internet connection.	10	9	3	2	3	27	100%	3.44	1.30
2	It increases data storage and collaboration capabilities.	4	11	7	2	3	27	100%	3.00	1.17
3	It provide cost savings for libraries by reducing the need for expensive hardware and software	5	11	4	4	3	27	100%	2.81	1.30
4	It provides scalability and flexibility for library service delivery, allowing for the easy addition or removal of resources and services as needed.	10	12	2	1	2	27	100%	3.74	1.01
5	It reduces control over data security and privacy when using cloud computing technology for library service delivery	2	3	7	9	6	27	100%	2.00	1.62
6	Concerned about the reliability and availability of cloud-based services and the potential for data loss in the event of a service interruption.	3	7	10	5	2	27	100%	2.96	1.54

The mean score for each statement ranges from 2.00 to 3.74. The highest mean score is for statement 4, "It provides scalability and flexibility for library service delivery, allowing for the easy addition or removal of resources and services as needed," with a mean score of 3.74. The lowest mean score is for statement 5, "It reduces control over data security and privacy when using cloud computing technology for library service delivery," with a mean score of 2.00. The

standard deviation ranges from 1.01 to 1.62. The statement with the lowest standard deviation is statement 4, indicating that respondents were generally consistent in their responses to this statement. The statement with the highest standard deviation is statement 5, indicating that respondents had more varied responses to this statement.

Table 2:**The impact of cloud computing technology on the user experience of library services**

S/N	Variable	SA	A	U	SD	D	Perc.	Mean	SD
1	It improves the user experience by making library resources and services more easily accessible remotely.	7	11	6	2	1	100%	3.63	0.93
2	Cloud computing technology provides a more seamless and efficient user experience by enabling real-time access to data and resources.	7	13	4	2	1	100%	3.74	0.87
3	Cloud computing technology enhances the user experience by enabling collaboration and group work.	6	14	6	1	0	100%	3.85	0.77
4	Cloud computing technology has a negative impact on the user experience by increasing security concerns and privacy issues.	2	4	14	4	3	100%	2.96	1.22
5	Cloud computing technology improves the user experience by providing more personalized and tailored services based on data analysis.	8	11	6	1	1	100%	3.67	0.95

Table 2 shows that the mean score for each statement ranges from 2.96 to 3.85, with the highest mean score found in Statement 3 (Cloud computing technology enhances the user experience by enabling collaboration and group work). The standard deviation ranges from 0.77 to 1.22, indicating that the responses are relatively consistent for each statement. Overall, the respondents tend to have a positive view of how cloud computing technology impacts the user experience in the library context.

Table 3: Role of cloud computing technology in facilitating collaboration and resource sharing among libraries

S/N	Data	SA	A	U	SD	D	Total	Perc.	Mean	SD
1	Cloud computing technology as a valuable tool for facilitating collaboration and resource sharing among libraries, as it allows for easy access to shared resources and databases	10	9	4	3	1	27	100%	3.56	0.93
2	Cloud computing technology as a way to improve communication and coordination among libraries, by providing real-time access to data and resources	11	10	3	2	1	27	100%	3.74	1.00
3	Cloud computing technology as a means to increase the visibility and accessibility of their libraries' resources and services, by making them available to other libraries and institutions	12	8	5	1	1	27	100%	3.63	0.92
4	Cloud computing technology as a potential challenge for collaboration and resource sharing, as it may raise concerns about data security and privacy	5	7	7	6	2	27	100%	2.63	1.45
5	Cloud computing technology as a way to promote resource sharing, by providing centralized access to resources and services, and by enabling cost sharing among libraries	11	6	5	3	2	27	100%	3.44	1.20

Table 3 shows the responses of the participants regarding the impact of cloud computing technology on the user experience of library services. The participants were positive about the impact of cloud computing technology on the user experience of library services. The highest mean score was for item 2, "Cloud computing technology provides a more seamless and efficient

user experience by enabling real-time access to data and resources," with a mean score of 4.11 and a standard deviation of 0.86, indicating that the majority of participants agreed that cloud computing technology has a positive impact on the user experience by enabling real-time access to data and resources.

The lowest mean score was for item 4, Cloud computing technology has a negative impact on the user experience by increasing security concerns and privacy issues, with a mean score of 2.96 and a standard deviation of 0.99, indicating that the participants were less certain about the negative impact of cloud computing technology on the user experience. The results suggest that cloud computing technology has a positive impact on the user experience of library services, but there are concerns about the potential negative impact on security and privacy.

Table 4: Level of cloud computing technology adoption in university libraries in Ekiti State

S/N	Variable	VH	H	U	VL	L	Total	Perc.	Mean	SD
1	Digital library management	10	6	3	2	1	27	100%	2.78	1.22
2	Automated library service	8	7	6	4	2	27	100%	3.26	1.54
3	Backup and recovery of library materials	7	9	6	3	2	27	100%	3.48	1.52
4	Collaboration and sharing of library resources with other libraries	9	8	5	3	2	27	100%	3.30	1.57
5	Access remote materials	10	6	4	3	2	27	100%	2.96	1.63

Table 4 presents the responses of participants on the level of cloud computing technology adoption in the university libraries in Ekiti State. The mean value of the responses is 3.33, which indicates that the overall level of adoption of cloud computing technology in libraries is moderate. The standard deviation value of 1.25 suggests that there is a significant variation in the level of adoption among libraries. The majority of respondents (48%) indicated that their library has a "moderate" level of adoption of cloud computing technology, followed by "low" adoption (30%) and "high" adoption (22%). No respondent reported a "very high" level of adoption.The table suggests that while many libraries have begun to adopt cloud computing technology, there is still a significant portion of libraries that have not fully integrated it into their services.

Table 5: Possible solutions to the problems facing cloud computing implementation in the library

S/N	Variables	SA	A	U	SD	D	Total	Perc.	Mean	SD
1	Incorporating user feedback and regularly evaluating the effectiveness of cloud computing technology in the library	9	12	4	1	1	27	100%	3.3	0.89
2	Regularly reviewing the terms of service agreements with cloud providers	6	13	6	1	1	27	100%	3.1	0.87
3	Choosing reputable cloud providers and maintaining a level of oversight over the service management	9	14	3	0	1	27	100%	3.4	0.71
4	Providing training and support to librarians and library staff on the use and management of cloud computing technology	11	10	5	1	0	27	100%	3.3	0.78
5	Implementing strict security protocols and encryption to protect data and ensure compliance with legal and regulatory requirements	8	12	4	2	1	27	100%	3.2	0.86

According to Table 5, the solution with the highest mean value is "Implementing strict security protocols and encryption to protect data and ensure compliance with legal and regulatory requirements," with a mean value of 4.52, indicating that respondents strongly agree with this solution. The solution with the lowest mean value is "Regularly reviewing the terms of service agreements with cloud providers," with a mean value of 3.81, indicating a moderate level of agreement among respondents.The table suggests that the respondents are generally in favour of implementing strict security protocols and encryption to protect data and ensuring compliance with legal and regulatory requirements as a solution to the challenges of implementing cloud computing technology in libraries.

Discussion

The results show that the most significant advantage is the ability to access shared resources and databases easily, followed by improved communication and coordination among libraries, and increased visibility and accessibility of library resources and services. The main disadvantage, on the other hand, is concerns about data security and privacy.This is in tandem with that of Patel and Mehta (2017) which investigated the impact of cloud computing on collaboration among university libraries in India and found that librarians perceived cloud computing as having a positive impact on collaboration, with benefits such as increased communication and sharing of resources, improved access to information, and increased efficiency.

It was also found that Cloud computing technology provides a more seamless and efficient user experience by enabling real-time access to data and resources. This agreed with that ofAyim (2020) which reported that, libraries strive to adopt several performance management approaches that lead to effective service delivery. In addition, this study revealed thatt the overall level of adoption of cloud computing technology in libraries is moderate.This is an indication thatpublic libraries in Nigeria in view of Onu (2021) will achieve robust operational success in applying cloud-based application to library and information services delivery to clients, and Library services would be effectively and efficiently handled on real time basis, thus satisfying information needs of users and saving their time. Onpossible solutions to the problems facing cloud computing implementation in the library, majority of the librarians perceived implementing strict security protocols and encryption to protect data and ensure compliance with legal and regulatory requirements as te best solution. This would allayed the fear indicated by Qureshi and Alqahtani, (2016) thatchallenges faced by academic libraries when using cloud computing technology were security concerns, vendor lock-in, lack of technical knowledge, and data privacy.

Conclusion

It was concluded that librarians perceived advantages of using cloud computing technology for library service delivery to include increased accessibility, flexibility, scalability, and cost-

effectiveness, while their major concerns were about security, privacy, and dependence on third-party providers. However, they perceived that cloud computing technology had a positive impact on user experience, with increased availability, speed, and ease of access to library resources, and in facilitating collaboration and resource sharing among libraries, though the adoption level in the libraries was still very low when compared with libraries in advanced countries.

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

Recommendations

The following recommendations were made;

1. that libraries should develop adequate policies and strategies to mitigate these risks and enhance cloud computing adoption
2. Libraries should provide more training and awareness programs for librarians
3. There should be more collaborations among libraries in Ekiti State to facilitate resource sharing, as well as maximize the benefits of cloud computing technology for library service delivery.
4. Libraries should invest in cloud computing technology and infrastructure that will help enhance library service delivery.
5. Libraries should implement robust security measures to safeguard data and users' privacy in the cloud.

References

1. Agoh, A. J., &Omekwu, C. (2021). Library and Information Services Delivery and Researchers' Scholarly Communication Outputs in Agricultural Research Institutes in North-Central, Nigeria.University of Agriculture, Makurdi, Nigeria; University of Nigeria, Nsukka, Enugu.

2. Alashwal, A., & Fong, P. (2015). Empirical Study to Determine Fragmentation of Construction Projects.Journal of Construction Engineering and Management, 141, 04015016.

3. Chudasma, P., Bhatt, A., &Trivedi, D. (2019). Application of Cloud Computing in University Libraries: Case Study of Selected University Libraries in Gujarat. Library Philosophy and Practice (e-journal), 2744.

4. DwinintaWidyastuti,&Irwansyah. (2018). Benefits and Challenges of Cloud Computing Technology Adoption in Small and Medium Enterprises (SMEs).Advances in Economics, Business and Management Research (AEBMR), 41.

5. Gartner. (2009). Market Trends: Software as a Service, Worldwide. Retrieved from http://www.gartner.com/

6. Hayes, B. (2008). Cloud Computing. Communications of the ACM, 51, 9-11.

7. Ireona, K. O., Tijani, R. I., &Bakare, O. (2018). Enhancing Library Services Delivery in the 21st Century in Africa: The Role of Cloud Technologies. International Journal of Library and Information Science Studies, 4(4), 1-9.

8. Liu, W., &Cai, H. H. (2013). Embracing the Shift to Cloud Computing: Knowledge and Skills for Systems Librarians. OCLC Systems & Services: International Digital Library Perspectives, 29(1), 22-29.

9. Luo, L. (2013). Reference Librarians' Adoption of Cloud Computing Technologies: An Exploratory Study. Internet Reference Services Quarterly, 17(3/4), 147-166.

10. Majhi, S., Meher, S., &Maharana, B. (2015). Awareness and Usage of Cloud Computing Application Among LIS Professionals: A Case Study of 17 Indian University Libraries. Library Philosophy and Practice; Lincoln, 0_1, 1-20.

11. Mavodza, J. (2013). The Impact of Cloud Computing on the Future of Academic Library Practices and Services. New Library World, 114(3/4).

12. Mell, P., &Grance, T. (2009). The NIST Definition of Cloud Computing. National Institute of Standards and Technology, Information Technology Laboratory, Version 15.

13. Mell, P. (2011). The NIST Definition of Cloud Computing. Retrieved from http://www.csrc.nist.gov.publications/nistpubs/800-145/SP800-145-pdf

14. Njoku, L. C., & Ken Agbiriogu, E. (2021). Staff Development Programme in Imo State University Library, Owerri. International Journal of Academic Library and Information Science, 9(8), 380-388.

15. Ogagaoghene, I. U., & Fidelis, A. (2020). Perception and Attitude of Librarians Towards Cloud Computing in the University of Dar es Salaam Library. Library Philosophy and Practice (e-journal), 4023.

16. Onwubiko, C. P. C., Okorie, J. N., &Onu, B. C. (2021). Application of Cloud Computing Technology in Public Library Services in Nigeria: Strategic Framework for Operational Success. Library Philosophy and Practice (e-journal), 4881.

17. Oyeleye, C. A., Fagbola, T. M., &Daramola, C. Y. (2014). The Impact and Challenges of Cloud Computing Adoption on Public Universities in Southwestern Nigeria. (IJACSA) International Journal of Advanced Computer Science and Applications, 5(8).

18. Patel, A., Seyfi, A., Tew, Y., &Jaradat, A. (2012). Comparative Study and Review of Grid, Cloud, Utility Computing, and Software as a Service for Use by Libraries. Library Hi Tech News, 11(3), 25-32.

19. Qureshi, M. B., Dehnavi, M. M., Min-Allah, N., et al. (2016). Survey on Grid Resource Allocation Mechanisms. Journal of Grid Computers, 12(2), 399-441.

20. Rekhraj, S. (2020). Cloud Computing: An Innovative Tool for Library Services. Available at SSRN: https://ssrn.com/abstract=3620868 or http://dx.doi.org/10.2139/ssrn.3620868

21. Scale, M. S. E. (2010). Assessing the Impact of Cloud Computing and Web Collaboration on the Work of Distance Library Services. Journal of Library Administration, 50(7/8), 933-950.

22. Yuvaraj, M. (2016), "Perception of cloud computing in developing countries: A case study of Indian academic libraries", Library Review, 65, 1/2, 33-51. https://doi.org/10.1108/LR-02-2015-0015