

Original Article

# Contributive Effects of Cloud Computing to Positive Changes of Students' Academic Information Accessibility

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**Abstract** - Cloud computing is seen as the delivery of computing services such as servers, storage, databases, networking, software, analytics, and intelligence via the use of the Internet “the cloud” to offer faster innovation, flexible resources, and speedy retrieval processes. This research work examined how cloud computing can bring about positive changes to students' academic information storage, retrieval, and sharing in Nigeria tertiary institutions. 100 students were sampled among all tertiary institution students in Lagos State. The Data collected were analyzed using simple clustered columns (Bar chart). Overall findings indicated that there was high agreement towards the fact that cloud computing is accessible free and can be accessed by an authorized owner or users, and it is always available at any time of need. Conclusions drawn from the findings suggested that the use of cloud computing has really helped students positively in their academic information storage, retrieving, and sharing purposes. Recommendation implored teachers to intensify further on the application of cloud computing in the classroom and how it is to be used to improve their information accessibility and sharing.

**Keywords** - Cloud computing, Academic information, Student Accessibility, Information Accessibility.

## I. INTRODUCTION

For years, the student's academic information was kept in different bulky files and folders but later discovered the many different ways through which computers could be more helpful as opposed to the use of the cupboards, files, folders, and tables, which showed crystal disparity in the use of old way of keeping records of students and that of the use of computers and cloud computing systems. The traditional use of the computer to keep or store documents in the local disk might be sometimes difficult to retrieve as a result of several dangers to the particular computer or disk problem. The limited features of traditional computers gave birth to cloud computing, especially in the educational system. The adoption of effective computing

in education and as well as the need to kick against these limitations, led to a rise in the demand for more feasible and user-friendly technologies like grid computing, distributed computing, and autonomic computing, amongst others, until cloud computing evolved.

There is no doubt that one of the biggest achievements of this generation is “Cloud Computing” amongst others. As a result of this, educational institutions throughout the world have become highly dependent on information technology to provide its numerous services. Successful transition to cloud computing in academic institutions depends on a good definition for transition strategies [1].

This paper focused on the Contributive Effects of Cloud Computing to Positive Changes of Students' Academic Information Accessibility. It proffers answer to the extent to which cloud computing can be of help to improve retrieving vital academic information and how the information on the cloud will be accessible to only authorized persons. The study provides the solution to the problems students, parents, and other organizations do face when information is needed about a student or group of students for their academic requirements and progresses. The study was guided by the following research questions:

- ✓ To what extent has the use of cloud computing improved academic information retrieval?
- ✓ How is the academic information on the cloud accessible to only authorized people?
- ✓ To what extent is the academic information available to the students at the right time?

## II. RELATED LITERATURE

Cloud computing is a vast subject, and as such various researchers, authors and scholars have tried to define the concept based on their views. According to [2], “cloud computing is a sort of computing which is exceedingly versatile and uses virtualized assets that can be shared by the clients”. Cloud computing is considered the evolution of a variety of technologies that have come together to change organizations' approaches for building their IT infrastructures. Cloud computing is seen as an emerging



commercial infrastructure and internet-based cost-efficient computing, where information can be accessed from different web browsers by customers according to their requirements viewed by some scholars. Also, Reference [1] cited that “The cloud computing is easier computing service with less infrastructure complexity”. According to [3] who said that “cloud computing is an emerging technology paradigm that migrates current technological and computing concept into utility-like solutions similar to electricity and water systems”. Cloud computing is the use of virtualized resources in delivering hosted services over the network to the clients with the help of an internet connection. However, cloud computing entails using a network of remote servers hosted on the internet as opposed to a local server, and as such providing online services such as back-up, storage, accessibility, and collaboration which allows multiple users to work on and edit documents at the same time. Therefore, cloud computing technology has been a disruptive technology that stands to provide various benefits to organizations, to lower initial investment costs, to get resources on demand, to provide scalability service, and to save operational costs. Cloud computing, in general terms, is defined as anything that involves delivering hosted services over the internet. The idea of cloud computing is based on a very fundamental principle of reusability of IT capabilities. Actually, there are many definitions for cloud computing, but the notion revolves around enabling users or customers to get computing services by overcoming the complexities of computing resources (e.g., software, hardware, storage, and infrastructure).

According to [4], “Cloud computing can be defined as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, application, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”. Misconception about cloud computing has been considered as the internet often arises, and it is important to know the difference. The Internet is a global network of billions of interconnected computers around the world. It offers many resources and services, such as the World Wide Web and email, and it is actually a network of networks, which connects billions of computers belonging to millions of public, private, government, and academic networks. Internet uses the TCP/IP (Transfer Control Protocol/Internet Protocol) for the communication between interconnected computers. At the same time, Cloud computing is the emerging technology of delivering many kinds of resources as services, mainly over the Internet. Delivering party is referred to as the service providers, while the users are known as the subscribers. However, the Internet basically is a network of the worldwide networks of computers, but cloud computing uses the internet as a medium to deliver resources that are normally available only locally for use to anyone who requires it and is connected to the internet.

Cloud hosting deployment models represent the exact category of the cloud environment and are mainly distinguished by the proprietorship, size, and access. It tells about the purpose and the nature of the cloud. In order to know which deployment model matches your website requirements, it is necessary to know the four deployment models. This cloud model is composed of four deployment models according to [5]: Public Cloud (the type that opens for public), Private Cloud (the type that permits only the authorized users), Hybrid Cloud (the type that combines private, public, or community clouds), and Community Cloud (the type that shared within the organization which belongs to a particular community). We need to know the kind of student academic information that is essential to be stored and retrieved in the cloud.

Students’ academic information is seen as an integral part of the students and institution; in fact, the information is/is important to the institution and more to students themselves. The students’ academic information could be students’ grades, grade reports, transcripts, academic honor, academic progress, academic advising, graduation requirements, student identification number, and others. Education is very necessary for individual students and also preparing of the students with the needed knowledge and information for their professions. This is one of the major essential aims and goals of any institution. In order to do this successfully, there are processes institutions should take into consideration that will make the information retrieving accessible and available easier and comfortable. Several types of research have been carried out on students’ academic information and institution; the results have shown that technology and technological facilities have great impacts and effects on service quality on student’s perceptions [6]. Giving a good quality of service to students has been a common topic of interest for many researchers [7], [8], [9], [10], [11], and [12]. The quality of service in the institution will bring about easy retrieving, accessibility, and availability of students’ academic information. In the educational sector, quality of service is regarded as a fundamental aspect of educational excellence[13]. At times, academic information of the students might be available on the internet or institution websites but not be accessible by the students who are in need of such information. So, students’ academic information accessibility is as important as the information itself.

Students’ academic information accessibility is an important theme in the kinds of literature. To [14], it is possible that information is available on the internet or electronically but not possible to lay hands on them. The more accessible students’ academic information, the better the students and their parents become in terms of their children's progress in an institution. Many researchers like [15] and [16] also observed the same in their studies. That is why [14] further said that the availability of information does not imply its accessibility because, at the time, the source of information may be available but not to have access to it. Reference [16] in his study identified accessibility as one of the prerequisites of information use. Information retrieval, availability, and accessibility should be made easy and possible for those concerned such as

students, parents based on the request and validity of the right owner of the information and what the information is sought for.

**III. MATERIALS AND METHODS**

This study employed a descriptive research design. The population of the study involved all tertiary institution students within Lagos Metropolis. 100 students were sampled from three tertiary institutions (Lagos State University, 50), Adeniran Ogunsanya College of Education, 25), and Lagos State Polytechnic, 25), respectively, using a stratified sampling technique approach. A self-Structured questionnaire was the major instrument used to collect data. The instrument was subjected to face and content validities using a sample of the respondents as well as an expert in the field of computing, respectively. 7.89 reliability index was gotten after the instrument was tested under Chronbach Alpha reliability analysis. The data collected were collated and analyzed using pictorial representation (Simple Clustered Columns Bar Chart) to test the formulated research questions.

**IV. RESULTS**

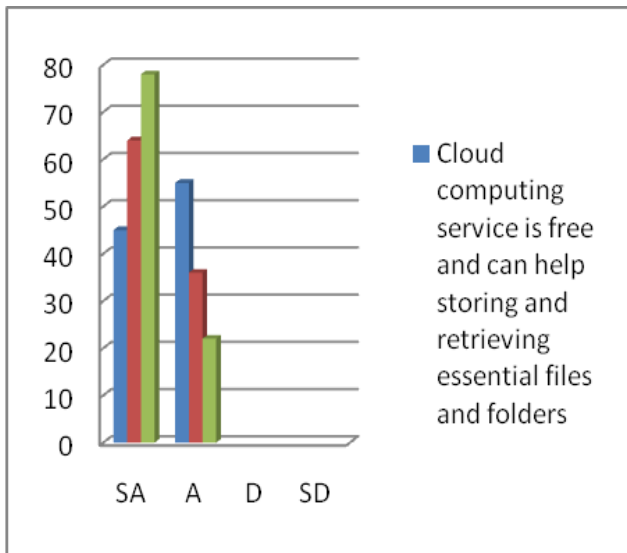


Fig. 1 Cloud computing is helping to improve information storing and retrieving

Fig. 1 depicts the response of respondents towards how cloud computing can help improve storing and retrieving of information. As it shows from figure 1, all participants agreed strongly or normally that cloud computing service is free and can help store and retrieve essential files and folders (100 agreed and strongly agreed to this), also that it is accessible to the user anytime (100 agreed and strongly agreed to this) and finally that it is easy to use by the students (100 agreed and strongly agreed to this). This offers an answer to the first research question that says, “To what extent has the use of cloud computing improved retrieving academic information?”

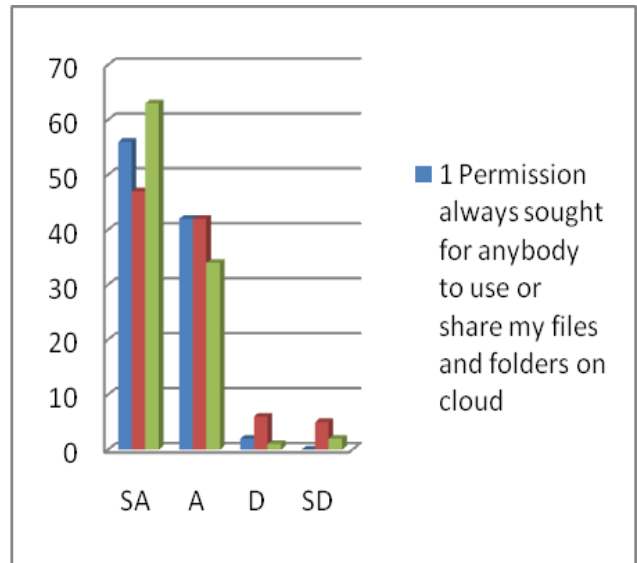


Fig. 2 Cloud computing in retrieving information by authorized users

Fig. 2 illustrates how information on the cloud would be retrieved by an authorized user. Figure 2 presents that permission always sought for anybody to use or share my files and folders on the cloud (98 agreed and strongly agreed to this while only 2 disagreed and strongly disagreed to this); at times, I suspect intruders trying to gain access to my account on cloud (89 agreed and strongly agreed to this while only 11 disagreed and strongly disagreed to this), and I used to be informed if anybody makes changes to my folders on cloud (97 agreed and strongly agreed to this while only 3 disagreed and strongly disagreed to this). This means that retrieving information on the cloud is monitored and improved to kick against just anybody having access to information. This satisfies the research question that says, “How the academic information on the cloud is accessible to only authorized people?”

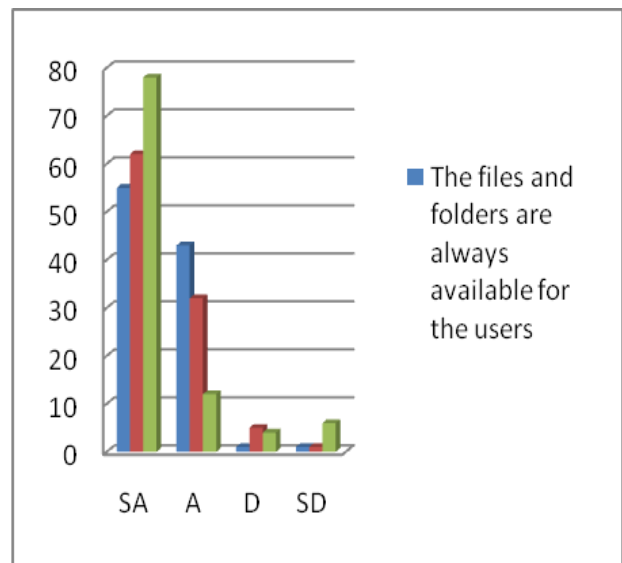


Fig. 3 Cloud computing is making information available at any time

Fig. 3 describes how cloud computing would make information available to owners at normal times. Figure 3 presents that the files and folders are always available for

the users (98 agreed and strongly agreed to this while only 2 disagreed and strongly disagreed to this), another person can share the files or folders provided the owner gives the permission (94 agreed and strongly agreed to this while only 6 disagreed and strongly disagreed to this), and it never fails to be available and accessible to the user any time (90 agreed and strongly agreed to this while only 10 disagreed and strongly disagreed to this). This provides the solution to the research question that says, "To what extent at which the academic information is/are available to the students at the right time?"

## V. DISCUSSION

The result of the Analysis of data showed that students' use of cloud computing plays a major role in their academic information, storage, availability, and accessibility. It means that it has a positive impact on their information kept on the cloud. Results obtained from the analysis showed that students use the cloud to store, retrieve, and share information via the cloud. [1], supported this when they say, "Management of learning activities of students like study pattern and individual models becomes easy with the help of cloud computing. However, students are presented with opportunities to store, retrieve and share their academic information on the cloud in order to save cost, risk, and time respectively. In the same trend, it was observed that the rate at which students improve when exposed to cloud computing was so high (see fig.1). Most of the responses from the students showed that cloud computing has really improved their information retrieval greatly. [4] stated that "Cloud computing provides resources and capabilities of Information Technology (e.g., applications, storages, communication, and collaboration) via services offered by Cloud Service (CSP)". The findings also showed that in cloud computing, the restriction plays a major role, especially to the owner of the information (students). This implies that efforts have been put in place to block away intruders from the information that is not meant for them. That is why the need of authorized permission is highly needed before such information can be given out. This assertion is in line with the view of [17] over the releasing of information on cloud computing. He opined that the action of information seeking heavily depends on the need, the perceived accessibility, sources, and information-seeking practice.

Hence - as revealed from the findings-, getting information by the students from cloud computing must be timely. This means that students get their information at the right time from the right source (authorized person). This finding was supported by the result of [18], [19] gotten from their research when they said, "the cloud allows us to access our work anywhere, anytime and share it.

## VI. CONCLUSION

The result from the findings of this study showed that cloud computing could be used to improve the students' academic information storage, retrieving, and sharing. It is far better used than concentrating on traditionally based

information processes that are not reliable or frustrating. Though cloud computing has a downside on how safe information is maintained yet, cloud computing as an exciting development is a significant alternative to today's educational problems in terms of information storage, accessibility, and sharing with less risk. The study will be beneficial to numerous numbers of stakeholders like students, teachers, school managers as well as government by providing Necessary Avenue for people to engage in cloud computing for the purpose of storing, accessing, retrieving, and sharing information with ease and proper monitoring by enforcing privacy and security on the information held on the cloud.

## VII. RECOMMENDATION

The following recommendations were made:

- ✓ Awareness courses should be put in place to alert students of the advantages derived from the use of cloud computing.
- ✓ Lecturers should do more in instilling the habit of using cloud computing platforms to store, retrieve and share essential information.
- ✓ More cloud platforms with easier accessibility and functionality should be developed.
- ✓ Orientation training programs should be organized by tertiary institutions at regular intervals so that the extreme users can improve their proficiency in the use of cloud computing for its academic resolves
- ✓ As technology is improving the tertiary institutions should also strive to improve with it. However, the curriculum should include foundation courses in cloud computing in order to help breed students that will efficiently use these emerging technologies as regards to their academics.

## REFERENCES

- [1] Haryani Siti, A., Shamsul Anuar M., Abdulkarem A., Abdulaziz A., Cloud Computing in Academic Institutions. ICUIIMC (IMCOM), (2013). Kota Kinabalu, Sabah, Malaysia.
- [2] Ercan, Tuncay., Effective use of Cloud computing in Educational Institutions. *Procedia Social and Behavioral Sciences*, 2 (2010) 938-942.
- [3] Khalil, Issa M.; Abdullah, K., and Muhammad, A. (2014), Cloud computing (A Survey). *Computers*, 3 (2014) 1-35. doi:10.3390/computers3010001.
- [4] Mell, Peter and Grance, Timothy., The NIST definition of Cloud computing. NIST special publication, (2011) 800-145.
- [5] Tilwani Mashook, Harshvardhan S., Nidhi Barot., A Survey on Cloud Computing, *National Conference on Latest Trends in Networking and Cyber Security, IJIRST*, (2017).
- [6] Al Khattab, S. & Fraij, F., Assessing Students' Satisfaction with Quality of Service of students information system, *management and marketing journal*, 1 (2011) 111-125
- [7] Oldfield, B. M., & Baron, S., Student perceptions of service quality in a UK university business and management faculty. *Quality Assurance in Education*, 8(2) (2000) 85-95.
- [8] Elliott, K. M., & Shin, D., Student satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management*, 24(2) (2002) 197-209
- [9] Arambewela, R. and Hall, J., An empirical model of international student satisfaction, *Asian Pacific Journal of Marketing and Logistics*, 21(4) (2009) 555-569.
- [10] Alves, H., & Raposo, M., The influence of university image on student behavior. *International Journal of Educational Management*, 24(1) (2010) 73-85.

- [11] Usman, A., The Impact of Service Quality on Students' Satisfaction in Higher Education Institutes of Punjab. *Journal of Management Research*, 2(2) (2010). Accessible at: <http://www.macrothink.org/journal/index.php/jmr/article/view/418/1470>
- [12] Mulalić, M., Prospects and Challenges of Private Higher Education in Bosniaan Herzegovina. *The Journal of International Social Research*, 5(20) (2012) 361–372.
- [13] Dyson, P., Farr, A. and Hollis, N.S., Understanding, measuring, and using brand equity *Journal of Advertising Research*, 36(6) (1996) 9-21.
- [14] Aguolu, C. C. and Aguolu, I. E., *Libraries and Information Management in Nigeria*. Maiduguri: ed.-Inform Services, (2002).
- [15] Slater, T. F., Sawyer, B. C. & Striuli, U., *Biochim. biophys. Acta*, 77, 383. *Students Information System, Management and Marketing Journal*, 1 (1963) 111-125
- [16] Allen., (1963). *Online Library*. Accessed Freruary, 2017. Available [onlinelibrary.wiley.com/doi/10.1111/j.1363091.1963.tb01204.x/abstract](https://onlinelibrary.wiley.com/doi/10.1111/j.1363091.1963.tb01204.x/abstract)
- [17] Kuhithau., *Kuhithau Model*, (1991). Accessed January 3, 2018. Availabl[https://en.wikipedia.org/wiki/Carol\\_Kuhlthau](https://en.wikipedia.org/wiki/Carol_Kuhlthau)
- [18] Yadav, K., *Role of Cloud Computing in Education*. *International Journal of Innovative Research in Computer and Communication Engineering*, 2(2) (2014) 3108-3112.
- [19] Adeleke Imran A, Muraina Ismail O. and Adegbuyi Kazeem K., *Adoption of Cloud Computing Technology for Effective University Administration in Nigeria*. *Current Journal of Applied Science and Technology*, 39(40) (2020) 1-8.