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Perception and Attitude of Librarians towards Cloud Computing in the University of Dar es Salaam Library

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Abstract

The study investigated the perception and attitude of librarians towards Cloud Computing in the University of Dar es Salaam library. Five research objectives were raised to guide this research work; some of which are determining the level of awareness of cloud computing by librarians, perception of cloud computing by librarians, attitude of librarians towards cloud computing and others. It applied a descriptive research design using quantitative approach. The population of the study was made up of 125 librarians but a census sampling method was employed to generate 94 respondents and only questionnaire was used to collect data. The study used Statistical Product and Services Solution (SPSS) program version 21 to generate percentages and frequencies from quantitative data which were presented in tables. The findings of the paper revealed that librarians at the University of Dar es Salaam are aware of Cloud Computing technology; they have positive perception about it and also receptive disposition towards cloud computing amongst others. It was therefore recommended that library heads should always encourage staff not to only be aware of new technologies but to take a bold step in applying these technologies. They should endeavour to sponsor staff for further studies, seminars and conferences.

Keywords: Cloud Computing, perception, attitude, librarians, University of Dar es Salaam.

Introduction

In the area of technology today, the world is geometrically and radically changing for good. All sectors in the economy are now beginning to think out of the box and inventing different ways of getting things done in a more effective and efficient ways. This, libraries and librarians have taken seriously as a primary task in order to comprehensively transform the library sector. Today, librarians talk about computerization, digitization, makerspace, cloud computing and other technological advancement. Cloud computing according to Yuvaras (2015) is a computing type 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. To Majhi, Meher & Maharana (2015), cloud

computing is a type of 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 (CC) is as simple as 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. Sudhier & Seena (2018) explained some as the concepts that facilitates cloud computing in our libraries which are IaaS (infrastructure as a service), PaaS (platform as a service), SaaS (software as a service) and DaaS (Desktop as a service). They used IaaS to mean an infrastructure of computer in virtual form, PaaS to mean an integrated platform for development, analysis, testing deployment and assisting of web appliances. SaaS is a business oriented model which encourages the development and support of software vendors. DaaS is seen to be an advanced platform ahead of SaaS.

From the above discuss, it is therefore clear that the concept of cloud computing cannot be overemphasized as it helps librarians to develop all kinds of services through the help of the internet. The resources may include but not limited to tools and applications like software, data, servers, databases, networking/internet, storage etc. Instead of the conventional and traditional way of keeping documents and files on a proprietary hard drive for future access, with cloud computing, storage is now made easy through saving in remote databases. Frankenfield (2019) supported this by submitting that cloud computing is called cloud computing because the information being provided is accessed remotely either in a virtual space or a cloud. A study by Huang, Liu & Liu (2012) revealed that with the help of network in cloud computing, learners are able to get a lot of information and communicate with each other quickly and easily while learning is no longer confined to the classroom. Although several studies have been conducted on different aspects of cloud computing such as Majhi, Meher & Maharana (2015) on awareness and usage, Ashktorab, & Taghizadeh, (2012); Agandi, Agandi, & Gull, (2013); Pal, (2013); Tritt, & Kendrick, (2014) and Yuvaras (2015) on problems and prospects, Swapna, & Biradar (2017) and Sudhier & Seena (2018) studied adoption of cloud computing technology, but none is yet to survey the perception and attitude of librarians towards cloud computing technology at the University of Dar es Salaam Library. Thus, this study is an attempt to address this gap. The study is aiming at determining the level of awareness of cloud computing by University of Dar es Salaam Library, to find out how university of Dar es Salaam librarians perceive cloud computing, to investigate the attitude of librarians towards the adoption of cloud computing, to find out the benefits of cloud computing in libraries and to navigate the challenges encountered in the adoption of cloud computing.

Statement of problem

The concept of cloud computing which is a service oriented technology, Internet supported and remote based is relatively new in some libraries in developed and developing countries. Adopting cloud computing by librarians will no doubt boost and enhance the services they render, this is hinged on the fact that with cloud computing, there won't be duplication of efforts, libraries will have a global outlook on the web and by extension optimization of library services will be guaranteed. To this end, no 21st century library wishes to be kept aloof in the implementation of cloud computing. This study is therefore carried out in order to investigate how librarians in the University Dar es Salaam perceive this new trend and also their attitude towards its adoption. The study is also very peculiar as it has not been carried out before in the University under investigation to the best of the researchers' knowledge.

Objectives of the Study

1. To determine the level of awareness of cloud computing by librarians of University of Dar es Salaam.
2. To find out how university of Dar es Salaam librarians perceive cloud computing.
3. To investigate the attitude of librarians towards the adoption of cloud computing.
4. To find out the benefits to users of cloud computing in libraries.
5. To navigate the challenges encountered in the adoption of cloud computing.

Literature review

Awareness of cloud computing by University of Dar es Salaam Library

The cloud computing which enables its users to have access to more robust computing by introducing flexibility and centralizing storage and processing has been seen to be popular in some libraries and unpopular in sister libraries. Patel (2014) on his part supported the fact that librarians are fully aware of the concept of cloud computing by stating that libraries have always welcomed cloud based services such as e-journal access, statistics tracking, digital library hosting and other allied services and activities. He further submits that the use of software as a service (SaaS) for instance has been in vogue since the year 2000 with the convergence of companies like serials solution. The cloud computing technology seems to be quite popular in libraries of the 21st century though may not be too visible in a few libraries in the developing countries. To this end, Seena & Sudhier (2014) noted that libraries around the world are aware and also use CC in a number of areas that could be unknown to them. For instance: website hosting, library automation, digital libraries etc.

On their part, Seena & Sudhier (2014) investigated attitude of library professionals on cloud computing applications: a study on the Kerala University Library. They therefore discovered that majority of library professionals precisely 42.16% are not aware of the CC technology though 21.57% of respondents studied have little knowledge. Muhammad et al (2017) while supporting the awareness of cloud computing by librarians documented that 75% of respondents firmly agreed that they are aware of how cloud computing works. Contrary to this view, Motamedian (2011) remarks in his study entitled users' perception towards cloud computing that 23% of his respondents were not in any way familiar with the concept of cloud computing which he saw as a reasonable high size. He therefore recommended more efforts by librarians in order to popularize the concept of Cloud Computing.

Perception of cloud computing

Librarians have mixed perceptions about the use of cloud computing technology. For instance Yuvaras (2015) while using the technology Acceptance Technology Model (TAM) to assess librarians' attitude to use of CC discovered that librarians of today perceive CC as an easy technology to adopt. Burger (2019) submits that the utilization of cloud computing may not be a positive transformation as perceived as there are quite a number of complexities and implications that ought to be considered, for instance, is there a technical skill on the part of librarians? Other researchers have found that the cloud computing technology is no doubt a birth that will transform the economy across sectors. This Muhammad et al (2017) stated when they discovered from their respondents that 70% of them did agree that the CC is

relatively a new technology that will not only be helpful in libraries but in other fields of life. The CC technology has been seen to literally be a rescuer though some scholars still criticize this position. In line with this, Motamedian (2011) discovered from 78% respondents that cloud computing is an evolving concept that will gradually mature and will never fade away, whereas 22% did not agree to this view. It is very important to have a positive disposition about a particular technology before it can be fully adopted for use. In line with this, Le Roux & Evans (2011) investigated how CC can be of great benefit to the African states, they both agreed that South Africa is a special hub as the country has the required positive perception and potential to bridge the technological gap in both secondary and tertiary institutions. It must be known at this point that the positive or negative perception of a particular technology is actually hinged on a number of factors such as data security, perceived technical competence, top management support, cost etc. To Phaphoom, Wang & Abrahamson (2013), the concept of CC has brought to bear a very significant transformation to national development hence, people in both academics and other environments perceive it as a heart-warming shift in the paradigm of computing service.

Attitude of librarians towards the adoption of cloud computing

Librarians from different libraries have myriad attitudes towards adoption of cloud computing. A study by Seena & Sudhier (2014) revealed that majority of professionals strongly agreed with the opinion that cloud computing applications improve quality of library services. This is an indication of a positive view library professionals have of cloud computing applications. Likewise, studies by Pal (2013) and Swapna & Biradar (2017) indicated that libraries are shifting their services to the *cloud* from which, with the help of networking and other facilities; they are able to access both their existing applications and documents from anywhere and at anytime. This informs that using cloud computing enables librarians to access library resources without geographical restrictions (Abidi, & Abidi, 2012; Tritt & Kendrick, 2014; Swapna & Biradar 2017). However, a study by Yuvaraj (2015) raised concerns about cloud computing indicating that moving from ground to the cloud is surrounded by ambivalence as to whether cloud computing offers the best solution for serving users' needs or not. This was a clear sign that while some are excited about cloud computing, others are holding back from adopting as revealed by literature.

A study by Tritt & Kendrick (2014) showed that some librarians prefer to have their information kept on hard drives they have access to, or something like that, instead of cloud. This seems to be rooted in the librarians' lack of trust in cloud as a place to keep their information. On the other hand, Yuvaraj (2015) revealed that there is 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. Generally, literature shows that due to varying reasons, people have different attitudes towards cloud computing.

Perceived benefits to users of cloud computing in libraries

A study by Musungwini (2016) revealed that Google Docs can be used by academics in a series of ways, to cover a multitude of tasks in academia. These academic household range across the academia strata commencing with the ability to work on files anywhere, anytime, and the provision of quick feedback from numerous people concurrently and asynchronously. Likewise, studies by Bouyer & Arasteh (2014) argue that cloud computing enables

lecturers/teachers to quickly arrange educational services that enhance learning and enable teachers to individualize learning based on performance data and each student's unique learning style. Cloud computing it indeed enhances students' active participation, increases the learning engagement, and enriches their learning process (Parker & Chao, 2007). Cloud computing technologies are free or low-cost for users such as students and teachers to support learning, social interaction, context creation, publishing, and collaboration. A variety of cloud apps do not actually require installing software on the user's computers. Some large software enterprises offer educational editions of cloud based learning management system for free of charge, for example Microsoft (Microsoft, 2015) and Google (Google, 2015). Examples of cloud-based apps include Microsoft Office 365, Dropbox, Google Apps, and YouTube. SLA is one of the characteristics that make cloud computing appealing to educational administrator as it helps to provide access to students for software and apps that are not previously available.

Library and information centres are constantly in search of low-cost and best solutions that may enable them to serve the user need efficiently and effectively (Yuvaraj, 2015). As almost all library documents are in cloud Pal, (2013) argued that less maintenance costs, less IT infrastructure costs and lower software costs is required. This informs that cloud computing is necessity and not optional in enabling to scale up or down IT requirements for quickly and efficiently without hampering services provision (Abidi, & Abidi, 2012; Gosavi, Shinde & Dhakulkar, 2012; Alotaibi 2013; Swapna & Biradar 2017; Pal, 2013). On the other hand, libraries can use cloud resources of service providers instead of spending funds for procuring costly systems and equipment. Similar findings were observed by Abidi, & Abidi, (2012) who reported that using cloud computer minimizes library expenses as capital expenditure done on infrastructure will chiefly be converted into operational expenditure. In library operation this helps to cut down cost and ensure saving more money for other library activities (Pal, 2013). Not only that but also it helps to save the time of the users and service providers (Hussaini, et al. 2017). A study by Alotaibi (2013) affirms that with cloud computing help to cut down the time involved in buying and setting up additional hardware, software and other necessary resources every time a new service is required.

Using of cloud computing in library services it ensures security. According to the study by Hussaini, et al. (2017) pointed out that the security in terms of data loss, leakage and system crash is guaranteed since the account, service is always monitored by the third party to avoid traffic hijacking and malicious insider. Moreover, Pal (2013) revealed that with cloud computing there is less chance of malware invading the device, device being physically stolen and less chance for data to be lost if the client computer crashes or is stolen. He further argued that theoretically data stored in the cloud is safe since a cloud hosting company uses several ways of backup in order to ensure that no any data will be lost. Similar findings was observed by Pal (2013) who argued that the need for maintaining and backing up the data will be no more the responsibility of the libraries since all the data will be stored in the cloud which shall be managed by some cloud provider. On the other hand Hussaini, et al. (2017) argued that with cloud computing, libraries can be rest assured of a strong back up of their information resources in case of server crash and other unforeseen events.

Using cloud computing it supports library services as it allows information sharing, mobility and collaboration. Collaboration with colleagues in other libraries simply would not be possible without cloud computing (Abidi, & Abidi, 2012; Tritt & Kendrick, 2014). This has allowed sharing and access to library information services without geographical restrictions. This is to confirm with the study by Alotaibi (2013) which pointed out that since services in the cloud can be accessed anytime from any computer, it's easy to collaborate with

employees in distant location. Library users would be able to browse a physical shelf of books, CDs, or DVDs or choose to take out an item or scan a barcode into his mobile devices (Gosavi, Shinde & Dhakulkar, 2012) and share to their colleagues (Tritt & Kendrick, 2014) or share from one library to another library (Abidi, & Abidi, 2012; Pal, 2013; Tritt & Kendrick, 2014). This sharing of library resources will reduce duplications of efforts. This was confirmed by the study of Abidi, & Abidi, (2012) which revealed that libraries will be able to share their electronic data resources which shall lead to reduction of duplicate data resulting in cutting down the overall budget of the libraries.

A study by Abidi, & Abidi, (2012) argued that through sharing of data among the libraries will in principle of reducing the overall cost and increase the efficiency. Also adoption of cloud computing will check the staff redundancies and increase the library efficiency (Yuvaraj, 2013). This improves efficiency as it ensures large capacity of storage information (Hussaini, et al. (2017). Furthermore, Yuvaraj (2013) benefits that libraries would derive from deploying cloud computing. According to him, in the meantime libraries would optimise their services by deploying cloud computing through high computing power, location and device independency, high scalability, less maintenance, less indulgence in library activities, unlimited storage capacity, diverse support, faster deployment and development, greener library services, ubiquitous availability of library services, pay-per-use, reduced technology obsolesce and no capital investment. With cloud computing, the meagre budget of libraries can sustain the libraries to provide maximum information services.

Perceived challenges encountered in the adoption of cloud computing

Like every technological concept, cloud computing is not an exception in terms of trust and security issues (Yuvaraj, 2015). Ensuring both privacy and security of cloud information is not easy (Hussaini, et al. 2017). As a result, efforts to encourage people to use this technology are not yielding the needed results because people have fear of putting their digital information in the hands of third parties (Tritt & Kendrick, 2014; Agandi, Agandi & Gull 2013; Sahu, 2015). A study by Sahu (2015) reveals that people fear that their information will no longer be confidential, or it will be more prone to theft and loss because the libraries do not have ownership of the servers on which they keep their contents. A study by Alotaibi (2013) came up with questions with regards to data mobility, and ownership. Regarding data mobility and ownership, the questions were; once you decide to stop using cloud services, can you get all your data back? How certain will you be sure that the service provider will destroy your data once you've cancelled the service? Regarding privacy, the question is on how much data cloud companies are collecting and for what purpose? Overall, although some libraries and their users have adpted cloud computing, they have worries about their ownership and privacy of their information (Pal, 2013; Tritt & Kendrick, 2014; Agandi, Agandi & Gull 2013; Sahu, 2015).

Another source of privacy and security concerns is fear of malicious insider threat. This concern originates from service providers' inability to reveal how they hire people, how they grant them access to assets, or how they monitor them. Existing and potential users fear that failure to monitor malicious insiders may risk data managed through cloud computing. This was confirmed by Ashktorab & Taghizadeh (2012) in their study in which they revealed that deletion without a backup, loss of the encoding key, or unauthorized access, data is always in danger of being lost or stolen. Considering that if data managed through cloud computing are lost, a library will have no physical or local back up (Pal, 2013).

Another challenge for cloud computing is its dependence on internet connection. Libraries without or with unstable internet connections cannot implement cloud computing (Swapna & Biradar 2017; Hussaini, et al.2017). Where cloud computing is in use, when an Internet connection goes down for any reason, all the operations of the organization in question will be in a stand-still until connectivity is back (Swapna & Biradar 2017). A study by Agandi, Agandi & Gull (2013) confirms that Internet has been a driving force in various technologies that have been developed, including cloud computing. This informs that it is impossible for library that has lost its internet connection (Pal, 2013). Apart from reliance on internet connectivity, cloud computing increases bandwidth demands because of their need for high-speed connections to perform effectively and efficiently (Swapna & Biradar 2017; Hussaini, et al. 2017). As a result, libraries need to have sufficient financial budgets to run their servic with reliance on cloud computing. This was confirmed by Hussaini, et al. (2017) in their study which revealed that budget constraint is another challenge for libraries wants to use cloud computing. The cost implications come from equipment procurement, infrastructure set up and implementation.

Research methodology

This study was carried out at the University of Dar es Salaam because of long history in the application of ICT based in offering library services to users. It applied a descriptive research design in order to ascertain perception and attitude of librarians towards clouds computing in the study area. This study employed quantitative approach in determining level of librarians' awareness towards CC at the UDSM library, librarians' perceptions, attitudes, perceived benefits and challenges towards the adoption of clouds computing.

The study employed a census sampling method to generate 94 respondents and only questionnaire was used to collect data. The study used Statistical Product and Services Solution (SPSS) program version 21 to generate percentages and frequencies from quantitative data which have been presented in tables.

Results

Demographic characteristics of respondents

Respondents were asked to indicate their sex, age category, education qualification, and working experience. These variables were required because they are useful in determining perceptions and attitudes towards cloud computing. The responses received have been processed into results presented from Table 1 to Table 4.

Table 1: Sex of respondents

	Frequency	Percent
Female	50	53.2
Male	44	46.8
Total	94	100.0

Table 1 revealed that majority of the respondents are females with average number of 50 (53.2%) on the other hand, the males are 44 (46.8%).

Table 2: Respondents' age

20-29	35	37.2
30-39	30	31.9
40-49	18	19.1
above 50	11	11.7
Total	94	100.0

Table 2 above showed that librarians at the University of Dar es Salaam are relatively young with those between 20-29 having the highest number of 35 (37.2%), followed by those between 30-39 having 30 of them in the library, 40-49, 18 and finally above 50 were 11 librarians.

Table 3: Education qualification of respondents

	Frequency	Percent
Certificate	7	7.4
Diploma	40	42.6
First degree	22	23.4
Master degree	19	20.2
PhD	6	6.4
Total	94	100.0

Table 3 displayed the education qualification of respondents as those with diploma had the highest number followed by first degree, master degree with 6 PhD librarians.

Table 4: Working experience of respondents

below 5 years	35	37.2
6-15 years	35	37.2
16-25 years	15	16.0
above 26 years	9	9.6
Total	94	100.0

Table 4 is for working experience of the librarians, 35 (34.2%) librarians are below 5 years, also, 35 are between 6-15 years of experience, 15 (16.0%) are between 16-25 years of experience and finally, 9 (9.6%) above 26 years.

Table 7: Level of awareness of Cloud Computing (CC) by Dar es Salaam   University librarians

		aware		Not aware	
		F	%	F	%
i.	I know that Cloud Computing (CC) is a new development in the field of information technology.	69	73.4	25	26.6
ii.	I know that CC is a distraction.	16	17.0	78	83.0
iii.	Cloud computing is for adequate information delivery in libraries.	46	48.9	48	51.1
iv.	Cloud computing has to do with cloud data storage.	54	57.4	40	42.6
v.	I know that IaaS, PaaS, SaaS and DaaS are components of cloud computing.	17	18.1	77	81.9
vi.	I know that cloud computing is connected to virtualized system.	53	56.4	41	43.6
vii.	Cloud computing is manually inclined.	25	26.6	69	73.4
viii.	CC brings together data for a data base with remote access.	45	47.9	49	52.1
ix.	Cloud computing encourages ubiquitous access.	43	45.7	51	54.3
x.	CC enables convenient network access to information resources.	42	44.7	52	55.3
xi.	CC has nothing to do with information technology.	20	21.3	74	78.7

Source: Field data, 2019

Table 5, 6 and 7 are for awareness of cloud computing by librarians. It is very obvious that librarians are very aware of cloud computing, this is shown in Table 5 where 90 (95.7%) librarians agreed to be aware of cloud computing and 4 (4.3%) disagreed.

Table 8: Perception of cloud computing by Dar es Salaam University librarians

		SA		A		D		SD	
	Option	F	%	F	%	F	%	F	%
i.	I feel that cloud computing is very useful to my job	67	71.3	26	27.7	1	1.1	-	-
ii.	I see cloud computing as just averagely useful	14	14.9	28	29.8	49	52.1	3	3.2
iii.	I perceive cloud computing as a big distraction to my work	13	13.8	13	13.8	35	37.2	33	35.1
iv.	I feel cloud computing has slowed down my professional work	16	17.0	14	14.9	33	35.1	31	33.0

Source: Field data, 2019

Table 8 is for the perception of cloud computing by librarians at University of Dar es Salaam. Out of the 94 respondents, 67 (71.3%) of them did perceive cloud computing as a formidable

technology. This is no doubt a positive perception. On the other hand, 49 (52.1%) disagreed that cloud computing is less useful.

Table 9: Attitude towards cloud computing by Dar Es Salaam University librarians

		SA		A		N		D		SD	
		F	%	F	%	F	%	F	%	F	%
i.	I do not feel like using cloud computing in my library	6	6.4	12	12.8	6	6.4	33	35.1	37	39.4
ii.	I secretly use cloud computing in my daily work	12	12.8	26	27.7	9	9.6	26	27.7	21	22.3
iii.	Always not happy when using cloud computing	5	5.3	12	12.8	3	3.2	29	30.9	45	47.9
iv.	Cloud computing is a difficult task hence, I don't use it	10	10.6	8	8.5	5	5.3	26	27.7	45	47.9
v.	I do not need cloud computing to do my job effectively	9	9.6	10	10.6	7	7.4	25	26.6	43	45.7
Vi	It will take me many years to accept cloud computing	8	8.5	3	3.2	13	13.8	30	31.9	40	42.6
Vii	Libraries should stay away from cloud computing	17	18.1	3	3.2	11	11.7	30	31.9	33	35.1
Viii	Cloud computing must be practiced in all libraries	56	59.6	18	19.1	3	3.2	6	6.4	11	11.7

Source: Field data, 2019

On Table 9, the attitude of respondents towards cloud computing is fair enough as 56 (59.6%) of the respondents affirmed this, while 33 (35.1%) strongly disagreed that "I do not feel like using cloud computing in my library". The implication of this is that librarians have very positive attitude towards cloud computing.

Table 10: Perceived benefits of cloud computing by Dar es Salaam University librarians

		SA		A		N		D		SD	
		F	%	F	%	F	%	F	%	F	%
	Cloud computing minimizes costs of software and hardware maintenance	48	51.1	31	33.0	2	2.1	11	11.7	2	2.1
i.	Cloud computing enhances effective and efficiency in library services provision	49	52.1	35	37.2	1	1.1	8	8.5	1	1.1
ii.	Cloud computing guarantees privacy and security	45	47.9	20	21.3	26	27.7	3	3.2	-	-
iii.	Adoption of cloud computing supports information sharing, mobility and collaboration	57	60.6	28	29.8	5	5.3	4	4.3	-	-
iv.	Adoption of cloud computing enables large capacity of information storage	54	57.4	29	30.9	8	8.5	3	3.2	-	-

Source: Field data, 2019

Just to highlight a few in Table 10, 54 (57.4%) of the librarians stated that cloud computing is beneficial to them in storing large capacity of information, 57 (60.6%) feel that cloud computing supports information sharing mobility and collaboration and 49 (52.1%) are of the opinion that cloud computing enhances effectiveness and efficiency in the library services delivery.

Table 11: Perceived challenges encountered in the adoption of cloud computing by Dar es Salaam University librarians

		SA		A		N		D		SD	
		F	%	F	%	F	%	F	%	F	%
i.	Likeliness of third party invading privacy	24	44.7	39	41.5	10	10.6	2	2.1	1	1.1
ii.	Fear of inability to get data back when a decision to stop using cloud computing services	23	24.5	44	46.8	13	13.8	10	10.6	4	4.3

	is made									
iii.	Lack of assurance all information stored in cloud will be deleted once a client has decided to cancel the service	34	36.2	27	28.7	18	19.1	10	10.6	5	5.3
iv.	Lack of physical or local backup to cover effects of missing data	31	33.0	38	40.4	15	16.0	5	5.3	5	5.3
v.	Cloud computing applications require a strong network connection	51	54.3	28	29.8	4	4.3	10	10.6	1	1.1
vi.	Operating with reliance on cloud computing is expensive in terms of bandwidth charges	53	56.4	27	28.7	12	12.8	2	2.1	-	-

Source: Field data, 2019

Table 11 talks about the perceived challenges of cloud computing, virtually all respondents agreed to the challenges facing the introduction of cloud computing to be privacy invasion 42 (44.7%), fear of losing data 23 (24.5%), lack of physical or local back up 31 (33.0%), poor network connection 51 (54.3%) and expensive nature of cloud computing 53 (56.4%).

Discussion of findings

Findings to objective one showed that librarians at the University of Dar es Salaam are aware of cloud computing. This finding is in line with that of Majhi, Meher & Maharaha (2015) when they found in their study that 54 (96%) of their Indian respondents are familiar with the concept of cloud computing.

Findings to objective two indicated that the respondents have a positive perception about cloud computing. Again, this is in sync with Chetty (2014) in the study where all respondents perceived that radical investment in cloud computing by government and various organizations is not a wasted effort.

Objective three is on the attitude of librarians towards cloud computing which is said to be fair enough. This view is not in agreement with Aharony (2014) who hinted that librarians have a resisting attitude towards emerging technologies in the library.

Findings to objective four have shown that many benefits accrue in the adoption of cloud computing. This is against the submission of Neethu & Vanaja (2017) when they argue that adopting cloud computing will only lead to having lazy librarians in a nation where information service delivery is key.

 It was also found that the role of academic libraries in teaching and learning cannot be overstated. This finding is in line with that of Huang, Liu & Liu (2012) when they argue that cloud computing services are available to enrich learning resources for learners and teachers while learners and teachers can search for learning resources more quickly and easily. Google, for example, has powerful search function, including a blog search, college search, life search, image search, code search, web search, personalized search, book search, academic search, SMS search etc.

Finally, findings for objective five stated clearly that there are perceived problems hindering the full application of cloud computing by librarians. This finding is right as according to Neethu and Vanaja (2017), cloud computing adoption is challenged by slow internet connection, danger of data loss, security problem etc.

Conclusion and Recommendations

From the findings of the study, it can be deduced that librarians at the University of Dar es Salaam do not shy away from new technologies. For the sake of deploying modern education system anywhere and anytime in enhancing quick delivery of learning services and facilities, librarians, universities and other stakeholders should adopt usage of cloud computing. This is for the researchers, an interesting development as no 21st century library/librarian can ever succeed without full adoption of computerization and new technologies. This study therefore concluded that it is not just enough to be aware of, positively perceive Cloud Computing. To this end, librarians from all countries are therefore advised to makes sure there is full adoption of this relatively new technology in their day to day dealings particularly in supporting users. This will no doubt boost the effectiveness and efficiency of the job they do. A further recommendation is the fact that library heads should at all times remind their staff of the need to embrace new technologies and also strive to send staff for trainings, seminars and conferences.

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