10-1-2020

LIBRARY MANAGEMENT SOFTWARE: A COMPARATIVE STUDY OF CLOUD SERVICE AND IN-HOUSE SOFTWARE IMPLEMENTATION AT UPSA-GHANA

Amy P. A. Asimah
E. P. University College, Ho, amyasimah@gmail.com

Sebastian H. Ofoe
University of Professional Studies, Accra, ofoesab@gmail.com

LIBRARY MANAGEMENT SOFTWARE: A COMPARATIVE STUDY OF CLOUD SERVICE AND IN-HOUSE SOFTWARE IMPLEMENTATION AT UPSA-GHANA

Sebastian H. Ofoe

Assistant Librarian

University of Professional Studies, Accra

Email: ofoesab@gmail.com

Amy P. A. Asimah

Assistant Librarian

E. P. University College, Ho

Email: amyasimah@gmail.com

ABSTRACT

This study looks at Library Management Software, a comparative study of Cloud Service and In-house Software implementation at UPSA-Ghana with the help of key performance indicators. The purpose of this study is to identify the security effects of Cloud Software as a Service (SaaS), the benefits of Cloud Service as compared to In-house Software implementation within the context of Technology Acceptance Model (TAM). The study uses self-administered questionnaires to collect data and Statistical Package for the Social Sciences (SPSS) tool to analyze data collected from 52 respondents from UPSA. The results indicated that the users of the In-house library system face challenges such as system instability, lack of usability and user adaptation, system unreliability and malfunctioning, and poor training of staff to use the system. In terms of security inferences, maintenance expenses and procurement budgetary, majority of the respondents have indicated that In-house Software implementation were more advantageous than the Cloud Service. Nevertheless, there were indications that SaaS adoption would provide excellent service and minimize the frustration of staff. The study recommends user awareness creation of the services that SaaS offers, the need for the improvement of staff training on current IT developments and the motive for the acceptance of Cloud Services.

Key words: Library Management Software, Cloud computing, Software as a Service (SaaS), In-house Software, UPSA-Ghana

1.0 INTRODUCTION

The revolution of the Internet has brought about major changes in the way information is processed, stored, disseminated and retrieved. The cutting-edge technology in this contemporary information age which has brought about the advent of the technological emergence is seen in the way in which information is retrieved. This new emerging technology is Cloud Computing, specifically Software as a Service (Cloud SaaS).

Cloud computing basically runs on the Internet, sharing resources by request. SaaS is one aspect of Cloud Computing. Software as Service (SaaS), according to Ziff (2014), is "a way of distributing applications over the Internet as a service". That is, instead of installing and maintaining software, you simply access it through the Internet thus freeing yourself from difficult software and hardware management. This is software services that are hired instead of acquiring. It is acquired by subscribing to its service based software and all real time updates are stated in the terms. This technology provides a way of budget minimization on both operation and maintenance. This therefore means that users of SaaS have outsourced their activities making them spend less on the operation and maintenance cost and be successfully realistic in library procedure networks. In the view of Tayntor (2001), outsourcing is "a strategy by which a firm uses external sources for current activities that traditionally involves few people and resources, turning to external services providers". It is a way of engaging a third party services with the view of providing quality services. Although outsourcing could bring about rise or decline in the improvement, it could result in improved patron service

On the other hand, Library management system (LMS), according to Veronica et al. (2008), is "an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed". LMS basically comprise a relational database, software to interact with that database, and two graphical user interfaces. The software functions into separate programs known as modules (eg. acquisition, cataloging, circulation, serials and OPAC), each of them incorporated with a unified interface. Recently, LMS have incorporated automated managing resources and Moodle such as Learning Management System to enhance its use. However, there are some limitations that do not expedite the recognition of Cloud SaaS computing. Examples of these limitations are issues of data security, problems with large files or data transfer over the internet, unreliable internet connectivity, differences in structural designs,

and inability of the user to access SaaS applications which are held in the clouds and many others limitations.

Differently from SaaS, In-house software is software that is produced by a corporate entity for purpose of using it within the organization. However, it may later become available for commercial use upon sole decision of the developing organization. In-house software development is maintained and deployed by the organization's own funds which also include the physical, economic, organizational and operational feasibility studies. In addition, specialists such as system analysts and programmers come into play for better output development.

This article compares the potential risks as well as the benefits of using Cloud SaaS and In-house Software development of Library Management System in UPSA library. The specific objectives of the study were to:

1. find out the security effects of Cloud SaaS and In-house Software Management.
2. identify the benefits of Cloud SaaS and In-house Management Systems.
3. find out about the capabilities of the IT personnel of the University of Professional Studies, Accra.
4. find out the challenges encountered by staff in the use of the In-house Library Management System in UPSA library.

Various studies have examined the use of SaaS in University Libraries and have come out with different findings. Studies by Makori (2016); Levy (2013); Galvin and Sun (2012); Mavodza (2012); Patel, Seyfi, Tew and Jaradat (2011) and Cho (2010) focused on the use of SaaS-based library management system. Generally, the authors have concluded that SaaS should be seen as the future Library Management System for university library practices and services.
The problem that the study sought to investigate was whether the adaptation of a new emerging technology known as SaaS will solve the challenges of the UPSA in-house provision of library system which hinders the smooth operation of library services.

The study findings were significant as they will benefit practitioners such as the library professionals to better understand the acceptance of the new emerging technology and provide a contextual awareness in accommodating the implementation. It will also inform strategic

managers when formulating policies in relation to Information Communication Technology about the use and acceptance model in the library. For researchers, this study will provide a comprehensive overview of the new emerging technology, the potential risks and benefits for an informed decision and also add to the literature of Cloud SaaS for further research.

The second section presents a literature review on Library Management System, Cloud SaaS security, benefits and challenges and In-house Software management benefits and disadvantages. The third section describes the methodology of the study; the fourth section presents the results of the study; and the final section deals with the conclusion of the study and recommendations for future research.

2.0 LIBRARY MANAGEMENT SYSTEM (LMS)

According to Kumar (2011), libraries are offering services through the implementation of library systems that are recognized as a needed tool in the provision of effective customer services as well as stock management. He stated that these systems were grounded on the knowledge and experience of information professionals over the years. Valuable library automation software may include KOHA, Greenstone, LIBsis, and Granthlaya. A library system usually includes a relational database, software that interacts with database, with two graphical user interfaces. Library systems module include: Acquisition, Cataloguing, Circulation, Serials and Online Public Access Catalogue.

The findings of Kumar (2011), a comparative features of integrated library management software systems in Delhi in the selected Library Management Software Systems, showed that Liberty and Virtua were the best software when compared to the other selected LMS systems having regard to supporting library standards, technology standards, offering enhanced services and also incorporating most recent technological advancement. The results also revealed that nearly both software packages supported different hardware and software platform. Based on the gathered results, NettLib which follows after Liberty and Virtua supported maximum library standards. On the other hand, looking at web compatibility of the software for their different management modules, Liberty and Ls-Premia provide a total web-based solution for all of its management modules. In addition, the analysis relating to offering enhanced services reveals that Liberty is the only software among other selected LMS systems that offered maximum enhanced services. It is both surprising and disturbing to note that despite the fact that librarians are involved in

designing Library Management Systems and thus presumably should be aware of the requirements of not only themselves but also fellow librarians in addition to users. Several of the selected software packages studied did not provide certain important features. This is particularly noticeable with the free E-Granthalaya package, which fared worst yet, was the result of cooperation between programmers and library experts and based on the needs of Indian libraries.

Some important library software packages like Granthalaya, LibSys, Sanjay, Suchika, Basisplus-Techlibplus were evaluated. Factors for the selection for the evaluation of these software packages were facilities provided in the software packages, hardware requirements, operating system platforms, language of software development, search facilities, (Saxena and Srivastava, 1998). The writers concluded that Sanjay ver. 2.0 was suitable for small libraries, while Suchika, Granthalaya, and LibSys were most suitable software packages for big libraries.

2.1 Cloud SaaS

Several studies have been conducted on Cloud SaaS as a new emerging technology providing cost effective benefits to organizations. . According to Cho (2011), the new developed SaaS application has shown that there is the possibility of cost reduction on task and maintenance. Also extra expenditures that are required for upgrading the systems have the possibility of being reduced. Fariba et al (2015) add that the prospect of SaaS provides several considerable chances that help in improving the use of IT in firms deprived of cost and maintenance. Equally, a study by Judith (2013) has also indicated that, one cannot avoid the fact there are relevant issues that surround in the direction of contemporary information setting. She stated that there must be a change from the hardware and software method of storing and organizing information to the cloud computing which will solve the limited capacity of libraries to host and maintain their information database. The study by Cho (2011) on a SaaS-based library management system for the Korean library network indicated that most organizations install on their computers application software that they procure, adding that the emergence of SaaS allowed clienteles to contract networked commercial software. Cho concluded that the application of SaaS in library management system will not only boost cost-effective competence of confined library procedure, but also boost its operation.

2.2 Cloud SaaS Security

According to the new Gartner (2015) Report, Cloud Security encompasses technologies and standards that improve the security and reliability of cloud computing implementations.

- How software-defined perimeters will appeal to organizations looking for innovative and secure ways to both connect and collaborate with their digital business ecosystem.
- How the extension of data centers into the public Cloud also has placed a focus on software-based approaches for segmentation.
- Which critical security trends are essential for you to follow as you plan your Cloud security implementation?

In the views of Kippenberger (2000), all data security systems are penetrable. Secret keys and public keys can be compromised; viruses and direct cryptanalysis are possible exposures. Patel and Rekha (2014) stated that, in dealing with Software as a Service (SaaS) model, customer relies on the vendor for appropriate security controls. It is therefore essential that the several users of the service have each other's information or data kept undisclosed.

Yuvaraj (2015) similarly claimed that safety in the cloud involves the security of files and the facilities presented by the cloud vendor. He maintained that the safety concern are generally characterized into two kinds or categories which include the one being confronted by the cloud vendor and the other by customers. He described some of the top threats to cloud security as follows: breaches of data, files damage, stealing of accounts, repudiation of service outbreaks, mischievous insiders, mishandling of cloud application, shared technology vulnerabilities. The study of Yuvaraj (2015) attempted to fill the gap and provided solution to security concern that had been the main foundation of non-adaption of cloud computing in libraries.

2.3 Benefits and challenges of Cloud SaaS

SaaS is valuable to firms and individual users for several reasons. A study by Aleem and Sprott (2012) showed that organizations adopt cloud computing mainly because of the use of the business resources. They indicated that the impression of attaining cost on an ideal "pay as you use" was a great striking alternative for providers. Romero (2012) reported that Cloud computing was a high accessible platform that guaranteed swift right to use to hardware and software over the Internet, and offered a relaxed access and controlled processing easily managed by non-specialist users. Romero (2012) mentioned cost reduction, scalability, greater security and

accessibility, lower investment and reduced risk as some of the benefits of Cloud computing adoption.

Safari et al. (2015) conducted a study on "*the adoption of software-as-a-service (SaaS): ranking the determinants*". The study revealed that all attributes of Technology, which include relative advantage, compatibility, complexity, trialability, observability and security and privacy; Organisation which also include IT resource, sharing and collaboration culture as well as the environment competitive pressure, social influence, were significant in the acceptance of SaaS. Equally, Rader (2012) also mentioned certain consumer benefits of SaaS which included easy end-user startup, access anywhere, quick scalability and additional utilities.

In the view of Vannini (2014), software vendors and customers are faced with challenges when moving from an "on-premise" to a SaaS model. According to Herrman (2014), the biggest challenge was distribution despite the funding being received that affirmed "Gartner's forecasts on SaaS market that will grow at 20% through at least 2020, almost 3 times as fast as software overall and there remains ample opportunity for greater global penetration over time.
The finding of Aleem and Sprott (2012) revealed that data loss and leakage which accounted for 73.5 % from the analysis were voted as the top threat to cloud computing by respondents from their study, "*Let me in the cloud: analysis of the benefit and risk assessment of cloud platform*".

2.4 Benefits and challenges of In-house Software Management

Barrett & Baldry (2003) defined In-house process or approach as "the service that is delivered by a committed resource directly hired by the consumer firm". Thus implementation, checks and evaluation of performance are spearheaded by the owner and the worker. Wise (2007) agrees that the most significant benefit of in-house method is the opportunity to develop individuals rather than contracting from external provider, and thereby help in the career development among the employees. Similarly, Clydebuilt (2012) state that there is total control since there is no link to third party or outsourcer. Total control over the software becomes very significance particularly with planned development. In addition, IT staffs are engaged thereby making them more proactive and there is surety of familiarity.
With regards to the challenges of In-house software management, Clydebuilt (2012) states that valuable expenses is required to develop new system and much time is involved in the definition

of project specifications. Further, Clydebuilt explains that certain areas in the development cycle require skilled IT personnel. Pressures are bound to mount on in-house developers to meet deadlines whiles systems error check can be very lengthy. Atkin and Brooks (2005) make available additional understanding on the disadvantages of in-house approach:

- Problems in the controlling of the service arises when there is a poorly defined scope and with higher supervision costs and lowering of customer satisfaction. Meeting interested parties is very necessary.
- Without proper description of roles and tasks, it becomes very hard to quantify the performance of in-house developers.
- Self-satisfaction is on the prevalent threats to the in-house team's success and this is easily observed by clienteles.

With all these risks, benefits and challenges of the various LMS, there is the concern for management of libraries and their staff to critically evaluate which LMS best suits their modes of knowledge creation, dissemination and retrieval for the communities they serve. Reasonably, a number of studies in relation to Cloud SaaS and In-house software have been conducted. However, in relation to Cloud SaaS application in the information services centers and Ghanaian university libraries, very little attention has been given. The researchers deem it essential to undertake the study as they envision that the study will add a fresh element of knowledge to the literature and also serve as gap filling.

3.0 RESEARCH METHODOLOGY

The study used the survey method in comparing the benefits and risks of Cloud SaaS versus In-house Software for the development of a Library Management Software. The quantitative technique of the survey design was suitable for gathering numerical data and understanding the peculiar situation at UPSA. The main instrument for data collection was questionnaire. Questionnaire was used to gather information from UPSA staff. The population used for the study was fifty four drawn from the library, finance, and Information Technology (IT) departments.

The staffs from the university library were selected because they are ultimately responsible for the use of the Library Management Software. The staffs of the Finance department were included because they are responsible for releasing funds for projects in the library. Also, the IT

staffs were selected mainly because they are essential stakeholders when it comes to Information Communication Technology and the development of software.

The questionnaire which contained inquiries on Cloud SaaS and In-house Software for the development of a Library Management Software was self-designed and included both closed and open ended questions that provided specific responses from the respondents and also gave them the opportunity to air their opinions. The questions were arranged and divided into five broad sections and contained twenty five items. Section A dealt with biographical data of respondents. This included questions about the education background, number of years respondents have worked, and the department of the respondents. The Section B dealt precisely with the security assessment of SaaS and in-house development of library management software. Section C looked at the procurement cost. At the Section D the human capital training of staff was observed. Section E looked at the maintenance cost and finally Section F focused on the challenges encountered by staff using library management software.

Respondents were reached at the various departments through the permission of their Heads. Data collection was arranged after establishing the initial arrangement with the Heads represented in each department. The study used the Statistical Package for the Social Sciences (SPSS) system to analyse the collected data. The graphical tools in the SPSS were thus used to develop tables and frequencies.

4.0 FINDINGS OF THE STUDY

The study covered the background of staffs, security assessment, procurement and maintenance of library management software. It also looked at the human capital expertise as well as the challenges facing the current library system.

4.1 Security Assessment in the use of Cloud SaaS

The security of the IT services outsourced will depend on the providing firm, which is why rules and measures must be negotiated during the outsourcing contract (Fink, 1994). It is one of the primary objectives of the study which sought to look at the security implication for outsourcing and in-house software development of library management system, the perceived advantages and risks decision. With regards to if outsourcing LMS will leak out vital information, large proportion of the respondents agree that outsourcing LMS will disclose vital information. In a

similar vein, greater numbers of respondents have agreed to the assertion that outsourcing will put staff work at risk. Most of the respondents also stated that agents or outsourcers may not have the library's interest at heart and can lead to poor quality of work. A large number of the respondents also indicated that providing services over the Internet that link LMS to a webserver could render the university to new threats.

4.2 In-house Library Management Systems

Concerning in-house development or provision for a safe and better security, the findings revealed that larger fraction of the respondents representing 86.5% agreed to the assertion that in-house software development is a safe and better secure environment. An in-house approach remains to deal internally with products or services that require skill and knowledge in order to serve customers better. The study therefore sought to find out about the risk involved in developing in-house software. The finding revealed that large proportion of the respondents representing (84.6%) has shown that there is general reduction of involvement in the development of in-house software.

4.3 Procurement Budget on the need for Outsourcing

In this section the researchers sought to find out the cheapest but quality and reliable library management software provision. This involved outsourcing as an improvement to library performance, the financial projections and so on. With regards to whether outsourcing LMS truly improves library performance, the findings indicated majority of respondents believed that outsourcing of LMS will improve library performance. Also, majority of the respondents forming 80.8% said financial projections are accurate to outsource LMS of the university library. However, greater proportion of respondents representing 92.4% agreed that if LMS is developed in-house it will reduce the financial burden on the budget allocated for the library. A large percentage of respondents also indicated that getting the best outsourcer to build LMS was problematic.

4.4 Human Capital Training

In this section the researchers sought to find out the staffs' capabilities and human capital training. This also involved software development expertise, internal IT experts' availability and staff training. The finding shows that large fraction of the respondents has affirmed that the

university has requisite expertise to develop LMS for the library. Similarly, majority of respondents also stated that the university does not lack internal IT staff with new technology expertise. Also, large proportion of respondents indicate that in-house LMS will ensure less complex staff training on the use of the software since the developers will have control over their own design in training the staff in the use of the software.

4.5 Maintenance Cost

Maintaining a system comes with a cost and urgency. It is therefore important to consider these facts when developing a system. As one of the main objectives of this study the researcher sought to find out the cost variations in maintaining LMS. The findings revealed a large number of respondents indicate that it is cheaper and easier to maintain LMS when it is developed in-house than maintaining an outsourced LMS. However, the respondents which represent (52%) totally disagreed that there is quick response to resolve system failure when outsourced and majority of respondents clearly agreed to the claim in-house LMS development will provide the easy way of checking errors.

4.6 Library Management System Challenges

Software development has its own challenges and therefore need to be addressed. This section sought to find out from the respondents some of the challenges they faced in the use of the current library management system. Challenges from respondents included the following; failure in real time usage; slow when queried; system malfunctioning; the usage by staff; it is not being used by the university; scalability; lack of usability; user adaptation; not much has come up with; low bandwidth, were the opinions from the IT department. Others among the library professionals were stated as; unreliability; not always functioning; malfunctioning and system failure; internet connection; irregular access to the internet is affecting the piloting process; lack of understanding of the system; server not to be found; financial issues; poor training for staff to use the software; irregular power supply; user registration; generating of accession numbers; charging and discharging of materials; data entry problem; allocation of resources. The final suggestions were the respondents from the finance department who also stated the following; no idea of any challenges; lack of adequate skills in managing it.

5.0 DISCUSSION OF FINDINGS

5.1 Security Assessment in the use of Cloud SaaS

Yuvaraj, (2015) defines the word "security" to mean "a general word used to suggest several rules, tools and controls used for keeping records, uses and the related arrangement within the cloud". The researcher discovered from the findings that, majority of staff (82.7%) have agreed to the assertion that using Cloud SaaS will put staff at risk. This confirms (Grover et al., 1994), who stated that Outsourcing creates several staff-related problems. Thus, the client firm is faced with possible conflict of the IT staff that see subcontracting as a threat to their working position.

The finding also revealed that (84.6%) have shown that there is a general reduction involving in-house software development. This is backed by Barret and Baldry, (2003) who indicated that an in-house approach rests to deal within with services that necessitate ability and understanding in order to serve consumers better. It was also revealed that large proportion of the staff (84.6%) has shown that outsourcing library management software will disclose vital information. The findings agreed with Patel and Rekha (2014) stated that, in dealing with Software as a Service (SaaS) model, customer relies on the vendor for appropriate safety procedures of the structure. It is therefore essential that the several users of the service have each other's information or data kept undisclosed. Yuvaraj (2015) further affirms that library work encompasses voluminous files owing to which security sensitivities remain the main problem to broader acceptance in libraries.

5.2 Procurement Budget on the need for Outsourcing

Cost savings have become most of the reason for firms to outsource their services (Chukwunonso and Ribadu, 2013). Outsourcing has become a prime decision factor for a firm or company to purchase its products from an outsider, instead of executing the same task using inside facilities so as to reduce cost. Therefore, the study sought to discover how outsourcing can benefit an organisation or a firm.

5.3 Benefits of Outsourcing for Cloud SaaS Model

The findings the researchers gathered from the study revealed that 80.9% (forming a majority) believed outsourcing of library management software will improve the performance in the library service and thus create competiveness. This confirms the study conducted by Leavy (2004)

which revealed that a growing awareness in subcontracting serves as a possible source of competitiveness and value creation by outlining the four most promising prospects for using outsourcing approaches which include focus, scale without mass, disruptive innovation, and strategic repositioning.

Romero (2012) also recounted that Cloud computing is greatly accessible stand that guaranteed swift access to hardware and software over the internet, and offered a relaxed access and controlled processing easily managed by non-specialist users.

However, from the findings, it was also revealed that greater proportion of the respondents 92.4% were of the viewed that developing in-house library management software will reduce the financial burden.

5.4 Human Resources for the Development of Library Management Software

Again, the findings show respondents (71.15%) were optimistic that the university has the needed expertise to develop library software. The findings also revealed that a large segment of the respondents (82.69%) think that the university has the internal IT staffs who are specialists in modern technologies. Additionally, the results indicated that 78.85% (forming a majority) of respondents think in-house library management software will ensure less complex staff training on the use of the software since the developers will have control over their own design in training the staff in the use of the software.

The findings is in line with Kumar (2011), who opines that libraries are offering services through the implementation of library management software (LMS) systems that are recognised as a needed tool in the provision of effective customer services and that these systems are grounded on the knowledge and experience of information professionals. A software development is a technical area in system development process and therefore requires expertise that is knowledgeable in coding or programming languages. The findings revealed in-house management helps to improve on staff capabilities and therefore provide better benefits to the organisation. This confirms Wise (2007), who stated that the most significant benefits of in-house method is the opportunity to develop individuals.

5.5 Maintenance of Library Management Software Systems

The study also found out that majority of the respondents 42 (80.7%) indicated that outsourcing is very expensive to maintain with low as 10 (19.3%) disagreeing to the claim. The suggestion from the findings showed Cloud Service as a Software will pose a maintenance problem. This is backed by Vannin (2014), who indicated that Software vendors and customers are faced with challenges when moving from an "on-premise" to a SaaS model.

5.6 Library Management System Challenges

According to Veronica et al (2008), "a library management system (LMS) is an enterprise resource planning system to track items owned by the library as well as orders being made, for bills paid, and materials made borrowed by patrons".

The study revealed from the findings that greater portion of respondents (92.31%) was aware of the existence of library management system. Software development has its own challenges and therefore need to be addressed. The study sought to find out from the respondents some of the challenges they faced in the use of the current library management system and only 7.69% said they were unaware. The views from IT were system failure in real time usage; system slow when queried; system malfunctioning; the usage by staff; it is not being used by the university; scalability; lack of usability; user adaptation; not much has come up with; low bandwidth.

Again, it was established from the study that the information professionals had challenges which included system unreliability and functioning; irregular access to the internet is affecting the piloting process; lack of understanding of the system; poor training for staff to use the software; irregular power supply; user registration and generating of accession numbers. Further findings from the finance department revealed that respondents had no idea of any challenges but rather mentioned the lack of sufficient skills in managing the library systems.

The discussion of the main findings of the study have thus been summarized in the below prototype table.

Table 1 Summary of Findings

S/N	Question	Agreed %	Interpretation			
			In-house		Outsourced/SaaS	
			Plus	Minus	Plus	Minus
1	Outsourcing will reduce staff potential skills	82.7	√			√
2	There is a general risk reduction to have In-house LMS	84.6	√			√
3	Outsourcing LMS will improve library performance	80.9		√	√	
4	Building own LMS will reduce cost for budgetary allocation	92.4	√			√
5	Getting the best outsourcer to build LMS is a challenge	75	√			√
6	Do you think in-house LMS will ensure less complex staff training?	78.85		√	√	
7	LMS maintenance cost is very expensive when outsourced	80.7	√			√
8	It is easier to maintain in-house LMS than when outsourced	88.4	√			√
9	There is quick response to resolve system failure when outsourced	38.5	√			√
10	Developing in-house LMS provides easy access to error checking	96.1	√			√

6.0 CONCLUSSION AND RECOMMENDATIONS

6.1 Conclusion

Veronica et al (2008) have described library management system "as an enterprise resource planning system to track items owned by the library as well as orders being made, for bills paid, and materials made borrowed by patrons". It is an established fact that library management system is of great importance to library services providing efficiency in the smooth management of its operation to clientele. The study conducted revealed that, University of Professional

Studies, Accra, are currently using a library management system which was developed in-house by the IT department of the university. Professionals and Para-professionals who are the main users of the software and who also determine the success of library management system have shown great interest in the application and development of the system. However, they are faced with problems in the software and other related ICT challenges that hindered the smooth operation of the library in the bid to providing better services to its numerous patrons.

In contrast, SaaS, a new emerging technology which is referred to as Cloud computing, offer software application to users over the Internet on their network computers, mobile devices such as laptop, phone and personal digital assistance (PDAs). The services held in "the cloud" can be used to accomplish several purposes for both individuals and firms. Cloud computing offers cost reduction, scalability, lower investment, reduced risk, real time support, greater security and accessibility anywhere. Clouds Computing is valuable; companies or firms as well as academic institutions around the world are adopting cloud services due to its several benefits. Though cloud services have some shortcomings, the benefits far outweigh the disadvantages.

Technological Acceptance Model (TAM), according to (Davis, 1989), proposes that, several number of reasons inspired users' choice about how to use new technology as well as when to use that technology, mostly, "Perceived usefulness (PU) and Perceived ease-of-use (PEOU)". To adopt this model in terms of cost savings and operational efficiency, the university ought to examine the current global economic situation and come out with a decisive assessment in comparing the potential risks and advantages of either procuring SaaS or to maintain the current In-house Software Development for the Library Management System.

6.2 Recommendations

Per the findings of the study conducted, it is conceptually established that Library Management Systems is of great importance to library services, particularly, using the Cloud SaaS.

With Cloud SaaS the following benefits were observed; cost reduction, scalability, lower investment, reduced risk, real time support, greater security and accessibility anywhere for free of charge (Romero, 2012). Rader (2012), drawn some benefits as well to include easy end-user startup - no need to wait for internal IT projects completion, right to use everywhere, anytime - competences are available over the network through several devices, rapid scalability -

capabilities can be quickly scaled up or down to match the workload, additional functions - no need for third-party or additional installations. It provides quick applications access to additional capabilities.

With In-house software implementation the following were also practical; development costs perceived to be cheaper, control over software, strategic importance, able to define one's needs, software design easily fit with existing in-house systems, and developers are able to familiarize with system interface, (Clydebuilt, 2012).

It has been established from the findings that, In-house Software Implementation can reduce security problems, lower procurement expenditure, and reduce maintenance expenses. Cloud Services on the other hand, there were indications that SaaS adoption would provide better service and minimize the frustration of staff.

The following recommendations were made based on the outcome of the study:

6.2.1 Staff Training

The study recommends IT training for information professionals to be up to date with current trends of information systems usage.

6.2.2 User Awareness

The study recommends the reassurance of the main users of the library management software of the need to outsource some services to a third party for Cloud storage whilst educating them on the advantages and disadvantages Cloud computing.

6.2.3 Acceptance of Cloud SaaS

The study recommends the adoption of Cloud Services for Library Management Systems to help curb the numerous challenges that the In-house Software offers despite its cost and security implication as per the findings.

6.3 Further Studies

The researchers recommend further studies on the Evaluation of the challenges and benefits of Cloud SaaS in other public university libraries in Ghana.

References

Aleem, A., & Sprott, C.R. (2012). Let me in the cloud: analysis of the benefit and risk assessment of cloud platform. *Journal of Financial Crime*, 20(1), 6 – 24. http://dx.doi.org/10.1108/13590791311287337.

Barrett, P. & Baldry, D. (2003*). Facilities Management*: Towards Best Practice (2nd ed.). Oxford: Blackwell Publishing Ltd.

Cho, J. (2011). Study on a SaaS-based library management system for the Korea library network. *The Electronic Library*, 29 (3), 379 – 393.

Clydebuilt Business Solutions Ltd (2012). Retrieved from http://www.clydebuiltsolutions.com/wp-content/uploads/2012/05/Inhouse-VS-Off-the- Shelf-May.pdf. Accessed on 02/05/2016

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Science 35,982–1003. doi:10.1287/mnsc.35.8.982.

Fariba, S., Narges, S., & Alireza, H. (2015). The adoption of software-as-a-service (SaaS): ranking the determinants. *Journal of Enterprise Information Management*, 28 (3), 400 – 422. http://dx.doi.org/10.1108/JEIM-02-2014- 0017. http://393.dx.doi.org/10.1108/02640471111141115.

Fink, D. (1994). A security framework for information systems outsourcing. *Information Management & Computer Security*, 2 (4), 3-8.

Gartner (2009). *Market Trends: Software as a Service, Worldwide*. Retrieved from http://www.gartner.com/. Accessed on 9/01/2016

Galvin, D., & Sun, M. (2012). Avoiding the death zone: choosing and running a library project in the cloud. *Library Hi Tech*, 30 (3)

Grover, V.,Cheon, M.J. & Teng, T.C. (1994). A descriptive study on the Outsourcing of information systems functions. *Information & Management*, 27 (1), 33-44.

Herrman, B.L. (2014*). State of SaaS 2014 and its Challenges*. Retrieved 28 January 2016, *from http://blog.compass.co/2014-saas-market-outlook/*.

Judith, M. (2013). The impact of cloud computing on the future of academic library practices and services. *New Library World*, 114 (3-4), 132 – 141. http://dx.doi.org/10.1108/03074801311304041.

Kim, Y. T. X (2015).User acceptance of SaaS-based collaboration tools: a case of Google Docs. *Journal of Enterprise Information Management*, 28(3), 423 – 442. http://dx.doi.org/10.1108/JEIM-04-2014-0039.

Kippenberger, T. (2000*).E-security, The Antidote*. 5(1), 34 – 35. http://dx.doi.org/10.1108/EUM0000000006742.

Kumar, N. R. S. (2011). Comparative features of integrated library management software Systems. *The Electronic Library*, 29 (1), 121 – 146. http://dx.doi.org/10.1108/02640471111111479.

Levy, R. (2013). Library in the Cloud with Diamonds: a critical evaluation of the future of library management systems. *Library Hi Tech News*, 30 (3)

Mavodza, J. (2013). The impact of cloud computing on the future of academic library practices and services. *New Library World*, 114 (3/4).

Makori, E. O. (2016). Exploration of cloud computing practices in university libraries in

Kenya. *Library Hi Tech News*, 33 (9).

Patel, A., Seyfi, A., Tew, Y., & Jaradat, A. (2011). Comparative study and review of grid, cloud, utility computing and software as a service for use by libraries. *Library Hi Tech News*, 28 (3), 25-32.

Patel, N. S. & Rekha, B.S. (2014). Software as a Service (SaaS): Security issues and Solutions. *International Journal of Computational Engineering Research (IJCER)*, 4(6), 68.

Rader, D. (2012). How cloud computing maximizes growth opportunities for a firm challenging established rivals. *Strategy & Leadership*, 40 (3), 36 – 43. http://dx.doi.org/10.1108/10878571211221202.

Romero, N. L. (2012).Cloud computing in library automation: benefits and drawbacks. *The Bottom Line*. 25(3), 110 – 114. http://dx.doi.org/10.1108/08880451211276566.

Saxena, S.C., & Srivastava, R.K. (1998). Evaluation of library software packages. *Bulletin of Information Technology*, 18(5), 9-17. India: DESIDOC.

Singh, Y. K. (2006). *Fundamental of Research Methodology and Statistics*. New Age Publishers: New Delhi., pp. 221-250.

Tayntor, Ch.B. (2001). A practical guide to staff augmentation and outsourcing. *Information Systems Management*, 18 (1), 84-91.

Veronica, A., Paul, B., Ken, C., David, K., & Jane, P. (2008). *JISC & SCONUL Library Management Systems Study*. Retrieved from http://www.webarchive.org.uk/wayback/archive/20140615073047/http://www.jisc.ac.uk/media/documents/programmes/resourcediscovery/lmsstudy.pdf. Accessed on 09/01/2016

Yuvaraj, M. (2015). Security threats, risks and open source cloud computing security

solutions for libraries. *Library HiTech News*, 32 (7), 16 – 18. http://dx.doi.org/10.1108/LHTN-04-2015-0026.

Ziff, *D. (*2014). Retrieved 28 2016 from http://www.pcmag.com/encyclopedia/term/56112/saas. Accessed on 09/03/2016