Establishing clients' satisfaction levels with automated library based services

A case study at University of Cape Coast library, Ghana

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Abstract

Purpose – Library automation is required in academic libraries to meet the dynamic demands of clients. This study aims to investigate the level of clients' satisfaction of Sam Jonah library automation.

Design/methodology/approach – The study utilized the descriptive research design by using an exploratory case study research method. A disproportionate stratified random sampling was used to select 322 respondents (undergraduates, postgraduates and lecturers/researchers) who consented to participate in the study. Questionnaire and informal interview were used for the data collection.

Findings – The study showed that more than half of the clients of Sam Jonah library were moderately satisfied with the library's automation. Clients mostly access internet/Wi-Fi and reference service. Patronage of the services including photocopying, borrowing of books (circulation), e-resources/academic databases, institutional repository, library website and the OPAC was not encouraging. Increase in user education was recommended to improve their usage.

Research limitations/implications – The study was limited to only one academic library, namely, Sam Jonah library of the University of Cape Coast, Ghana.

Originality/value – The study provides insight into a case study of satisfactory level of clients in accessing automated services of Sam Jonah Library to serve as a basis for further research.

Keywords Internet, Client satisfaction, Library automation, Academic library, ICT, User education

Paper type Research paper

Introduction

Rapid changes in technology globally have impacted on the effective delivery of services by academic libraries. New technological methodologies have been used in scholarly communications and developing virtual space for libraries through research and knowledge commons. These changes have collectively transformed the traditional academic libraries. Traditional academic libraries therefore will have to accept the idea of using technologies in digital library systems for their effective operations so long as technology will continue to influence the delivery of information services. According to Choi and Rasmussen (2009), academic libraries have moved from concentrating on management of physical resources and its associated services to changing resources and services into digital forms to support teaching, learning and research. Academic libraries would therefore have to make use of modern Information and Communication Technology (ICT) to expedite better access to local and global information (Kavulya, 2004).

The main library of the University of Cape Coast began the automation of its operations in the year 2000. When this initiative begun, the cataloging section of the library was the

first to be automated using the software called BiblioFile. This eased the cataloging processing of library books. The BiblioFile is a commercial library software, which was subscribed yearly. However, in the year 2005, the library management decided to use a more integrated system and therefore used the software known as Alexandra. From the year 2007 till date, the main library of the University of Cape Coast, which is known as Sam Jonah library since September 2016 (Vice-Chancellor's Annual Report, 2016) has been using Koha (open source) for its operations. The library's migration from one automation software to the other indicates the library's desire to provide satisfactory service to its clients considering their needs. Millson-Martula and Menon (1995) posited that "the incorporation of users' personal needs and expectations into the development of programs and service" is one of the key factors to consider in the provision of high quality service . Further, the changing of the library automation system indicates the strategic role of the academic library to remain relevant in supporting the core activities of the university as these activities are also presented in various forms.

Ijiekhuamhen *et al.* (2015) enumerated several factors considered to assess the extent to which library users are satisfied with the services provided by academic libraries. These included the size and collection of library, sufficiency and effectiveness in the organization of its resources, the usefulness of its catalogs in providing access to its resources, the competencies and assistance of the library staff in making these resources available to the library users, and the carrying out user education. In addition, they added that some areas of library services are more easily evaluated that others (Ijiekhuamhen *et al.*, 2015). Identifying the knowledge gap that there is no literature in the area of assessing clients' satisfaction based on the academic library automation. This study attempts to investigate into the level of user satisfaction of academic library automation using the Sam Jonah Library of the University of Cape Coast as a case study to provide a basis for further research.

Statement of the problem

Academic libraries of today use ICT resources to automate their operations for clients' satisfaction. The automation involves the implementation of proficient and operative electronic library services, digitized institutional repositories, networked resource sharing, and management information systems. Libraries with ICT integration provide access to unlimited electronic information resources to their clients. The Sam Jonah library of University of Cape Coast has in recent times used more technological resources in automating its services. This innovative use of ICT in Sam Jonah library was not widespread.

Objective of the study

The main objective of the study is to determine the clients' level of satisfaction of the automation of Sam Jonah library.

Hypothesis

H0. There is no difference in clients' satisfaction of Sam Jonah library automation.

Literature Review – Theoretical framework

Technology acceptance model

Technology acceptance model is a model founded by Fred Davis in 1989. This model is used to assess people acceptance and usage or acceptance and implementation of any technology in an institution. It determines the factors that make an individual to either accept or reject

an emerging technology and use it. According to Davis (1989), these factors are the perceived usefulness of the technology and perceived ease of use of the technology. He further explained perceived usefulness of technology to mean the level of believe that one has that the use of a particular technology will increase or improve one's performance of work. In other words, the technology is useful in meeting the needs of the user. On the other hand, perceived ease of use of technology meant the level of believe that one has such that a particular technology is easy to use. This model is adopted by the researcher for this study because for an academic library to have developmental sustenance to be relevant in today's information world, it must use the use of ICT in the provision of its services for client satisfaction. Thus, the particular ICT to adopt must be determined by the perceived usefulness and perceived ease of use by the library staff and users (clients).

Academic library automation
The choice of a suitable software package for automation of academic libraries is vital. It is an obvious fact that there is no software that is hundred per cent efficient. This is to say that every integrated library software may have some negative impact on the efficiency of a library because of the particular software being used by the library. The library management or Librarian, however, need to have a better understanding of the particular needs of the library to ensure the right selection of a library automation software. The knowledge about the needs of the library will not only help in selecting a suitable software package for the automation but also help even in the selection of the appropriate hardware since hardware depends on the software design and complexity. There are several integrated library software packages used in the automation of academic libraries to provide efficient services to clients. Several scholars such as Patel and Bhargava (1995), Joes (1997), Airy (1999), Shrestha (2000), Aryal (2005), Mandal and Jeevan (2006) have done extensive research on the use of some of these library automation software like LibSys, SLIM21, PhpMyLibrary, AFW, OpenBiblio, Millenium, Alice, SLIM, Koha, EASYLIB, SOUL, Sierra, CDS/ISIS, SLIM++, WINISIS, etc. These integrated library management packages are either commercial or free and open source software. According to Adeyoyin and Wallis (2005), a good number of academic libraries in West Africa have adopted the use of library automation software in the handling of their information acquisition, storage, processing and retrieval.

Automation can be described as the use of computers and computer-based tools in the operation of the various routine task performed by humans. Library automation can simply be described as the process of computerizing library operations (Harinarayana, 1991; Kumar, 1987). It involves the application and use of ICT in libraries. Library automation is required in academic libraries of today, to meet the demand of the massive increase in the collection and transmission of new knowledge, and the problems of their acquisition, storage, processing and dissemination (Bhanja and Barik, 2009, Bhardwaj and Shukla, 2000; Rao, 1995; Khalid, 1991; Riaz, 1991). Library automation must be consistent with library standards and guidelines. Sharma (2007) defined library automation to involve the computerization of the entire library housekeeping operations like acquisition (Khalid, 1991; Riaz, 1991), cataloging (Amekuedee, 2005), circulation (Saffady, 1989), serials control (Riaz, 1991; Rao, 1995) and the handling of a large quantity of data more efficiently and quickly using computers and other modern information technologies. This definition suggests a holistic approach of using computerized information processing system in the daily operation and provision of library services. It should, therefore, be noted that when a system is in operation, careful attention is crucial to ensure that procedures are adjusted for effective and efficient use of available features and job design (September, 1990; Cotta-Schönberg (1989). An automated library is therefore one in which a computer-based system or

technology is used to control only one or several key functions performed by the library such as serials control, providing reference service, acquisition, cataloging of materials and circulation (Rajput and Gautam, 2010; Bhanja and Barik, 2009; Amekuedee, 2005; Rao, 1995; Khalid, 1991; Riaz, 1991; Saffady, 1989).

The advent of automation in libraries has restructured academic libraries and their mode of operation in recent times. In a traditional academic library, a typical structure will be the division of the library into functional sections of acquisition, cataloging and classification, circulation, serial control, subject indexing, and face-to-face reference service (Bhanja and Barik, 2009; Riaz, 1991). These key divisions manually performed their respective activities such as the acquisition librarian being responsible for purchasing library materials from bookshops; the cataloging and classification section being responsible for cataloging and classifying library materials, preparing card catalogs and processing the books for easy identification on the shelves, whereas the circulation section receive and issue library books to users by their use of library cards (Bhardwaj and Shukla, 2000). A research conducted by Ayiah and Kumah (2011) indicated that traditional academic library's processes and structures have been proven unsatisfactory to respond quickly in a technology-driven age. Change in academic libraries must not be seen as only desirable but compulsory because technology has many prospects that cannot be overlooked. Moyo (2004) asserted that automation of academic libraries has brought a transformation of the traditional academic library services to the provision of electronic services including online services and virtual reference services.

Automation of academic libraries has improved efficiency in service provision. It ensures effective control of the overall operations of the academic library, improves control of the library collections, improves existing services and introduces new ones, shares resources with other libraries and avoids duplication of work (Sharma, 2014). For example, the acquisition librarian can order books online just by clicking a button while sitting behind a computer. Other electronic collections such as e-books, e-journals, and databases are accessed using computers. It must therefore be noted that for academic libraries to deal with new challenges due to the increasing demands of its clients, they must consider repackaging the library services using ICT (Parvez, 2011). According to Omeluzor and Oyovwe-Tinuoye (2016), the integration of the appropriate automation into library operations and activities enable users of academic libraries to have access to information materials at any time, irrespective of their locations. For example, accessing the current content of information from online databases and quick response for Inter-library lending and document delivery (ILL/DD) services via email are made with the use of computers and internet. Automation of academic library operations, therefore, provides client services very rapidly, adequately and economically (Sharma, 2007; Rasul and Sahu, 2011).

The integration of ICT in academic libraries has greatly transformed the operations of the traditional academic libraries. Several decades ago, one may have asked if computers are needed in academic libraries. However, today, such a question is not relevant, as academic libraries around the world have realized that apart from the relevance of traditional libraries, computers are important tools for this information age. Morgan (1998) as cited by Adeyoyin (2006) rhetorically asked why anybody would trust a librarian today whose profession is about information and knowledge and had not mastered the use of a computer. Adeyoyin (2006) added that librarians who have upgraded themselves understand what the information age is about and take advantage of ICT.

The future of academic libraries in Africa especially is guaranteed by the integration of ICT. According to Afolabi and Abidoye (2011), a library can lose its significance in this digital world if it does not integrate technology into its operations to sustain its relevance. Our world today makes a demand on academic libraries to be able to respond and adjust to

the rapid changes in society while maintaining the efficiency and effectiveness of their operations (Adeyoyin, 2006).

The main purpose of academic library automation is to introduce a system of operating and controlling processes through automatic means using electronic devices and technologies to decrease the human efforts and involvement in the process for a more efficient productivity (Rajput and Gautam, 2010; Amekuedee, 2005). Academic library automation uses the use of ICT to provide continues development and also restructure the way academic libraries access, store, manipulate and share information to clients. It is therefore necessary for academic libraries to meet the present and future information needs of their users through automation processes. The integration of ICT into academic library services provides users with the opportunity to access abundant information at minimal cost within the shortest possible time available.

Internet usage in automated academic libraries
It is an obvious fact that since the advent of the internet, most automation systems of academic libraries around the globe make use of the internet. The internet has therefore helped in providing access to information from remote locations worldwide from any automated academic library environment. The internet has been simply defined as a global network of computer networks (Boohene *et al.*, 2014; Kumar, 1996). One can describe the usage of internet in the provision of information services in academic libraries as a paradigm shift due to the shift from the manual way of accessing information sources to a more remote and faster way to access information. The internet is now the medium use to access networked information resources and online databases. This technological idea has bridged the information access gap between the developed and developing countries. In reference to Oyedum (2007), he stated that the internet helps librarians especially reference librarians to answer questions and provide information which are usually more up-to-date than the printed resources. He added that with the internet, one can access a growing database of information online. Uddin (2003) research on "Internet use by university academics - a bipartite study of information and communication needs" indicated that there was the need for investment in the deployment of ICT in universities so that internet usage for research, teaching, and learning will enhance academics.

Slow internet connectivity speed has been a challenge to many establishments including universities in Africa. A survey by Jensen (2002) as cited in Global e-Schools and Communities Initiative (2011) revealed that almost 60 per cent of African countries have bandwidth that is less than that of a typical institution in the developed world. It is quite alarming from Jensen (2002) report that almost close to decade, the Global e-Schools and Communities Initiative (GeSCI) thematic paper in 2011 also reported that access to bigger bandwidth for ICT resources which require internet is a major hindrance in Africa. They further indicated that even for most universities in Africa, the basic infrastructure needed to support applications requiring bigger bandwidth is also inadequate. Although the history of internet availability in Ghana for example, dates back to the year 1995 via the support of the then Network Computer Systems (Boohene *et al.*, 2014), one could say that the slow speed of internet connectivity in several establishments in Ghana is still a major challenge today.

Tertiary institutions in Ghana should take deliberate steps to improve the internet connectivity speed especially considering the projection made by Claudine (1998) that the internet will have a more pervasive impact on the future of education and libraries of universities. According to Olufunmilola (2012), priority should be given to internet connectivity speed to support the informational activities carried out by both staff and

students in universities. internet connection speed is, therefore, relevant in retrieving information quickly and also in the provision online service (Qutab *et al.*, 2014).

Globalization on the other hand has encouraged independent learning, teaching, and research through the internet. Before the use of internet for the acquisition and dissemination of information; learning, teaching and research in universities were limited to the physical materials available to both students and lecturers by their institution's library or personal materials purchased. With the use of internet, the channels for acquiring and sharing information for learning, teaching and research in tertiary education have moved from the physical materials to electronic materials which present information in real time and space. According to Cisse (2004), ICT has enabled students and researchers to have access to limitless information and communicate globally. This is ensuring a meaningful and successful communication in education.

Client satisfaction of academic library automation
User satisfaction concept in libraries has evolved to include a focus on the users' perspective of the library (Ijiekhuamhen *et al.*, 2015). Applegate (1997) defined user satisfaction as "a personal, emotional reaction to a library service or product". In addition, Bitner and Hubbert (1994) indicated that user satisfaction includes service encounter satisfaction. This implies that a client's satisfaction or dissatisfaction of a library service is based on the experiences he/she encounters in the use a particular service.

The theoretical framework (technology acceptance model) for this study identified factors that could make an individual to either accept or reject an emerging technology and use it. One may ask, could it be that the choice of an automation system adopted by an academic library can affect the satisfaction of its clients in accessing information from the library? According to Ijiekhuamhen *et al.* (2015), "the abundance of resources available and the difficulty in being able to determine these resources also create problems for users". They added that the inability of users to easily recognize the specific use of an academic library's service due to new technologies, and hence the difficulty to access information resources contribute to client dissatisfaction (Ijiekhuamhen *et al.*, 2015). Academic libraries stand threatened by competitive sources of free books/information providers available on the internet and free e-learning platforms (Norliya and Khasiah, 2006; Hernon and Altman, 1996; White and Abels, 1995).

Methodology
Research design
The author used the descriptive research design to undertake the study. However, an exploratory case study research method was used. According to Bernard and Bernard (2012), the use of case exploratory study research is not for the determination of cause and effect. It is also not for generalizations (Creswell, 2013). This method narrowly focuses on exploration and description of events, as well as, provides initial information which leads to testable hypotheses for future research (Bhattacherjee, 2012). Hancock and Algozzine (2006) have indicated that case study research design embraces a wide range of research methods and tools. However, the selection of the various methods should be purposively done by the researcher. Case study designs normally use observations, interviews, documents and reports in its data collection (Creswell, 2013; Bhattacherjee, 2012; Hancock and Algozzine, 2006). On the other hand, a researcher can use a questionnaire if he feels the questionnaire will produce certain information better than the others (Hancock and Algozzine, 2006).

Population

The population of a study refers to all items or people which are sometimes known as the unit of analysis with the elements or characteristics that a researcher wants to study (Bhattacherjee, 2012). The population of the study consists of all staff (academic/non-academic) and students (postgraduates and undergraduates) of the University of Cape Coast. The target population for the study comprised lecturers/researchers, postgraduates, and undergraduates. Majority of the respondents fell within the age of 18 to 29 years and are mostly males.

Sampling and sampling size

A total of 322 respondents were involved in the study. A disproportionate stratified random sampling was used to select the respondents. A disproportionate stratified random sampling is the sampling method where the researcher divides the sampling frame into strata (subgroups) and use different fractions for the various subgroups (Bhattacherjee, 2012). The disadvantage to this type of sampling is when the researcher put too much emphasis on one strata leading to a skewed result (Bhattacherjee, 2012). This sampling method was used because by the researcher's observation, undergraduates form the larger fraction of the users of the library. Also, the Sam Jonah library has places designated for lecturers and researchers use only; postgraduate students use only; and for undergraduate students use only, hence it was easy for the researcher to meet the targeted population (Table I).

Instrument and data collection

Informal interview and structured questionnaire were used to elicit relevant data for the study. The purpose of the research was clearly explained to the respondents, and their consent was duly obtained before administering the questionnaire. The questionnaire was personally administered by the author.

Data analysis

Data analysis was done by the use of SPSS version 21, which produced the percentages, frequencies and tables to depict the analysis and findings of the study. Both descriptive statistics and inferential statistics were used for the study. Analysis of the data was done carefully for fair judgment, which enhanced the interpretation of the study results.

Results and discussion

Respondents' demographics

Table II, depicted that out of a total of 322 clients who were used for the study, 228 (70.8 per cent) were males and 94 (29.2 per cent) were females. This showed that majority of the respondents were males. Other studies have indicated that males are heavy users of library

Category of respondent	No. of respondents
Undergraduates	252
Postgraduates	59
Lecturers/Researchers	11
Total	322

Source: Field data (2017)

Table I.
Sample size

electronic information resources, databases and even the awareness of their availability (Bassi and Camble, 2011; Manda and Mukangara, 2007; Bar-Ilan *et al.*, 2003).

Table III, showed that about 253 (78.6 per cent) of library clients fell in the 18-29 age range, 45 (14.0 per cent) in the 30-39 age range, 22 (6.8 per cent) in the 40-49 age range and 2 (0.6 per cent) of library clients fell in the age range of 50 years and above. This revealed that majority of the respondents for the study were young adults. Studies have revealed that young people use the library electronic resources more than the older people (Horrigan, 2016; Stone and Collins, 2013; Cox and Jantti, 2012). According to Bar-Ilan *et al.* (2003), "the older the faculty member is, the less he or she uses electronic services and the less he or she prefers the electronic for-mat over the printed one". This suggests that Librarians of academic libraries should consider the user-friendliness of the automation system adopted to enable all of the clients access electronic information.

The analysis in Table IV revealed that the most highly accessed service by clients of Sam Jonah library is the internet/Wi-Fi availability indicated by 259 (80.4 per cent) of the respondents. This might be due to the free access to this facility without any login or

Gender	Frequency	(%)
Male	252	70.8
Female	59	29.2
Total	322	100
Source: Field data (2017)		

Table II.
Gender of respondents

Age	Frequency	(%)
18-29 years	253	78.6
30-39 years	45	14.0
40-49 years	22	6.8
50 and above	2	0.6
Total	322	100
Source: Field data (2017)		

Table III.
Age of respondents

Service	Yes		No	
	F	(%)	F	(%)
Borrowing of books (Circulation)	72	22.4	250	77.6
Reference service	187	58.1	135	41.9
Internet/Wi-Fi	259	80.4	63	19.6
Photocopying	123	38.2	199	61.8
OPAC (Online Catalogue)	37	11.5	285	88.5
E-resources/Academic databases	71	22.0	251	78.0
Institutional repository	50	15.5	272	81.5
Library website	53	16.5	269	83.5
Source: Field data (2017)				

Table IV.
Services accessed by clients of Sam Jonah library

password requirement. This was followed by the reference service 187 (58.1 per cent). Photocopying service 123 (38.2 per cent), borrowing of books 72 (22.4 per cent), e-resources/ academic databases 71 (22.0 per cent), institutional repository 50 (15.5 per cent), library website 53 (16.5 per cent) and the OPAC 37 (11.5 per cent) were services which were not highly patronized by the clients. This may be due to the lack of user education to equip clients with the requisite knowledge and skills to use them. ICT usage in storing, retrieving and dissemination of information become challenging to library users and therefore suggested that library users need to be educated to gain the requisite skills and knowledge to use such ICT facilities to retrieve information (Idowu, 2008; Iheaturu, 2002). Other studies have talked about the importance of user education for library users (Liu *et al.*, 2016; Uwakwe *et al.*, 2016).

The analysis of data collected on the level of satisfaction of clients regarding automation of Sam Jonah library in Table V revealed that 174 (54.0 per cent) of clients were moderately satisfied and only 14 (4.3 per cent) out of the 322 respondents indicated that they were highly satisfied. The table indicated that more than half of the clients of Sam Jonah library were moderately satisfied with the automated services provided by the library. According to Mohammad *et al.* (2014), "68 respondents out of 80 believed that automated library system is better than the manual system."

Hypothesis testing
A one-way between groups analysis of variance was conducted as showed in Table VI to explore the category of library clients on the satisfaction of the automated services of the Sam Jonah library. Respondents were divided into three groups namely undergraduates, postgraduates and lecturers/researchers. Table VI indicated that there was no statistically significant difference at the $p < 0.05$ alpha level in client satisfaction of Sam Jonah library automation services for the three client groups $F (2, 319) = 0.512$, $p > 0.05$. The author therefore fails to reject the null hypothesis that there is no difference between clients' satisfaction and the automated services of the Sam Jonah library.

Level of satisfaction	Frequency	(%)
Highly satisfied	14	4.3
Moderately satisfied	174	54.0
Satisfied	61	18.9
Not satisfied	73	22.7
Total	322	100.0

Table V.
Clients' satisfaction level of Sam Jonah library automation

Source: Field data (2017)

	Sum of squares	Df	Mean square	F	Sig.
Between Groups	0.803	2	0.402	0.512	0.600
Within Groups	250.516	319	0.785		
Total	251.320	321			

Table VI.
ANOVA Test for clients' satisfaction of automated services of Sam Jonah library

Source: Field Data (2017)

Conclusion and recommendations
Academic libraries are using ICT resources to automate a wide range of their operations, as well as, building databases and networks to provide better services to their clients. The availability of ICT resources in academic libraries facilitates the free flow of information for clients' satisfaction. The internet serves as the technological foundation for wider sharing of knowledge in this digital era. The potential of enabling access, organizing and disseminating information makes internet connectivity very crucial in automation of academic libraries.

Academic libraries especially in Africa should acquire bigger bandwidth for higher internet connection speed since most recent automation systems use internet to enable them fulfill their mandate in supporting the teaching, learning and research agenda of their institution. African university librarians must also consider the choice of their automation system in the provision of information to their clients. Increase in user education service is also recommended for academic libraries to reach more of their clients in order to quip them with the necessary knowledge and skills to access their available resources.

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