

KNOWLEDGE MANAGEMENT AND INNOVATIVE SERVICES IN UNIVERSITY LIBRARIES IN NIGERIA

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Abstract

Managing knowledge effectively leads to innovation. Academic libraries are beginning to implement knowledge management for the purpose of innovating services. However, there are little or no quantitative studies on knowledge management and service innovation in the context of university libraries in Nigeria. Through a survey of 250 librarians, this study investigates the effect of knowledge management (KM) on service innovation. The study found that knowledge capture/creation knowledge sharing/transfer, and knowledge application/use significantly impact service innovation in university libraries. In conclusion, the process of service innovation can be enhanced in university libraries by utilizing the phases of KM cycle as demonstrated in this study.

Introduction

University libraries in Nigeria are facing many challenges. Some of the challenges include coping with changes brought by advances in technology, shrinking budget allocations and increasing user demands. These challenges are now forcing many Nigerian university libraries to begin to look beyond their professional boundaries. However, authors like Islam, Agarwal and Ikeda (2017) have suggested that innovation is the key solution to the challenges facing academic libraries in the world today. Further, knowledge is the precondition for innovative activities in organizations. As innovation is dependent on knowledge, the same knowledge creates problems for innovation to take hold in organizations. According to Du Plessis (2007), the amount of knowledge generated in organizations has made the process of innovation a complex one. This complexity needs to be managed so as to improve innovation. There are quite a number of studies that have shown the importance of KM in improving innovation (Islam et al, 2017; Du Plessis, 2007; Adams and Lamont, 2007; Darroch and McNaughton, 2002). Innovation in itself is important to libraries. For instance, to keep pace with the increasing user demands, libraries need to leverage their strengths and to innovate to provide more responsive and flexible

services (Li, 2006). Islam et al (2017) state that “libraries need to embrace a scenario where knowledge is not just managed in the form of books and periodicals but created”(p.2). Libraries also need to leverage employee and user knowledge along with the emerging technologies (Islam et al, 2015).

However, while there are studies on KM in libraries (see Ugwu and Onyancha, 2017; Sarrafzadeh et al, 2010; Maponya, 2004; Wen, 2005) and on innovation in the context of libraries (see Brundy, 2015; Islam et al, 2015; Ward, 2013; Jantz, 2012; Scupola and Nicolajsen, 2010; Li, 2006), little or no studies have tried to provide empirical evidence linking KM with service innovation in academic libraries within Nigerian context. The purpose of this study is to investigate the effect of KM on service innovation in university libraries in Nigeria. Specifically, this study intends to determine:

- 1). The effect of knowledge capture/creation on service innovation.
- 2). The effect of knowledge sharing/capture on service innovation.
- 3). The effect of knowledge application/use on service innovation.
- 4). The overall effect of knowledge management on service innovation.

Literature Review

Concept of KM and the Library

Knowledge management is viewed differently by scholars (see Nonaka and Takeuchi, 1995; Dalkir, 2013; Townley, 2001; Harloe and Budd, 1994). Nonaka and Takeuchi (1995: 3) define KM as the “capability to create new knowledge, disseminate it throughout the organization and embody it in products, services and systems. The key concept in this definition is knowledge, which has become one of the organization’s key resources. Knowledge is defined as a “fluid mix of framed experience, value, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information” (Ma et al, 2008: 98). At the bottom of the knowledge value chain is data, which consist of unfiltered facts(Townley, 2001). Townley further states that data becomes information with the addition of contexts. The knowledge management cycle may be described as the process of transforming information into knowledge as a strategic valuable organizational assets. It is made up of a series of knowledge processing steps which include but not limited to knowledge capture, knowledge creation, knowledge contribution, knowledge filtering or selection, knowledge codification, knowledge refinement, knowledge sharing, knowledge access, knowledge learning, knowledge application, knowledge evaluation and knowledge re-use (Dalkir, 2013). Dalkir’s KM cycle was obtained

from a review of literature on KM processes. However, Agarwal and Islam(2014) have simplified these steps further by integrating them into three phases of KM cycle, namely: knowledge capture/creation, knowledge sharing/transfer, and knowledge application/use. Each of these three broad steps or phases is a component of KM. For instance, knowledge creation is an “integral part of knowledge management (Islam et al, 2017:2).

Since the steps underlying KM cycle represent integral parts of KM, Townley (2001) writes that a library is expected to select the knowledge that is most likely to help it achieve its goals. Depending on the goal of the library, appropriate/knowledge is required. This argument has been exemplified by authors such as Harloe and Budd (1994) and Townley (2001) who maintain that if the goal of the library is to achieve the effectiveness of the library portal, knowledge creation will require usage data. Furthermore, if the goal of the library is to increase patron satisfaction, the information required to achieve this will be obtained from organizing focus groups and carrying out surveys and interviews of patrons. Thus, this information with usage statistics will lead to knowledge user needs.

Some authors have tried to discuss the benefits of KM to library personnel (Teng and Hawamdeh, 2002), promoting a culture of knowledge sharing and expanding the library’s role to areas such as administration or support services (Townley, 2001; Teng and Hawamdeh, 2002). Further studies on KM in libraries have focused on few areas such as librarians’ awareness or perception of KM(Siddike and Islam, 2011), the relationship between KM and libraries (Roknuzzaman and Umemoto, 2009; Sarrafzadeh et al., 2010), need for KM in libraries (Wen, 2005), KM and digital libraries (Islam and Ikeda, 2014), mapping of KM tools and cycle for libraries (Agarwal and Islam, 2014), adoption of KM in libraries using web 2.0 (Islam et al, 2014) and relationship between KM and organizational factors in university libraries (Ugwu and Onyanacha, 2017).

Service Innovation and the Library

Service concept relates to how the customer needs are to be satisfied and what is to be done for the customer (Islam et al, 2017). Service innovation goes beyond service concept to include the client interface, the delivery system and technology (Hertog, 2000). Service innovation is defined as changes that offer value to the provider and affect service characteristics, and may be completely new to others (Gallouj and Weinstein, 1997).

Innovation is critical for libraries for their growth and survival (Li, 2006; Scupola and Nicolajsen, 2010). Elements of innovation, according to Lasneski (2015), include critical thinking, communication, and collaboration and creativity (4Cs). Islam et al (2017) state that adapting these elements into the library setting will help to facilitate innovation. A lot of innovation has been happening in libraries. Examples of innovations in library services include sending of a welcoming text message to the patron's phone when entering the library, use of RFID for books and cards, stations for podcasting and video casting, organizing related materials in one place by subject, encouraging patrons to hang out in the library, meet friends, have coffee, and pursue hobbies, learning courses in the library, and providing seed exchange services whereby patrons can borrow vegetables, herb and flower seeds, grow plants and return the seeds to the library at the end of harvest season (Best Colleges Online, 2016; Mashville Public Library, 2016; Islam et al., 2017) as well as making library resources more accessible to Wikipedia (Barr and Zenni, 2016). These examples are happening in public libraries around the world. Some academic libraries are now trying to be innovative by responding to campus needs, having technology integrated into every aspect of library service, embracing flexibility and providing places to engage (Lukamic, 2014) innovation in academic libraries is now a necessity and no longer a consideration (Brundy, 2015).

There are few studies that have looked at innovation in the context of academic libraries (White, 2001; Sheng and Sun, 2007; Scupola and Rheolajeen, 2010; Jing and Jin, 2009). Areas covered by these studies include relationship between library and innovation in digital reference services, customer role for service innovation, and knowledge innovation culture and innovation ideas in academic libraries. Further, some of the innovation ideas in academic libraries include: research data management to provide new services like where to find other people's work (Elves, 2015), proposing frameworks such as resources processes-values framework to help administrators become innovators and to foster an innovation culture (Yeh and Walter, 2016) and developing a conceptual model that utilizes the interaction between critical resources and technologies to deliver service innovation in academic libraries (Yeh and Ramirez, 2016).

KM and Service Innovation in Libraries.

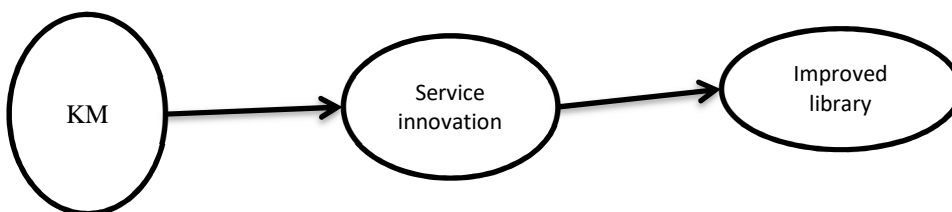
At the centre of service innovation is the customer, and in the library, the customer is the user. Library user or customer KM is conceptualized as the utilization of knowledge for, from and about users or customers so as to enhance the customer relating capability of organizations (Salomann et al, 2005). In the

context of academic libraries, knowledge for customers has to do with satisfying patron requirement for knowledge about services and other relevant items. Knowledge from customers refers to ideas and suggestions that would be useful for the library to implement. Knowledge about customers refers to understanding the patterns of patron information needs which include those that have been met through library services and those that are yet to be met. For instance, Kim and Abbas (2016) have found that RSS and blogs are widely adopted by academic libraries through a KM perspective whereby blogging enables the library to aggregate knowledge from users. Further, Rowley (2011) state that new service development in academic libraries depends on such factors as employee skills, availability of tangible and intangible resources, IT adoption, management support, innovation processes and user knowledge. Service innovation also requires knowledge of barriers prevalent in the library that need to be overcome before innovation can happen (Islam et al 2017). It has also been stated that KM is important for innovation in libraries because it helps to gather knowledge of user needs, innovation possibilities and barriers (Islam et al 2015).

Research Model and Development of Hypotheses

The research model for this study, as shown in fig.1 below, is based on the two variables, namely KM and service innovation. The model is helpful in demonstrating the relationship between KM and service innovation in academic libraries. While the steps in KM cycle are independent variables, service innovation is dependent variable.

Figure 1: Research Model



It is expected that the relationship between KM and service innovation will lead to improved library services or make library services to be more responsive and flexible (Li, 2006).

KM (Independent Variable)

The steps of KM cycle have been identified by Agarwal and Islam (2014) as consisting of knowledge capture/creation, knowledge sharing/transfer and knowledge application/ use. Studies have shown that the ability to create new knowledge is often at the heart of the organization and that knowledge creation and innovation have a strong relationship (Darroch, 2005; Schulze and Hoegl, 2008). Further, McAdam et al (2006) have conceptually established the relationship between knowledge creation and idea generation. Once knowledge has been captured and codified, it needs to be shared and disseminated throughout the organization (Dalkir, 2013). Through knowledge sharing, employees can exchange ideas or their knowledge and contribute to innovation for the organization (Wang and Noe, 2010). Lundrall and Nielsen (2007) are of the view that organizational innovation depends on employees' tacit and explicit knowledge. A library that can promote knowledge sharing practices among employees or between employers and users is likely to generate new ideas for innovation (Islam et al, 2017). When knowledge has been captured and shared, it becomes ready for use. Islam et al (2017) maintain that KM succeeds when knowledge is used. Cavusgil et al (2003) have shown that creating and using knowledge can lead to innovation. Based on the studies reported here, it is hypothesized that:

H1: Knowledge capture/creation will positively affect innovation in library services

H2: Knowledge sharing/transfer will positively affect innovation in library services

H3: Knowledge application/use will positively affect innovation in library services

Innovation in library services (Dependent Variable)

Service innovation has generally been classified as service concept, the service interface, the delivery system, and technology use (Herlog, 2000). In the context of libraries, service innovation refers to "new or improved technology interfaces, improved services, methods and other continuous work for patron satisfaction" (Islam, 2014:41). In this study, innovation in library services is defined as satisfying user needs through new ideas or services, new delivery methods, improved user interfaces as well as new technology applications (Islam et al, 2017). Knowledge management is now a pre-condition for organizational innovation. Tsai (2001) states that implementing knowledge management

promotes learning and cohesion among organizational units, creates organizational knowledge and increases the capability of the units to innovate. Furthermore, KM activities in organizations are capable of supporting employees to utilize organizational resources, to improve their innovative ability and to promote organizational innovation (Chen and Huang, 2009; Darroch, 2005). Based on these studies, though carried outside the library setting, it is hypothesized that:

H4: Knowledge management will positively affect innovation in library services

Methodology

Research type

This study proposed four hypotheses aimed at determining the relationship between knowledge management and innovation in library services. Quantitative approach underpinned by positivist philosophy was deemed appropriate for this study to determine this relationship through a field study utilizing a questionnaire for data collection. The questionnaire item used the 5-point Likert scale.

Sample

Academic librarians in Government-funded university libraries in Nigeria are the taught population for this study. University libraries were chosen because they speed up knowledge creation and transfer by providing innovative services to students, researchers and faculties. The academic librarians were drawn from the list maintained by the Librarians' Registration Council of Nigeria and only the librarians with active email addresses were contacted to participate in this study. Through this way, a total of 500 academic librarians were contacted to request for their consent to participate in the study. The purpose of the study was explained to them and they have the right to opt out by not filling out the questionnaire.

Measures

KM process

The classification of KM process by Agarwal and Islam (2014) and Dalkir (2013) was used. These authors classified KM process into: (1) knowledge capture/creation, (2) knowledge share/transfer, and (3) knowledge application/ use. Knowledge capture/creation refers to gathering information of user needs, of innovation possibilities and of barriers to innovation (Islam et al, 2015). Knowledge sharing/transfer is an activity through which tacit and explicit knowledge is exchanged through information dialogues, face – to face meeting, and group discussion (Islam et al, 2017). Knowledge application / use is an “activity through which the knowledge of user needs, barriers, innovation possibility and the overall knowledge of employees and users is analyzed and

synthesized to come up with creating innovative ideas to overcome barriers to innovation and to enhance library services” (Islam et al,2017: 6). The measures of knowledge capture/creation, knowledge sharing/transfer and knowledge application /use were gathered from different literature sources (Islam et al, 2015; Schulze and Hoegl, 2008; Agarwal and Islam, 2014; Wang and Wang, 2012; Kor and Maden, 2013; Xu, 2011).

Innovation in Library Services

Item measures for innovation in library services were developed from literature sources or adapted to suit the study (Edvardsson and Olsson,1996, Islam et al, 2017; Wang and Wang, 2012; Kor and Maden, 2013)

Data Collection and Analysis

The survey instrument was pretested on 16 librarians from the University of Nigeria, Nuskka Library system so as to check for any wording issues. Minor changes were made based on suggestions. The questionnaire was validated by three lecturers in the Department of Library and Information Science, University of Nigeria, Nsukka. Filling out the questionnaire implied consent. Thus, a participant could choose not to answer a question he/she was not comfortable with. In order to protect the identity of the participants, no names, email addresses or library names were gathered. Out of a total of 500 copies of questionnaires distributed, 250 copies were returned and found eligible. These copies were distributed via the email addresses of the librarians contacted to participate in the study. The return rate of the questionnaire was 250/500 or 50%.

A reliability analysis was carried out using Cronbach’s alpha. Table 2 shows the descriptive statistics and Cronbach’s alpha for the variables in the research model. After completing the reliability analysis, hypothesis testing was done using multiple linear regressions. The internal consistency was above 0.85 for all constructs.

Results of the Study

Demographics

The demographic distribution of the survey respondents are shown in table 1 below.

Table 1: Demographics (N=250)

Gender	Age	Education	Work experience
Female: 145(58%)	Mean: 45.67	Masters:101(40.4%)	Less than: 5(2%)
Male: 105(42%)	SD: 12.45	Ph.D; 53(21.2%) Bachelors: 96(38.4%)	11 – 20: 45(18%) 21 – 30: 95(38%)

Above 30:
105(42%)

Table 1 shows that the librarians who participated in the study had more than 30years (42%) work experience in the library field. Majority of the participants were female (50%), their average age was 45.6. and most of them held master degree as their highest educational qualification.

Descriptive statistical analysis of the research constructs

Table 2 shows the descriptive statistical analysis of all constructs in the research model. The Cronbach's alpha values of each of the constructs where also shown. The internal consistency was above 0.85 for all constructs. The mean value of each of the constructs was high showing that the librarians who participated in the study were committed to KM activities as well as innovation in library services. While the mean value of their innovative activities was 3.67, the greatest KM activity of the librarians was in the area of knowledge capture/ creation (Mean = 3.85.)

Table 2: Descriptive statistics and Cronbach's alpha

Code	Construct	No of item	Mean	SD	Reliability
KC	Knowledge capture/creation	5	3.83	0.95	0.90
KS	Knowledge sharing /transfer	5	3.61	0.92	0.87
KA	Knowledge application /use	6	3.58	0.85	0.90
SI	Innovation in library services	4	3.69	0.90	0.86

Hypothesis testing

Hypothesis testing was carried out using multiple linear regressions. Table 3 shows the B coefficients for the effect KC, KS, and KA on SI. As shown in this table, H1, H2, and H3 were strongly supported ($p < 0.05$). The adjusted R – Square (coefficient of determination) was 0.46.

Table 3: Effect of KC, KS and KA on SI

		Standardized coefficients		
		Beta	t	Sig.
	Constant	0	2.89	0.000
H1 supported	KC	0.34	3.27	0.002
H2 supported	KS	0.32	2.89	0.004
H3 supported	KA	0.32	2.95	0.003

Further, Table 4 shows the effect of KM on SI. This was accomplished by regressing SI on KM. The average of KM, KS and KA was computed to arrive at scores for over all knowledge management activities in Nigerian university libraries.

Table 4: Effect o KM on SI

		Standardized coefficient		
		Beta	T	Sig.
	Constant	0	5.28	0.000
H4 supported	KM	0.65	8.36	0.002

The results in Table 4 shows that H4 was strongly supported ($p < 0.05$). This means that knowledge management strongly influences services innovation in university libraries in Nigeria.

Discussion of Findings

In this study, four hypotheses were tested. The first hypothesis was tested with a strong relationship between knowledge capture/ creature and service innovation. The second hypothesis was tested whereby a strong relationship was found between knowledge sharing / transfer and service innovation. The third

hypothesis was also tested with a strong relationship between knowledge management and services innovation. However, knowledge capture/creation has the strongest influence on service innovation in university libraries in Nigeria.

The findings support the view that academic libraries with more capability of knowledge capture/ creation are likely to offer more innovative services to their users. Similarly, academic libraries with defined knowledge sharing/ transfer practices and better-developed knowledge application / use practices are likely to offer more new services. The relationship between knowledge capture/creation and service innovation, between knowledge sharing/transfer and service innovation, and between knowledge application/use and service innovation is conceptually supported in the literature, although not well supported with empirical evidence. The findings of this study are in conformity with studies conducted outside the library context such as Schulze and Hoegl (2008) and Darroch (2008) which found that innovation is extremely dependent on knowledge creation, sharing and its proper application. These studies further found that creating, sharing and applying knowledge effectively leads to innovation or generation of new services in organizations. The results also support Islam et al's (2017) study conducted in the context of academic libraries that found strong relationship between knowledge creation, its application and service innovation. The important finding in this study is that though knowledge capture and knowledge sharing are key components of KM they do not lead to innovation. It is only when the captured and shared knowledge is used and applied that it leads to innovation. This supports the assertion by Dalkir (2013) that in the absence of knowledge application /use, the other phases of the KM cycle are in vain. Thus, academic libraries ought to have knowledge capturing, sharing and use or application capabilities to be able to offer innovative services.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Library management should set out to implement knowledge management because it provides an environment for innovative library services.
2. Information related to user needs, innovation possibilities and barriers to innovation should be gathered for the purpose of generating new library services.
3. Research and discussion groups or network of knowledgeable staff should be formed in the library for sharing of knowledge.
4. Information gathered on user needs, innovation possibilities and barriers to innovation should be analyzed and synthesized to enhance library services.

Conclusion and Implications

The present study represents an attempt to establish the relationship between the underlying phases of KM and service innovation. The study found that academic librarians in Nigerian university libraries are practicing knowledge capture/creation, knowledge sharing, and knowledge application activities. The three phases of KM cycle are playing important role in university libraries' offerings of innovative services in Nigeria. Overall, the study shows a positive relationship between KM and innovation in university libraries in Nigerian context.

The study provides understanding of how librarians perceive KM and service innovation and the role of KM in bringing about innovative changes in library services. It is important for librarians to know the effect of KM on SI because it is a way of determining whether especially the university libraries in Nigeria are ready to implement KM or not. This study has shown that adopting KM would lead to service innovation in university libraries in Nigeria that are currently facing the challenges of budget cuts, increasing user demands and competitive information environment.

The study has implications for researchers interested in both KM and service innovation areas. The primary contribution of this paper is to open further areas of research by bringing KM and service innovation together for university library development in Nigeria. The reason is that innovation is the key or solution to many problems that university libraries in Nigeria are facing.

The study had some limitations. First, the return or response rate of the research instrument was 50%. This might have been affected by mails going to the participants' spam folders or perhaps by people deciding to ignore survey requests due to lack of gratification or tangible incentives. Second, as the concept of KM is still not clear to some librarians, the use of questionnaire as the only method of data collection might have affected the results in one way or another. Further studies in this research area should supplement questionnaire method with interviews. The present study has, therefore, shown the value of utilizing the perceptions of librarians to determine the effect of KM on service innovation in university libraries in Nigeria.

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