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Utilization of Information Systems for Effective Service Delivery in Academic Libraries: Threats and Challenges

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ABSTRACT

Achievement of Kenya's National Vision 2030 depends on embracing innovative technologies in various sectors of economy including the higher education sub-sector. The use of Information Systems has been widely accepted and proven to increase effective service delivery in most organizations. Academic libraries optimize their operations by using Information systems for educational and research ecosystem. Providing access to information resources, supporting effective service delivery including for scholarly communication, promoting information literacy and developing a culture of sharing and imparting knowledge to fulfil the mission and objective of the parent higher education institution. This paper explores the utilization of information system for effective service delivery in academic libraries, focusing on the various types of systems used and their impact on staff who utilize Information Systems in the academic libraries service delivery; barriers to optimal use of these systems are also identified. Interviews and questionnaires survey were used to collect data from three academic libraries one each in Kenya, Uganda and Rwanda namely; The East African University, Kampala University and East African University, Rwanda respectively, which were purposively selected. Data was analyzed and results presented comprising percentages and frequencies as well as the mean score. Technical challenges such as inadequate server storage and system failure, limited financial resources and human resources issues such as inadequate staff training as some of the major barriers to optimal utilization of Information Systems for effective service delivery in academic libraries. Adequate funding enhanced staff training and better management practices need to be ensured for optimal use of information systems for service delivery in academic libraries. In addition, strategies need to be developed to overcome challenges and maximize utilization of these systems in academic libraries service delivery.

Keywords: *Information systems, Academic Libraries, Library Information Systems, Kenya, Uganda, Rwanda, Service Delivery.*

INTRODUCTION

Information professionals are working in very complex but interesting times. They provide effective service by use of various information systems. In today's digital era, sustainability of academic libraries in their respective academic communities is achievable only if they continue to replace their erstwhile traditional physical modes of providing service to clients with ICT-driven modes especially the use of Information Systems (ISs). ISs involve a variety of information technologies (IT) such as computers, software, databases, communication systems, the internet, mobile devices and much more to perform specific tasks, interact with and inform various actors in different organizational or social contexts.

Academic libraries use variety of ISs to support their operations and services such as integrated

library systems, Digital Assets management systems, Security systems such as 3M security system and CCTVs. The ISs enable academic libraries to streamline their operations, automate routine tasks and provide users with easy access to a wide range of information resources.

ISs such as Integrated Library Management System (ILMS) has been widely accepted by most academic libraries in Africa as the most effective means for effective library service delivery through managing their collection, tracking circulation and providing online access to resources. Digital Assets Management Systems (DAMs) such as Institutional Repository (Dspace) system enable libraries to preserve and provide access to scholarly works provided by their faculty and resources while security systems provide security for library collection.

Recent research has focused on the potential benefits of ISs in enhancing service delivery, improving user experience, and promoting scholarly communication. Fu, Wang, & Wu (2021, p.102-345) identified potential benefits of ISs such as improved service delivery and user experience. In addition, they opined, academic libraries need to prioritize information system utilization to meet the evolving needs of their users and adapt to changes in the information landscape. However, one of the thorny issues is that of existing gap in literature regarding optimal utilization of ISs for effective service delivery in academic libraries.

Moreover, despite the adoption and usage of information systems in academic libraries, most academic libraries in Africa can't still boast of having them fully utilized in provision of academic library services, this is due to a lot of factors posing as threats and challenges to its optimal utilization in the area of service delivery. Therefore, this research paper sought to investigate the existing gap in literature by studying the threats and challenges in utilization of information systems in academic libraries for effective service delivery: a case study from three university libraries in Africa with intentions of making recommendations on addressing the threats and challenges.

Objective of the study

The four objectives of this study were:

- i. To identify the types of information system being used in the academic libraries under study;
- ii. To determine personal impact on utilization of information systems in academic library service delivery;
- iii. To identify the barriers to optimal utilization of information systems by the users in academic library;
- iv. To make recommendations based on the findings of the study.

LITERATURE REVIEW

The use of Information Systems (ISs) are inevitable in the digital age in every field. To provide effective services, academic libraries rely on ISs. In recent years, utilization of ISs has become increasingly important for academic libraries to effectively deliver services to their users. Community based cooperative society to a multinational corporation use ISs. Computerized IS play a major role in any organization because they are always aimed at lowering operational costs, increase profit, improve decision making skills, improve service by satisfying customer needs or gain competitive advantage so as to achieve organizational goals (Stair & Reynolds, 2018; Trivedi & Verma ,2020).

According to Saravanan et al., (2021), academic libraries need to embrace ISs to provide effective services; they recommended that, ISs could assist libraries in enhancing the quality and speed of

service delivery, as well as reducing costs. They further argue that, IS enables libraries to manage their resources efficiently, provide quick and accurate access to information and improve user satisfaction.

Laudon and Laudon (2018, P.44) technically defined Information Systems as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision-making and control in an organization. In addition to supporting decision-making, coordination, and control, ISs may also help managers and workers analyze problems, visualize complex subjects, and create new products.

Information systems involve a variety of information technologies (IT) such as computers, software, databases, communication systems, the internet, mobile devices and much more to perform specific tasks, interact with and inform various actors in different organizational or social contexts. It is necessary to note that, though major industries – including libraries - have invested much capital into the development and acquisition of ISs to transform service provision Ashish Rao et al. (2018). With studies even looking at the application of artificial intelligence in libraries

(Bagchi, (2020), a number of them have failed (Marnewick, (2017).

Recent studies have also explored potential of emerging technologies such as artificial intelligence, machine learning and block chain in transforming academic libraries services and operations. To perform the function of a knowledge convergence center and thereby respond effectively to a wide range of information demands. Fu, Wang, & Wu (2021) recommends that, academic libraries need to prioritize information system utilization to meet the evolving needs of their users and increase the quality of services provided with the IS as confirmed by Rafique et al. (2021) and Izuagbe (2021) that the quality and usefulness of online systems use in libraries positively affect their use. This gives an indication that information professionals and IT personnel should focus on effective service delivery in libraries and information centers ensuring that IS are of good quality, well managed and used effectively. According to Mills and Rayner (2022), academic libraries should invest in robust information systems to support effective service delivery. They suggested that, libraries should prioritize user needs and user experience in the design and implementation of information systems as well as engage in ongoing evaluation and assessment to ensure that these systems meet user needs over time. In the same thought, Mehra and Brahma (2022) opined that libraries should invest in robust information systems that can support a wide range of services, such as circulation, reference, and research support.

Currently, many academic libraries have adopted the use of ISs in provision of library services such as library automation, library website management, knowledge management, digital library management. Achieved using ISs such as KOHA integrated library management system, Digital Asset Management System such as Digital space, Remote Access and MyLibrary on Finger Tips (MYLOFT) for off campus access and Security Systems such as CCTV and 3M security systems. To ensure optimal utilization of this system, Baker (2008) argues that, there is need for technology for strategic information management and for libraries to be able to manage the vast information resources in the digital age. Technology management must consider trends, trajectories and capabilities to track the development of IS to ensure effective service delivery.

Ocloo (2021) recommends that, staff should be equipped with adequate information and training on ISs before and after the installation. This will enable library staff appreciate and use the ISS for specific library Functions. It is imperative that a library adopt ISs as a key asset in order to sustain its role as the hub of research and learning in any academic institution.

Despite the many evidence that exist in the literature on the impact of ISs utilization and

management in academic libraries leading to its success, in a study in Nigeria, Tella, Edward, Akanbi-Ademolake, and Akande (2021) noted the challenges faced by libraries in implementing open-source library system to include; lack of trained personnel, erratic power supply and lack of finance. Tella, Edward et al. (2021) identified these as some of the challenges and threats in optimal utilization of ISs for effective service delivery in libraries.

Review of this literature shows that, there is need to ensure optimal utilization of ISs in academic libraries thus decision to study the threats and challenges in using ISs for effective service delivery in academic libraries in The East African University Kenya, East African University Rwanda and Kampala University Uganda.

METHODOLOGY

The study employed mixed methods to investigate optimal utilization of ISs for effective service delivery in academic libraries. The researchers purposely selected three university libraries in Kenya, Uganda and Rwanda. This is due to the fact that, the universities are related to each other the universities are ; Kampala University in Uganda being the mother institution to The East African University in Kenya and East African University in Rwanda.

The researchers used questionnaire as the data collection tool to elicit responses from other staff who use electronic system in all the three libraries selected. On the other hand, interviews were used as a qualitative tool to obtain relevant information from IT personnel and Librarians from the selected universities to determine the use of ISs for effective service delivery.

A total 180 staff were targeted as respondents to collect quantitative data, the 180 questionnaires that were distributed, 160 were returned resulting in a response rate of 88.9% from the three libraries studied. Furthermore, 10 librarians and 10 IT staff were interviewed during data collection.

DATA ANALYSIS

Descriptive statistics were used to analyze data: - frequency tables, simple percentage and mean was used to present the results. For questions with two options, percentage were used to analyze the data responses that had a percentage of 50 % and above were rated positive and accepted. The percentages were decided using the following formula:

$$\text{Percentage} = f/N \times 100/1$$

For Likert scale responses, analyzes of data using arithmetic means with the use of data values of 4,3,2,1 for (SD) Strongly Agree, (A) Agree, (D) Disagree and (SD) Strongly Disagree was assigned to responses respectively.

The formula for calculating the mean is:

$$\text{Mean } x = \sum fx/f$$

Where, x= scores;

\sum =sum of scores F= frequency; and

N= number of scores

The researcher considered average mean of 2.5 and above acceptable, while rejected mean was the mean below 2.5.

This was calculated using the weighing attached to response options of Strongly Agree SA (4), Agree A (3), Disagree D (2), Strongly Disagree SD (1).

Hence $\frac{4+3+2+1}{4} = 2.5$

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FINDINGS

Table 1. Response on the main Information Systems used by staff in academic libraries under study

Type of ISs	Yes	No	%
Library Management System (LMS) e.g., KOHA	80	-	50%
Digital Asset Management (DAM) e.g., Dspace, Lib guide	40	-	25%
Electronic Security System (e.g., 3M system, CCTVs)	20	-	12.5%
Office suite	20	-	12.5%
Total	160	-	100%

The result in Table 1 indicates staff in academic libraries under study use the response on the main. Analyzed data shows that, majority 50% use Library Management System specifically KOHA for effective library service delivery. A number of forty being 25% respondents also accepted the use of Digital Asset Management Systems Precisely Digital space. On the other hand, 12.5% respondents accepted use of 3M Security System and other 12.5% respondent use office suite for service delivery, this implies that majority of academic libraries utilize LMS for effective library servicedelivery.

Table 2. Response on personal impact on utilization of Information Systems in academic library service delivery

Impact measures	SA	A	D	SD	TOTAL	MEAN
The IS increases my productivity	80 (50%)	60 (37.5%)	20 (12.5)	0 (0%)	160 (100%)	3.37
The IS enhances effectiveness on the job	100 (62.5%)	50 (31.25%)	10 (6.25%)	0 (0%)	160 (100%)	3.56
I have learnt much through the presence of IS in service delivery	68 (42.5 %)	85 (53.1 %)	7 (4.4%)	0 (0%)	160 (100%)	3.38
The IS enhances awareness and recall of job-related information	40 (25%)	90 (56.25%)	20 (12.5%)	10 (6.25%)	160 (100%)	3.0
The information system is easy to use and learn	60 (37.5%)	80 (50%)	15 (9.4%)	5 (3.1%)	160 (100%)	3.22
The IS includes necessary features and functions	30 (18.75%)	90 (56.25%)	40 (25%)	0 (0%)	160 (100%)	2.94

The result in Table 2 reflects the respondent's opinion on personal impact on utilization of ISs in academic libraries service delivery. All the items on the table recorded a high response score with mean of <2.5. Library staff response shows a high mean of 3.56 on information system enhancing their effectiveness on the job, followed by 3.38 mean on IS enabling library staff to learn much in providing effective service delivery. Additionally, increasing staff productivity had a mean of 3.37. Other IS impact included easy use of ISs with 3.22 mean, is enhancing staff awareness and recall of job-related information with 3.0 mean and lastly, is including necessary features and function with a mean of 2.94 (M=2.94). This indicates that utilization of information systems has positively influenced staff working in academic libraries under study. The implication of this finding is that, staff embraces utilization of information systems for effective service delivery in academic libraries.

Table 3: Response on the threats and challenges encountered in optimal utilization of ISs in academic library service delivery

Impact measures	SA	A	D	SD	TOTAL	MEAN
We have insufficient bandwidth	135 (84.38%)	24 (15%)	1 (0.62%)	0 (0%)	160 (100%)	3.84
We experience regular Power outages/surges	115 (71.88%)	20 (12.5%)	15 (9.38%)	10 (6.24%)	160 (100%)	3.5
The library experiences regular system downtime or failure	130 (81.25%)	25 (15.63%)	5 (3.12%)	0 (0%)	160 (100%)	3.78
I have inadequate IT skills and this hinders my efficient use of the IS	125 (78.13%)	10 (6.24%)	25 (15.63%)	0 (0%)	160 (100%)	3.63
There is inadequate server storage to store library data	112 (70%)	45 (28.13%)	3 (1.87%)	0 (0%)	160 (100%)	3.68
I received insufficient training on the use of the IS and this hinders my efficient use of the IS	140 (93.75%)	20 (6.25%)	0 (0%)	0 (0%)	160 (100%)	3.87

Key: SA = Strongly Agree; A= Agree; D = Disagree and SD = Strongly Disagree

Table 3 results reveals that the major threats hindering utilization of IS in academic libraries as identified by the respondents are insufficient staff training and insufficient bandwidth with mean of 3.87 and 3.84 respectively. Most respondents also pinpointed slowness of the system /System failure with a mean of 3.79 and libraries staff experiencing system downtime with 3.78 mean. Another set of challenges was the inadequate server storage with 3.68 mean, regular downtime from internet service provider with 3.66 mean. In addition, respondents pinpointed inadequate IT skills as a major challenge with 3.63. The inadequate qualified IT staff to provide support was also a challenge with 3.60 mean, regular power surge with 3.5 mean and finally, the major challenge was lack of modern IT equipment with 3.03 mean.

DISCUSSION ON FINDINGS

Types of ISs used in academic libraries service delivery.

The findings of the study show that, information systems majorly used for effective service delivery in academic libraries, LMS such as KOHA and DAM such as Institutional Repository (Digital space). Other systems included, 3M security systems, CCTVs and office suite for library security management and information repackaging respectively. Libraries should focus on ensuring the usability and accessibility of these systems, in order to enhance user satisfaction and encourage increased usage (Mehra and Brahm, (2022). Academic libraries should prioritize investment in IS and collaborate with other institutions to share resources and knowledge and should engage in continuous evaluation and improvement of their ISs to ensure they remain effective Liu, Q., Wang, L., & Cheng, J. (2021).

Staff impact on the use of IS in academic libraries service delivery

Findings reveals that utilization of IS has positively influenced librarians and information professionals working in academic libraries. This is evident through increase of staff productivity, enhanced information awareness, ease use of IS and promotion of information literacy in academic library service delivery. This implies that, IS have been utilized for effective service delivery in academic libraries.

Furthermore, a study carried out by Uche-Ibeabuchi and Okolie-Osemene (2021) on “challenges and opportunities of implementing an Integrated Library System in university library” explored benefit of the system in enhancing service delivery, user experience, and promoting scholarly communication.

Threats and challenges encountered in optimal utilization of ISs in academic libraries service delivery

On the other hand, the analysis of the results reveals that, quite a lot of factors stand as threats and challenges to the optimal utilization of ISs for effective academic library service delivery. The entire population of study accepted inadequate staff training as well as insufficient bandwidth as their major threats and challenges hindering optimal utilization of IS for effective service delivery in the libraries under study. This collaborates with Kuwata and Aghaei (2021) findings in their work on exploring the challenges and opportunities of utilizing IS in academic libraries. This work identified system downtime and lack of staff expertise as the major challenges to effective utilization of ISs in academic libraries. This was also revealed in research by Ocloo and Skyi (2021) on “The challenges and prospects of using ISs in academic libraries where they concluded that inadequate funding as one of the major challenges faced thus implication that, enough funds are not allocated for staff training and system hardware and software upgrading and maintenance.

Additionally, inadequate server storage, regular downtime from internet service provider poses to be some of the major challenges hindering optimal utilization of ISs in academic libraries service delivery. A population of 78.13 % and 6.24% of respondents strongly agreed and agreed respectively that inadequate IT skills hinders efficient use of the IS. The researchers were able to discover that, this is due to inadequate staff training on the use of ISs in the libraries under study. Some other respondents in the population of 81.25% and 15% attest on the slowness of system as another threat that hinders ISs utilization; this was due to the fact that lack of modern IT equipment as one of the factors that pose as threat and challenges in the utilization of ISs for effective

academic library service delivery.

CONCLUSION AND RECOMMENDATIONS

There is no doubt that ISs are the power-generating house for effective library service delivery in academic libraries. Utilization of ISs is inevitable in the information digital age thus librarians and information professionals should adopt a proactive approach to ensure optimal utilization of ISs for effective and efficient service delivery in their work environment and information rich society. However, it is not surprising that, a lot of factors stand as threats and challenges hindering optimal utilization of ISs for effective academic library service delivery. If academic libraries must live to continually fulfil their crucial role in the provision of quality and effective service delivery through promoting information literacy, supporting research and providing access to information using ISs, the following recommendations should be considered; academic libraries should invest on storage space on server for library data; alternatively, seek to store data on the cloud. They should also provide adequate funds in library budget to cater for hardware and software upgrade and maintenance as well as funds to increase bandwidth. Additionally, academic libraries should establish information literacy program to curb the issue of inadequate IT skills by teaching user and faculty how to navigate digital resources effectively and find relevant information. With acquisition of modern IT equipment, the challenge of slowness of system can be easily resolved.

Furthermore, Academic libraries should invest in provision of alternate source of power supply to forestall power outage/surge challenges as well as provide adequate training and user support to their staff and user. This will help them to use library information systems effectively and efficiently and overcome system complexity issues.

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