

Original Research

THE IMPACT OF USABILITY, FUNCTIONALITY AND RELIABILITY ON USERS' SATISFACTION DURING LIBRARY SYSTEM ADOPTION

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Abstract

This study determined the impact of system usability, functionality, and reliability on the satisfaction of system users with its relevance in service provision. The study was motivated by the fact that operation staff (of the chosen case for study) admitted that they were uncomfortable with the use of the library system in their operations. Methodologically, the study followed the quantitative approach. The study included all library staff to its sample, who were 52. Accordingly, data were collected through a structured questionnaire. The analysis used inferential statistics to decide the position of stated hypotheses. Collectively, the study found that system usability, system functionality and system reliability significantly impacted the perceived satisfaction of users, who are engaged with different library operations. This study recommends that these variables should be enhanced for users to adequately support the Library Management System, and other systems within the organisation.

Keywords: *Library Management System, Information System, System Adoption*

1.0 INTRODUCTION

Organisations are changing the way they use Information Systems. For example, higher learning Institutions are highly engaged with the use of Information Systems to address challenges associated with the large number of students and the need to increase convenience among users (Amando, Martyns, Bibot, & Dajab, 2018; Ankrah, Agbodza, & Atuase, 2019). One of the Information Systems with a high level of use is the Library Management System. Within higher learning setup, Library Management Systems come with other benefits such as speedy access, retrieval and dissemination of information for better customer service experience (Lubua, Pretorius, & Semlambo, 2017). For an organisation to benefit from the Library System, it is necessary to meet standards associated with its availability, reliability and functionality, among others (Amando, Martyns, Bibot, & Dajab, 2018; Hoover, 2018). In addition, the study by Fagerland and Hosmer (2017) supported the importance of standards, together with other factors such as usability and efficiency.

According to Lubua (2019) usability is attained when the system satisfy conditions for users to perform tasks effectively, safely and efficiently. According to the study by Egunjobi and Awoyemi (2012), conducted in Nigeria, the system usability is affected by factors such as the ease of use and the completeness of functionalities. Furthermore, the study by Vera and Edore (2015) suggested usability to be affected by the level of skills possessed by the user of the system. Overall, both Egunjobi and Awoyemi (2012) and Vera and Edore (2015) had a common understanding that Usability affected system uses in developing countries, and Africa in particular. Nevertheless, the question remains on the magnitude of its impact on user satisfaction within the Tanzanian context, and Library Management Systems.

On the other hand, the concept of functionality within Information System's concept simply refers to those attributes of the system enabling the user to perform different activities through input, processing and output (Kamble, Raj, & Sangeeta, 2012). If the user struggles to apply a system to solve a pending problem, the system is not suitable for a given task or operation. According to the study by Badlani and Singhal (2017) conducted in Kenya, most local systems fails to meet operational requirement of users. In another study by Shafiq, et al. (2014), conducted in Library Systems, the delivery of services is affected by the failure of systems to fit into user needs. Furthermore, it was reported that functionalities are equally affected post system delivery to users because of inadequate skills by system's maintenance and support staff (DeLone & McLean, 2016). The current study understands the importance of appropriate system's functionalities, this is the reason why it determines its status and how it affects the satisfaction of users of library systems within a selected case for study.

In addition, a system is meaningful if it is reliable. The study by Wangila (2014) defined system reliability as the probability of the system, including its hardware, to perform satisfactorily for the specified time and environment. Factors such as the failure of devices, incompetent maintaining team, or even failure to update the system appropriately are some of the causes of poor reliability. The unreliable system is not suitable for the organisation. Knowing the value of system reliability, the current study determined whether the Library Management System of the selected case for study, reliably serves user needs, and how that affects user satisfaction.

2.0 OBJECTIVE OF THE STUDY

This study determined the impact of the Library Management System usability, functionality, and reliability on the level of user satisfaction with its operations. The motivation for this study was the fact that users of the Library Management System (of the case for study) admitted that they were uncomfortable with the use of the library system, during informal conversations. The source of such information remains anonymous to the public to protect the reputation of the organisation.

3.0 LITERATURE REVIEW

Petter, DeLone and McLean (2008) defined user satisfaction as the level of fulfilment in users' desire with the services offered by the system in the areas such as system content, ease of use, timeliness, accuracy, and format. In the same context, DeLone and McLean (2016) and Mohamed, Hussin and Hussein (2009) suggested that user satisfaction is a proper reflection of the quality of a system. Because of this reason, the current study is interested at addressing the satisfaction of users of the Library Management System, and how factors such as system usability, functionality, and reliability impact it.

Usability of the system

This is one of the attributes of the software quality. The variable measures the effort needed for users to learn to use the product (Dugalic & Mishev, 2012). In another context, usability is the capability of the software product to be learned, used and be attractive to the user when used under specified conditions (Egunjobi & Awoyemi, 2012). According to Madan and Dubey (2012), usability is a vital feature for software quality because its emphasis is on the development of an interactive software applications meeting user needs. A system with the required level of usability is expected to be effective, efficient, engaging error tolerant and easy to learn (Russ & Saleem, 2018). There is a consensus that these factors are important in the adoption of any system, and their poor scale would lead to a poor implementation of a new system. Since there are studies in the African context which report low satisfaction to users, the current study needed to know whether the perceived level of system usability affected the satisfaction of users of the Library Management System to the selected case for study. Therefore, hypotheses 1, was formulated for testing.

Null hypotheses

H₁: Library System usability does not impact the level of its users' satisfaction

Functionality of the system

Rouse (2005) defined functionality as the quality of being suitable to serve the intended purpose. In addition, the International Standard Organisation (2017) defined functionality as a set of attributes with functions that satisfy the needs of the user. Moreover, Information System's functionality relates to the capability of the system to give its users what they expect in performing their duties (Lu, Wang, & Hayes, 2012). Vera and Edore (2015)

stressed that the alignment of functionalities of the system with user requirements determine its usefulness for a given task. On the same issue, DeLone and McLean (2016) together with Cenfetelli (2008) argued that functionality is the critical indication for estimating the usefulness of the system. Since the study by Venkatesh and Bala (2008) commented that both the attitude of users and the perceived usefulness relate to the rate of use of the new technology, it is unarguable that the system functions are critical in a new system. Based on the importance of system functionality, the current study decided to test whether it affects the level of user satisfaction to a Library Management System. Therefore, the null hypothesis 2 was stated for testing.

Null hypothesis

H₂: The perceived relevance of system’ functionality does not determine the level of user satisfaction

The reliability of the system

Reliability is another important attribute of the software quality (Osaki, 2012). The system must maintain its specific level of performance under stated conditions for a stated period of time to be considered as reliable (Madan & Dubey, 2012). According to Wangila (2014), The level of performance of a system is specified during system development, and it must be sustained all the time, including when software faults occur (Sindhuja & Dastidar, 2009). According to Tworek (2018), maximum reliability of the system is achieved when the system is accurate, secured, available, accepted, and has a short response time and responsive support service. The current study understands the importance of system’s reliability to its performance; therefore, it thought of the possibility that the current level of system reliability could affect the level of users’ satisfaction in the process of adopting Library Management Systems. Therefore, hypothesis 3 was formulated for testing.

Null hypothesis 3

The perceived level of reliability does not impact the level of user satisfaction

4.0 METHODOLOGY

This study adopted the quantitative approach. Its operations were based on testing hypothetical statements stated in section 4.0. Since the study used hypotheses testing, it is objective in nature. Therefore, it allows the researcher to follow scientific procedures of sampling, data collection and analysis (Saunders, Lewis, & Thornhill, 2016). Ultimately, the result of the analysis is generalizable to populations with settings similar to that of the study (Lesko, Buchanan, Westreich, Edwards, Hudgens, & Cole, 2017). Table 1 summarises key components of the survey questionnaire.

Table 1: The Nature of the questionnaire

Variable	Information Extracted	Nature
Demographic	Gender	Nominal
	Age group	Ordinal
	Working experience	Ordinal
User satisfaction	The level of satisfaction with the ability of the system to deliver library services	Ordinal
System usability	The perceptions of users on operability of the system	Ordinal
System functionality	The perceptions of users on the ability of the system to deliver intended work	Ordinal
System reliability	The extent which users perceive the system as reliable while performing its intended functions	Ordinal

Source: Authors’ own data (2021)

Sampling and data collection

The population of the study included 52 librarians of a higher learning institution based in Arusha-Tanzania; Data were collected from the entire population. This number is adequate for quantitative analysis (Taber, 2018). Overall, data collection exercise was administered through the Google form to avoid the impact of physical contacts during COVID-19 pandemic. All questions were closed-end questions to fit into quantitative analysis, as recommended by Saunders, Lewis and Thornhill (2016).

Data analysis

Hypotheses presented in section 3.0 tests a causal relationship. All variables of included in hypotheses are ordinal in nature (Table 1), therefore, the study used ordinal regression; this position of the study is supported by Fagerland and Hosmer (2017). Table 2 summarised the main relationships of the study and the model used for analysis. In ensuring that the study is valid, the questionnaire was sent to the respondent's email, and an emphasis was made to ensure that only intended people respond. In addition, the study tested through the Cronbach Alpha, and the observed ratio was 0.794. According to Dawson (2002) and Ravid (2011) the acceptable minimum ratio is 0.6.

Table 2: The Analysis of Variables

No	Input variables	Output Variables	Analysis Model
1	Usability	User satisfaction	Ordinal regression
2	Reliability	User satisfaction	Ordinal regression
3	Functionality	User satisfaction	Ordinal regression

Source: Research own data (2021)

5.0 RESULTS

This section presents results of the study. The sample of the study consisted of 52 respondents. The main theme of the study was to determine the impact of factors such as usability, reliability and functionality on user satisfaction during, Library Management System adoption. The first part of this section provides the descriptive information of the dependent variable of the study, and how it relates with selected demographic variables. The second part of this section (that is subsection 5.2) presents the findings responding to the research objective and hypotheses stated in section 3.

5.1 Gender, Age, work experience and the level of satisfaction with Library Management System

The study determined the categorical relationship between three demographic variables (gender, age and work experience) and the level of satisfaction with the Library Management System. According to Table 3, a large percentage of librarians are male (53.8%). This shows that males are not only employed in higher learning institutions, but also secure chances for studies related to information sciences. Unlike in the study by Tworek (2018) and Kilango, Qin and Nyon (2017), it is important to acknowledge that the observed gap in employment is closing; therefore, gender is not something to worry about, in this speciality.

Table 3: Demographic Variables

Variable	Elements of Measurement	Frequency	Per cent
Gender	Male	28	53.8
	Female	24	46.2
	Total	52	100.0
Age	18 - 24 years	17	32.7

	25 - 34 years	21	40.4
	35 - 44 years	10	19.2
	45 years and above	4	7.7
	Total	52	100.0
Working experience	1 year or below	18	34.6
	between 2 and 5 years	13	25.0
	6 years and above	21	40.4
	Total	52	100.0

Source: Authors' own source (2021)

On the other hand, the study determined the categorical relationship between gender and the level of satisfaction of the Library Management System users. The study used chi-square because one of the variables was dichotomous. The study observed the p-value as 0.000, which suggests a significant categorical relationship between gender and the level of satisfaction with the Library Management System. In addition, the study tested the relationship between the age of respondents and the level of satisfaction. According to Table 4; the study observed the One Way ANOVA p-value as 0.665. The value is greater than the threshold. Because of this observation, there is no significant categorical relationship between the age of respondent and the level of satisfaction among Library Management System users. Furthermore, the study determined the significance of the categorical relationship between working experience and the level of satisfaction with the system. The One Way ANOVA results show that the p-value is 0.591; the value is greater than the threshold. With this value, the working experience does not have a significant categorical relationship with the level of employees' satisfaction.

Table 4: Categorical Information on Demographic Characteristics and User Satisfaction

Independent Variable	Dependent Variable	Analytical Model	p-value
Gender	User Satisfaction	Chi-Square	0.000
Age	User Satisfaction	One Way ANOVA	0.665
Working experience	User Satisfaction	One Way ANOVA	0.591

Source: Authors' own source (2021)

5.2 The Impact of Usability, functionality and reliability on user satisfaction

Based on section 2.0, this study determined the impact of usability, functionality, and reliability on the level of user satisfaction during the adoption of Library Management System. The study used ordinal regression to determine the strength of this relationship. Based on the model fitting information presented in Table 5, the p-value is 0.000. With this model fitting information, ordinal regression qualifies to test the impact of the system usability, functionality and reliability on user satisfaction with the system. Furthermore, according to data presented in Table 7, the study observed the Nagelkerke pseudo r-square value as 0.610; this value expresses the strength of the relationship between the provided set of variables.

Table 5: Model Fitting Information

Predictor Variables	Dependent Variable	p-value
Usability, functionality, reliability	User Satisfaction	0.000

Source: Authors' own source (2021)

The significance of the impact of system usability, functionality, and reliability on user satisfaction

The first part of this section provided the collective information of the impact of the system usability, functionality and reliability on user satisfaction. Collectively, system usability,

functionality and reliability determine the perception of system' users satisfaction. Nevertheless, it was important to know the contribution of each stated variable in this relationship. This would enable the study to respond to hypotheses stated in section 3.0.

The *first* hypothesis determined whether system usability impacted the level of user satisfaction. Based on the Parameter Estimates presented in Table 6, the observed p-value is 0.000. This value suggests that the system usability has a significant impact on the perceived user satisfaction; therefore, the study rejects the hypothesis suggesting that library system usability does not impact the level of its users' satisfaction. The study by Shafiq et al (2014) considers poor usability as a threat on the effectiveness of a new system; the lack of effectiveness will eventually impact the level of satisfaction. Accordingly, the study by Sindhuja and Dastidar (2009) suggested that users experience on usability of online system related to their satisfaction. Also, the study by Venkatesh and Bala (2008) talked about the ease of use of the system, which is equated to the system usability. The study emphasized on user's self-efficacy, computer playfulness and results demonstrability as critical in ensuring the system usability. This position is supported by Sindhuja and Dastidar (2009) whose study focused on bioinformatics.

Table 6: The Summary of Parameter Estimates

Predictor Variables	Dependent Variable	p-value
Usability	User Satisfaction	0.000
Functionality	User Satisfaction	0.000
Reliability	User Satisfaction	0.000

Source: Authors' own data (2021)

The *second* hypothesis needed to know the significance of the impact of system functionality on user satisfaction. Since the collective information is presented in the first paragraph of section 5.2, the current part determines the significance of the causal relationship between the two variables. According to the information in Table 6, the observed p-value is 0.000. This value suggests a significant impact of the system functionality on the user satisfaction. Therefore, the study rejects the hypothesis suggesting that the perceived system' functionality does not determine the level of user satisfaction. With regard to these observations, the study by Amando, Martyns, Bibot, and Dajab (2018) emphasized that system features must work properly and provide desired results. The system characterised with frequent breakdown and faults receives a low approval rate, which eventually impact users' satisfaction (Russ & Saleem, 2018).

Table 7: Summary of the Nagelkerke pseudo r-square

Predictor Variables	Dependent Variable	R-square
Usability, functionality, reliability	User Satisfaction	0.610

Source: Users own data (2021)

The *third* hypothesis focused on understanding whether the system reliability impacted the level of satisfaction of users. According to results of analysis presented in Table 6, the parameter estimates suggest the p-value of 0.000. Observed results suggest a significant impact of the system reliability on user satisfaction; therefore, the study rejects the hypothesis that system reliability does not impact user satisfaction on library systems. The system reliability is good when there is a high chance that hardware, software and firmware will perform intended tasks satisfactorily for a specified time and environment (Ankrah, Agbodza, & Atuase, 2019). The study by (DeLone & McLean, 2016) identified the competency of experts among key factors for ensured system reliability. Systems managed by people with

poor skills results to poor reliability (Kamble, Raj, & Sangeeta, 2012; Lubua, 2019). On the other hand, non-human factors such as hardware and software failure, and inadequate facilitating resources like power and the internet can have a negative impact on the reliability of the system.

5.0 CONCLUSION AND RECOMMENDATION

This study determined the impact of usability, functionality, and reliability on user satisfaction of the Library Management System in a higher learning Institution based in Arusha-Tanzania. The study concludes that the satisfaction of users with the Library Management System depends on its usability, functionality and reliability. Therefore, the selection and adoption of the Library Management System need to consider the quality of the system in relation to its usability, reliability and functionality to boost its acceptance among users. In addition, this study recommends future extension of current results by including respondents from other learning institutions of the country. Also, it encourages the use of research approach.

How to cite this paper: Lubua, Edison Wazoel & Elias, James Dea (2021). The impact of usability, functionality and reliability on users' satisfaction during library system's adoption. *Journal of Informatics*, 1(1), 13-22

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