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Abstract

The purpose of this paper was to investigate the antecedents for the utilisation of Web 2.0 tools to enhance Knowledge Management (KM) practices in academic libraries of Tanzania. Eight out of the twelve academic libraries were selected. Data gathered through questionnaires distributed to library staff (n= 278), with a response rate of 91.36%. The study used the DeLone and McLean Information System (IS) Success Model to come up with KMS Success Model. Thus, the KMS Success Model was empirically via a Structural Equation Modeling (SEM) approach to examine the antecedents for the utilisation of Web 2.0 tools for the KM practices in academic libraries. The findings reveal that service quality increases user satisfaction and intention to use Web 2.0 tools. Knowledge quality and system quality increase the intention to use and net benefits of using Web 2.0 tools.

Further, user satisfaction increases intention to use and net benefits, whereas intention to use increases the net benefits of using Web 2.0 tools to enhance KM practices in academic libraries. This study was conducted to introduce new direction of KM practices through the application of Web 2.0 tools. DeLone and McLean IS Model was used to develop KMS success model which was tested and proved positive significant in KM practices and in facilitating libraries services.

Keywords: *Academic Libraries; Knowledge Management (KM); DeLone and McLean IS Success Model; Knowledge Management System (KMS); Web 2.0 tools, Tanzania.*

Paper type: Research paper.

Introduction

KM practices began in the mid-1990s (Hislop, 2013), as a means of making knowledge more accessed, used, and shared. Most of the knowledge produced in the academic environment is lost when academicians leave the academic environment. The significant challenges identified for such loss are lack of KM practices and mechanisms to enhance such practices (Hislop, 2013; Jain, 2013; Mosha, 2017). Currently, academic libraries have significantly developed and are applying some KM practices in the provision of library services (Gandhi, 2004; Singh, 2007). It is also evident that, academic libraries have been undergoing a period of profound changes and the right paradigm shift from collection development to KM (Lwoga and Sife, 2006), as well as from information management to KM (Singh, 2007). These changes necessitate academic libraries to become collection developer, information providers, as well as, knowledge creators, seekers and keepers. In that case, academic libraries need to seek knowledge and ensure that, such knowledge is well maintained, preserved, and accessed. Thus, the main aim of KM practices in academic libraries is to ensure that the knowledge created, collected, and acquired is well preserved, accessed, used, and shared (Mosha, 2017). However, academic libraries need to employ a proper mechanism to ensure that all the mentioned activities are well maintained. The advent of Web 2.0 tools is among the mechanism to ensure that knowledge within the academic environment is well maintained. The application of KM practices is currently supported by emerging technological tools including Web 2.0 tools (Mosha, 2017).

Most of the academic libraries employ Web 2.0 tools to enhance library activities and KM practices in Tanzania (Muneja and Abungu, 2012; Lwoga, 2014; Mosha, Holmner, 2015; Mosha, 2017; Mwantimwa and Nkhoma-wamunza, 2017); and in other African countries' academic libraries for example in Nigeria (Baro, Edewor and Sunday, 2014) and in South Africa (Ngcobo, 2016). Generally, the application of Web 2.0 tools in academic libraries has transformed the traditional activities of academic libraries to a more collaborative approach (Ram and Kataria, 2011). However, despite the advantages of Web 2.0 tools to support KM practices, their application in academic libraries in Tanzania and in other sub-Saharan African (SSA) countries is still slow (Akeriwa, Penzhorn and Holmner, 2015; Islam, Anwarul; and Ikeda, 2014; Mosha, Holmner and Penzhorn, 2015). Thus, there is a need for academic libraries to facilitate the use of Web 2.0 tools for implementation of KM practices in academic libraries (Nelson, 2008).

The term "Web 2.0" was first introduced by Tim O'Reilly in 2004 to describe the vast number of new internet applications that support online collaboration and communication among people (O'Reilly, 2005). Web 2.0 tools facilitate a more socially connected Web, where people can easily communicate, edit, collaborate, participate and share knowledge (O'Reilly, 2005; Hosseini and Hashempour, 2012). Among the capabilities of Web 2.0 tools is the ability to facilitate communication and the exchange of knowledge in academic libraries (Kim and Abbas, 2010).

The use of Web 2.0 tools to support KM practices has been acknowledged by various authors (Nelson, 2008; Mosha, 2017). This study investigated the application of Web 2.0 tools to enhance KM practices in academic libraries in Tanzania. In this study, Web 2.0 tools were regarded as KMS.

DeLone and McLean Information Systems (IS) Success Model application in academic libraries

Most academic libraries implement Information Systems (IS) to enhance their daily activities. However, most of such IS lacks IS models used to test the IS's success and/or effectiveness. In addition, most of these IS models seemed to be poor, not well tested, and not clearly articulated (Halawi, McCarthy, and Aronson, 2008; Rammutloa and Blaauw, 2017). The application of DeLone and McLean IS Model has been acknowledged by the majority of academic libraries to test and support the application of IS (Alzahrani *et al.*, 2017; Lwoga, 2013; Rammutloa and Blaauw, 2017).

Many organisations have been developing Information Systems (IS) designed specifically to facilitate KM practices, which are termed as Knowledge Management Systems "KMS" (Alavi and Leidner, 1999). KMS is a class of IS that focuses on the creation, gathering, organising and disseminating of an organisation's knowledge (Alavi and Leidner, 1999). KMS have been used to enhance the creation, communication and sharing of knowledge (Alavi and Leidner, 1999; Akeriwa, Penzhorn and Holmner, 2015); however, there is a scarcity of models developed to evaluate KMS success (Alavi and Leidner, 1999; Kulkarni, Ravindran and Freeze, 2007; Akeriwa, Penzhorn and Holmner, 2015). Thus, studies have been using DeLone and McLean IS Success Model to guide on the formulation of KMS Success Model purposely for testing the application of KMS (Jennex and Olfman, 2003; Kulkarni, Ravindran, and Freeze, 2007; Clay, Dennis, and Ko, 2005). This study used DeLone and McLean IS Success Model (DeLone and McLean, 1992, 2003, 2016) to come up with KMS Success Model which was used to test the application of Web 2.0 to enhance KM practices in academic libraries. In this study, Web 2.0 tools were regarded as KMS.

Research model and hypotheses development

DeLone and McLean IS Success Model comprises of six interrelated constructs which are: information quality, system quality, service quality, intention to use/use, user satisfaction and net benefits (DeLone and McLean, 2003). Information quality, systems quality and service quality in this model were measured separately to avoid affecting user satisfaction and the use of the system (DeLone and McLean, 2003). Intention to use was regarded as an "attitude", whereas "use" was seen as a "behavior" (DeLone and McLean, 2003). The "use" precedes "user satisfaction" in a process sense; however, in a positive experience, "use" leads to greater "user satisfaction" in a causal sense (DeLone and McLean, 2003). Similarly, the increased "user satisfaction" increased "intention to use," and thus "use." Consequently, "use" and "user satisfaction" lead to "net benefits" (DeLone and McLean, 2003). Figure 1 presents the DeLone and McLean IS Success Model.

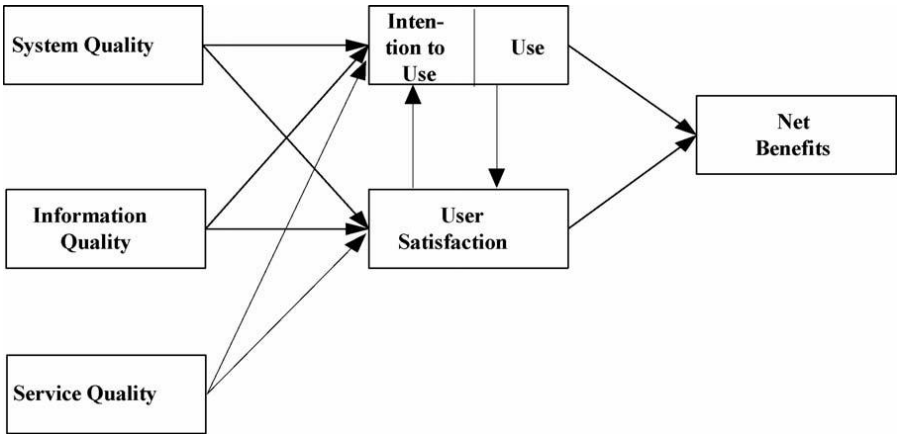


Figure 1: DeLone and McLean IS Success Model (DeLone and McLean, 2003).

Thus, in this study knowledge quality replaced information quality as used in DeLone and McLean IS Success Model. The application of knowledge quality instead of information quality was also reflected in other studies (Clay, Dennis, and Ko, 2005; Jennex and Olfman, 2003; Kulkarni, Ravindran, and Freeze, 2007; Wu and Wang, 2006). Deploying knowledge as part of an overall KM initiative enhanced the structural changes to facilitate the creation, sharing and use of such knowledge (Jennex and Olfman, 2003). In addition, the qualities (i.e. knowledge, system, and service) were treated separately to reflect individual effects on user satisfaction and intention to use as in DeLone and McLean IS success model (DeLone and McLean, 2003).

The intention to use construct leads to a higher user satisfaction and vice versa (DeLone and McLean, 2003), whereas in this study, user satisfaction was used to increase the intention to use and not the other way around. Thus, the outcome of user satisfaction and intention to use was measured to increase the net benefits of Web 2.0 tools in academic libraries. Figure 2 presents the KMS Success Model in this study.

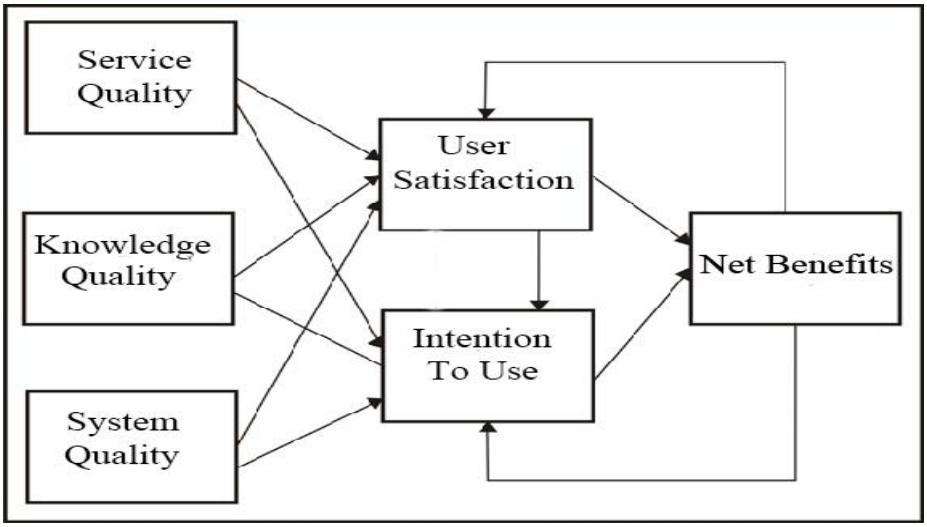


Figure 2: KMS Success Model

The following section explains the explanations of constructs deployed in the KMS Success Model as used in this study.

Service quality

Service quality reflects the importance of service and support provided by the system (DeLone and McLean, 2003; Jennex and Olfman, 2003; Kulkarni, Ravindran and Freeze, 2007). Service quality is a key to ensuring good service is provided or to exceeding what users expect from the service offered (Parasuraman, Zeithaml, and Berry, 1985). In this study, service quality reflects the services and support provided by library staff to ensure the utilisation of Web 2.0 tools for KM practices in academic libraries.

Library staff should ensure the quality of the services offered to their users in the Web 2.0 environment (Parasuraman, Zeithaml, and Berry, 1985; Lin, 2007). Service quality measures in this study include responsiveness, content/scope and timeliness, reliable access, guidelines, assurance, technical support, and reliability. Service quality has been found to influence user satisfaction and net benefits in Hawaii and United Kingdom libraries (Skok and Kalmanovitch, 2005; Lin, 2007). Besides, service quality had a significant positive effect on perceived net benefits in the use of Library 2.0 Services in the academic setting in Tanzania (Lwoga, 2013). This study investigated how service quality affects both user satisfaction and intention to use Web 2.0 tools. Therefore, the following hypotheses were proposed:

H1: Service quality has a positive effect on user satisfaction in using Web 2.0 tools.

H4: Service quality has a positive effect on the intention to use Web 2.0 tools.

Knowledge quality

The Delone and Mclean IS Success Model has used information quality to reflect traditional IS, whose primary content is information (DeLone and McLean, 2003; Wu and Wang, 2006; Kulkarni, Ravindran and Freeze, 2007). In the context of KMS success model, knowledge quality is substituted for information quality as the type of content contained in the system (Wu and Wang, 2006; Kulkarni, Ravindran and Freeze, 2007). Knowledge quality is the degree to which the knowledge contained in a KMS is used to assist users in accomplishing their tasks (Clay, Dennis and Ko, 2005). Knowledge quality ensures the right knowledge is captured and available (Jennex and Olfman, 2003).

Knowledge quality in this study ensures reliable knowledge content is created, shared, and stored in the academic libraries. Knowledge quality increases user satisfaction and intention to use the system (Wu and Wang, 2006). Knowledge quality in this study reflects how well the Web 2.0 tools in terms of its input and output in academic libraries. Constructs employed to ensure knowledge quality in this study include reliable knowledge, accurate knowledge, relevant knowledge, understandable knowledge, completeness, practicable, meaningful knowledge, and up to date knowledge. Library staff believe that the quality of knowledge provided by Web 2.0 tools in their libraries is better than those of others; thus, they are more likely to use Web 2.0 tools for KM practices (Jennex and Olfman, 2003; Wu and Wang, 2006; Kulkarni, Ravindran and Freeze, 2007). In this study, knowledge quality is believed to increase user satisfaction and intention to use Web 2.0 tools in academic libraries. Therefore, the following hypotheses were developed in this study:

H2: Knowledge quality has a positive effect on user satisfaction in using Web 2.0 tools.

H5: Knowledge quality has a positive effect on intention to use Web 2.0 tools.

System quality

System quality is a measure of the information processing system itself (Wu and Wang, 2006; Kulkarni, Ravindran, and Freeze, 2007). System quality reflects how well the KMS performs the functions of knowledge creation, storage/retrieval, transfer and application (Jennex and Olfman, 2003). System quality involves hardware and software constructs of the system (Lwoga, 2013). System quality ensures the reliability and predictability of the system, independent of the knowledge it contains and the ease of using the system (Garrity and Sanders, 1998). In this study, system quality reflects how well the Web 2.0 tools perform the functions of KM practices in academic libraries.

System quality has been found to be a strong indicator of user satisfaction and intention to use the system in the context of IS in Tanzania (Skok and Kalmanovitch, 2005), and it is moderately influenced by net benefits in United Kingdom libraries (Skok and Kalmanovitch, 2005). Librarians are more likely to continue using the Web 2.0 tools because they interact better with Web 2.0 tools. The constructs employed to measure the system quality in this study include usability, adaptability, availability, flexibility, stability, reliability, and accessibility. Therefore, the following hypotheses were proposed:

H3: System quality has a positive effect on user satisfaction in using Web 2.0 tools.

H6: System quality has a positive effect on intention to use Web 2.0 tools.

User satisfaction

User satisfaction is the level of fulfillment that users expect when using the system for the first time (Wu and Wang, 2006; Kulkarni, Ravindran, and Freeze, 2007). User satisfaction dimension reflects the actual level of KMS, as well as the satisfaction of the KMS users (Jennex and Olfman, 2003). In academic libraries, user satisfaction refers to the feeling of pleasure or displeasure that results from the benefits that a user hopes to receive from the interaction with the online services (Clay, Dennis and Ko, 2005). In this study, user satisfaction reflects the sum of one's feelings of pleasure or displeasure regarding the use of Web 2.0 tools in academic libraries. User satisfaction constructs in this study include efficiency, effectiveness, meeting knowledge needs, enjoyment, and adequacy. Intention to use the system and the net benefits brought about by the system are the significant factors of user satisfaction (DeLone and McLean, 2003; Skok and Kalmanovitch, 2005). Therefore, the following hypotheses were proposed in this study:

H7: User satisfaction has a positive effect on intention to use Web 2.0 tools.

H8: User satisfaction has a positive effect on the net benefits of Web 2.0 tools.

Intention to use

The intention to use the system reflects the perceptions of the benefits of the KMS by its users, which predict their continued intention to use the system (Garrity and Sanders, 1998; DeLone and McLean, 2003). Intention to use the system is a very important factor in determining IS acceptance by users in the IS field (Wu and Wang, 2006; Lin, 2007). In this study, intention to use the system reflects the likelihood of library staff employing the system in performing their duties. Intention to use the system also ensures the actual use of the system among library staff. This is because library staff showed the intention to use the system after being satisfied with what the system brought to their daily activities. Intention to use the system in this study reflects the right decisions regarding the use of Web 2.0 tools in academic libraries to ensure various activities such as recording knowledge, communicating knowledge, sharing knowledge and creating specific knowledge. Thus, the following hypothesis was proposed:

H9: Intention to use has a positive effect on the net benefits brought about by using Web 2.0 tools.

Net benefits

Net benefits reflect the degree to which a user believes that use of the system results in benefits to the user or the organisation (Parasuraman, Zeithaml and Berry, 1985; Lin, 2007; Urbach and Muller, 2012). In the context of this study, net benefits refer to the positive impact of Web 2.0 tools in academic libraries. In addition, net benefits explain the actual use of the system whereby library staff indicates the advantages brought after using the system. Constructs employed in this study to ensure net benefits include new knowledge and innovation, ideas acquisition, managing and storing knowledge, tasks accomplishment, job enhancement and quality of work improvement.

Method

The study participants included library staff working in academic libraries in the selected public universities in Tanzania. This study has used statistical power analysis software package known as The Sample Size Calculator of Creative Research System (Creative Research Systems, 2003) to obtain its sample size. The confidence level is usually of either 95% or 99%; this states that the probability of including the population mean within the confidence interval (Gray, 2004). In this study, a confidence level used was 95%. A confidence level of 95% is often deemed sufficient (Gray, 2004). Therefore, a sample size of 278 was obtained. A systematic random technique was then employed to select library staff participated in this study. The lists of library staff working in the selected academic libraries were obtained and the interval of 2 was used to select the participants.

Questionnaires were used to collect data in this study. In total, 254 (91.4%) respondents completed the questionnaire. The survey items were developed by using research instruments as proposed by various researchers as shown in Table 3. A five-point Likert scale, ranging from "1 = strongly disagree" to "5 = strongly agree", was used. Measurement constructs were pretested with 20 library staff at Nelson Mandela African Institution of Science and Technology (NM-AIST) in Arusha, Tanzania. Some constructs were modified based on the responses in the pilot test.

The structural equation modeling (SEM) approach was used to validate the research model. AMOS version 23.0 was used to analyse the hypotheses generated. Confirmatory factor analysis (CFA) was conducted in order to examine the reliability and validity of the measurement model, while the structural model was analysed to test the associations conceptualised in the research model.

Results

Background information on respondents

129 (50.8%) were men and 125 (49.2%) were female. Approximately half of the respondents 119 (46.9%) were from 21 to 30 years. Majority of respondents 71 (8.0%) were from UDSM Library. Four departments were identified in this study: readers' services; collection development; library schools and information studies; and ICTs and e-resources. Majority of the respondents 132 (52.0%) were working at readers' service departments in selected academic libraries. Table 1 presents the characteristics of the respondents to the survey.

Table 1: Background of respondents: survey (questionnaire) (N = 254)

		Frequencies	Percentages
Gender			
	Male	129	50.8
	Female	125	49.2
Age			
	21-30 years	119	46.9
	31-40 years	100	39.4
	41-50 years	27	10.6
	Above 51 years	8	3.1
Job location			
	ARU	18	7.1
	OUT	20	7.9
	MUHAS	15	5.9
	MU	40	15.7
	SUA	31	12.2
	SUZA	14	5.5
	UDSM	71	28.0
	UDOM	45	17.7
Working department			
	Readers' services	132	52.0
	Collection development	82	32.3
	ICT and e-resources	31	12.2
	Information studies	9	3.5

Data screening and examination

Exploratory factor analysis (EFA) was used for data screening and examination. EFA was employed to condense a group of empirical indicators into a small set of factors (latent variables) with a minimum loss of information. In this regard, the 254 datasets that were employed in this study were coded and analysed by using SPSS version 21. Z score (standardisation of values) was used to check the presence of outliers, where after 7 items were deleted, leaving the final 247 datasets to be analysed. Correlation of items from visual analysis found that most of the items

were highly correlated. Further, the result of Bartlett's test was significantly below 0.05. The KMO result was 0.84, which is above the limit of 0.6 (Hair *et al.*, 2014). Thus, KMO indicated that the items (in 247 datasets) were appropriate for CFA.

Measurement model

The measurement model was used to explain the relationships between measured items (variables) and latent variables and was assessed in terms of construct validity (Stoelting, 2002). Six constructs were identified, namely system quality, knowledge quality, service quality, user satisfaction, intention to use and net benefits.

The first-order CFA was conducted by using AMOS version 23 to test the measurement model. The common six model-fit indices were used to evaluate the overall goodness-of-fit. These common six model-fit indices are chi-squared normalisation by degrees of freedom ($\chi 2/df$); the adjusted goodness-of-fit index (AGFI); the non-normalised fit index (NNFI); the comparative fit index (CFI), the incremental fit index (IFI) and root mean square error of approximation (RMSEA) (Hair *et al.*, 2014). Table 2 presents the model fit indices for the measurement model.

Table 2: Model fit indices for the measurement model

Model fit indices	Recommended values	Measurement model
X^2/df	≤3.0	0.946
AGFI	≥0.8	0.946
NNFI (TLI)	≥0.9	1.005
CFI	≥0.9	1.000
RMSEA	≤0.05	0.000
GFI	≥0.9	0.968

The measurement model was further assessed by using three criteria: reliability, composite reliability (CR) and average extracted variance (AVE). (Hair *et al.*, 2014) define "reliability" as an assessment of the degree of consistency between multiple measurements of a variable. Reliability of factors was estimated by assessing the Cronbach's alpha coefficient and factor loadings from the CFA. Cronbach's alpha coefficient for each aspect was investigated. Cronbach's alpha coefficient exceeding the 0.7 thresholds indicates a high level of consistency among the aspects.

Convergent validity was evaluated by examining the factor loadings from the CFA. All the factor loadings of the items in the CFA for the measurement model were greater than 0.6. Thus, all the factors in the measurement model had adequate reliability and convergent validity. Table 3 presents the results of the CFA for the measurement model.

Table 3: CFA results for measurement model

Constructs	M	SD	Factor Loadings	A	Sources	
Service quality	**0.666**					
12-Web 2.0 tools inspire trust and confidence (assurance) in users			4.09	0.826	0.781	Gorla, Somers and Wong, 2010; Masrek, Jamaludin and Mukhtar, 2010
11-Library provides reliable technical support personnel			4.14	0.760	0.637	Petter, DeLone and McLean, 2008; Lwoga and Questier, 2014
Knowledge quality	**0.680**					
20- Web 2.0 tools provide accurate knowledge for managing library services (accuracy)			4.07	0.754	0.709	Wu and Wang, 2006
19-Web 2.0 tools provide reliable knowledge for managing library services (reliable)			4.13	0.741	0.707	Wu and Wang, 2006
System quality	**0.763**					
23-Web 2.0 tools are very easy to use (usability)			4.30	0.754	0.858	Petter, DeLone and McLean, 2008
22-Web 2.0 tools are easy to learn and adapt (adaptability)			4.28	0.742	0.709	DeLone and McLean, 2003; Jennex, Murray E., and Olfman, 2003
Intention to use	**0.817**					
17-I will use Web 2.0 tools to help me record my knowledge			3.77	0.911	0.762	Wu and Wang, 2006
15-I will use Web tools to create my specific knowledge			3.87	0.901	0.757	Wu and Wang, 2006
User satisfaction	**0.777**					
5-I am satisfied with Web 2.0 tools' efficiency			4.06	0.794	0.733	Wu and Wang, 2006
4-I am satisfied with Web 2.0 tools' effectiveness			4.07	0.796	0.818	Wu and Wang, 2006
3- I am satisfied that Web 2.0 tools meet my knowledge processing needs			4.12	0.780	0.648	Self-developed
Net benefits	**0.706**					
7-My performance on the job is enhanced by Web 2.0 tools			4.43	0.652	0.749	Al-Shibly, 2011
6- My information and decision making shared properly by Web 2.0 tools			4.49	0.680	0.705	Al-Shibly, 2011

Convergent validity was evaluated by using CR and AVE. Composite reliability assessed the internal consistency of the measurement model. The recommended criteria for composite reliability (CR) is 0.70 or above and an AVE of more than 0.50 (Bagozzi, Yi, and Phillips, 1991). The findings of the convergent validity are shown in Table 6, which indicates that all the CR values ranged between 0.6 and 0.8, and AVE between 0.5 and 0.6. Thus, the research model can be considered to have acceptable convergent validity.

Discriminant validity assesses the extent to which a concept and its indicators differ from another concept and its indicators (Fornell and Larcke, 1981). Fornell and Larcke (1981) assert that when a square root of the AVE is greater than its correlations with all other constructs, then discriminant validity has been established. All the square roots of the AVEs were greater than the correlations between the constructs and other constructs in the model. Further, all diagonal values exceeded the inter-construct corrections; thus, the results confirm that the research instrument had satisfactory construct validity. Therefore, the CFA measurement model has adequate reliability, convergent validity, and discriminant validity. Table 4 indicates CR, AVE, and discriminant validity of constructs.

Table 4: Composite reliability (CR), average variance extracted (AVE) and discriminant validity of constructs

	CR	AVE	Knowledge Quality	Satisfaction	Benefit	Service Quality	Intention	System Quality
Knowledge quality	0.668	0.501	0.708					
Satisfaction	0.779	0.542	0.374	0.736				
Benefit	0.692	0.529	0.564	0.477	0.727			
Service quality	0.671	0.508	0.489	0.383	0.406	0.713		
Intention	0.812	0.590	0.403	0.599	0.224	0.510	0.768	
System quality	0.763	0.619	0.440	0.259	0.502	0.213	0.272	0.787

Structural Equation Modeling (SEM)

SEM was employed in this study to explain the relationships between multiple variables. The same set of goodness-of-fit indices was used to observe the structural model. Therefore, Table 5 indicates the results for the model fit indices for the structural model.

Table 5: Model fit indices for the structural model

Model fit indices	Recommended values	Structural model
X^2/df	≤3.0	1.569
AGFI	≥0.8	0.915
NNFI (TLI)	≥0.9	0.949
CFI	≥0.9	0.964
RMSEA	≤0.05	0.048
GFI	≥0.9	0.947

The findings revealed that there is a large difference between model fit indices of the CFA and SEM models. Therefore, the model respecification was conducted on the assessment of the modification indices and standard residuals. Hair *et al.*, (2014) define "model respecification" as the modification of an existing model with estimated parameters to correct for inappropriate parameters which are encountered in the estimation process, as well as to create a competing model for comparison. The results were as follows:

Assessment of residual value

Residual values of above 2.5 were noted. For instance, Q27f4 – Q27a1 has 4.902. Q27f4 has values of above 2.5 with other variables. Q27f5 also has values of above 2.5 with other items.

Assessment of modification indices

The assessment of net benefits and knowledge quality has a modification index of 19.9, followed by net benefits and system quality, which has a modification index of 17.05, and net benefits and service quality, which has a modification index of 7.726. Therefore, there is a relationship between net benefits and system quality, net benefits and knowledge quality and net benefits and service quality that may further improve the model. After adding the relationships, the researchers ran SEM again to get the fit indices for the modified SEM.

Modified Structural Equation Modeling (SEM)

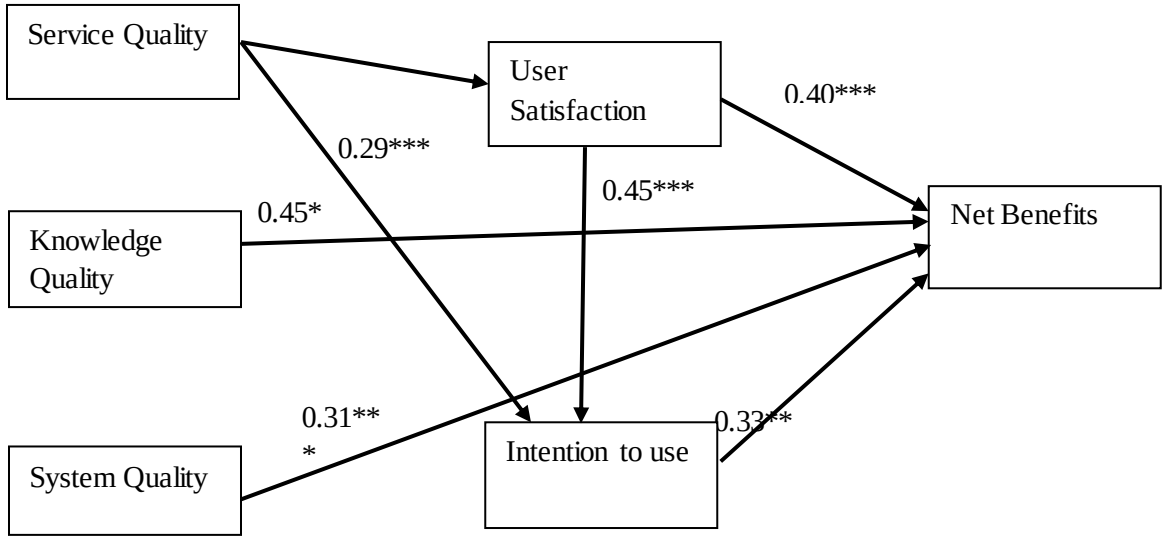
Modified SEM was conducted again after the model respecification process; when compared with the modified SEM and CFA models, the results showed no significant difference. The same goodness-of-fit indices were observed in the modified SEM. Table 6 presents the fit indices for the modified structural model.

Table 6: Model fit indices for the modified structural model

Model fit indices	Recommended values	Modified structural model
X^2/df	≤3.0	0.946
AGFI	≥0.8	0.946
NNFI (TLI)	≥0.9	1.000
CFI	≥0.9	1.000
RMSEA	≤0.05	0.000
GFI	≥0.9	0.968

When comparing the modified SEM and CFA models, the results showed no significant difference between these two models. This means that the model fit of the modified SEM was just as good as that of the original model (measurement model); thus, the researchers decided to continue with the modified model.

Figure 5 indicates SEM results after modification and it shows standardised path coefficients, their significance for the structural model and the coefficients of determinants (R^2) for each endogenous construct. The standardised path coefficient indicates the strengths of the relationships between the independent and dependent variables. In addition, the new relationships (H10, H11 and H12) suggested by the validated model were assessed. Therefore, out of twelve hypotheses, seven were significant. Figure 3 presents hypotheses testing results, standardised path coefficients, and significance.



Note:*p<0.05;**p<0.001;***0.001

Figure 3: Hypotheses testing results, standardised path coefficients, and significance

Discussion of study findings

The majority of participants fell into the 21–30-year age group. The participants in this age group were born after computer technology became widespread; hence, they are technologically savvy and can easily access and use Web 2.0 tools in their daily duties. The second age group was between 41 and 50 years; as such, they were considered decision-makers for the implementation of Web 2.0 tools to enhance KM practices in academic libraries. More male participants participated in this study, indicating a need for academic libraries to encourage female participants to access and use Web 2.0 tools to enhance KM practices. Library staff from readers' departments made the most use of Web 2.0 tools. This is commendable because of their interaction with library users in their daily activities. Thus, they can use Web 2.0 tools to improve their services and to communicate with library users.

The study findings provide significant support for the KMS success model. Nine relationships were proposed; however, after model respecification, three new relationships emerged: H10 – Service quality has a positive effect on net benefits; H11 – Knowledge quality has a positive effect on net benefits; and H12 – System quality has a positive effect on net benefits. Therefore, seven out of the twelve hypotheses were supported.

In this study, service quality had a significant effect on user satisfaction and intention to use Web 2.0 tools. Other studies indicated a direct relationship between service quality and user satisfaction (Kettinger and Lee, 1994; DeLone and McLean, 2003, 2016; Masrek, Jamaludin and Mukhtar, 2010); others revealed a direct relationship between service quality and intention to use (Petter, DeLone and McLean, 2008; Wang, 2008; Chua and Goh, 2010). Library services such as website and online resources ensure service quality of Web 2.0 tools in academic libraries (Chua and Goh, 2010). The interactive and participatory nature of Web 2.0 tools could have contributed positively

to service quality (Lwoga, 2013). Other factors such as responsiveness, content/scope, reliable access, user guidelines, and technical support should be implemented to influence the service quality of Web 2.0 tools in academic libraries. However, this study didn't indicate a direct relationship between service quality and net benefits; the quality of Web 2.0 tools to ensure the net benefits should be guaranteed in academic libraries for users to appreciate the benefits of Web 2.0 tools in academic libraries.

Knowledge quality did not have a significant effect on user satisfaction and intention to use Web 2.0 tools in academic libraries. However, Rai, Lang and Welker (2002) found a positive relationship between knowledge quality and user satisfaction; whereas, Halawi, McCarthy and Aronson (2008) found that information (or knowledge) quality is significantly related to intention to use the system. On the other side, this study found a strong relationship between knowledge quality and net benefits. Findings from other studies revealed the following: knowledge quality is related to decision-making efficiency (Gatian, 1994), knowledge quality is associated with decision making (Shih, 2004), and knowledge quality has a significant impact on decision-making (Bharati and Chaudhury, 2006). Thus, increased knowledge quality would be associated with net benefits.

System quality had no significant effect on user satisfaction in this study. Karlinsky and Zviran (2012) also indicate that there is no relationship between system quality and user satisfaction. These findings were also supported by (Jennex and Zyngier, 2007) that the extent of the system use alone is not considered a good measure of KMS success. Other studies found a positive relationship between system use and user satisfaction (Iivari, 2005; Wu and Wang, 2006; Kulkarni, Ravindran and Freeze, 2007; Halawi, McCarthy and Aronson, 2008). However, Fitzgerald and Russo (2005) suggest that with the improved system quality might positively relate to subsequent system use. System quality had no significant effect on the intention to use the system as revealed in this study. Similar findings were obtained from previous studies (McGill, Hobbs and Klobas, 2003; Jennex and Zyngier, 2007; Klein, 2007). Thus, there is a need to increase the system quality to enhance the intention to use the KMS (Wu and Wang, 2006).

Despite the fact that, this study didn't indicate the direct relationship between system quality and intention to use, academic libraries need to increase the effectiveness of Web 2.0 tools, thus intention to use. System quality depends on the intended operational characteristics which are concerned with whether there are errors in the system, its ease of use, responsive time, flexibility and stability (Wu and Wang, 2006). This study also revealed that system quality had the strongest direct effect on net benefits. Similar findings were obtained by the previous IS studies (Hong, Thong and Tam, 2001; Devaraj, FAN and Kohli, 2002; Yang and Yoo, 2004; Wixom and Todd, 2005; Chiu, Sheng and Chang, 2007; Hsieh and Wang, 2007).

User satisfaction had the strongest significant effect on the intention to use the system as revealed in this study. Similar findings were obtained from previous studies (McGill, Hobbs, and Klobas, 2003; Bharati and Chaudhury, 2006; Wu and Wang, 2006; Chiu, Sheng, and Chang, 2007; Halawi, McCarthy, and Aronson, 2008). User satisfaction is among the important constructs for the proper application of any KMS within an organisation. This is because users need to be satisfied with the system they are using as well as the value and the benefit of that system. Livari (2005) reports a direct relationship between user satisfaction and net benefits.

User satisfaction leads to the following net benefits: simplifying work methods among users (Klein, 2007); improving job performance (Livari, 2005); increasing productivity and effectiveness (Rai, Lang, and Welker, 2002; Bharati and Chaudhury, 2006; Klein, 2007); improving decision-making (Chiu, Sheng and Chang, 2007); and enhancing job satisfaction (Petter, DeLone, and McLean, 2008). The intention to use Web 2.0 tools also increases the net benefits of such tools. Intention to use also indicates the actual use of the system after being known the benefit of the system. And this was indicated under the net benefits brought after using the system. Halawi, McCarthy and Aronson (2008) identified a significant relationship between intention to use and net benefits measured by improvement in users' job performance. Further, Petter, DeLone, and McLean (2008) assert that the intention to use is positively associated with improved decision-making.

An implication of the study

Most of academic libraries in Tanzania are currently using Web 2.0 tools to enhance various services; however the usage of these tools to enhance KM practices is still low and unplanned among the academic libraries. KM practices in academic libraries on the other hand are new and need deep investigations and guidance on its implementation. Thus, the application of Web 2.0 tools to enhance KM practices in Tanzania is very important. This study will therefore guide on the formulation and implementation of policies and guidance on using Web 2.0 tools and KM practices implementation among academicians, librarians, policy makers and other policy implementers is needed. On the other hand, the use of Web 2.0 tools affects the societies as well. People are using Web 2.0 for academic issues and personal communications.

In the academic environment academic libraries should ensure the proper application of Web 2.0 tools to enhance KM practices. Service quality played a key role to enhance user satisfaction and intention to use Web 2.0 tools in academic libraries. In this case, academic libraries should ensure reliable Web 2.0 services, quick attention to users' queries and demands, ensure trust and confidence among users, as well as individual attention to are guaranteed. These could also be line with the other services such as website, internet, bandwidth and reliable power supply. Academic libraries should also employ skilled library staff to manage Web 2.0 services and to ensure proper usage of such services in their libraries. This entails that the proper application of Web 2.0 tools ensures the reliability of services and thus increases the intention to use them regularly.

Knowledge quality was found to play a key role in providing the net benefits of using Web 2.0 tools in academic libraries. Academic libraries, therefore, need to improve the quality of the knowledge stored to attract more library users to make use of it. This could be facilitated by the establishment of a knowledge repository (KR) to store the knowledge created and communicated in academic libraries. It is, therefore, important for accurate and correct knowledge to be used by the right person at the right time and in the right context.

Despite the fact that knowledge quality did not indicate the strongest effect on user satisfaction and intention to use Web 2.0 tools; there is a need for library staff to ensure the quality of knowledge stored in academic libraries to raise user satisfaction and intention to use Web 2.0 tools. Factors such as accuracy, relevance, timeless, and completeness need to be used for the proper usage of Web 2.0 tools in academic libraries. Academic libraries should monitor and evaluate the online content as well as user-generated content to ensure knowledge quality.

System quality was found to play a key role in providing the net benefits on using Web 2.0 tools in academic libraries. Therefore, there is a need for academic libraries to improve the system quality to enhance user satisfaction in the use of Web 2.0 tools. In this case, academic libraries should employ system administrators to improve the system quality in place through customisation and updating processes. However, system quality did not indicate the strongest effect on user satisfaction and intention to use Web 2.0 tools, academic libraries should ensure usability, adaptability, flexibility, reliability, and accessibility of the system.

User satisfaction was found to play a key role in the intention to use Web 2.0 tools, as well as, on providing the net benefits of Web 2.0 tools. User satisfaction on using Web 2.0 tools from time to time increase the intention to use such tools and which later brings to net benefits. Thus, academic libraries need to ensure the ways of satisfying their users to increase the usage of Web 2.0 tools. Librarians, in turn, should take advantage of a wide range of Web 2.0 tools in their libraries to strengthen their intention to use them. In addition, the intention to use Web 2.0 tools in academic libraries leads to net benefits in terms of good services, which will attract more users to use the Web 2.0 tools. In other words, the intention to use Web 2.0 services increases when there is a high level of user satisfaction. This would compensate for the high investment cost of developing and maintaining the Web 2.0 services.

Despite the implications to academic libraries and higher learning in general, the application of Web 2.0 tools such as Facebook, Whatsapp, Twitter, and Blogs brought many advantages to our societies. Web 2.0 tools which are also termed as "Social Media Tools" have been used to the majority of people as the means of communication, advertising and promoting business among societies and the means of getting important information. Despite the mentioned advantages, Web 2.0 tools have been used to educate our societies, there are lots of "open movements" like open scholarship, open science, and open education whereby people can join without through these tools and benefited a lot.

Conclusion

The KMS Success Model is considered to make a valuable contribution to academic libraries and other institutions with similar conditions. Web 2.0 tools (such as Facebook, Twitter, Blogs, and Tagging) are regarded as KMS that are used to enhance KM practices. The application of Web 2.0 tools provides seamless services to academic libraries and improves KM practices. Therefore, the authors of this study conclude that the development of a KMS success model could be a useful measurement tool for KMS Success Model in academic libraries and other institutions. It could also be useful for designing various KMS Success Model to ensure effective KM practices.

References

Akeriwa, M., Penzhorn, C. and Holmner, M. (2015) "Using mobile technologies for social media based library services at the University of Development Studies Library, Ghana", Information Development, Vol. 31 No. 3, pp. 284–293, doi: 10.1177/0266666913515898.

Al-Shibly, H. (2011), "Human resources information systems success assessment: An integrative model", *Australian Journal of Basic and Applied Sciences*, Vol. 5 No. 5, pp. 157–169.

Alavi, M. and Leidner, D. (1999), "Knowledge management systems: issues, challenges, and benefits", *Communications of the AIS*, Vol. 1 No. 7, pp. 1–27.

Alzahrani, A. I., Mahmud, I., Ramayah, T., Alfarraj, O., and Alalwan, N. (2017), "Modelling digital library success using the DeLone and McLean information system success model", *Journal of Librarianship and Information Science*, pp. 1–16, doi: 10.1177/0961000617726123.

Bagozzi, R., Yi, Y., and Phillips, L. (1991), "Assessing construct validity in organizational research", *Administrative Science Quarterly*, Vol.36 No.3, pp. 421–458.

Baro, E. E., Edewor, N. and Sunday, G. (2014),"Web 2.0 tools: A survey of awareness and use by librarians in university libraries in Africa", *Electronic Library*, Vol. 32 No. 6, pp. 864–883, doi: 10.1108/EL-11-2012-0151.

Bharati, P. and Chaudhury, A. (2006), "Product customization on the web: an empirical study of factors impacting choiceboard user satisfaction", *Information Resources Management Journal*, Vol. 19 No. 2, pp. 69–81.

Chiu, C.M., Sheng, C. and Chang, H. (2007) 'Examining the integrated influence of fairness and quality on learners" satisfaction and Web-based learning continuance intention.', *Information Systems Journal*, 17(3), p. 271–287.

Chua, A. Y. K. and Goh, D. H. (2010),"A study of Web 2.0 applications in library websites", *Library and Information Science Research*, Vol. 32 No. 3, pp. 203–221, doi: 10.1016/j.lisr.2010.01.002.

Creative Research Systems (2003), "Sample size calculator", available at: http://www.surveysystemcom/sscalc.htm (accessed 14 June 2014).

Clay, P. F., Dennis, A. R. and Ko, D. (2005), "Factors affecting the loyal use of knowledge management systems", *Proceedings of the 38th Annual Hawaii International Conference on System Sciences*, Big Island, pp. 1–10, doi: 10.1109/HICSS.2005.271.

Delone, W. H. and Mclean, E. R. (1992), "Information systems success: The quest for the dependent variable", *Information Systems Reseach*, Vol. 3 No. 1, pp. 60-95.

Delone, W. H. and Mclean, E. R. (2003), "The DeLone and McLean model of information systems success: A ten-year update", *Journal of Management Information Systems*, Vol. 19 No. 4, pp. 9–30, doi: 10.1080/07421222.2003.11045748.

Delone, W. H. and Mclean, E. R. (2004),"Measuring e-commerce success: Applying the DeLone and McLean information systems success model", *International Journal of Electronic Commerce*, Vol. 9 No. 1, pp. 37–41, doi: 10.1080/10864415.2004.11044317.

Delone, W. H. and Mclean, E. R. (2016), "Information systems success measurement: Foundations and trends", *Information Systems*, Vol. 2 No. 1, pp. 1-116, doi: 10.1561/2900000005.

Devaraj, S., FAN, M. and Kohli, R. (2002), "Antecedents of B2C channel satisfaction and preference: validating e-commerce metrics", *Information Systems Research*, Vol. 13 No. 3, pp. 316–333.

Fitzgerald, G. and Russo, N. (2005), "The turnaround of the London ambulance service computer-aided dispatch system (LASCAD)", *European Journal of Information Systems*, Vol. 14 No. 3, pp. 244–257.

Fornell, C. and Larcker, D. (1981), "Evaluating structural equation models with unobservable and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39–50.

Gandhi, S. (2004), "Knowledge management and reference services", *Journal of Academic Librarianship*, Vol. 30 No. 5, pp. 368–381, doi: 10.1016/j.acalib.2004.06.003.

Garrity, E. and Sanders, E. G. L. (1998), "Introduction to information systems success measurement", in: E.J. Garrity, G. L. S. (Eds), *Information Systems Success Measurement*, Idea Group Publishing, Harrisburg, PA., pp. 1–12.

Gatian, A. (1994), "Is user satisfaction a valid measure of system effectiveness?', *Information & Management"*, Vol. 26 No. 3, pp. 119–131.

Gorla, N., Somers, T. M. and Wong, B. (2010), "Organizational impact of system quality, information quality, and service quality", *Journal of Strategic Information Systems*, Vo. 19 No. 3, pp. 207–228, doi: 10.1016/j.jsis.2010.05.001.

Gray, D. (2004),"*Doing research in the real world"*, Sage publications, London.

Hair, J., Black, W., Babin, B., Anderson, R. and Tatham, R. (2010),"*Multivariate data analysis"*, 7th ed.,Pearson Prentice Hall, Upper Saddle River, NJ., doi: 10.1038/259433b0.

Halawi, L. A., McCarthy, R.V. and Aronson, J. E. (2008), "An empirical investigation of knowledge-management systems' success",*The Journal of Computer Information Systems*, Vol. 48 No. 2, pp. 121–135.

Hislop, D. (2013), "*Knowledge management in organizations: a critical introduction"*, 3rd ed., Oxford University Press, Oxford.

Hong, W., Thong, J.Y.L., Wong, W. and Tam, K. (2001), "Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics", *Journal of Management Information Systems*, Vol. 18 No. 3, pp. 97–124.

Hosseini, E. and Hashempour, L. (2009), "The status of librarians ' knowledge sharing by the usage of Web 2.0 tools: A case study of Central Libraries of Tabriz Governmental Universities", *E-Science and Information Communications in Computer and Information Science*, Vol. 371, pp. 128–137.

Hsieh, JJPA. and Wang, W. (2007), "Explaining employees' extended use of complex information systems", *European Journal of Information Systems*, Vol.16 No. 3, pp. 216–227.

Islam, Md A and Ikeda, M. (2014), "Convergence issues of knowledge management in digital libraries", *The journal of information and knowledge management systems*, Vol.44 No. 1, pp. 140–159.

Jain, P. (2013), "Knowledge Management in Academic Libraries and Information Centres: A Case of University Libraries", *Journal of Information and Knowledge Management*, Vol.12 No. 4, pp. 1–13, doi: 10.1142/S0219649213500342.

Jennex, M. and Olfman, L. (2003),"A knowledge management success model: An extension of Delone and Mclean's is success model" *Proceedings of the Americas Conference on Information Systems (AMCIS 03),* pp. 12-31,Tampa, Florida.

Jennex, M.E., Smolnik, S. and Croasdell, D. (2007), "Towards measuring knowledge management success", In *Proceedings of the 40th Annual Hawaii International Conference on System Sciences (HICSS 2008),* pp. 1–8, doi: 10.1109/HICSS.2008.461.

Karlinsky, Y. and Zviran, M. (2012)," Factors influencing perceived benefits and user satisfaction in knowledge management systems",*Information System Managemen*, Vol. 3 No. 1, pp. 55-73, doi: 201207130201053174900l.

Kettinger, W.J. and Lee, C. (1994), "Perceived service quality and user satisfaction with the information services function", *Decision Sciences*, Vol. 25 Vol. 5, pp. 737–766, doi: org/10.1111/j.1540-5915.

Kim, Y. and Abbass, J. (2010), "Adoption of library 2.0 functionalities by academic libraries and users: A knowledge management perspective", *The Journal of Academic Librarianship*, Vol. 36 No.3, pp. 211–218, doi: 10.1016/j.acalib.2010.03.003.

Klein, R. (2007), "An empirical examination of patient-physician portal acceptance", *European Journal of Information Systems*, Vol. 16 No.6, pp. 751–760.

Kulkarni, U., Ravindran, S. and Freeze, R. (2007),"A knowledge management success model: Theoretical development and empirical validation", *Journal of Management Information Systems*, Vol. 23 No.3, pp. 309–347, doi: 10.2753/MIS0742-12222303.

Levy, M. (2009), "WEB 2.0 implications on knowledge management", *Journal of Knowledge Management*, Vol.13 No. 1, pp. 120–134, doi: 10.1108/13673270910931215.

Lin, H.-F. (2007), "Measuring online learning systems sucess: applying the updated DeLone and McLean Model", *Cyber Psychology and Behaviour*, Vol. 10 No. 6, pp. 817–821, doi: 10.1089/cpb.2007.9948.

Livari, J. (2005), "An Empirical Test of the Model of Information System Success", *Information Systems Journal*, Vol.36 No. 2, pp. 8–27, doi: 10.1145/1066149.1066152.

Lwoga, E.T. and Questier, F. (2014), "Faculty adoption and usage behaviour of open access scholarly communication in helath science universities", *New Library World*, Vol. 115 No.3/4, pp. 116–139.

Lwoga, E. (2013), "Measuring the success of library 2.0 technologies in the African context: The suitability of the DeLone and McLean model", *Campus-Wide Information Systems*, Vol. 30 No. 4, pp. 288–307, doi: 10.1108/CWIS-02-2013-0011.

Lwoga, E. T. (2014), "Integrating Web 2.0 into an academic library in Tanzania," Electronic Library, 32(2), pp. 183–202. doi: 10.1108/EL-06-2012-0058.

Lwoga, E. T. and Sife, A. S. (2006), "From collection management to knowledge management practices: Considerations for the Sokoine National Agricultural Library in Tanzania", In *XVII Standing Conference of Eastern, Central and Southern Africa Library & Information Associations*, pp. 140–155.

Masrek, MN, Jamaludin, A. and Mukhtar, S. (2010), "Evaluating academic library portal effectiveness: a Malaysian case study", *Library Review*, Vol.59 No.3, pp. 198–212, doi: 10.1108/00242531011031188.

McGill, T., Hobbs, V. and Klobas, J. (2003), "User-developed applications and information systems success: A test of DeLone and McLean's model", *Information Resources Management Journal*, Vol. 16 No. 1, pp. 24–45, doi: 10.4018/irmj.2003010103.

Mosha, N.F., Holmner, M. and Penzhorn, C. (2015), "The role of social media tools to enhance knowledge sharing among knowledge workers in higher learning institutions: A case of Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania", In *Paper presented at the 81st International Federation of Library Associations and Institutions (IFLA) - World Library and Information Conference, Cape Town, South Africa, 15-21 August 2015*.

Mosha, N.F. (2017), "Application of web 2.0 tools to enhance knowledge management practices in academic libraries in Tanzania", University of South Africa (UNISA), South Africa.

Muneja, P. and Abungu, A. (2012), "Application of web 2.0 tools in delivering library services: a case of selected libraries in Tanzania", In Paper presented at the 20th SCECSAL Conference hosted by KLA on 4th to 8th June 2012 at Laico Regency Hotel, Nairobi, Kenya, pp. 1–23. Available at: http://www.scecsal.viel.co.ke/images/e/e3/Application_of_Web_2.0_tools_in_Delivering_Library_Services-_A_Case_of_selected_Libraries_in_Tanzania.pdf/ (accessed 23 March 2017).

Mwantimwa, K. and Nkhoma-wamunza, A. (2017), "Perception on adoption and application of web 2.0 technologies in selected academic libraries in Tanzania. Available at: journals.udsm.ac.tz/index.php/lj/article/download/1028/956%0A%0A/ (accessed 20 November 2018).

Nelson, E. (2008) 'Knowledge management for libraries.', Library Administration and Management, 22(3), pp. 135–137.

Ngcobo, E. N. (2016), "The use of web 2.0 technologies in academic libraries in South Africa", University of Kwazulu Natal, Pietermaritzburg, South Africa. Available at: https://researchspace.ukzn.ac.za/handle/10413/14478/ (accessed 20 November 2018).

O'Reilly, T. (2005),"*What is Web 2.0? Design patterns and business models for the next generation of software*", Available at: available: http://www.im.ethz.ch/education/HS08/OReilly_What_is_Web2_0.pdf (Accessed 03 March 2018).

Parasuraman, A., Zeithaml, Valerie, A. and Berry, L. (1985), "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, Vol. 49, pp. 41–50.

Petter, S., DeLone, W. and McLean, E. (2008), "Measuring information systems success: models, dimensions, measures, and interrelationships", *European Journal of Information Systems*, Vol. 17 No 3, pp. 236–263, doi: 10.1057/ejis.2008.15.

Petter, S. and McLean, E. R. (2009), "A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level", *Information and Management*, Vol. 46 No. 3, pp. 159–166, doi: 10.1016/j.im.2008.12.006.

Rai A., Lang, S.S. and Welker, R. (2002), "Assessing the validity of IS success models: an empirical test and theoretical analysis", *Information Systems Research*, Vol. 13 No. 1, pp. 5–69.

Ram, S., Anbu, J.P.A.K. and Kataria, S. (2011), "Responding to user's expectation in the library: Innovative Web 2.0 applications at JUIT Library: A case study", *Program: Electronic Library and Information Systems*, Vol. 45 No. 4, pp. 452–469, doi: 10.1108/00330331111182120.

Rammutloa, M. and Blaauw, D. (2017), "Application of DeLone and McLean's Model to assess effectiveness in ODL Libraries', In *International Conference on Intellectual Capital and Knowledge Management and Organisational Learning at Kidmore End: Academic Conferences International Limited in December 2017*, pp. 376–381.

Shih, H. (2004), "Extended technology acceptance model of internet utilization behavior", *Information and Management*, Vol. 41 No. 6, pp. 719–729, doi: 10.1016/j.im.2003.08.009.

Singh, S. (2007), "What are we managing knowledge or information?", *VINE: The Journal of Information and Knowledge Management Systems*, Vol. 37 No. 2, pp.169–179.

Skok, W. and Kalmanovitch, C. (2005), "Evaluating the role and effectiveness of an intranet in facilitating knowledge management: a case study at Surry County Council", *Information and Management*, Vol. 45 No.2, pp. 731–744, doi: DOI: 10.1016/j.im.2004.04.008.

Stoelting, R. (2002),"*Structural equation modelling/path analysis,* available at: *http://userwww.sfsu.edu/efs/classes/bio1710/path/SEMebpage.htm* (accessed 06 February 2015).

Urbach, N. and Muller, B. (2012), *"The updated DeLone and McLean model of information systems success"*, In Dwivedi, Y.K., Wade, M.R. and Schneberger, S. (Eds), Information systems theory:explaining and predicting our digital society, Springer, New York, NY, pp. 134–139, doi: 10.1007/978-1-4419-6108-2.

Wang, Y. S. (2008) "Assessing e-commerce systems success: A respecification and validation of the DeLone and McLean model of IS success", *Information Systems Journal*, Vol. 18 No. 5, pp. 529–557, doi: 10.1111/j.1365-2575.2007.00268.x.

Wixom, B.H. and Todd, P. (2005), "A theoretical integration of user satisfaction and technology acceptance", *Information Systems Research*, Vol.16 No. 1, pp. 85–102.

Wu, J. H. and Wang, Y. M. (2006), "Measuring KMS success: A respecification of the DeLone and McLean's model", *Information and Management*, Vol. 43 No. 6, pp. 728–739, doi: 10.1016/j.im.2006.05.002.

Yang, H.D. and Yoo, Y. (2004), "It is all about attitude: revisiting the technology acceptance model", *Decision Support Systems*, Vol. 38 No. 1, pp. 19–31.