Impact of Interface Characteristics on the Perceived Ease of Use and Perceived Usefulness of Digital Library Adoption among Post-Graduate Students in Somalia

Mohamed Muse Hassan
Lecturer,Faculty of Economics and Social Science- SIMAD UNIVERSITY
E-mail: mmuse@simad.edu.so

Ali Yassin Sheik Ali- PhD
Assistant professor;Faculty of Business and Accountancy-SIMAD UNIVERSITY
E-mail: proffali@hotmail.com

Abstract
The Main objective of this paper was to investigate the impact of interface characteristics—terminology and screen design—on the perceived ease of use and perceived usefulness of digital libraries among post-graduate students in Somalia. Convenient sampling method was adopted for sample selection and a structured questionnaire was distributed on July, 2014. The study found out that terminology used on the digital library interface has a positive influence on its perceived ease of use. Also, screen design has much impact on the perceived ease of using digital library. Finally, a positive correlation between perceived ease of use and perceived usefulness was found. These findings imply that some factors such as exclusion of technical terms and jargons to enhance ease of use of digital libraries should be taken into consideration (when planning and building digital libraries).
Keywords: Digital library, Terminology, Screen Design, Perceived ease of use, Perceived usefulness.

1. INTRODUCTION

Information retrieval is a basic skill for students in post-graduate studies, and technology has changed how they can get it. Through digital libraries—information stored in online form—students can access and retrieve digitized e-journals and e-books without needto be physically available in libraries (Kim, 2010). Yet, in general, students overlook or underutilize digital resources (Hong, Thong, Wong, & Tam, 2002).

Tan Sri Dr Abdullah Sanusi (TASDAS) Digital Libraryholds a wide range of resources in print and online format. Currently, there are close to 30,000 volumes of printed books in the library system. The library subscribes to 37 online databases comprising e-books, e-theses and many more. To date, there are more than 82,000 e-books and 32,000 journal titles, about 930,000 e-thesis titles, three newspaper databases and one local legal act database covering all courses offered in OUM (OUM Prospectus, 2012).

The library has developed its own e-content of about 3,000 titles comprising articles, papers presented at conferences, books, past exam papers and also dissertations and theses. It also conducts information skills workshops and makes use of Web 2.0 technology such as blogging and Facebook to encourage users to utilise the library facilities and services effectively, including various online databases (OUM Prospectus, 2012).

The technology acceptance model (TAM) is widely cited and used when examining the adoption of information technology and systems (Adams, Nelson, & Todd, 1992; Chau, 1996; Chau& Hu, 2002; Davis et al., 1989; Doll, Hendrickson, & Deng, 1998; Jackson, Chow, & Leitch, 1997; Jiang, Hsu, & Klein, 2000). The model has been used to examine influential factor of adoption of e-commerce (Jiang, Hsu, & Klein, 2000), 3G technology and mobile services (; Nysveen, Pedersen &Thornbjomsen, 2005; Dhaha & Ali, 2014) and library adoption (Ramayah&Aafaqi, 2004; Kim, 2010).To find out how users adopt technology, TAM suggests that usage is determined by intention to use (IU), which, in turn, is determined by perceived usefulness (PU) and perceived ease of use (PEOU).

The majority of studies on digital library adoption extended the theoretical framework of the TAM model and examined several external variables that study TAM's major constructs: *perceived ease of use and perceived usefulness*. Therefore, in addition to these constructs, several external variables were found to affect the behavior intention to use digital libraries (Hong et al. (2002). Still, one external variable, that is more important in the context of developing countries and which most studies on digital library take for granted, is the impact of interface characteristics on digital library users (students)—except one study by Park, Lee, Chung, Roman, (2007) that studied digital library adoption in the context of developing countries. They reason is because of under-utilization of information systems in the developing countries.

Furthermore, according to Hong et al. (2002), previous studies on digital library adoption using the TAM model have "generated mixed results," (p.115). Because of this, they included several external variables in their study, namely individual differences, organizational context, and interface characteristics, to study

extensively digital library adoption. At the end of their paper, they recommended further investigation in other countries to confirm if their finding would have generalizability.

Therefore, with the recommendation of further studies in other countries by Hong et al. (2002) and the notion of under-utilization of information systems in the developing countries by Park et al. (2007), this study examines the effect of interface characteristics on digital library adoption by graduate students in Somalia. To our best knowledge, this study is the first research of its kind in Somalia on the end-users' adoption of digital libraries.

2. RESEARCH FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Hong et al. (2002)argued that huge sums of money have been spent on designing functioning digital libraries, and research has shown that potential users may still not fully utilize them. Their study is one of the most cited when studying user acceptance of digital libraries. Their findings indicate that perceived usefulness and perceived ease of use are determinants of user acceptance of digital libraries. In addition, interface characteristics and individual differences affect perceived ease of use and, in directly, perceived usefulness of digital libraries. Interface characteristics in terms of terminology clarity, screen design, and navigation clarity, can positively affect perceived ease of using digital libraries. The research model is presented in Figure 1.
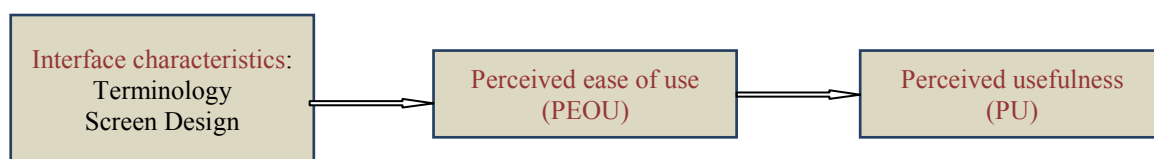

Figure1. Research model

Interface Characteristics

Interface characteristics means how users interact with the system. This influences users' beliefs on TAM constructs(Davis, 1993). Interface characteristics comprises screen terminology and screen design. Terminology refers to the words, sentences, and abbreviations used in the system (Lindgaard, 1994) where byscreen design relates to how information is presented on the system's screen (Lindgaard, 1994).

As revealed by Hong et al. (2002), interface characteristics were found to be significant determinants of perceived ease of use of digital libraries. In addition, in developing countries the success of information systems (aka digital libraries) depends on how the system is customized from the user's perspective because it is users who will, at the end, decide if it is functional and successful (Park et al. 2007). Therefore, based on the above discussions, this study examines the effect of interface characteristics on digital library adoption by post-graduate students in Somalia. Based on the above empirical findings, the paper hypothesizes that:

H1: Screen terminology has a direct influence on the perceived ease of use of digital library adoption.
H2: Screen design directly influences users' perceived ease of use of digital libraries.

Perceived ease of use (PEOU)

Perceived ease of use (PEOU) has been studied extensively in the literature (Chau, 2001; Hong et al., 2002; Thong et al., 2004; Ramayah & Aafaqi, 2004; Ramayah et al., 2004). PEOU is the "degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). If users find a system an easy to use, they will take it as a useful one (Thong et al., 2004). PEOU is important for untried users and/or potential adopters and is less significantas an antecedent of PU(Davis, 1989; Adam set al., 1992). Therefore, based on the above discussion:

H3: Perceived ease of use is positively related to perceived usefulness of digital library adoption.

Perceived usefulness (PU)

PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). In fact, system adoption research proposes that "a system that does not help people perform their jobs is not likely to be received favourably" (Nysveen, Pedersen, &Thornbjomsen, 2005, p. 537). The crucial reason that users exploit digital libraries is that they find the systems usefulto their information needs or search tasks (Hong et al., 2002). Past researches (Ramayah et al., 2004; Ramayah&Aafaqi, 2004; Davis, 1989; Ramayah, Ignatius, &Aafaqi, 2002, Ramayah,Sarkawi, & Lam, 2003) has shown that PU influences computer usage directly. Hence, it is hypothesized that:

H4: Perceived usefulness is positively related to digital library adoption.

3. RESEARCH METHODOLOGY

The overall objective of this paper was to investigate the impact of interface characteristics on the perceived ease of use and perceived usefulness of digital libraries among post-graduate students in Somalia. Data were collected from post-graduate students in OUM-SIMAD UNIVERSITY MBA collaboration program.

Individual post-graduate student was the unit of analysis for this study; and convenient sampling method was adopted for selection. A structured questionnaire developed by Thong et al.(2004) was adopted and the data was collected from the respondents in the SU Centre for Post-Graduate studies—this campus the students use for their distance education.

4. RESULTS
4.1: Demographic profile
The demographic data of the respondents is summarized in Table 1. Fifty seven completed questionnaires were returned out of 80 sets that were distributed. The study's participants comprised 73.7% of males and 26.3% of females. This implies a heavy participation of males, but it was just a coincidence since they were not randomly selected. Also, the program is a male dominated one. Majority of the study's participants, 75.4%, were between the ages of 24-29. Other 14% of participants were between the ages of 30-35. The remaining 10.5 were more than 36 years. In addition, they were almost married, 63.2%. But, at the same time, 31.6% were unmarried.

When we tried to find out the experience of participants with digital library, we found out mostly were new to this system (52.6%). But, their experience with computer is different because 84.2% of the participants have been using it more than 5 years.

Here we found out that since participants were new to digital libraries, they were not new to computer, in general. As the above data shows, more than 80 percent were more experienced with computers, but the participants are new to digital libraries.

Table 1: Demographic Data

Variable	Frequency	Percentage
Gender		
Male	42	73.7
Female	15	26.3
Age		
24-29	43	75.4
30-35	8	14.0
More than 36	6	10.5
Marital Status		
Single	18	31.6
Married	36	63.2
Experience with digital library (months)		
Less than 6	30	52.6
7-12	16	28.1
13-18	7	12.3
19 or more	3	5.3
How many years of experience do you have in using a computer?		
Less than one year	3	5.3
1-2 years	1	1.8
3-4 years	5	8.8
More than 5 years	48	84.2

4.2: Reliability Analysis
Reliability test was conducted on website terminology, Screen design, perceived ease of use and perceive usefulness. Cronbach's coefficient alpha of .752, .768, .763 and .871 for these variables were generated respectively as shown on table (2).This indicated thatthevariables internally consistent and reliable. Therefore, the variables deemed reliable for further analysis.

Table 2: Reliability Analysis and Descriptive Statistics

Variable	Mean	Standard Deviation	Cronbach's Alpha
Website terminology	3.09	1.06	**.752**
Screen design	2.65	1.01	**.768**
Perceived ease of use	3.171	1.19	**.763**
Perceived usefulness	3.33	1.25	**.871**

4.3: Relationship between the variables
Table 3 presents the results of the inter-correlation among the variables. The correlation analysis was conducted to see the initial picture of the inter-relationships among the variables under the study. The importance of

conducting correlation analysis is to identify any potential problems associated with multicolinearity. The result shows that website terminology is positively correlated with screen design (r = 0.468, p-value < 0.05) and perceived ease of use (r = 0.562, p-value < 0.05), but not correlated with perceived usefulness (r = 0.174, p-value = 0.22). Screen design is positively correlated with perceived ease of use (r= 0.327, p-value < 0.05) and not correlated with perceived usefulness (r=.246, p-value=0.082. Perceived ease of use is positively correlated with perceived usefulness (r= 0.560, p- value < 0.05).

Table 3: Inter Correlations of Variables

Variables	1	2	3	4
Website Terminology	1			
Screen Design	.468[**]	1		
Perceived Ease of Use	.562[**]	.327[**]	1	
Perceived usefulness	.174	.246	.560[**]	1

4.4: Hypothesis test
Moreover, hypotheses testing were conducted using regression analysis. The findings are presented in Table 4.
Table 4 Multiple Regression Analysis

Independent variables	Dependent variable	Beta	T	Sig.	Δ R²
Website_ Terminology	Perceived Ease of Use(PEOU)	.562	4.754	.000	.316
Screen Design	Perceived Ease of Use(PEOU)	.327	2.394	.021	.107
Perceived Ease of Use(PEOU)	Perceived Usefulness(PU)	.560	4.829	.000	.314

The regression coefficient from the table 4 above indicates that the independent variable website terminology is the most important in explaining the variance in Perceived ease of use(PEOU) with (β=.316) then screen design with (β=.107) and the F-change is significant. The finding from this study explains that there is positive and significant relationship between interface characteristics element (website terminology and screen design) with perceived ease of use (PEOU). Also the result indicates positive and significant relationship between perceived ease of use (PEOU) and perceived usefulness(PU); all hypotheses of the study were accepted.

5. DISCUSSION AND CONCLUSION
This study is an attempt to examine the impact of interface characteristics on the TAM belief constructs: perceived ease of use and perceived usefulness. As the above results show, screen terminology used on the digital library has a positive influence on its perceived ease of use. This is especially true for those students in developing countries who wish to understand the terms used in the digital library when retrieving required and recommended journal articles for their academic purposes. This observation is consistent with the findings by Hong et al. (2002). If system designers want the user to find the system easy to use, clear and understandable, terminology will reduce search efforts and ensure fast and efficient search of information. This clear technology will provide an easy system to the users. To attain best adaptation of the system, jargons and technical terms should be excluded. In addition, if the system's vocabulary is matched with user's language, terminology clarity will be achieved. Once terminology clarity is present, then it would make it easier for end-users to use the digital library.

On the other hand, screen design has large impact on the perceived ease of using digital library. This is due to the fact that most users are new to digital library, though they are familiar with the use of computers. Furthermore, screen design would affect the perceived ease of use of digital library in view of the fact that post-graduate students are more interested in searching for information. Thus, the findings are consistent with the finding of the study conducted by Hong et al. (2002), which found that screen design contributed significantly to the perceived ease of using digital library.

However, an interesting finding from this study is that there is a positive correlation between perceived ease of use and perceived usefulness. This means that most post-graduate students who find it easy to use digital library are also likely to find digital library to be useful. Postgraduate students want to become skilful in using the digital library within the shortest time frame and probably do not want to go through the hassle of reading up manuals. This result is consistent with the study of Hong et al. (2002).

This study has provided implications that can help universities better understand the impact of interface characteristics on perceived ease of using digital library among post-graduate students. The findings implied that some factors of interface characteristics at one point or another contributed to a certain extent the perceived usefulness and perceived ease of using digital library. Factors such as terminology should be studied more in-depth to gain more insight about the end-users.

This study also hoped that these factors could be incorporated by people who build digital libraries. Factors such as exclusion of technical terms and jargons to enhance ease of use of digital libraries should be taken into consideration when planning and building digital libraries. Clear terminology to provide effective communication of system instructions and responses to users should be given priority by organizers of digital

libraries.

A more effective digital library would ensure that the post-graduate students would make full use of the digital library technology when doing their research as this would solve the problems faced by them in the traditional library. Moreover, students who need to do research would benefit from a more effective digital library as it would provide a combination of digitally delivered content with learning support and services (Waller & Wilson, 2001). The digital library provides more choices, enhances flexibility and will often provide the learner within stint feedback. It allows students to select learning materials and is convenient to access at any time and at any place (Wang, 2003).

In conclusion, analysis of the data collected discovered that interface characteristics to certain extent have impact on the post-graduate students' perceived usefulness and perceived ease of using digital library. Further, terminology has an impact on the perceived ease of using digital library.

REFERENCES

Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly*, *16*(2), 227-247.

Chau, P. Y. K. (1996). An empirical assessment of a modified technology acceptance model.*Journal of Management Information Systems, 13*(2), 185-204

Chau, P. Y. K., & Hu, P. J. (2002).Examining a model of information technology acceptance by individual professionals: An exploratory study.Journal of Management Information Systems, 18(4), 191-229.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly*, 13*(3), 319–339.

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavior impacts. *International Journal of Man-Machine Studies, 39*, 475-487.

Dhaha, I.S.Y & Ali, A.Y. S. (2014). Behavioral intention and satisfaction with 3G technology among students in Somalia: A structural equation modeling study. *World Applied Sciences Journal, 32*(2), 243-252.DOI: 10.5829/idosi.wasj.2014.32.02.331

Doll, W. J., Hendrickson, A., & Deng, X. (1998). Using Davis's perceived usefulness and ease-of-use instruments for decision making: A confirmatory and multigroup invariance analysis. *Decision Sciences, 29*(4), 839-869.

Hong, W., Thong, J.Y.L., Wong, W.-M., Tam, K.-Y. (2002). Determinants of user acceptance of digital libraries: An empirical examination of individual differences and system characteristics. *Journal of Management Information Systems, 18*(3), 97–124.

Jackson, C. M., Chow, S., & Leitch, R. A. (1997).Toward an understanding of the behavioral intentions to use an information system.*Decision Sciences, 28*, 357-389.

Jiang, J. J., Hsu, M., & Klein, G. (2000). E-commerce user behavior model: An empirical study. *Human Systems Management, 19*, 265-276.

Kim, Y.-M. (2010). The adoption of university library website resources: A multigroup analysis. *Journal of the American Society for Information Science and Technology, 61*(5), 978–993.

Lindgaard, G. (1994*). Usability Testing and System Evaluation: A Guide for DesigningUseful Computer Systems*. New York: Chapman & Hall.

Nysveen, H., Pedersen, P. E., &Thornbjomsen, H. (2005). Intentions to use mobile services: Antecedents and cross-service comparisons. *Journal of Academy of Marketing Science, 33*(3).330-346.

Ramayah, T. &Aafaqi, B. (2004).Role of self-efficacy in e-library usage among student of a public university in Malaysia.*Malaysia Journal of Library and Information Science, 9*(1), 39-57.

Ramayah, T., &Jantan, M. (2004). Internet usage among Malaysian students: The role of demographic and motivational variables. *PRANJANA: The Journal of Management Awareness, 7*(2), 59-70.

Ramayah, T., Sarkawi, F., & Lam, S. C. (2003).Attitude and intention to use web-based supply chain management (SCM) among SMEs. The proceedings of the Asia Pacific Seminar on E-Customer Relationship Management, 8-9 July, Shah Alam, Selangor, Malaysia.

Park, N., Lee, S., Chung, J., Roman, R. (2007).Conference Papers -- National Communication Association., Database: Communication & Mass Media Complete, p1. 41p. 3 Diagrams, 3 Charts.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar