

Voice of Academia

Academic Series of Universiti Teknologi MARA Kedah

Special Issue: Information Management

VoA
Volume 12 (1)
2017

Copyright © 2017 by the Universiti Teknologi MARA, Kedah
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission, in writing, from the publisher.

© Voice of Academia is jointly published by the Universiti Teknologi MARA, Kedah and Penerbit UiTM (UiTM Press), Universiti Teknologi MARA Malaysia, Shah Alam, Selangor. Printed by Perpustakaan Sultan Badlishah, Universiti Teknologi MARA, Kedah.

The views, opinions and technical recommendations expressed by the contributors and authors are entirely their own and do not necessarily reflect the views of the editors, the Faculty or the University.

Digital Library Acceptance and Continued Use: Conceptual Framework

*Abd Latif Abdul Rahman**, Adnan Jamaludin

Faculty of Information Management, Universiti Teknologi MARA Cawangan Kedah, 08400 Kedah, Malaysia

ARTICLE INFO

Article history:
Received 26 November 2017
Received in revised form
31 March 2017
Accepted 13 April 2017
Published 1 June 2017

Keywords:

digital library, acceptance, continued use, conceptual framework

Corresponding Author:

ablatif@kedah.uitm.edu.my

ABSTRACT

At present, users are already relying on the availability of the digital library for their information needs to support their daily tasks. In the context of the university environment, the digital library in the university is being utilized by students and academics almost all the time. This is because their learning and teaching activities involve using information resources which are offered by the digital library. As such, the digital library in universities is not only playing an important role but it will also become one of the most sophisticated and important information systems supporting the universities' activities. In this context, librarians and information professionals who are responsible for the development of the digital library need to understand the intricacies of it so that the advantages and benefits can be exploited for the betterment of library and information service provisions. One of the most important aspects about the digital library in the university environment is its acceptance and usage by the university community, particularly the students. The success of the digital library is only as good as its acceptance and usage by the users and as such, it is crucial to investigate and understand not only its acceptance and usage, but also how and why it is being accepted and used. In other words, variables that are deemed important that may have some influences on the acceptance and use of digital library need to be examined. Therefore, this paper develops a conceptual framework on digital library acceptance which includes Performance Expectancy, Effort Expectancy, Information Quality and Digital Library Services as a predictor of continued use of digital library. Because the digital library is one of the most significant technologies in the field of library and information science, this proposed model would contribute significant benefits for librarians and information professionals at large. Furthermore, with the dearth of research in this area, the proposed model would contribute with a better understanding of the extent to which the digital library is being accepted and continued used, through an analysis of the factors involved and how they interact with each other. With these insights, professionals can improve and enhance the services of the digital library so that users could obtain the optimum benefit.

©2017 UiTM Kedah. All rights reserved.

1. Introduction

Regarded as one of the most innovative developments in the field of library and information science, the digital library is emerging in many libraries around the world, particularly in the libraries of the universities. Library and information professionals are capitalizing on the flexibility and advantages of the digital library to offer new and sophisticated services to their library users. These services, which previously were impossible for the conventional library to provide, now offer not only the library users with the many choices of information services but also offer the librarians the capability to maximize the provisions and the utilization of their library collections for the benefit of their users. As a specialized information retrieval system, the digital library is designed and developed to suit many elements of a sophisticated information system.

From the technological aspect, the digital library is built on the advancement of new information and communication technology, particularly the Internet, database design and development, information retrieval technology, and web technology. Meanwhile, from the user perspective, the digital library is designed with the variety of users' characteristics in mind so as to enable the ease of use. Furthermore, from the informational aspect, the digital library contains a range of information types and formats from a variety of sources to fulfill the information needs of library users. With all these aspects embedded in the new information system called the digital library, librarians hope that in future the digital library would replace the way most services are offered by the conventional library.

At present, users are already relying on the availability of the digital library for their information needs to support their daily tasks. In the context of the university environment, the digital library in the university is being utilized by students and academicians almost all the time. This is because their learning and teaching activities involve using information resources which are offered by the digital library. As such, the digital library in universities is not only playing an important role but it will also become one of the most sophisticated and important information systems supporting the universities' activities.

In this context, librarians and information professionals who are responsible for the development of the digital library need to understand the intricacies of it so that the advantages and benefits can be exploited for the betterment of library and information service provisions. One of the most important aspects about the digital library in the university environment is its acceptance and usage by the university community, particularly the students. The success of the digital library is only as good as its acceptance and usage by the users and as such, it is crucial to investigate and understand not only its acceptance and usage, but also how and why it is being accepted and used. In other words, variables that are deemed important that may have some influences on the acceptance and use of digital library need to be examined.

2. Literature Review

2.1 Related Models

First, In relation to this, several studies have been carried out by researchers particularly through the adoption of relevant existing models such as the Technology Acceptance Model (TAM) developed by (Davis F. B., 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by (Venkatesh, Morris, Davis, & Davis, 2003).

Reference (Hong, Thong, Wong, & Tam, 2002) have attempted to examine a set of external variables through the adoption of TAM. The set of external variables are interface characteristics, organizational context, and individual differences. While (Tibenderana et al., 2010) and (Orji, 2010) have also attempted to examine the set of variables in UTAUT model (Venkatesh, Morris, Davis, & Davis, 2003) along with addition of other variables relevant to the context of their study. Among the variables added are relevance and awareness by (Tibenderana & Ogao, 2008b) and (Tibenderana et al., 2010) and Nationality by (Orji, 2010).

The development above is only to show that research in digital library focuses around the examination of variables that are deemed significant from the perspective of the researchers in trying to explain its acceptance and continued use. Perhaps, there are other variables that may also be significant which have not been examined in the studies of digital library thus far. In consideration that digital library is an information system, previous studies on the acceptance and continued use of digital library did not include other important variables. According to (Delone & Mclean, 2003), information quality and the service quality are important in the success of an information system. The Information Success Model developed by Delone and Mclean (Delone & Mclean, 2003) explains that information quality and service quality are variables that could influence the intention to use of information system. However, to date, these variables have not been examined in all the studies related to digital library acceptance that have thus far conducted by (Tibenderana & Ogao, 2008b) and (Orji, 2010). In other words, these researchers did not attempt to explain the role of information quality and the service quality in the acceptance and continued use of the digital library. Therefore, in this propose conceptual framework, information quality and service quality are taken into account to close the gap left by the previous studies to explain the acceptance and continued use of the digital library. In doing so, the understanding of digital library acceptance and continued use would be enhanced.

The next section would discuss on the meaning and definition of digital library, and will follow with the proposed conceptual framework for the study on the acceptance and continued use of the digital library in Malaysian research universities.

2.2 Meaning and Definition of Digital Library

Digital library is a term first heard in the early 1990s when universities and institutions began to develop their digital collections. Since then, research on digital libraries has been carried out by many researchers from various disciplines such as computer science, information science, management science, and psychology, thereby giving rise to terms with different meanings by different individuals and in a variety of situations (Singh, Mittal, & Ahmad, 2006; Shiri, 2003). In this context, (Borgman, 1999) pointed out that the definition of digital library originated from two different perspectives: first, digital library from the technical aspect which has usually been defined by computer scientists and engineers; and second, digital library from the perspective of collection, organization, and service which has normally been defined by library and information professionals. This has resulted in numerous definitions and meanings of digital library that are illustrated in a variety of perspectives, and those discussed below are just illustrative rather than comprehensive.

From the access and retrieval aspects of digital library, it is defined as “a system providing a community of users with coherent access to a large, organized repository of information and knowledge” (Lynch & Garcia-Molina, 1995). As a distributed library information service, the digital library can be physically located or in a virtual space or in a combination of both that provides most of the resources in the form of digital form to its users (Rowlands & Bawden, 1999). Reference (Hong, Thong, Wong, & Tam, 2002) refer to the digital library as an electronic collection including items such as electronic journals and online databases with fuller capabilities than normal information retrieval, which can be accessed via the library’s homepage.

From the perspective of collection, organization, and services, a digital library contains a collection of digital objects such as text, images, videos and audio, together with the methods for access and retrieval, selection, creation, organization, maintenance and sharing of the collection (Witten & Bainbridge, 2002).

From the perspective of organization, a digital library is an organizational entity that is organized in a structured and manageable way with a wide range of (academic) assets, such as metadata, catalogues, primary source materials, learning objects, datasets, and digital repositories. It is a place to search for these assets, to discover their existence, to locate them and then, if required, receive them. It also recognizes and supports the core authoring functions of creation, iteration, finalization and publication (Baker, 2006).

From the meanings and definitions of digital library given above, it can be concluded that a digital library concerns all types of digital collections that could be searched and accessed through the library website either for the purpose of viewing, downloading, printing, or loaning. This means that, if a user is searching and accessing a collection of journal articles in an online database offered by a library through the library website, it is considered that the user is using a digital library. Furthermore, if a user is searching and accessing library collections that are offered in a digital form through the library OPAC, then it can also be considered that the user is using a digital library.

3. Proposed conceptual framework for continued use of digital library

Based on the foregoing discussion on the various models and variables that are related to digital library use, and in line with the purpose of this present study, Figure 1 below depicts the conceptual framework for the present study which seeks to investigate students continued use of the digital libraries in Malaysian research universities. For the purposes of the present conceptual framework, the conceptual framework is adapted from a combination of the Unified Theory of Acceptance and Use of Technology model (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003), the Technology Acceptance Model (TAM) (Davis F. B., 1989) and the Information System Success (ISS) model (Delone & Mclean, 2003). The conceptual framework consists of the dependent variable named as Intention to Use the Digital Library, and four independent variables, i.e. Information Quality, Service Quality, Effort Expectancy, and Performance Expectancy. These independent variables influence the dependent variable. In addition, the influence of Effort Expectancy and Performance Expectancy on the Intention to Use the Digital Library is moderated by the User Characteristics.

Intention to Use, which is the dependent variable of the study, is directly adopted from all the three models (UTAUT, TAM, and ISS). Similar to the way this variable is treated in all three models, Intention to Use is appropriate for the present study because the data collection

instrument used is a self-reporting questionnaire rather than the analysis of log file. Furthermore, Intention to Use is more stable and precise in evaluating an information system (Szajna, 1994).

Performance Expectancy and Effort Expectancy are variables adopted from UTAUT which correspond to the variables termed Perceived Usefulness and Ease of Use in TAM. Meanwhile, Information Quality and Service Quality are variables adopted from the ISS Model. Information Quality and Service Quality are pertinent in the context of the digital library environment because the nature of a digital library is that it contains many different types and formats of information. Since it is an information system that users rely on, the service of a digital library is of utmost importance and users should be able to access it when they need to use it.

The variable Service Quality is renamed as Digital Library Services in this framework. As for the variable System Quality, this variable is not included in the present conceptual framework because of its similarity to Performance Expectancy. In addition, Social Influence, which is a variable found in UTAUT model, is also not incorporated in this framework because of its irrelevance to the digital library environment. Intention to use a digital library is voluntary, whereas social influence is mandatory in nature. Therefore, social influence has no effect on the intention of the users to use digital library.

User characteristics such as age, gender, and experience, which have been tested in UTAUT model as moderating variables, are tested again in the present study and consequently they are included in this framework because the users of the digital library are diverse.

3.1 Continued Use of Digital Library

Continued Use of the Digital Library (CUDL) refers to the intention of digital library users to continue the use of the digital library again in the future as a result of their prior experience of using it. Their intention can be examined from the following dimensions and elements: (Davis F. B., 1989) (Venkatesh, Morris, Davis, & Davis, 2003) (Davis F. D., 1989) (Venkatesh, Thong, & Xu, 2012).

- Preference to use the digital library relates to digital library users liking to use the digital library again and expressing a preference to have access to the digital library again.
- Predicting use of the digital library relates to digital library users predicting that they would continue to use the digital library again and also predicting that they would regularly use the digital library in future.
- Planning refers to future actions the digital library users say they would undertake before using the digital library again, which relates to plans to equip themselves with the knowledge and skills needed to use the digital library, plans to use the digital library at any place where it can be accessed, and plans to use digital library with appropriate technology.

3.2 Effort Expectancy (EE)

Continued Use of the Digital Library (CUDL) refers to the intention of digital library users to continue use the digital library again in the future as a result of their prior experience of using it. Their intention can be examined from the following dimensions and elements: (Davis F. B., 1989) (Venkatesh, Morris, Davis, & Davis, 2003) (Davis F. D., 1989)

(Venkatesh, Thong, & Xu, 2012).

- Preference to use the digital library relates to digital library users liking to use the digital library again and expressing a preference to have access to the digital library again.
- Predicting use of the digital library relates to digital library users predicting that they would continue to use the digital library again and also predicting that they would regularly use the digital library in future.
- Planning refers to future actions the digital library users say they would undertake before using the digital library again, which relates to plans to equip themselves with the knowledge and skills needed to use the digital library, plans to use the digital library at any place where it can be accessed, and plans to use digital library with appropriate technology.

3.3 Performance Expectancy (PE)

The Performance Expectancy (PE) refers to the degree to which digital library users believe that using the digital library will assist them and be an advantage in performing their tasks. Performance Expectancy can be examined from the following dimensions and elements: (Davis F. B., 1989) (Venkatesh, Morris, Davis, & Davis, 2003) (Davis F. D., 1989) (Venkatesh, Thong, & Xu, 2012).

- Time taken, which refers to the amount of time taken to complete their academic tasks using the digital library and the extent to which it frees up time for them to do other academic tasks.
- Performance, which relates to the ability of the digital library users to complete their tasks as planned and therefore complete them within the time frame needed.
- Productivity, relates to the ability to increase the quantity and improve the quality of the tasks undertaken.

3.4 Information Quality (IQ)

Information quality refers to the usability of the digital information resources retrieved by the users from the digital library. Usability can be examined from the following dimensions and elements: (Delone & Mclean, 2003) (Al-Hakim, 2007) (Al-Hakim, Latif, 2007) (Bailey & Pearson, 1983).

- Accuracy of the digital information resources in the digital library, which relates to correctness, freedom from errors, and accuracy
- Relevance of the digital information resources in the digital library concerns the relatedness of the digital information resources in the digital library to the user's needs
- Comprehensiveness of the digital information resources in the digital library relates to completeness, comprehensiveness, and sufficiency of the resources
- Authoritativeness of the digital information resources in the digital library relates to dependability and reliability
- Comprehensibility of the digital information resources relates to the ability to be understood.

3.5 Digital Library Services (DLS)

Digital Library Services (DLS) refers to the availability of digital library services for the

users to use the digital library. The digital library services can be examined from the following dimensions and elements: (Delone & Mclean, 2003) (Parasuraman, Zeithaml, & Berry, 1988) (Zeithaml, Parasuraman, & Malhotra, 2002).

- Accessibility, which relates to the digital library services being available at all times
- Reliability, which relates to the occurrences of breakdowns in the services of the digital library.
- Responsiveness, which relates to the promptness of the digital library services to provide assistance, facilitate use and demonstrate a quick response time.
- Efficiency, which relates to the economic value of using the digital library including factors such as cost incurred and time taken when using it.

3.6 Digital Library Acceptance (DLA)

Digital Library Acceptance (DLA) in this study is operationally defined as a composite construct of the four independent variables which are Performance Expectancy (PE), Effort Expectancy (EE), Information Quality (IQ) and Digital Library Services (DLS). A high level of composite constructs of independent variables means that a high level of digital library acceptance and vice versa.

3.7 User Characteristics (UC)

User characteristics refer to the characteristics of digital library users which have the followings dimensions and elements:

- Age, which relates to the age of the digital library users, measured in years.
- Gender, either male or female.
- Experience relates to the number of years a user utilizes a digital library. It can also relate to the frequency of use in a week.

4. Discussion On Variables

Based on the conceptual framework, the following aspects of the variables are discussed:

- The influence of Effort Expectancy on Continued Use of the Digital Library
- The Influence of Performance Expectancy on Continued Use of the Digital Library
- The Influence of Information Quality on Continued Use of the Digital Library
- The Influence of Digital Library Services on Continued Use of the Digital Library

4.1 The influence of Effort Expectancy on Continued Use of the Digital Library

Effort Expectancy has a positive relationship with Continued Use of the Digital Library. This relationship is moderated by the characteristics of the users. This means that when Effort Expectancy is high, the Continued Use of the Digital Library would also be high, particularly among male, or younger, or experienced users.

Male digital library users tend to have high Effort Expectancy because they are more receptive towards information technology and also find it easier to operate the technology. This is also true of younger users and experienced users of digital libraries. Furthermore, younger users are also more skilful when they use digital library compared to older users.

H4: Effort Expectancy has a positive influence on Continued Use of the Digital Library (CUDL), after controlling for the effect of Performance Expectancy, Information Quality and Digital Library Services.

H5: There is a positive relationship between Effort Expectancy and Continued Use of the Digital Library (CUDL) as moderated by gender of users after controlling for the effect of Performance Expectancy, Effort Expectancy, Information Quality, Digital Library Services and gender.

H6: There is a positive relationship between Effort Expectancy and Continued Use of the Digital Library (CUDL) as moderated by length of experience of users after controlling for the effect of Performance Expectancy, Effort Expectancy, Information Quality, Digital Library Services and experience.

H7: There is a positive relationship between effort expectancy and Continued use of the Digital Library (CUDL), as moderated by age of users, after controlling for the effect of performance expectancy, effort expectancy, information quality, digital library services and age.

4.2 The influence of Performance Expectancy on Continued Use of the Digital Library

Performance Expectancy also has a positive relationship with Continued Use of the Digital Library when the relationship is also being moderated by the characteristics of the users. In a situation where Performance Expectancy is high, Continued Use of the Digital Library by these users is high, particularly among the male or younger or experienced users.

Male digital library users tend to be more comfortable with digital library use hence they are always looking for benefits and performance gains and therefore spend more time using the digital library as compared to their female counterparts (Venkatesh, Thong, & Xu, 2012).

In terms of age, younger digital library users as compared to older ones, tend to find the digital library quite easy to use, as well as being useful especially in obtaining digital information resources for their research work. This leads to high Continued Use of the Digital Library.

H1: Performance Expectancy has a positive influence on Continued Use of the Digital Library after controlling for the effect of Effort Expectancy, Information Quality and Digital Library Services.

H2: There is a positive relationship between Performance Expectancy (PE) and Continued Use of the Digital Library (CUDL), as moderated, by gender after controlling for the effect of Effort Expectancy, Information Quality, Digital Library Services and gender.

H3: There is a positive relationship between Performance Expectancy (PE) and Continued Use of the Digital Library (CUDL), as moderated by age of users, after controlling the effect of Effort Expectancy, Information Quality, Digital Library Services and age.

4.3 The influence of Information Quality on Continued Use of the Digital Library

Information quality has a direct positive influence on Continued Use of the Digital Library. This means that in a situation when the level of information quality is high, it will contribute to high level of Continued Use of the Digital Library. The digital library users expect a high quality of information from a digital library to motivate them to use it in their academic work. High quality is very useful to the digital library users.

H8: Information Quality has a positive influence on Continued Use of the Digital Library after controlling for the effect of Performance Expectancy, Effort Expectancy and Digital Library Services.

4.4 The influence of Digital Library Services on Continued Use of the Digital Library

Digital library services also have direct positive influence on Continued Use of the Digital Library, because when the level of service quality is high, it will contribute to a high level of intention to use the digital library. To digital library users, high quality service is important so that they would be able to use the digital library without any interruptions.

H9: Digital Library Service has a positive influence on Continued Use of the Digital Library after controlling for the effect of Performance Expectancy, Effort Expectancy and Information Quality.

5. Conclusion

Because the digital library is one of the most significant technologies in the field of library and information science, this study has significant benefits for librarians and information professionals at large. Furthermore, with the dearth of research in this area, the proposed model could assist librarians and information professionals as the information providers to study the reality of digital library acceptance and continued use, particularly among the students in the research-intensive universities. Librarians and information professionals who are the information providers could gauge with a better understanding of the extent to which the digital library is being accepted and continued used, through an analysis of the factors involved and how they interact with each other. With these insights, professionals can improve and enhance the services of the digital library so that users could obtain the optimum benefit.

Acknowledgment

Highest gratitude to Malaysian Ministry of Higher Education and Universiti Teknologi MARA (UiTM) (FRGS Research Grant (600-RMI/FRGS/ 5/3 (155/2013) and RAG Research Grant (600-RMI/RAGS 5/3 (143/2013) for giving us opportunity and ample time in doing research.

References

- A Parasuraman., Zeithaml, V.V., & Berry, L. L. (1998). SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, 64 (1), 12-40
- Ali, S. (2003). Digital library research: current developments and trends. *Library review*, 52(5), 198-202.
- Bagozzi, F.D., Warshaw,R.P. & Davis, P.R., (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8) 982-1003.
- Bailey, J. E., & Pearson, S. W. (1983). Development of a tool for measuring user satisfaction. *Management Science*. 29, 530-545.
- Borgman, C. L. (1999). What Are Digital Libraries? Competing Visions. *Information Processing and Management*, 35, 227-243.
- David, B. . (2006). Digital library futures: a UK HE and FE perspective. *Interlending & Document Supply*, 34(1), 4-8.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-339.
- Delone, H. W., & Mclean, R. E. (2003). The Delone and Mclean model of information systems success: a ten-year review. *Journal of Management Information Systems*, 19(4), 9-30.
- Hong, W., Thong, Y. L., Wong, M.W., & Tam, Y. K. (2002). Determinants of User Acceptance of Digital Libraries: An empirical examination of individual differences and Systems Characteristics. *Journal of Management Information Systems*, 18(3), 94 – 124.
- Latif Al-Hakim. (2007). Information quality factors affecting innovation process. *International Journal of Information Quality*, 1(2), 162-176.
- Latif Al-Hakim. (2007). The effect of information quality on surgery process variation. in (Ed.), *Managing worldwide operations and communications with information technology*, 1497-1500.
- Lynch, C., & Garcia-Molina, H. (1995). Interoperability, scaling, and the digital libraries research agenda. [Online]. Retrived from <http://www.hpcc.gov/reports/reports-nco-iita-dlw/main.html>
- Orji, R. O. (2010). Impact of Gender and Nationality on Acceptance of A Digital Library: An Empirical Validation of Nationality Based UTAUT Using SEM. *Journal of Emerging Trends in Computing and Information Sciences*, 1(2), 68-79.
- Rowlands, I., & Bawden, D. (1999). Building the digital library on solid research foundations. *Aslib Proceedings*, 51(8) , 275-282.

- Singh, G., Mittal, R. & Ahmad, M. (2006). A bibliometric study of literature on digital libraries. *The Electronic Library*, 25(3), 342-348.
- Szajna, B. (1994). Software evaluation and choice: predictive evaluation of the Technology Acceptance Instrument. *MIS Quarterly*, 18(3), 319–324.
- Tibenderana, P., Ogoa, P., Ikoja-Odongo, J & Wokadala, J. (2010). Measuring Levels of End-Users' Acceptance and Use of Hybrid Library Services, *International Journal of Education and Development using Information and Communication Technology* 6(2), 33-54.
- Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Viswanath Venkatesh., Thong, J. Y. L., & Xin Xu. (2012). Consumer Acceptance And Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 157-178.
- Witten, I., & Bainbridge, D. (2002). *How to build a digital library* : Morgan Kaufmann.
- Zeithaml, V., Parasuraman, A., & Arvind Malhotra. (2002). Service Quality Delivery through Web Sites: A Critical Review of Extant Knowledge. *Journal of the Academy of Marketing Science*, 30(4), 362-75.



VOA - ISBN: 1985-5079

