

WEB OPAC END USER SATISFACTION CRITERIA

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This dissertation is dedicated to my loving family and close friends for their endless support and encouragement.

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ABSTRACT

Academic libraries function as the resource for retrieving information related to the end users requirements. Since academic libraries are now competing for the end users attention and interest, the current dispute faced is to deliver prompt, instant, seamless right of entry to resources and information to stay on relevant in the fast growing information technology era. Web OPAC demonstrate as a remote retrieval and function as question-answering, richly interactive information discovery and retrieval system to support decision making, that has no fundamental boundaries on the type and formats of data and information it can find, access, recover, exhibit, and distribute. There are numerous studies conducted to measure Web OPAC end user satisfaction, however the measurement criteria is unstructured and varies depending on the scholars interest. The objective of this study is to develop Web OPAC end user satisfaction criteria. In order to achieve the objective, this study has explored the criteria used in Library Science and Information System end user satisfaction as recommended by previous researchers. Web OPAC end user satisfaction criteria has been refined which integrated End User Computing Satisfaction (EUCS) criteria with Library Science end user satisfaction criteria. The criteria are evaluated by using survey and instrument verification which involved experience end users, senior management and system owner of UTM Library. This study could assist the Information Technology managers, system owners and the library management in determining the satisfactory level of an information system in an academic library. An academic library will be able to identify which criteria to address in order to have an ideal system that could satisfy the end users.

ABSTRAK

Perpustakaan Akademik berfungsi sebagai pusat sumber untuk mendapatkan pelbagai maklumat yang berkaitan dengan keperluan pengguna perpustakaan. Oleh kerana perpustakaan akademik sekarang bersaing hebat untuk mendapatkan perhatian pengguna di era teknologi maklumat kini, maka ia perlulah menawarkan maklumat yang cepat, pantas dan tepat kepada semua pengguna perpustakaan. Web OPAC merupakan kaedah untuk mendapatkan maklumat secara tepat dan terperinci yang membolehkan maklumat dicapai secara interaktif untuk menyokong membuat sebarang keputusan. Ianya tidak mempunyai sempadan untuk memperolehi pelbagai jenis maklumat dan data. Terdapat banyak penyelidikan dan kajian yang telah dijalankan berkaitan dengan pengukuran kepuasan penggunaan Web OPAC, walaubagaimanapun kriteria pengukuran yang digunakan tidak berstruktur dan bergantung penuh kepada kecenderungan penyelidik itu sendiri. Objektif penyelidikan ini dijalankan adalah untuk menyenaraikan secara terperinci kriteria pengukuran kepuasan penggunaan Web OPAC. Objektif ini dapat dicapai dengan menggabungkan kriteria yang telah digunakan di dalam bidang Sains Perpustakaan dan Sistem Maklumat. Kriteria kepuasan penggunaan Web OPAC yang diusulkan adalah berdasarkan kepada kriteria *End User Computing Satisfaction (EUCS)* dan bidang Sains Perpustakaan. Kriteria ini di nilai berdasarkan kajian dan verifikasi peralatan yang melibatkan pengguna yang berpengalaman, pengurusan atasan dan pemilik system Perpustakaan UTM. Hasil penyelidikan ini dapat membantu pengurus teknologi maklumat, pemilik system dan pengurusan perpustakaan untuk mengukur tahap kepuasan pengguna terhadap sistem maklumat di perpustakaan. Perpustakaan akademik juga mampu untuk menilai dan menumpukan perhatian terhadap kriteria yang penting untuk menyediakan sistem yang dapat memenuhi kepuasan pengguna.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

According to (2012) Horizon Report, the key trends that drive educational technology are also valid for academic libraries. The end users wish for information retrieval and access to resources and materials through social media and networks which are available anytime and anywhere become more demanding to support their challenge-based and active learning in the higher education institution.

Connaway, Dickey, & Radford (2011) reveals, with the overwhelming and widespread usage of the World Wide Web and search engines provided Google, end users have easy access to find resources that they required. Academic libraries more often than not are the first resource for retrieving information related to the end users requirements. Since academic libraries are now competing for the end users attention and interest, the current dispute faced is to deliver prompt, instant, seamless right of entry to resources and information to stay on relevant in the fast growing information technology era. The new academic library has to be established on the just-in-time style and access to resources either electronic or printed is more vital than the vast library collection.

Academic libraries must establish the notion that the institution is a valuable asset to the academic activity. In a current editorial by Rick Anderson (2011) of ACRL Research Planning and Review Committee reported that *“unless we give our funding bodies better and more compelling reasons to support libraries, they will be forced by economic reality to stop doing so”*. The academic libraries are facing a challenge to contribute to teaching and education, research, consultation, social, expert and public commitment. Current value-related studies have examined on the correlation among library collection usage and student grade and contribution towards the students and faculties success.

These problems were the generally stated and argued trends in the present literature, at conferences, and by professional authorities. The academic libraries issues focused on the usage of its collection. Online Public Access Catalogue (OPAC) has always been the most suitable tool to retrieve the library collection by the end users in order to utilise the materials according to their specific needs. Being able to complete the retrieval effectively has often represented a difficult task to be accomplished by the end users.

1.2 Problem Background

The critical challenge faced by the academic libraries is to provide the end users with the right information and materials to fulfill their information needs effectively and efficiently. Without the usage of Web OPAC some important information or materials could be left out and lead the end users to unnecessary materials instead. University Technology Malaysia (UTM) Library OPAC was currently updated to the third phase. The new Web OPAC was launched on April 1st, 2013. The aim is to change from traditional OPAC to Web OPAC and to provide a one-stop searching platform for the ease of use of the end users. Based on the current settings, UTM Library’s end users now have a choice to search for printed and electronic materials through the Web OPAC.

Academic libraries aim to connect end users to the best potential resources. Web OPAC demonstrate as the advance version compared to the first generation of OPACs, particularly in terms of remote retrieval and access by end users and end users prospective to incorporate with lots of document varieties and resources via a single interface. Most studies focused on the interface and the system itself. However, very modest assessment of the systems and end users satisfaction has been conducted. One of the study emphasized in this context is done by Majors (2012) which conducted a study on the end users successful rate to complete common library tasks, unaided, using the Web OPAC interfaces. The result of the study indicate that the end users are having problems with typing error, high searching failure, puzzled with the truncation and low determination or early session termination.

Previous studies in Library Science demonstrated a variety set of Web OPAC end user satisfaction criteria used. It is also an unstructured criteria and emphasis on the scholar's interest. It is quite a difficult task for an organization to apply those end user criteria to measure their Web OPAC performance. This is due to the fact that they are not able to identify which criteria to use, which is more important and which to include or not. The structured and standard set of criteria is not available and detailed out. However, according to Wang, Xi, & Huang (2007), End User Computing Satisfaction (EUCS) is frequently used and tested in wide and various domains as an instrument to evaluate end user satisfaction. Most of the researchers used EUCS to measure end user computing satisfaction due to the fact that Information System can be measured directly. The reliability and validity of EUCS have been established extensively. EUCS is selected because it evaluates terminal computer user holistic assessment based on using experience of an information system and represent as an instrument to measure satisfaction of users who directly interact with a specific application, which is suitable for Web OPAC end user satisfaction study. However, EUCS criteria alone shall not extensively cover Web OPAC end user satisfaction in detail unless other element and criteria from Library Science is included as well. Integrated end user satisfaction criteria based on EUCS and Library Science shall provide more comprehensive criteria especially tailored to Web OPAC end user satisfaction.

1.3 Problem Statement

The problem background identified stated that the academic libraries must be able to provide the end users with the right information and materials to fulfill their information needs effectively and efficiently with the use of Web OPAC. Studies on Web OPAC systems and end users interaction should be focused on to ensure the academic library collection is fully utilised. Academic library can apply Federated Search System, Open-URL link-resolvers and Electronic Resource Management System in Web OPAC to offer rich navigation and discovery tools for end users. The problem statement stated below is derived from the problem background documented from the literature.

The problem statement for this study is **“How to Develop Web OPAC End User Satisfaction Criteria?”**

There are three sub-questions that are based on the above main question:

- i. What are the Web OPAC end user satisfaction criteria?
- ii. How to develop integrated Web OPAC end user satisfaction criteria based on Library Science and End User Computing Satisfaction?
- iii. How to validate and practically apply the Web OPAC end user satisfaction criteria?

1.4 Research Objectives

The objectives of this study are:

- i. To investigate Web OPAC end user satisfaction criteria.
- ii. To refine integrated Web OPAC end user satisfaction criteria.
- iii. To validate and practically apply the Web OPAC end user satisfaction criteria.

1.5 Scope of Study

This study focused on:

- i. Web OPAC end users satisfaction in UTM Library.
- ii. Integrated Web OPAC end user satisfaction criteria based on EUCS model and Library Science unstructured satisfaction criteria.

1.6 Significance of Study

The study on UTM students' satisfaction with Web OPAC could reveal the actual usage and satisfaction level of Web OPAC among the end users.

The proposed integrated approach to measure Web OPAC may benefits many stakeholders as follow:

- Librarian
Librarian can provide a platform for courses and ongoing teaching assistance to assist the end users in optimizing Web OPAC effectively.
- Library
The management of the library can analyze the overall performance of the service offered via Web OPAC system. From this, the management can provide feedback to the vendor on the effectiveness of the aforementioned system. Hence, the library management can provide solutions to rectify any issue and provide solution in improving the service via Web OPAC system.
- Vendor
The feedback retrieved from the library management can be used by the vendor to upgrade the system with up-to-date features that fits the end user's needs and current technological trends.
- End user
They can contribute ongoing ideas to optimize the Web OPAC system by providing personal and technological perspective on the system.

The Web OPAC should be appealing, user friendly and state-of-the-art information retrieval system, in order to fulfill the requirement of the end users, anticipate end users participation, support discovering and retrieval of information resources.

1.7 Chapter Summary

This chapter presents a brief outline and overview of the study on Web OPAC end users satisfaction. The background of the problems was emphasized and discussed in this chapter. The research objectives of this study were also highlighted followed by the study scope. The significance of this study has been described as well. By developing this research effectively, the aims and objectives of the study will be accomplished.

REFERENCES

- Aggelidis, V. P., & Chatzoglou, P. D. (2012). Hospital information systems: Measuring end user computing satisfaction (EUCS). *Journal of Biomedical Informatics, 45*(3), 566-579.
- Anderson, R. (2011). The Crisis in Research Librarianship. *Journal of Academic Librarianship, 37*(4), 290.
- Babu, B. R., & O'Brien, A. (2000). Web OPAC interfaces: an overview. *Electronic Library, The, 18*(5), 316-330.
- Bailey, J. E., & Pearson, S. W. (1983). Development of A Tool for Measuring and Analyzing Computer User Satisfaction *Management Science, 29*, 530-545.
- Bailey, K. (2011). Online Public Access Catalog: The Google Maps of the Library World. *Computers in Libraries, 31*(6), 30-34.
- Bhaskar, R. (1978). *A Realist Theory of Science*. Hemel Hempstead: Harvester.
- Breeding, M. (2010). *Next-gen library catalogues*. New York: Neal-Schuman Publishers.
- Cockrell, B. J., & Jayne, E. A. (2002). How do I find an article? Insights from a web usability study. *The Journal of Academic Librarianship, 28*(3), 122-132.
- Connaway, L. S., Dickey, T. J., & Radford, M. L. (2011). If it is too inconvenient I'm not going after it: Convenience as a Critical Factor in Information-seeking Behaviors. *Library & Information Science Research, 33*(3), 179-190.
- Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. *Doctoral dissertation, Sloan School of Management, Massachusetts Institute of Technology*.
- DeLone, W. H., & McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research, 3*(1), 60-95.
- Doll W, & G., T. (1988). The measurement of end-user computing satisfaction. *MIS Quarterly, 12*(2), 259-274.

- Doll, W. J., & Torkzadeh, G. (1988). The measurement of end-user computing satisfaction. *MIS Quarterly*, 12(2), 259-274.
- Festinger, L. A. (1957). *Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.
- Fishbein, M., & Ajzen, I. (1975). *Belief attitude, intention, and behavior : An introduction to theory and research*. Reading, Mass. ; Don Mills, Ontario: Addison-Wesley Pub. Co.
- Fornell C, & F, L. D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Market Research*, 18(2), 39–50.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J Market Res*, 18(2), 39–50.
- Gallaway, T. O., & Hines, M. F. (2012). Competitive Usability and the Catalogue: A Process for Justification and Selection of a Next-Generation Catalogue or Web-Scale Discovery System. *Library Trends*, Vol. 61, No. 1, 173–185.
- Gavrilis, D., Kakali, C., & Papatheodorou, C. (2008). Enhancing Library Services with Web 2.0 Functionalities. In B. Christensen-Dalsgaard, D. Castelli, B. Ammitzbøll Jurik & J. Lippincott (Eds.), *Research and Advanced Technology for Digital Libraries* (Vol. 5173, pp. 148-159): Springer Berlin Heidelberg.
- Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS Quarterly*, 19(2), 213-236.
- Han, M.-J. (2012). New Discovery Services and Library Bibliographic Control. *Library Trends*, 61(1), 162–172.
- Hancock-Beaulies, M., Robertson, S., & Neilson, C. (1991). Evaluation of online catalogues: eliciting information from the user. *Information Processing & Management*, 27(5), 523-532.
- Hildreth, C. R. (1985). Online public access catalogs. *Annual Review of Information Science and Technology*, 20, 234-285.
- Hoffman, G. L. (2009). Meeting users' needs in cataloguing: What is the right thing to do? *Cataloguing and Classification Quarterly*, 47(7), 631–641.
- Ives, B., Olson, M. H., & Baroudi, J. J. (1983). The Measurement of User Information Satisfaction. *Communications of the ACM*, 26(10), 785-793.

- Johnson, F. C., & Craven, J. (2010). Beyond Usability: The Study of Functionality of the 2.0 Online Catalogue (OPAC). [Article]. *New Review of Academic Librarianship*, 16(2), 228-250.
- Kani-Zabihi, E., Ghinea, G., & Chen, S. Y. (2008). User perceptions of online public library catalogues. *International Journal of Information Management*, 28(6), 492-502.
- Kumar, S., & Vohra, R. (2013). User perception and use of OPAC: a comparison of three universities in the Punjab region of India. *The Electronic Library*, 31(1), 36-54.
- Madhusudhan, M., & Aggarwal, S. (2011). Web-based online public access catalogues of IIT libraries in India: An evaluative study. *Program*, 45(4), 415-438.
- Majors, R. (2012). Comparative User Experiences of Next-Generation Catalogue Interfaces. *Library Trends*, 61(1), 186–207.
- Maughan, P. D. (1999). Library Resources and Services: A Cross-Disciplinary Survey of Faculty and Graduate Student Use and Satisfaction. *The Journal of Academic Librarianship*, 25(5), 354-366.
- Md. Maidul, I., & Ahmed, S. M. Z. (2011). Measuring Dhaka University students' perceptions of ease-of-use and their satisfaction with University Library's online public access catalogue. *Performance Measurement and Metrics*, 12(3), 142-156.
- Md. Maidul Islam, & Ahmed, S. M. Z. (2011). Measuring Dhaka University students' perceptions of ease-of-use and their satisfaction with University Library's online public access catalogue. *Performance Measurement and Metrics*, 12(3), 142-156.
- Miksa, S. D. (2008). A survey of local library cataloguing tool and resource utilization. *Journal of Education for Library and Information Science*, 49(2), 128-146.
- Mulla, K. R., & Chandrashekara, M. (2009). A study on the effective use of online public access catalogue at the libraries of engineering colleges in Karnataka (India). *International Journal of Library and Information Science*, 1(3), 029-042.

- Oliver, R. L. (1977). Effect of Expectation and Disconfirmation on Postexposure Product Evaluations - an Alternative Interpretation. *Journal of Applied Psychology*, 62(4), 480.
- Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, 17(4), 460.
- Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Refinement and assessment of the SERVQUAL scale. *Journal of Retailing*, 67(4), 420-450.
- Park, I. (1997). A comparative study of major OPACs in selected academic libraries for developing countries - User study and subjective user evaluation. *International Information and Library Review*, 29(1), 67-83.
- Park, N., Roman, R., Lee, S., & Chung, J. E. (2009). User acceptance of a digital library system in developing countries: An application of the Technology Acceptance Model. *International Journal of Information Management*, 29(3), 196-209.
- Rapp, D. (2012). ALA Midwinter 2012: From Consumer Electronics Through Post-ILS, Top Tech Trends Run the Gamut. *Library Journal*, 22.
- Schultz-Jones, B. e. a. (2012). Historical and Current Implications of Cataloguing Quality for Next-Generation Catalogues. *Library Trends*, 61(1), 49-82.
- Sekaran, U. (2003). *Research methods for business* (4th ed. ed.). Hoboken, NJ John Wiley & Sons.
- Skinner, D. G. (2012). A Comparison of Searching Functionality of a VuFind Catalogue Implementation and the Traditional Catalogue. *Library Trends*, 61(1), 208 - 217.
- Snow, K. (2011). A study of the perception of cataloguing quality among cataloguers in academic libraries.
- Thanuskodi, S. (2012). Use of Online Public Access Catalogue at Annamalai University Library. *International Journal of Information Science*, 2(6), 70-74
- Thong, J. Y. L., Hong, W., & Tam, K.-Y. (2002). Understanding user acceptance of digital libraries: What are the roles of interface characteristics, organizational context, and individual differences? *International Journal of Human Computer Studies*, 57(3), 215-242.
- Venkatesh, V. e. a. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.

- Wang, L., Xi, Y., & Huang, W. W. (2007). *A validation of end-user computing satisfaction instrument in group decision support systems*. Paper presented at the 2007 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2007, September 21, 2007 - September 25, 2007, Shanghai, China.
- Yang, J., & Ding, Y. (2009). B2B E-commerce Website Customer Satisfaction: a Formula and Scale. *IEEE*, 58, 191-197.