USER ONLINE LIBRARY DATABASE SURVEY AND RETURN ON INVESTMENT (ROI): A CASE STUDY IN UNIVERSITI TUN HUSSEIN ONN MALAYSIA (UTHM)

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter presents the overview of this research. The first section started with the brief introduction of the research. This is followed by the discussion of the library background, research problem, researach research questions and research objectives.

1.2 Introduction of the research

The introduction of ICT in the field of Libraries and Information Sciences has transformed ways of accessing, storing, retrieving and disseminating information among library users (Cullen, 2001). There is no longer a need for large cataloging facilities and extensive manual labour to ensure all library resources are properly indexed and accessible. In the digital age, librarians need to plan for additional services which can be implemented and support to the users (Thenmozhi & Gopalakrishnan, 2014). Based on the user requirements different types of services are provided in the academic libraries, Sriram and Rajev (2014) urges that these facilities and services have greater impact on the users' satisfaction. The academic library users, in general, expect some cost benefit services so as to use the library regularly (Sriram & Rajev, 2014). Apart from this, the libraries provide some academic facilities to have international benchmarking.

In present, Return on Investment (ROI) has emerged as a tool for measurement performance and quality of academic libraries to quantify impact in the face of budget challenges that allocated by academic libraries. According to Neal (2011), very often ROI studies are really about cost avoidance for users of a library and these

"economic impact figures" have gained some traction in public libraries. In this context, it is vital for libraries to design and develop innovative services that have tangible values to effectively serve the organization (He, Chaudhuri, & Juterbock, 2011; Kingma & McClure, 2014). It is also important for the Library to measure its performance longitudinally to ensure it continues to develop and improve (Walton & Leahy, 2013).

1.3 Library Background

Tunku Tun Aminah Library begin its operation in 1993, when UTHM was known as Pusat Latihan Staf Politeknik (PLSP). With a collection of 5,000 copies of book inherited from the Politeknik Batu Pahat, the PLSP Library occupied a small two-storey building that could accommodate about 120 users. Its mission was to support academic staff and students in learning, teaching and research.

To accommodate the increasing number of users, the library building has been extended to provide more reading area in year 2000. The extension has increased the floor space for reading to 200 seats. With the opening of a branch library at the Town Campus in 2004, and B5 Library (above the Bursary Office) in 2006, the seating capacity has been increased to 500 seats. In July 2008, the Town Campus Library has moved to a new premises, to accommodate more collections, provide more reading area consequently give better services.

In May 2010, UTHM Library has moved to a new building which has 16,000 square meters of floor area. It can accommodate as many as 300,000 volumes of books and 3,000 users. It provides a spacious and conducive learning environment. It has 100 carrel rooms, 40 discussion rooms, 2 seminar rooms, a post graduate research room, an auditorium, a closed reference room, a journal room and a 24 hours reading room.

The development of library collection in various fields of study, especially in science and technology, has been intensified to support academic activities. Currently the library has acquired about 200,000 copies of books, 10,000 titles of

thesis, 40 titles of printed journal, 50 titles of magazine and 20,000 items of audio-visual materials. The library has also subscribed the services of 26 databases (e.g.: Emerald, Science Direct, Springerlinks, IEEE Xplore), 4 e-books (e.g.:Knovel, EBSCHost, E-brary, EngnetBase) and 300 titles of e-journals.

The library automation was initiated in 1997 to provide better and faster services. Currently, the library is using SirsiDynix Symphony to manage its operations, automate tasks and improve staff productivity.

1.4 Research Problems

Library use study as an aspect of users' studies is a vital aid for effective planning and management in academic libraries. Most evaluative studies on library use have always concentrated on students' use of academic libraries. Little comprehensive study has been conducted on the relationship between the level/year of study of students and the use of library resources. The usage pattern of library resources by level of students and the satisfaction they derive in using the library are the main focus of this research. Chandrasekar and Murugathas (2013) stated that library user surveys have become widespread in Academic Libraries. It must be properly designed and administered, so user surveys could provide both quantitative and qualitative data directly from the target population.

Majid et al. (2001) investigated factors shaping users' perception on effectiveness of agricultural libraries in Malaysia. Their study focuses not only on the adequacy of collection, services and facilities but also the promotion and location of libraries. They argue that library effectiveness is very much depended on how much users are satisfied with the services rendered. Kassim (2009) conducted similar study among university academic staff in Malaysia and found that satisfaction on online databases is only moderate at 3.29 out of five. Kiran (2010) used SERVQUAL to measure service quality and customer satisfaction in one of Malaysia university. Consistent with other library studies conducted in Malaysia, the satisfaction level is

reported slightly above average. However, she does not reported the impact of the service quality on user satisfaction.

In India, Saikia and Gohain (2013) studied the use and user satisfaction on Online Public Access Catalogues (OPAC) services at Tezpur University. Their study has been descriptive in terms of identifying the frequency of OPAC use and the level of user satisfaction. Despite moderate level of satisfaction among users, the performance and quality of the OPAC system is rated as very satisfactory. All these studies have used descriptive analyses to conclude their findings and no inference on the relationship between factors affecting user satisfaction and continuance could be deduced.

In the context of Malaysian Technical Universities or MTUN, the increasing number of postgraduate students and the demand for high quality publications and research have made the use of online databases indispensable. As a matter of fact, even undergraduate students are expected to retrieve, use and apply information in their respective field of study effectively via the use of these databases. However, the investment in these databases is high. For example, University Tun Hussein Onn Malaysia (UTHM) invested more than one million Malaysian Ringgit in 2013 to subscribe to only twenty-nine databases. Such high investment requires high accountability especially in the light of current government budgeting policy called Outcome Based Budgeting (OBB) (The World Bank, 2010). Thus, to justify the university investment in the online library databases, the outcome measure or effectiveness in the form of user satisfaction need to be measured (Ball, 2008). However, majority of studies conducted among established universities had been focusing mainly on library circulation services, infrastructure, place and services (Kassim, 2009; Majid, et al., 2001, Islam et al., 2014; Shoid & Kassim, 2014; Taib, Rante, & Warokka, 2013; Walton & Leahy, 2013).

At present, there is a limited study focusing on library online databases user satisfaction especially in MTUN libraries. For example, Abdullah (2001) had embarked a comparative study on the use of academic libraries websites. In his study, he focused only on selected Malaysian premier universities and their respective library websites and not the library online databases per se. In addition Mohd Yusoff et al. (2009) who examine the usage of e-library among students in a

public university in Malaysia using the TAM. They found that PEOU is significantly related to PU and PU is significantly related to actual usage. However, this study does not measure user satisfaction and continuance to use

Considering these gaps, this study aimed to identify the top five frequently used online databases in UTHM library, and the relationships between online database quality with UTHM user's satisfaction, continuance to use and its return on investment (ROI).

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1.5 Research questions

Based on the above discussions, the primary research questions are as follows:

1) What is the top five frequently used online database in UTHM library?
2) What is the relationship between library online databases quality with user satisfaction?
3) What is the relationship between library online database quality with continuance to use?
4) What is the Library "Returned of Investment (ROI)"?

1.6 Research objectives

This study embarks on the following objectives:

1) To identify the top five frequently used online database in UTHM library
2) To identify the relationship between library online databases quality with user satisfaction.
3) To identify the relationship between library online database quality with continuance to use
4) To identify the Library "Returned of Investment (ROI)" .

1.7 Summary

This study tries to gauge the quality of UTHM library online database towards user satisfaction and continuance to use. In addition, the return of investment per download article subscribe in online database are also been studied. This study aims to extend past studies by measuring the usage level from various perspective.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews key constructs investigated in this research. The discussion starts with the overview of a general library performance model and narrowed to specific application in the context of online databases performance. Indirect indicator of online databases user satisfaction and direct performance indicator using ROI serves as the research framework. Evolution of related theories and models of user satisfaction and ROI measurements are reviewed to justify the best models/theories to be adopted in this research. Previous studies on both constructs are synthesized to formulate subsequent hypotheses and answer the research objectives determined earlier.

2.2 Overview of Library Performance Measurement

Measuring library performance has been a focus among library research for many decades (Stanley & Killick, 2009). Many approaches have been utilized in tandem with development of various theories across disciplines. In essence, measuring library performance could be done using either indirect or direct indicators. The most common indirect indicator to measure library performance would be library user satisfaction (Saikia & Gohain, 2013; Ball, 2008).

Consequently, user satisfaction studies among libraries have been flourishing ranging from library facilities to online data collections. Nitecki (1996) noted, “A measure of library quality based solely on collections has become obsolete” (p. 181). As a result, the traditional measure of library quality has shifted from collection size to “availability and accessibility of adequate learning resources, such as library and information technology support services” (“Characteristics of Excellence,” 2006, p. 43). This shift in assessment has transformed academic libraries from a library-centric view that focuses on processes, functions, and services to a customer-centric view. In fact, according to Zeithaml, Parasuraman, and Berry (1990), “The only criteria that count in evaluating service quality are defined by customers. Only customers judge quality; all other judgments are essentially irrelevant” (p. 16). Emphasis on this type of assessment has “libraries turning to customer surveys to determine the extent to which the library is or is not meeting the customer’s expectations”.

According to McMurdo (1980), user satisfaction studies flourish in the literature of libraries and information science as early as in 1967 due to increased awareness of user requirements. The library data are gathered to identify the patterns of library use, to evaluate users' attitudes to the library, and assessing the degree of satisfaction being achieved. However, in the recent years, with increase sophistication of wide range of library services provided, the concept has evolved to include a broader focus on users’ perspective of the library (Kassim, 2009). As user satisfaction has been recognized as one method to evaluate the library effectiveness (Cullen, 2001), measuring it becomes a requisite. Moreover, substantial evidence indicates that user satisfaction is strongly linked with continuance to use in the future. This would help the decision-maker to decide whether to continue the subscription or not.

In similar view, the need to measure library performance objectively has encouraged studies on library values and return of investment (for example Luther, 2008). In fact, Missingham (2005) have succinctly summarized the rise of contingent valuation theories applications in library and information science. According to her,

there are three phases of studies to demonstrate the library performance. The first phase studies focus on evaluation on costs in comparison with efficiency. The second phase studies focus on the library abilities to provide financial return to organizations. The third phase of studies takes a broader view of library values to various stakeholders. The relevancy of return of investment has gained its newest height at this phase.

2.3 Theories and Models related to User Satisfaction

The concept of customer satisfaction had emerged from the concept of consumer satisfaction largely from the marketing discipline. Accordingly, it is useful to review all related models of customer satisfaction and how they are linked to the concept of customer and later on user satisfaction.

Erevelles and Leavitt (1992) examined various models of consumer satisfaction and broadly categorize those models under The Expectations Disconfirmation Model, The Perceived Performance Model, Norms in Models of Consumer Satisfaction, Multiple Process Models, Attribution Models, Affective Models and Equity Models:

1. The Expectations Disconfirmation Model is one of the most popular model in consumer satisfaction research. It compares consumers ‘ pre-consumption expectations with post-consumption experiences of a product/service to form an attitude of satisfaction or dissatisfaction toward the product/service’. In this model, expectations originate from beliefs about the level of performance that a product/service will provide.
2. The Perceived Performance Model deviates from the above mentioned in that expectations play a less significant role in satisfaction formation. The model performs especially well in situations where a product/service performs so positively that the consumer’s expectations get discounted in her/his post-consumption reaction to the product/service.
3. Norms Models resemble the Expectations Disconfirmation Model in that the consumer compares perceived performance with some standard for

performance. In this case, however, the standard is not a predictive expectation. Rather than considering what will happen in the consumption experience, the consumer uses what should happen as the comparison standard. This is the normative meaning of "should" rather than its occasional chronological connotation in the English language.

4. Multiple Process Models characterize the satisfaction formation process as multidimensional. That is, consumers use more than one standard of comparison in forming a (dis)confirmation judgment about an experience with a product/service.
5. Attribution Models integrate the concept of perceived causality for a product/service performance into the satisfaction process. Consumers use three factors to determine attribution's effect in satisfaction. These are locus of causality, stability, and controllability. The locus of causality can be external (that is, the service provider gets the credit or blame)or internal (that is, the consumer is responsible for the product/service performance). Stable causes would tend to have more impact in satisfaction because consumers tend to be more forgiving of product/service failures that appear to be rare events. Finally, controllability affects attribution in that a poor outcome in a consumption experience may mean that the consumer will be unsatisfied with the product/service provider if the consumer believes the provider had the capacity, that is, control, to perform in a better fashion
6. Affective Models differ from previous models in that it goes beyond rational processes. In these models, emotion, liking, and mood influence (dis)satisfaction feelings following the consumption experience.
7. Equity Models emphasize the consumer's attitude about fair treatment in the consumption process. Fair treatment can use the concept of the equity ratio (that is, the amount of her/his return for her/his effort made) or the concept of social comparison (that is, the perceived, relative level of product/service performance that other consumers experience).

The usefulness of each model of consumer satisfaction is contingent upon context and types of products. This indicates that satisfaction on services requires

different parameters. Thus, the concept of consumer satisfaction has changed to customer satisfaction, heralding the features of service quality.

Seth, Deshmukh, and Vrat (2005) reviewed 19 service quality models which include Technical and Functional Quality model, Gap model, Attribute Service Quality Model, Synthesized model of Service quality, Performance only model, Ideal Model of Service Quality, EP and NQ Model, IT alignment Model, Attribute and Overall affect Model, Model of perceived quality and satisfaction, PCP attribute Model, Retail Service Quality and Perceived Value, Service Quality , customer value and customer satisfaction model, antecedents and mediator model, internal service quality model, internal service quality DEA model, internet banking model, IT-based model and Model of e-service quality. In essence, they found that factors affecting the customer satisfaction and dimensions of customer satisfaction have evolved to integrate the features of technology. This is where the term 'user satisfaction' has started to be used instead of normal customer satisfaction.

According to Zeithaml et al. (2001), user satisfaction model for online services or products have not been firmly established. Various studies have attempted to identify the key dimensions of service quality or customer satisfaction in the context of narrowly defined online industries. Wolfinbarger and Gilly (2003) highlight four contributors to the online retailing experience which include website design, reliability, privacy/security and customer service. On the other hand, Ho and Wu (1999) uncovered five factors that significantly affected customer satisfaction with cyber shopping stores. These are logistical support, technological characteristics, information characteristics, homepage presentation and product characteristics. Similarly, Choi et al. (2000) have empirically confirmed that customer satisfaction with Internet retail stores was primarily determined by four indicators, i.e. assurance, product presentation, customer relationship and system performance. A close examination of the above-mentioned studies has revealed that user satisfaction with web-based services (or online user satisfaction) can be explained by conceptual paradigms drawn from the fields of management information systems, human–computer interaction and service marketing.

Table 2.1 demonstrates several useful approaches for explaining online user satisfaction. These are the technology adoption model, end-user satisfaction with computing (EUCS), and the SERVQUAL model. The technology adoption model proposes that customer intention to adopt a new information technology is primarily determined by the ease of use and the usefulness of the technology (Davis, 1989; Davis et al., 1989).

Table 2.1 Conceptual foundations related to e-satisfaction

Paradigms	Constructs related to internet setting	Previous studies
Technology adoption model	Usefulness Ease of Use	Davis(1989) Davis et al (1989) Hendrickson and Collins (1996) Igbaria et al (1997)
End-used computing satisfaction	Content Accuracy Format Ease of use TImeliness	Doll and Torkzadeh (1988) Delone and McLean (1992) Hendrickson and Collins (1996)
SERVQUAL	Reliability Responsiveness Assurance Empathy Tangible	Parasuraman et al (1988, 1991)

It is apparent that usefulness and ease of use of Internet transactions can play a pivotal role in customer satisfaction with online services. A typical website often contains a database interface, which serves as an expert system. From this perspective, online consumers are the end-users of the computer programs and the networked system. Hence, the end-user computing satisfaction model could serve as a reference for assessing end-user satisfaction with a website as an information system. Doll and Torkzadeh (1988) have generated a 12-item scale that gauges five

quality dimensions influencing end-user satisfaction. These are content, accuracy, format, ease of use and timeliness. The reliability and validity of this scale have been confirmed through other studies (Evanschitzky et al., 2004; Hendrickson & Collins, 1996). The most frequently utilised paradigm is the SERVQUAL measurement scale generated by Parasuraman et al. (1985). Based on 10 initial dimensions (tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding the customer and access) Parasuraman et al. (1988) further purified the consideration set to five: tangibles, reliability, responsibility, assurance and empathy. These five service quality attributes constitute the basis for global measurement of service quality. SERVQUAL has been applied to projects in various service industries, although it has received some criticism (for a comprehensive review, see Cronin & Taylor, 1994; Dabholkar et al., 1996). The primary concerns raised by the critics are that: (1) difficulty arises in measuring different types of expectations (Cronin & Taylor, 1994); and (2) service quality dimensions tend to be context-bounded and service-type-dependent (Bienstock et al,1997; Van Dyke et al., 1997).

Another influential model on assessing information system success is DeLone and McMelan Information Success Model (D&M IS Success Model). A meta model analysis done by Petter & McLean, (2009) found that this model has been well-validated across various contexts and types of information systems. D&M IS Success Model identified six dimensions of system success which include System Quality, Information Quality, Use, User Satisfaction, Individual Impact and Organizational Impact.

Based on these extensive discussions on models of user satisfaction, this study adopted only three dimensions namely System Quality, Service Quality and Information Quality from D&M IS Success Model. System quality refers to the desirable characteristics of an information system such as ease of use, system flexibility, system reliability, and ease of learning, and system features. Information quality refers to relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness, and usability of the system. On the other hand, Service quality, which is very similar with SERVQUAL concept, refers to the

quality of the support that system users receive from the IS department and IT support personnel in terms of responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff. Another two dimensions were taken from Technology Acceptance Model (TAM) (Davis, 1989). Derived initially from Theory of Reasoned Action and Theory of Planned Behavior, TAM proposes two important constructs that affect intention to use and quality of the information system which are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) Literatures so far has confirmed that PU has a positive relationship with both adoption intention (Johnson, 1989) and continuance intention (Bhattacherjee & Barfar, 2011; Suki & Ramayah, 2010). In retrospect, PEOU has been found to influence both PU and adoption intention(Davis, 1989) satisfaction (Vankatech et al, 2011; Hong, Thong & Tam, 2006) and continuance intention Vankatech & Davis (1996) and actual continuance usage. Moreover, user satisfaction is affected by service quality(Kiran, 2010; Cullen, 2001; Muhammad Jaber Hossain, 2012), Perceived Ease of Use (Mohd Yusof, 2009), Perceived Usefulness (Mohd Yusuf et al, 2009; Almahamid & Abu Rub; 2011), user characteristics (Mohd Yusuf et al, 2009; Al-maskari, & Sanderson, 2010),and system quality (Al-maskari & Sanderson, 2010; Almahamid & Abu Rub, 2011). Based on these empirical supports, this study included PU and PEOU to the research framework.

2.4 Previous Studies on Library User Satisfaction

Majid et al. (2001)investigated factors shaping users' perception on effectiveness of agricultural libraries in Malaysia. Their study focuses not only on the adequacy of collection, services and facilities but also the promotion and location of libraries. They argue that library effectiveness is very much depended on how much users are satisfied with the services rendered. Kassim (2009) conducted similar study among university academic staff in Malaysia and found that satisfaction on online databases is only moderate at 3.29 out of five. Kiran (2010) used SERVQUAL to measure service quality and customer satisfaction in one of Malaysia universities. Consistent with other library studies conducted in Malaysia, the satisfaction level is reported slightly above average. However, she did not report the impact of the service quality on user satisfaction. In India, Saikia and Gohain (2013) studied the use and user satisfaction on Online Public Access Catalogues (OPAC) services at Tezpur

University. Their study has been descriptive in terms of identifying the frequency of OPAC use and the level of user satisfaction. Despite moderate level of satisfaction among users, the performance and quality of the OPAC system is rated as very satisfactory. All these study have used descriptive analyses to conclude their findings and no inference on the relationship between factors affecting user satisfaction and continuance could be deduced.

Nordin, Kassim and Baharuddin (2012) found that information quality, service quality and system quality have significant impact on user satisfaction while Zainal, Razak, and Che (2013) affirmed the roles of information and system quality on WebOPAC user satisfaction. They further operationalize Information Quality to include documentation, training, timeliness, accuracy, content, format and ease of use while System Quality include system speed, accessibility, integration with social media, knowledge of the system and skills.

A study conducted among online shopping customers in Malang found that information quality provided in Forum Jual Beli (FJB) Kaskus website has direct and significant effect towards customer satisfaction in conducting online shopping (Wheny, Kertahadi and Suyadi , 2012). They also found that service quality has positive and significant effect towards customer satisfaction in doing online shopping.

Quality of information and service quality could also increase employees' satisfaction. Alhendawi and Baharuddin (2013) reported that as the quality of information and e-service increased, the satisfaction with Web-based Information System will increased.

Kim and Lee (2014) revealed that perceived usefulness and user satisfaction significantly positively impact intention to use a personal robot service. Additionally, perceived usefulness has a far more significant effect on the intention to use the service compared to user satisfaction. The service quality was determined to be a significant antecedent of both perceived usefulness and user satisfaction. System

quality proved to be a major determinant of perceived usefulness and user satisfaction, and to have strong effect on perceived usefulness than service quality

A study conducted among customer of commercial bank in Jordan empirically confirmed that service quality is an important antecedent of customer satisfaction. (Mohammed and Alhamdani, 2011). The correlation matrix indicates that service quality were positively and moderately correlated with customer satisfaction. Specifically, there was a significant positive relationship between Assurance and customer satisfaction The positively moderate correlation were for Responsiveness and customer satisfaction, reliability and customer satisfaction and between empathy and customer satisfaction. Thus, this indicates that there was a statistically significant link between service quality and customer satisfaction.

Eboli and Mazzulla (2007) highlight that global customer satisfaction, is best explained by the indicator of the quality level perceived by the user (perceptions variable), On the other hand, the indicator of the quality level expected by the user has a lower value. In this case, they suggested that an improvement of the service in terms of service planning and reliability can be more convenient for transport operators because the service planning and reliability latent variable has the greatest effect on global customer satisfaction

Karim and Chowdhury (2014) study showed that service quality dimensions are crucial for customer satisfaction in private commercial banking sector in Bangladesh. These dimensions which are tangibility, reliability, responsiveness, assurance and empathy significantly and positively influenced customer attitudes in terms of satisfaction.

Zhao et al (2012) examined the effects of service quality and justice on customer satisfaction and continuance intention of mobile value added services using a multidimensional model. Their study show that all three dimensions of service quality (interaction quality, environment quality and outcome quality) have significant and positive effects on cumulative satisfaction while only one dimension of service quality (interaction quality) has a significant and positive effect on

transaction-specific satisfaction. Besides procedural justice, the other two dimensions of justice (distributive justice and interactional justice) significantly influence both transaction-specific satisfaction and cumulative satisfaction. Furthermore, both types of customer satisfaction have significant and positive effects on continuance intention.

Previous literature also highlight the importance of Perceived Ease of Use (PEOU) and perceived usefulness (PU) towards user satisfaction and continuance to use. For example, Lee and Chen (2014) who explore the continuance intention usage of m-commerce consumer confirmed that perceived usefulness could affect user satisfaction which in turn could influence continuance intention. This study also highlight the importance of quality in retaining the consumer.

Past researchers had identified the relationship between Perceived Ease of Use (PEOU) and perceived usefulness (PU) towards continuance intention to use (Mohd Suki and Mohd Suki ,2011; Wangpipatwong, Chutimaskul, & Papasratorn, 2008; Kim and Lee, 2014; Ramayah,.2006; Ramayah & Ignatius, 2005; Bhattacherjee, 2001; Zheng et al ,2012; & Thiruselvi, et al ,2013) and satisfaction (Bhattacherjee, 2001, Chen et al 2009). Both PEOU and PU reported to have a positive influence towards satisfaction and continuance intention to use.

Based from the above literature review, it can be postulated that service quality, system quality and information quality could enhance the customer or user satisfaction and continuance to use. This study also proposed that PEOU and PU could also affect user satisfaction and continuance intention to use.

Hence it is expected that:

H1: Library online database quality could enhance user satisfaction
H2: Library online database quality could enhance continuance intention to use

(Please refer to Appendix 1 for the summary of literature review).

Based from the above discussion, the research framework for this study is proposed as in Figure 2.1.

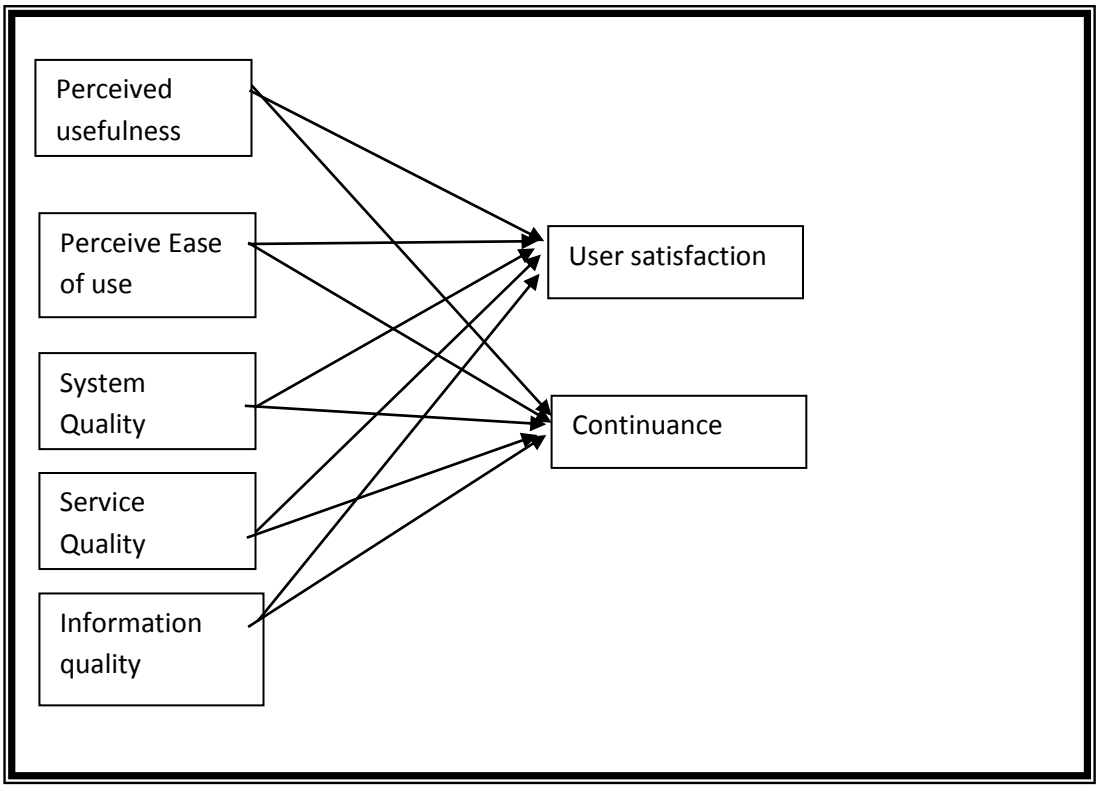

Figure 2.1 Proposed Research Framework For The Study

2.5 Library Return on Investment

White (2007) defines ROI as "One of the assessment tools available to libraries to determine the effectiveness of financial resource usage is return on investment. Return on Investment (ROI) is simply defined as a ratio of resources (usually financial) gained or lost in a process/investment/ result to the total amount of resources provided. A positive ROI indicates that more benefit than cost has been generated by the process/investment/result; a negative ROI indicates less benefit was generated than the resource provided." The return on investment formula:

$$ROI = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

Many studies have been published considering ROI in all types of libraries, but the literature reveals a preponderance of studies focusing on public libraries. This may be due to the fact that public libraries consume a high proportion of government public funds for cultural activities, so they are among the most common types of libraries vulnerable to closure as a result of retrenchment.

Most of the studies associated with library performance tried to measure the ROI and the value of libraries using contingent valuation that realizes on user's perceptions of specific services (Luther ,2008; Elsayed & Saleh, 2013; Kingma & Mcclure, 2015). Nevertheless, those perceptions are just opinions and do not reflect the actual level of performance compared to cost-benefit analysis. Tenopir, and King (2007) and Tenopir (2012) who embarked in measuring library investment, recommended three ways of measuring the value of library products and services. They are implicit values, explicit values and derived values. Recently, this viewpoint has shifted again as outcome-oriented assessment, which Tenopir and King, (2007) labeled it as derived values. Studies related to ROI have emerged from outcome-oriented assessment in conjunction from the field of economics. From the perspective of ROI studies for the library , the ROI emphasized on how the library contributes to revenue-generating activities and creates value for research purposes.

Based from previous studies (Gellings, 2007; Luther, 2008; Tenopir, 2010), the calculation of ROI OI can be based on two methods. The first method is by measuring the ROI based on grant received. The second method of assessing the ROI is based on the number of downloaded articles or resources.

2.5.1 ROI based from grant received

According to Sidorko (2010), ROI measurement for library databases is ranked as the least likely strategy to be adopted. The reasoning behind this reluctance is most likely related to one or more of three fundamental concerns: (i) there is great complexity involved in successfully making such a demonstration; (ii) the expected

rate of success is too low; and, (iii) there is no proven mechanism or formula that can be readily adopted. Elsayed and Saleh (2013) further added the fear of negative result and lack of awareness of the ROI concept and how to measure it are some of the reasons.

There are various techniques in measuring library ROI. One of the technique was introduced by Grzeschik (2010). Grzeschik (2010) uses the model developed by Luther (2008) at the University of Illinois at Urbana Champaign and applied it to the Berlin School of Library and Information Science and the University Library of the Humboldt University, Berlin. Luther's (2008) study of ROI can be considered the first study in an academic setting. This was based on the work of Strouse (2003) who developed a ROI model for a corporate library. Strouse's model was based on the concept of the outcome or contribution of corporate and government libraries to their institutions in terms of the time and cost saved by users and also the income generated by using the library resources.

Thus, in this study the model incorporated was adapted for the academic environment by researchers in the UIUC case study (Gellings, 2007; Luther, 2008; Tenopir, 2010).In context of Malaysia, the main issue is some of the data are not available for the complete calculation because of the weaknesses in the record and information updating. Furthermore, there are some databases systems do not provide the necessary statistical information needed by the university. Thus, the study only applied ROI calculation from the values of grant received in 2013.

The calculation of ROI based on grant technique had been utilized by researchers in the UIUC (Gellings, 2007; Luther, 2008; Tenopir, 2010). These researchers conducted their research from the academic environment perspective. The adapted model is based on these variables:

• x = percent of faculty who secure grants using citations from library collections in their

proposals

• y = percent of grant proposals that are successful

• z = the average grant income

• xx = the average grant income generated using resources from the library's collections

In mathematical formula, the calculation of ROI is based on the following;

$$\frac{\left(\begin{array}{c}\textbf{Percentage of faculty who use citations in grant proposals who are also PIs}: \\ \left(\frac{number\ of\ PIs\ \times\ \%\ of\ faculty\ who\ use\ citations\ in\ grant\ proposals}{number\ of\ tenure\ system\ faculty}\right) \\ \times \\ \textbf{Percentage of proposals that are successful and use citations obtained through library}: \\ \left(\frac{number\ of\ grant\ awards\ \times\ \%\ of\ faculty\ who\ say\ citations\ are\ important\ to\ grant\ awards}{number\ of\ grant\ proposals\ \times\ \%\ of\ proposals\ that\ include\ citations\ obtained\ through\ library}\right) \\ \times \\ average\ size\ of\ grant \times number\ of\ grants\ expended\ in\ one\ year\end{array}\right)}{total\ library\ budget}$$

2.5.2 ROI based on number of downloaded articles or resources.

Another approach of calculating the ROI is by concentrating on the number of downloaded articles or resources from the library databases. The calculation of ROI involve measuring ROI based on total downloads by faculty member.

The ROI was calculated according to the following procedure:

(1) The statistics of full text downloads by University academic staff and students through the intended year, distributed by database titles was first gathered. Thus the databases that commonly been used in the university can be identified. The example of database title that could be gathered were EBSCO, PROQUEST, Science Direct, IEEE or Wiley.

(2) This is followed by identifying the full text or pay-per view purchase for each database vendor .

(3) Next the calculation of the total cost of purchase of downloaded documents is conducted. In this case the total cost of purchase of downloaded document

refer to the cost that would have to be paid by the university if it did not pay for the database subscriptions.

(4) The last step of the calculation for the library ROI per downloaded documents is as follow:

$$ROI = \frac{\sum \text{Cost of citation obtained through the UTHM- database subscription budget}}{\text{Database subscription budget}}$$

2.6 Summary

This chapter reviews the literature relevant to the research topic. It indicates the importance of quality service, information quality and system quality towards user satisfaction. In addition, this study also proposed that perceived usefulness and perceived ease of use could enhance user satisfaction and continuance intention to use. This chapter also reviews the library Return on Investment (ROI). Specifically the ROI can be measured based on calculating the ROI of grant received or by assessing the ROI based on the number off download articles or resources.

The following chapter will discuss the methodology for this study.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter presents the research methodology underpinning the study. The research methodology for the study will be discussed in the first section. The quantitative survey research which used a case study approach and secondary data that had been employed will be explained. This is followed by a detailed description of the research process undertaken for the study.

3.2 Research methodology

Existing user online database studies have used either the quantitative or the qualitative approach. However, the quantitative approach has dominated research into the association between user satisfaction and service quality.

This research is divided into two phase 1. Phase 1 focuses the research method used to determine the library databases quality, user satisfaction and continuance. Specifically, the objectives of this phase are to determine the relationship of library databases quality towards user satisfaction and identify the usage of library databases among researchers, students and staff as a whole. The 1st phase of this study consists of all library users and not limited to the grants members or principal investigator. On the other hand, the approach on Phase 2 had been conducted to determine Return on Investment (ROI) and the implicit measures of library products and services. This phase focused more on non-financial or implicit measurement of benefits and financial or direct benefits. This phase was conducted among academic staffs that granted with research grants either externally funded

(i.e. MOHE, Private Companies, International grants) or internally funded (i.e contract grants). The second phase of data collection cycle was conducted among Principal Investigator (PI) and research team members and excluded students, non-academic staffs and academic staffs without research grants.

3.2.1 Phase 1: Library database quality and user satisfaction

The first part of the study is try to investigate the library database quality and user satisfaction.

3.2.1.1 Sampling frame

The sampling frame for this study included Universiti Tun Hussein Onn Malaysia (UTHM) academic staffs (including grants members or principlal investigator) and post graduate students since they are the most frequent users based on user logs in the library system. Accordingly, a total of 1059 users were identified for this study with sampling size of 272 user (Krejcie & Morgan, 1970). Sampling frame and sampling stratification of the actual data collection is as shown in Table 3.1:

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