



Model for Digital Services in Libraries

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Abstract. With the new method of information delivery for the library, the quality of service and Digital Library issues become paramount importance. Various model and framework have been proposed to evaluate the Quality of Service in Digital Library. Unfortunately, features that contribute towards the Digital Library services quality have not been factored into the design of most existing quality of services model in Digital Library. This paper presented a result of hypothesis testing which eventually proposed a new conceptual model on the service quality of the digital library. This model incorporated two new features that determine the right third-party source services. It also offers an opportunity for further investigation for evaluating the service quality effectiveness in the digital library. It is conforming to the study backgrounds through a variety of research designs and settings by examination of the hypotheses presented in this study. Survey research designs employing third party sources services as a sample in the model would best match the requirements for validating the proposed framework. The result shows that all three hypotheses are supported. As a result, we propose a conceptual model for evaluating the service quality of the digital library and further analyze the effectiveness model with several contributing features grouped as a third-party source.

Keywords. Digital library; Quality library services; Service quality effectiveness

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1. Introduction

In the conventional library setup, the library users must be physically present in the libraries if they need to make use of the library services such as reference services, interlibrary loan, and bibliographic search services. As a result of advances in information and web technologies, many of the traditional library services have been digitized resulting in Digital Library. As a result, libraries have changed their information management (e.g., gathering, organizing, storing, retrieving and disseminating) activities into digital format [1]. Various new services such as access to electronic or digital collections (online databases, electronic journal, e-books and digitized collections), electronic publishing, web portals, online reference, and online document delivery, helpdesk and online library instructions have been introduced in service delivery by the libraries. This development has improved access to appropriate, current and pertinent information at incredible speed.

An important and significant change in the library system is the introduction of the third-party source services such as computers, search engines, and scholarly databases. This change has brought with it stringent Quality of service (QoS) requirements from the library patrons. Digital Library introduces interactive information flow between end-user and the third-party service (service provider) using online access tools [2]. Thus, the library must now include online usage and electronic resources in the overall evaluation of the Digital Library [3]. For that reason, every effort to measure digital library service quality must be established upon a strong understanding of the phenomenon of service quality and what indicates service quality from the user perspective [4]. Therefore, QoS requirements of library service users coupled with the changes in the library service provision have mandated the need for a new approach to evaluating the quality of library service provisioning.

The relationship between Digital Library and third-party sourced services is different from normal customer/service provider relations [5]. It is crucial for libraries to face to the challenge of their patrons' demand especially which is related to the increasing sensitivity to soft service components, value and the quality of service offered in the current networked environment [6]. However, there is no work to the best of our knowledge that takes into account the influence of the quality of the third-party sourced services in the digital library when evaluating library service quality.

The aim of this paper is to close this gap in the literature. This paper also attempts to discuss at a conceptual level on the service quality of the digital library. We make two main contributions; first, we introduce new features that determine the right third-party sourced services efficiently. The second contribution is to provide a number of factors for digital libraries to use it as an evaluation method to determine the library service quality. The rest of the paper organized as follows. Section 2 focuses on describing the proposed model. It is then followed by the results of the analyses for proposed model. The results are accompanied with detailed explanations especially the outcome of the hypotheses testing.

2. Digital Library Model

A model is conceptualized based on the previous work of others [7–9]. As shown in Figure 1, the proposed model for consideration the impact of third-party sourced services on Digital Library Services Quality. Based on a review of previous work, we added three features in the model. The first features consist of (1) Service quality features (i.e. environment quality, delivery quality, and outcome quality) as a dependent variable. The second features independent variables are (2) internal-focus (Digital Library) perspective, and third features are (3) external-focus (end-user) perspective. The components of internal perspectives are procedures and standard. While the components for external perspectives are aboutness and usability. The sufficient variables for the relationship between service quality and Digital Library will be (4) third-Party Sourced services features, which include utilization, capability access quality and indicator. All of these features, components and variables are chosen because of their strong support from previous studies. Their applicability and suitability in the context of service quality in Digital Library selected justified by the outcome of the interview with randomly selected experts' who's working with digital library environment.

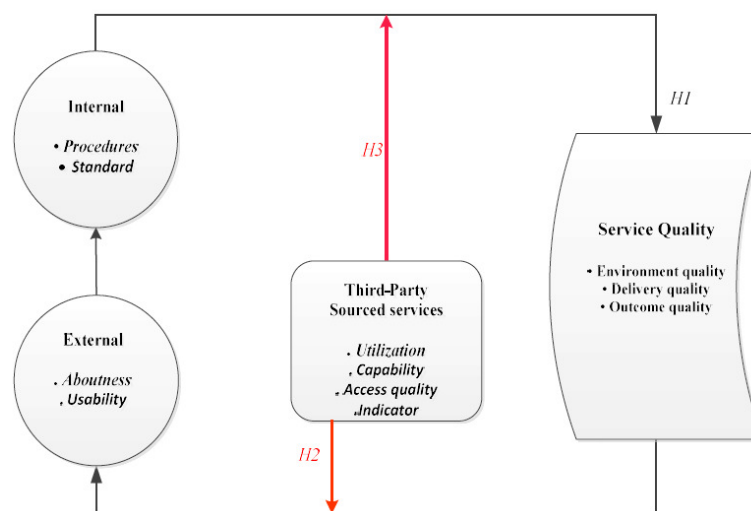


Figure 1. Proposed model of digital library[10]

In essence, we hypothesize that:

- H1: Services quality is significantly related to an internal perspective factor (Digital Library).
 H2: The third-party service provider has direct effects on the level of services quality that digital libraries provide.
 H3: The third-party service provider is significantly related to the external perspective factor.

3. Measurement Model Assessments

The research model for this study is tested using partial least squares (PLS). Smart PLS 2.0 M3 [11] is used to assess the measurement and structural model for this study. This statistical program assesses the psychometric properties of the measurement model and estimates the

parameters of the structural model. The validity and reliability of the measurement model for this study are evaluated using the following analyses: internal consistency reliability, indicator reliability, convergent validity and discriminant validity. The following subsections in Table 1 and Table 2, present the findings for each of the analysis used to evaluate the validity of the measurement model for this study.

Table 1. Measurement Constructs

Construct	Items	Coding
Internal factors	The digital library has functional infrastructures ease learning	A1
	The digital library has access tools that allow users to find things on their own	A2
	Users have the resources necessary to use digital library.	A3
	Users have the knowledge necessary to use digital library.	A4
	Digital library is compatible with other technologies that user use.	A5
	Users can get help from others when they have difficulties using digital library	A6
External factors	The digital library has functional facilities that inspires study and learning	B1
	Learning how to use the digital library is easy for users.	B2
	User's interaction with the digital library is clear and understandable.	B3
	Users find digital library easy to use.	B4
	It is easy for users to become skillful at using digital library.	B5
	Users can get help from librarian when they have difficulties using digital library	B6
Third Party	The third party provides on time and reliable deliveries	C1
	The third party performs promised service with dependability and accurately	C2
	Librarian discusses regularly with third party provider on the methods of ensuring that performance goals are being met	C3
	The third party brings service issues to a complete and satisfactory close	C4
	The third party helps digital library improve operations efficiency	C5
	The third party provides automation and advance information technology service	C6
	The third party maintains up-to-date technical data of library products/services	C7
	The third party understands the service needs of the digital library	C8
Service Quality	The library has modern and functional equipment that allows easy access to information	D1
	Librarian has the dependability in handling user's service problems	D2
	The digital library service to obtain digital resources never breaks down	D3
	Digital library provides the service at the time.	D4
	Library gives prompt service to customers.	D5
	Users have the convenient access to library collections	D6

Table 2. Hypothesis

Hypothesis	Relationship	Std Beta	Std Error	t-value	Decision
H1	INTERNAL → SERV_QUAL	0.331	0.065	5.124**	Supported
H2	EXTERNAL → THIRD_PARTY	0.745	0.076	9.850**	Supported
H3	INTERNAL → THIRD_PARTY	0.148	0.082	1.812**	Supported

** : $p < 0.01$, * : $p < 0.05$

Based on the analysis, it shows that Service Quality is influenced directly by internal ($\beta = 0.331$, $t = 5.124$, $p < 0.01$). As a result, hypothesis H1 is supported.

Further, from the analysis the third party is influenced directly by an external factor ($\beta = 0.745$, $t = 9.850$, $p < 0.01$). As a result, hypothesis H2 is supported. On the other hand, the third party is directly influenced by an internal factor ($\beta = 0.148$, $t = 1.812$, $p < 0.05$). As a result, hypothesis H3 is supported.

The measurement model also demonstrated satisfactory convergent and discriminant validity by having AVE value greater than 0.50, all manifest variables loaded on their respective latent variable and the square roots of AVE for each construct are greater than its inter-correlation. Second, the validation of the structural model demonstrated satisfactory results. The R2 were substantial with a value of 80.7%. This demonstrates strong explanatory power. Moreover, the structural model is supported. Based on the path coefficient assessment, five proposed relationships have β value greater than 0.1 and are significant at least at the level of 0.05. Finally, the structural model exhibited two significant mediating relationships. Based on the analysis made, proves that the third party indispensable element in the measurement of quality in digital services.

4. Conclusions and Future Work

This study offers an opportunity for further investigation for evaluating the service quality effectiveness in the digital library. It conforms to the study backgrounds through a variety of research designs and settings through the examination of the hypotheses of this study. Survey research designs employing thirds-thirds party sources services as a sample in the model would best match the requirements for validating the proposed framework. To this end, we propose a conceptual model for evaluating the service quality of the digital library and further analyze the effectiveness model with several contributing features grouped as a third-party source. The proposed model should be interested in both library practitioners and the academic community. For library practitioners, the model will enhance their understanding of the features that contribute towards Quality of services in the digital library. A proposed model also provides plenty research opportunity to be validated by academic community, i.e. to support or disprove the proposed propositions. In the future, we are developing a new tool using Service Level Agreements (SLAs) method for evaluating the QoS in the digital library.

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Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

All the authors contributed significantly in writing this article. The authors read and approved the final manuscript.

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