Journal of Informatics and Mathematical Sciences
Vol. 9, No. 4, pp. 1183–1189, 2017
ISSN 0975-5748 (online); 0974-875X (print)
Published by RGN Publications

http://www.rgnpublications.com

Research Article

User Satisfaction Role in Mediating Enterprise Resource Planning (ERP) System Effectiveness

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Abstract. Over the past, a decade, companies in Malaysia show deep interest in implementing the Enterprise Resource Planning (ERP) system to improve their business processes. Due to the capability offered by this so-called robust system, it yields interest in companies to implement this system but is lacking in knowledge on the impact after the execution of the system. Notionally, the effectiveness of the system can be measured only after successfully implementing the system. The user acceptance and satisfaction of using the system thus need to be investigated to measure its effectiveness. This research is conducted via a cross-sectional survey of 150 respondents. The responses were analyzed with employing structural equation modeling (SEM). The role of user satisfaction as a mediator is addressed in identifying the most important and significant factors contributing to the effectiveness of ERP system. Findings of this study revealed that the highest contribution was due to service quality where user satisfaction factor is embedded as a mediator in the SEM model of studying the relationship of service quality towards net benefits.

Keywords. Enterprise Resource Planning (ERP); Service quality; User satisfaction; Telecommunication; IS effectiveness

MSC. 74B15

Received: June 7, 2016 **Accepted:** December 25, 2016

1. Introduction

Over the past a decade, companies in Malaysia showed a deep interest on implementing the Enterprise Resource Planning (ERP) system to improve their business process. Due to the capability offered by this robust system, it yields interest in companies to implement this system but is lacking with knowledge on the impact after the execution of the system. There are various factors contributing to the information system (IS) effectiveness. Many factors have been addressed to ensure effectiveness of the system such as information quality, system quality, service quality, user satisfaction or net benefits (see [2, 9, 12]). The role of user satisfaction as a mediator cannot be underestimated in influencing the effectiveness of the ERP system [3].

Considering the huge amount [12] that has been invested in implementing the robust system like ERP (Enterprise Resource Planning) system, the satisfaction of user's in engaging the system became a priority for top management. However, the effectiveness of the system can be measured after the implementation of the system is successful.

User Satisfaction is important in evaluating the effectiveness of the ERP system. Satisfying customers' demand is the ultimate goal of the ERP system in the organization [5]. Nonetheless, the user acceptance and satisfaction of using the system thus need to be investigated to measure its effectiveness. Therefore, user satisfaction became an indicator of a successful ERP system in any organization. Moreover, the reliability of the system to provide meaningful information and give a good service is highly demanded amongst users. In addition, the overall performance and the satisfaction of the users using the system after the implementation must be measured periodically [6].

The objective of the research is to reveal the role of user satisfaction in mediating the information quality, system quality and service quality towards net benefits after implementing the ERP system in one of the telecommunication organization in Malaysia.

2. Literature Review

Enterprise Resource Planning (ERP)

ERP system can be defined as an integrated information system with the sharing of databases to manage all information, resources and function of an organization [1]. The integration of all the technical and operational information, information from all the departments into unified database, not only can be considered as a business solutions but may also be defined as ERP system (refer [7–9, 12, 14]).

User Satisfaction

User satisfaction can be defined as the willingness of user using a system and the frequency of users in daily tasks. DeLone and McLean (2003) also stated that the repeat purchases, repeat visits, and user surveys can be classified as the overall measures of user satisfaction. In 1988, Doll and Torkzadeh introduced the end-user computing satisfaction (EUCS). This model had become famous amongst researchers who have interest in studying user satisfaction. The element of EUCS encompasses elements of format, ease of use [4], content, accuracy, and timeliness (see [4, 10]).

3. Method

The adoption of DeLone and McLean Updated IS Impact model 2003 [2] is nothing new in research development. This study has purely adopted the Updated IS impact model of DeLone and McLean 2003 for research framework (Figure 1). However, this framework has stressed the factors of *Use* and *Intention to Use* in affecting the IS model, but this study has omitted these factors since the users have obliged to use the system in their daily tasks (refer [9, 11, 12]). The remaining factors that have been used in this study were information quality, system quality, service quality, user satisfaction and net benefits (Figure 2).

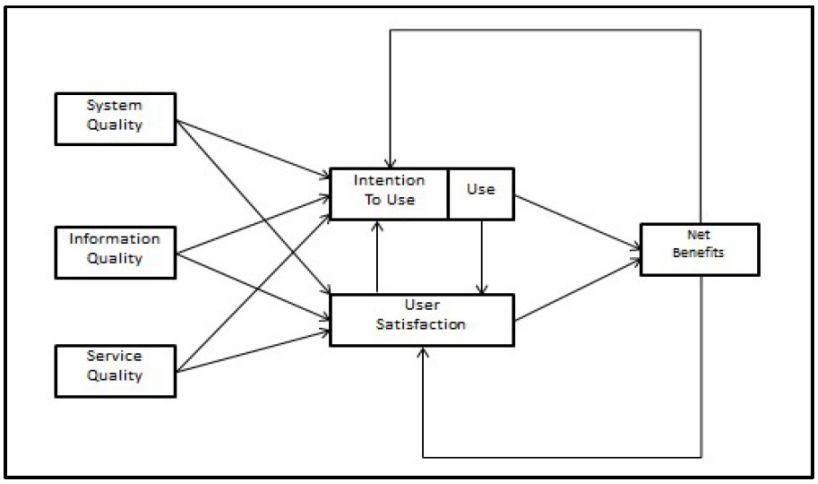

Figure 1. Updated DeLone and McLean IS Success Model (2003)

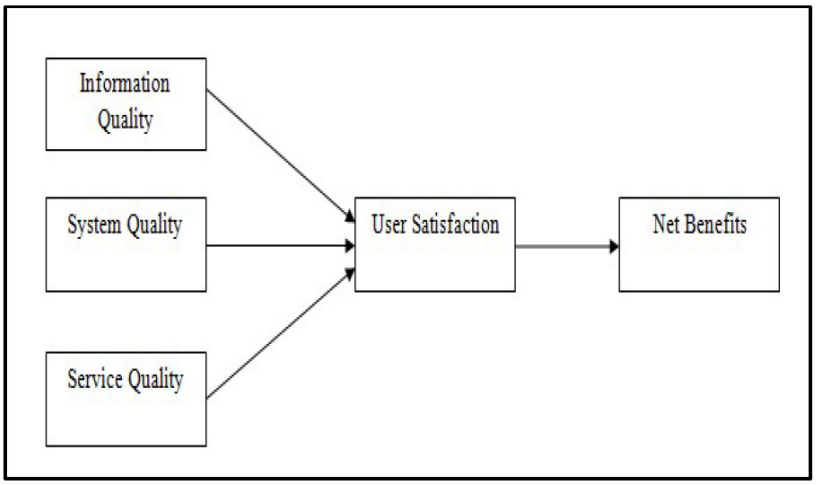

Figure 2. The Research Framework

The research framework has been validated by empirical study based on a questionnaire. All of the 43 questions incorporate all elements i.e. *information quality, system quality, service quality, user satisfaction, net benefits* and *user profile.* The elements were constructed and verified by a senior lecturer and the senior officers from organizations. The measures used

in this study comprised of Likert scale ranging from 1 to 7. The lowest scale was "Strongly Disagree" (coded as 1) and the highest scale was "Strongly Agree" (coded as 7). The study sample was 150 participants who was selected using a stratified proportionate random sampling. This sampling was used based on the system privileges given by the administrator.

In this study, completeness, accuracy, format, currency, relevance and understandability of the information content were used in measuring the Information Quality. While reliability, flexibility, accessibility, ease of use, response time, ease of learning and user requirements were used in measuring System Quality. For Service Quality, the SERVQUAL five dimensions used were tangibles, reliability, responsiveness, assurance and empathy.

4. Results and Discussion

A total of 150 questionnaires were returned, with 100% response rate. Table 1 shows the respondents grouped by gender.

Table 1. Number of respondents grouped gy gender

Gender		
	Frequency	Valid Percent (%)
Male	77	51.3
Female	73	48.7
Total	**150**	**100.0**

The distribution of gender, of male and female, were almost similar with a mere difference of only 2.6%, higher in male gender.

The hypotheses generated for the study on the mediating effect of user satisfaction in the following relationships were:

(i): *Information Quality and Net Benefits*

H_o: *User Satisfaction* has no mediation between *Information Quality* towards *Net Benefits*

H_1: *User Satisfaction* mediates Information Quality towards *Net Benefits*

(ii): *System Quality and Net Benefits*

H_o: *User Satisfaction* has no mediation between *System Quality* towards *net benefits*

H_2: *User Satisfaction* mediates System Quality towards *Net Benefits*

(iii): *Service Quality and Net Benefits*

H_o: *User Satisfaction* has no mediation between *Service Quality* towards *Net Benefits*

H_3: *User Satisfaction* mediates *Service Quality* towards *Net Benefits*

Table 2 shows the results of the relationship between Information Quality, System Quality and Service Quality towards Net Benefits without the presence of User Satisfaction.

Table 2. Regression Weights (before adding User Satisfaction construct)

	Estimate	S.E.	C.R.	P
Net Benefit ← Information Quality	.022	.112	.198	.843
Net Benefit ← System Quality	.278	.163	1.699	.089
Net Benefit ← Service Quality	.530	.119	4.461	*

*: $p < 0.05$

While Table 3 shows the results of the relationship between Information Quality, System Quality and Service Quality towards Net Benefits with presence of User Satisfaction as a mediator.

Table 3. Regression Weights (after adding User Satisfaction construct)

	Estimate	S.E.	C.R.	P
Net Benefit ← Information Quality	–.031	.099	–.314	.753
Net Benefit ← System Quality	.181	.144	1.260	.208
Net Benefit ← Service Quality	.246	.115	2.135	.033

*: $p < 0.05$

The results from the SEM analysis (Table 4) show that only one hypothesis was supported than three hypotheses.

Table 4. SEM Analysis

Hypothesis		Formulation of hypothesis	Results
(i)	H_o:	*User Satisfaction* has no mediation between *Information Quality* towards *Net Benefits*	Supported
	H_1:	*User Satisfaction* mediates Information Quality towards *Net Benefits*	**Not Supported**
(ii)	H_o:	*User Satisfaction* has no mediation between *System Quality* towards *net benefits*	Supported
	H_2:	*User Satisfaction* mediates System Quality towards *Net Benefits*	Not Supported
(iii)	H_o:	*User Satisfaction* has no mediation between *Service Quality* towards *Net Benefits*	Not Supported
	H_3:	*User Satisfaction* mediates *Service Quality* towards *Net Benefits*	**Supported**

In Table 4, it clearly indicates that these two hypotheses supported the null hypotheses: User Satisfaction and Information Quality towards Net Benefits, and User Satisfaction and System Quality towards Net Benefits. However, User Satisfaction it was shown to fully mediate the relationship between Service Quality and Net Benefits.

These surprising results showed that information quality and system quality in ERP system were not sufficient to satisfy satisfaction rating in their job. The role of User Satisfaction as a mediator only affected Service Quality of the ERP system. DeLone and McLean (2003) have claimed that quality has three dimensions which are Information Quality, System Quality and Service Quality. They proposed that:

"Each dimension should be measured or controlled for separately since singularly or jointly, they will affect subsequent use and user satisfaction."

Since construct use was omitted from this research framework, only three IS quality affected User Satisfaction. Based on the SEM analysis, both constructs; Information Quality and System Quality did not influence User Satisfaction except for Service Quality.

The findings of this study reveals that users were not satisfied with Information Quality and System Quality provided in ERP system. They were only satisfied with Service Quality. Therefore, User Satisfaction only successfully mediates Service Quality towards Net Benefits. These findings were similar with a study conducted by Saeid and Hassan (2010) [14], which revealed that User Satisfaction was only mediated by Service Quality with Net Benefits.

5. Conclusion

This research presented an evaluation of ERP effectiveness in telecommunication organization by employing SEM. The findings revealed that mediation only occurred between Service Quality and Net Benefits.

Therefore, the IT governance in this organization should take prompt action in improving the Information Quality and System Quality of the ERP system to ensure that the ERP system is more effective amongst end users. Caution has to be practiced to ensure a successful end business process via ERP.

The strengths and weaknesses of the ERP system can be evaluated by empirical research. Thus, it has been proven that Information Quality, System Quality and Service Quality only can be evaluated by end-users. A good ERP system can bring many benefits towards end-users and organization itself.

Acknowledgements

This project was partially funded by the Fundamental Research Grant (FRGS/1/2015/SKK01/UITM/03/1). We would like to thank the participants and the top management of the company for the permission to conduct this study at their premises.

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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