

Impact of System Quality, Information Quality and Service Quality on Performance

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Abstract

An information system (IS) is a set of formal procedures by which data are collected, processed into information, and distributed to users (Hall, 2007). The users, either individual or group are much dependent on the information to make decision in order to increase productivity and to gain competitive advantage. In order to support that, the organization should have high quality of information system. High quality of information system with good information technology can create sustainable competitive advantage (Porter and Millar, 1985). The objective of this research is to find out the effect of system quality, information quality and service quality on individual performance and organizational performance. This study used part of DeLone and McLean IS model to test the results. Survey was conducted to 372 information system users in Kota Kinabalu, Sabah, Malaysia. The result found out that there is a positive and significant effect of system quality, information quality and service quality on individual performance as well as organizational performance. The findings support DeLone and McLean study (2003). The result of the study can be used by users in an organization to develop high quality of information system that is supported by vendors to produce good quality of information. The findings are also expected to improve knowledge in Accounting Information System, Management Information System and Performance Management System.

Key word: *Information System, System Quality, Information Quality, Vendor and Service Quality, Individual Performance, and Company's Performance.*

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1. Introduction

2.

Information and communication technology (ICT) has penetrated in every part of our lives and our societies, and transformed the ways we think, we feel, and act (Zhang and Benjamin, 2007). The use of the ICT by private as well as public organization across the world is beginning to emerge (Leidner and Jarvenpaa, 1993; Sandholtz et al., Goldberg, 1997; Roblyer and Edwards, 2000 in Ifinedo, 2006). However, the study about information system factors that contribute to increase company's performance is limited. DeLone and McLean (2003) suggest that information quality, system quality, service quality, intention to use and user satisfaction can increase company's performance. Unfortunately, study conducted by Livari (2005) did not support DeLone and McLean study.

The objective of this research is to find out the effect of system quality, information quality and service quality on individual performance and organizational performance. The rest of the paper is structured as follows: Firstly, the literature review, research model and hypotheses are succinctly presented. Secondly, the research methodology is described. The next section deals with the data analysis. Finally, the discussion and conclusion of the study are presented.

3. Research Background and Research Hypothesis

Information System (IS) refers to a system of people, data records and activities that process the data and information in an organization, and it includes the organization's manual and automated processes (http://en.wikipedia.org/wiki/Information_systems). The term of information system refers to the specific application software that is used to store data records in a computer system and automates some of the information-processing activities of the organization. Meanwhile, Hall (2007) define IS as a set of formal procedures by which data are collected, processed into information, and distributed to users. There are some elements of IS that are

needed to conduct the processing in a computer-based information system (Yusof, 2006). They are hardware, software, database, telecommunications, procedures and people.

In order to give benefit to users, an organization should have high quality of IS. In 1992, DeLone and McLean conducted study to define IS success consisting of six variables such as system quality, information quality, intention to use, user satisfaction, individual impact and organizational impact. Using an empirical test of DeLone and McLean model of information system success, Livari (2005) found out that perceived system quality are significant predictors of user satisfaction with the system, but not of system use. He also found out that perceived quality was also a significant predictor of system use. In addition, user satisfaction was found to be strong predictor of individual impact, whereas the influence of system use on individual impact was insignificant.

However, in 2003, based on research contribution since their original paper, and based on changes in the role and management of information system, DeLone and McLean modified their findings. In the new model, quality has three major dimensions: information quality, system quality and service quality. Another modification was elimination of individual impact and organizational impact as separate variables, replacing them with net benefits. Peter and McLean (2009) have empirically evaluated the relationship within the DeLone and McLean IS success model using the quantitative method of meta-analysis. They found out that the majority of the relationships posited in the updated DeLone and McLean IS success model were supported.

By having 29 firms implemented enterprise resource planning system (ERP) and 62 individual ERP users in Estonia and Finland, Ifinedo (2006) conducted research to find out the impact of system quality, information quality, and vendor service quality to individual impact, work group impact, and organizational impact. The result found out that system quality and organizational impact appear to predict success more than do other dimensions. Individual impact comes next and it should be noted that ERP adoptions tend to be focused more on achieving effectiveness for the organization than for improving individual impacts. Information quality and vendor/consultant quality do not appear to be as important as the preceding three in predicting ERP success. Finally, the workgroup impact did not yield any meaningful information with its inverse connotations.

Using structural equation modeling techniques that were applied to data collected by questionnaire from 119 users of Government to citizen (G2C) eGovernment systems in Taiwan, Wang and Liao (2008) tested Delone and McLeane studied the success of G2C eGovernment systems from citizen perspective. Based on their study, they found out that except for the link from system quality to use, the hypothesized relationships between the six variables are significantly or marginally supported by the data. The findings also provide several important implications for eGovernment research and practice.

Figure 1 shows the updated DeLone and McLean IS success model that will be tested in this study. The following, will discuss the variables that were used by DeLone and McLean to test the IS benefit.

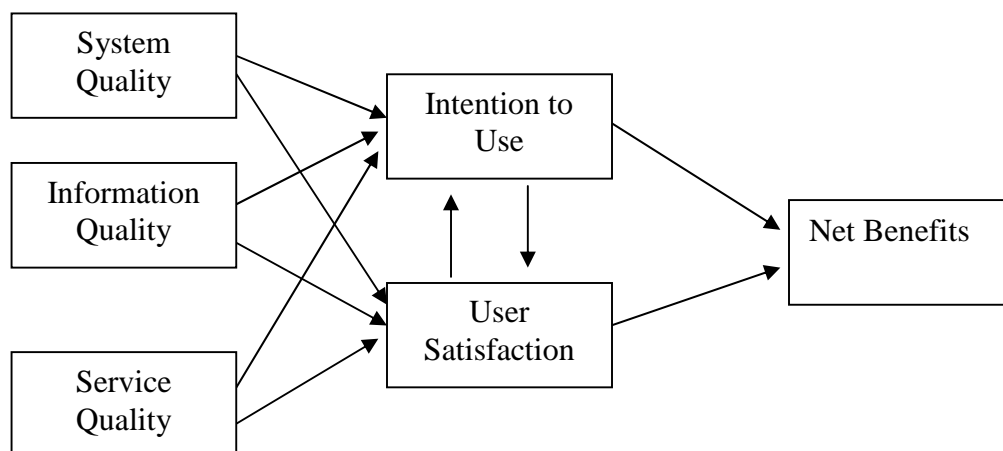


Figure 1: DeLone and McLean IS Success Model

2.1. System Quality

System quality is a measure of the information processing itself. (http://business.clemson.edu/ISE/html/system_quality.html). System quality was equivalent to the technical level of communication (Peter and McLean, 2009). According to the authors, the system quality is performance of the IS in term of reliability, convenience, ease of use, functionality, and other system metrics. Meanwhile, DeLone and McLean (2003) measured system quality in terms of ease of use, functionality, reliability, flexibility, data quality, portability, integration, and importance.

2.2. Information Quality

Information quality is characteristics of the output offered by the IS such as accuracy, timelines, reliability, and completeness (Peter and McLean (2009). Quality of information serves as the background for all steps in communication process in the modern enterprise (Michnick, 2009). Information quality (IQ) was measured in terms of accuracy, timelines, completeness, relevance, and consistency (DeLone and McLean, 2003). Meanwhile, Michnick (2009) tested the information quality by broken the information quality into four evaluation aspects. The aspects are intrinsic, contextual, representational and accessibility of IQ.

2.3. Service Quality

Service quality is a measure of the quality of information system services. ([http:// business.clemson.edu/ISE/html/system_quality.html](http://business.clemson.edu/ISE/html/system_quality.html)). Generally, service quality is a tool developed to assess general service quality for marketing researchers. Pitt and Watson (1997) enhanced the Delone and McLean to include Service Quality as one of the determinants to information system effectiveness. Service quality is a support of users by the IS department, often measured by the responsiveness, reliability, and empathy of the support organization (Peter and McLean, 2009). Analyzing the effectiveness of IT service components is becoming increasingly important (Roses, Hoppen, and Henrique, 2008). The authors developed five dimensions of service quality that was adopted from Berry et al (1990). The dimensions are tangibles, reliability, responsiveness, assurance and empathy. Tangibles are the appearance of physical facilities, equipment, personnel and communication materials. Reliability is the ability to perform the promised service dependability and accurately. Responsiveness is willingness to help customers and provide prompt service. Assurance is knowledge and courtesy of employees and their ability to convey trust and confidence. Meanwhile, empathy is the ability of the firms to provide care and individualized attention to customers.

2.4 Intention to Use

Intention to use is a recipient response to the use of the output of an IS ([http:// business.clemson.edu/ISE/html/system_quality.html](http://business.clemson.edu/ISE/html/system_quality.html)). Research conducted by Jackson et.al (1997) indicated that (1) the direct effect of situational involvement on behavioral intention as well as attitude is significant in the negative direction, (2) attitude seems to play a mediating role, and (3) intrinsic involvement plays a significant role in shaping perceptions. They concluded that the user involvement construct needs to be separated into its psychological as well as its participative components for developers to understand its impact on the systems development process. Intention to use is expected future consumption of an IS or its output (Peter and McLean, 2009). System use was typically voluntary and was measured as frequency of use, time of use, number of accesses, usage pattern, and dependency (DeLone and McLean, 2003).

2.5 User Satisfaction

User Satisfaction is a subjective evaluation of the various individual, organizational, and societal consequences of IS Use (Seddon, 1997). He asserts that the User Satisfaction measure is a measure of the net benefits perceived by the information system's stakeholders (individuals, groups of individuals, management of organizations, and society). Seddon maintains that previously introduced user satisfaction measures (eg. Ives, Olson, and Baroudi) do not adequately measure this idealized construct. User satisfaction is approval or likeability of an IS and its output (Peter and McLean, 2009).

2.6. Net Benefit

Net benefits is the effect of an IS has on an individual, group, organization, industry, society, etc. which is often measured in terms of organizational performance, perceived usefulness, and affect on work practices (Peter and McLean, 2009). On the other hand, Bernroider (2008) use different measurements for his study. The measurements are enhanced decision making, reduced cycle times, efficiency, effectiveness, system costs, business process improvement, enabler for desired business processes, increase organizational flexibility, improved innovation capabilities, revenue impact and profit impact.

2.7 Research Model and Hypothesis

Our study objective is to find out the effect of system quality, information quality and service quality on individual performance and organizational performance. The study is focused on individual and organizational in Kota Kinabalu, Sabah, Malaysia.

The target population is individual and organizational as well. This study was carried out on 372 information system users in Kota Kinabalu, Sabah, Malaysia. Questionnaires prepared using the Likert's 5-point scale. A total of 400 questionnaires were distributed but only a total of 372 questionnaires were returned. For data analysis purposes and text clarity, data obtained were analyzed using the Statistical Package for Social Science (SPSS) program. The statistical methods for hypothesis testing are regressions analysis. Figure 2 shows the research model for this study. The following is our research hypothesis based on information system users in Kota Kinabalu, Sabah, Malaysia perceptions:

H1: There is a significant, positive relationship between system quality and individual performance.

H2: There is a significant, positive relationship between system quality and organizational performance.

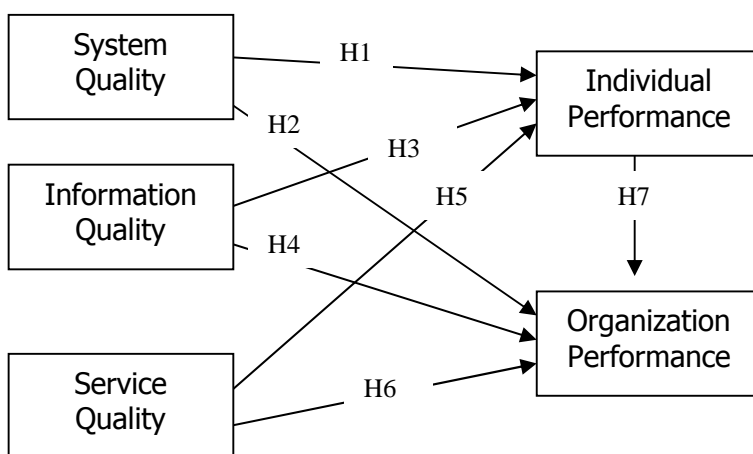
H3: There is a significant, positive relationship between information quality and individual performance.

H4: There is a significant, positive relationship between information quality and organizational performance.

H5: There is a significant, positive relationship between service quality and individual performance.

H6: There is a significant, positive relationship between service quality and organizational performance.

H7: There is a significant, positive relationship between individual performance and organizational performance.



2.8 Research Findings

Reliability Measurement

The data collected was subjected to reliability analysis to establish the reliability of the measures. The variables are assessed for reliability using the Cronbach's Alpha in the questionnaires in this study. Tables 1 provides a summary for all the variables in the analysis.

No	Variables	Items	Cronbach's Alpha
1	Information Quality	10 Questions	0.992
2	System Quality	9 Questions	0.856
3	Service Quality	8 Questions	0.982
4	Individual Impact	6 Questions	0.898
5	Organizational Impact	11 Questions	0.905

Table 1 : Reliability Testing

The analysis recorded reliability Cronbach's Alpha that ranges from 0.856 to 0.992. Based on Nunally (1979) and Hair et al (1998) all dimension are very well within the acceptable range of 0.6 to 0.9. The variables showed acceptable Cronbach's Alpha values of more than 0.6. The overall result is good with outputs indicating strong Cronbach's Alpha values.

Hypotheses Testing

Table 2 below shows the statistical summary results of the model regression to all hypotheses testing.

	Hypothesis	Beta	t Value	Sig.	Results
H1	There is a significant, positive relationship between system quality and individual performance.	0.811	8.890	0.000	Supported ($p \leq 0.001$)
H2	There is a significant, positive relationship between system quality and organizational performance.	0.572	6.740	0.000	Supported ($p \leq 0.001$)
H3	There is a significant, positive relationship between information quality and individual performance.	0.564	5.878	0.000	Supported ($p \leq 0.001$)
H4	There is a significant, positive relationship between information quality and organizational performance.	0.576	6.211	0.000	Supported ($p \leq 0.001$)
H5	There is a significant, positive relationship between service quality and individual performance.	0.745	8.054	0.000	Supported ($p \leq 0.001$)
H6	There is a significant, positive relationship between service quality and organizational performance.	0.546	7.224	0.000	Supported ($p \leq 0.001$)
H7	There is a significant, positive relationship between individual performance and organizational performance.	0.861	8.786	0.000	Supported ($p \leq 0.001$)

Table 2: The Results of Hypotheses Testing

The results in Table 2 show that there is significant positive relationship between system quality and individual performance ($t = 0.811$, $p = 0.000$). Thus, H1 is accepted. Therefore, it is concluded that system quality is a strong determinant of user intention to use. Hypotheses testing for H2 also show that there is significant positive relationship between system quality and organizational performance ($t = 0.572$, $p = 0.000$). Thus, H1 is supported by the testing. It means system quality is a strong determinant of individual and organizational performance.

To prove the relationship between information quality and individual performance (H3) and information quality and organizational performance (H4), the table above show that H3 ($t = 0.564$, $p = 0.000$) and H4 ($t = 0.576$, $p = 0.000$) testing is accepted. These results concluded that information quality is a strong determinant of individual performance and as well as organizational performance.

The results for H5 and H6 show that there is significant positive relationship between service quality and individual performance ($t = 0.745$, $p = 0.000$). Thus, H5 is accepted. Therefore, it is concluded that service quality is a strong determinant of individual performance. Hypotheses testing for H6 also show that there is significant positive relationship between service quality and organizational performance ($t = 0.546$, $p = 0.000$). Thus, H6 also supported by the testing. It is means service quality is a strong determinant of organizational performance.

Lastly, the results in Table 2 show that there is significant positive relationship between individual performance and organizational performance ($t = 0.861$, $p = 0.000$). Thus, H7 also is accepted. It is means individual performance has a strong relationship with organizational performance.

The analysis recorded overall R Square value that ranges from 0.674 – 0.892. Therefore, it is concluded that all independent variables can explains more than 60 percent of dependent variables (in other words, all independent variables have relationship with independent variables).

4. Conclusions

The papers report on an empirical test of the IS success model of DeLone and McLean (1992) as a predictive model. Overall, the present findings support the model. It is found out that system quality, information quality and service quality affect individual performance positively and significantly. It is also found that the company's performance also affected positively and significantly by the system quality, information quality and service quality. The result of the study also can be used by users in an organization to develop high quality of information system that is supported by vendors to produce good quality of information. The findings are also expected to improve knowledge in Accounting Information System, Management Information System and Performance Management System based on the individual and organization perception.

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