MEASURING ELECTRONIC CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM OF HOTEL SECTOR IN THAILAND: AN EMPIRICAL STUDY OF THE DELONE AND MCLEAN SUCCESS MODEL

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ABSTRACT

Current information technology integration into business systems is now almost essential to survival. Systems need to be able to adapt and manage the technology properly. But because of the rapid changes of technology, as a result, it is necessary to study the effectiveness of information technology at all times to meet the response of service users appropriately. This paper proposes and empirically assesses Electronic Customer Relationship Management (eCRM) systems in the hotel sector of Thailand, applying the updated DeLone and McLean IS Success model. This is derived through an analysis of current practices of eCRM and review of IS success literature. The sample includes 241 users who used eCRM Systems in hotels from five provinces in the northern part of Thailand. This research is an integrated analysis, using questionnaires for collecting data. Results show strongly direct associations among system quality, information quality, service quality, user satisfaction and service performance which are the variables in the updated DeLone and McLean IS success model from initial correlation analysis. Subsequent regression analyses confirm these associations. Additionally, over and beyond the effects of dependability on success of the hotel sector, it also helps practitioners and managers gain deep insights into how to implement eCRM successfully.

Keywords: 1) Electronic Customer Relationship Management 2) DeLone and McLean Model, Hotel

1. Introduction

Evaluating the success of information systems (IS) is one of the critical issues in IS literature (Walsham, 2018). It is argued "if IS research is to make a contribution to the world of practice, a well-defined outcome measure (or measures) is essential" (DeLone and McLean, 1992). DeLone and McLean's (1992) model is considered the most comprehensive IS assessment model available in the IS literature (Myers et al., 1997). As such, DeLone and McLean's model has gained wide acceptance among IS researchers who attempted to test and validate the usefulness of different parts of this model (Almuatiri, 2001; Seddon 1997; Teo and Wong, 1998). Recently, this model in DeLone and McLean (1992) was reaffirmed by DeLone and McLean as "a sound basis for IS success measurement" in (DeLone and McLean, 2003).

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DeLone and McLean's model has gained strong theoretical and empirical support and it can be a useful model for assessing IS success globally if it is applied in other societies and cultures. Several studies have examined IS globally. For example, the organizational impact, system quality, information quality, and service quality were studied in organizations from information technology (IT) department (Gola, et al. 2010) and G2C eGovernment systems were empirically studied with Taiwan citizen (Wang and Liao, 2008). Similarly, the use and user satisfaction of open source software systems were studied in higher educational institutes (Vijitakula, 2009). To that end, the researchers evaluate empirically the application of DeLone and McLean's model in an electronic customer relationship management (eCRM) in Thai hotel sector organizations.

This study is being conducted to answer the following questions: To what extent are DeLone and McLean's (2003) model applicable in eCRM in Thai hotel sector? Can it help us understand the relationships between the model variables as it exists in eCRM in Thai hotel sector? In order to answer these research questions, an empirical study was conducted to analyze the relationships among the variables in DeLone and McLean's model using an online survey of using eCRM in hotels in five provinces in northern part of Thailand.

The aim of this study is to apply the DeLone and McLean model in eCRM in Thai hotel sector and report the results of the relationship among the variables. The intent of this research is not a formal test of the DeLone and McLean model. Consequently, this research is an applied analysis of this model and not a theoretical model/instrument evaluation exercise.

This study presents a brief literature review and the research methodology. It is followed by data analysis and the results found followed by the conclusion. A brief literature review would be sufficient as this research is applied in nature and the interested reader can find a detailed review of the literature on IS evaluation in DeLone and McLean (2003).

2. Literature Review

This literature reviews a relevant study of eCRM system and eCRM system performance in general and a study of IS support user satisfaction. It also explores the IS of practice especially how IS have been affected by the eCRM to the performance outcomes.

Electronic customer relationship management (eCRM)

Modern technology is currently used in many areas making it easy and fast to work. The Customer Relationship Management or CRM system has been developed using the technology involved resulting in the system. eCRM is the latest technique companies are using to increase and enhance their marketing skills and capabilities. Integrating both technological and marketing elements, eCRM covers all aspects of the customer's online experience throughout the entire transaction cycle (Pre-purchase, At-purchase and Post-purchase).

Parvinen et al (2017) proposed that the emergence of e-commerce has changed many aspects of existing businesses and generated new companies with new business models, business opportunities, and processes. Existing companies are being challenged to rethink the most basic business relationship: the one between an organization and its customers. Despite media types about the Internet changing the rules of engagement with customers, it has not changed the underlying fact that addressing customers' needs leads to sustainable profit (Shan and Lee, 2003). Specifically, e-commerce practice has not replaced the need for human contact at key points in sales, marketing, and customer support.

Ahme et al (2018) stated that of eCRM is to; 1) create long-term relationships with customers with minimum cost, 2) reduce the customer defection rate, 3) increase the profitability from low-profit customers, 4) focus on high-value customers and specific

benefits of e-CRM. According to Kennedy (2006), definite opportunities of e-CRM are; 1) enhanced Customer Interaction and Relationships, 2) managed customer touch points - the personalization and E-Loyalty, 3) sourced of competitive advantage.

Sawhney et al. (2001) suggested that for the customer, technology-enabled selling opens other doors for productivity. First, Web-based search engines have significantly enabled customers to find new suppliers and easily view the range of their product and service offerings. Additionally, Internet applications have dramatically simplified the ordering process and streamlined open-order inquiry. Web-enabled communication tools have made it easy for customers and suppliers to engage in bidirectional communication, a feature that increases one-to-one personalization of the transaction experience.

Law (2018) studied the evaluation of hotel websites' quality, usability and benefits. In this study, the website evaluation is helpful in determining ways in which, and the extent to which, the website design and content achieve the aims of promoting the organization; adding value to the customers and creating customers' satisfaction, evaluating websites' quality and functionality are helpful in this context.

Harfoushi (2013) pointed out that eCRM reduces costs relating to contacting customers as well as it transfers some responsibility to the customer, which reduces administrative and operational costs for the business, therefore adding value to the business.

Therefore, after reviewing the literature in relation to website quality, usability, IS success and user satisfaction in the context of specific hotel website features, a hotel website evaluation model was generated. eCRM this concept and practice provides the ability to capture, integrate, and distribute data gained at the organization's web site throughout the enterprise. In spite of the growing popularity, very little is known about this concept as a strategy as well as an enterprise wide application. This research objective is to enhance the existing knowledge of the eCRM trend by providing useful guidelines for the efficient integration of eCRM. The researchers depart from the point of view that the key to successfully managing customer relationships lies in the ability to integrate existing CRM processes with e-CRM applications.

DeLone and McLean IS success model

The DeLone and McLean IS success model was developed by DeLone and McLean (1992) to evaluate IS success and provides a basis for future research. DeLone & McLean (2003) have since updated this model to include research conducted between 1992 and 2003, see figure 1 revised DeLone and McLean IS success model. The variables displayed in figure 2, adopted DeLone and McLean IS success model, represent the variables used in this study. The primary differences between the original and updated models included:

(1) The service quality variable is added to show the importance of service and support in successful e-Commerce systems.

(2) Adding a measurement for user attitude, i.e. intention to use, and

(3) Organizational and individual impact flops lead to a greater ungenerous final performance construct. The categories of the updated taxonomy were system, information, and service quality, intention to use, use, user satisfaction, and net benefits.
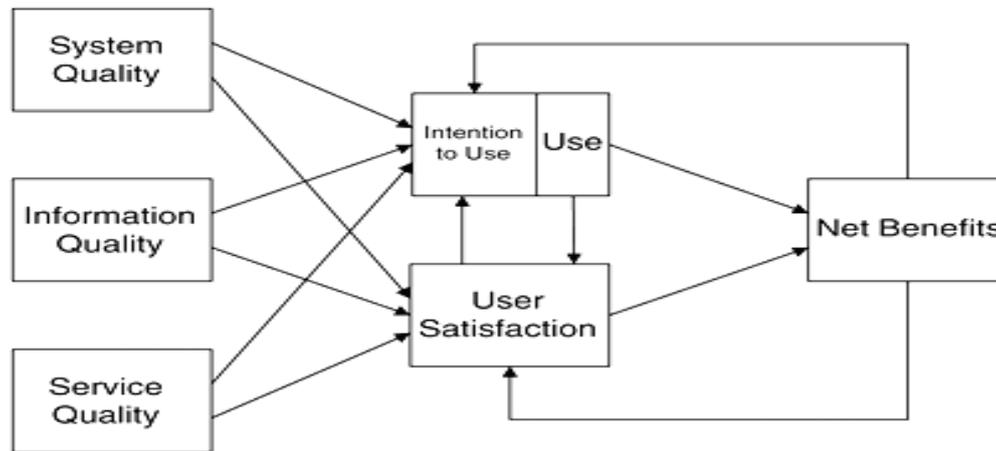
Figure 1: DeLone and McLean's IS Success Model
(DeLone and McLean (2003), Figure 3, p. 24)

The above model of DeLone and McLean (2003) includes six types of factors; system quality, information quality, service quality, intention to use/ use, user satisfaction, and net benefits. This research work is to study six factors from the model; system quality, information quality, service quality, user satisfactions (repeat purchases and repeat visits), and Service performance (See Figure 2).

3. Research Model and Hypotheses

In accordance with DeLone and McLean (2003), this study proposes a comprehensive, multidimensional model of eCRM systems success (see Figure 2), which suggests that system quality, information quality, service quality, user satisfactions included repeat purchases and repeat visits, and service performance are success variables in eCRM systems.

Thus, the following hypotheses are proposed:

H1: There is a significant, positive relationship between system quality and repeat purchases.

H2: There is a significant, positive relationship between system quality and repeat visits.

H3: There is a significant, positive relationship between Information quality and repeat purchases.

H4: There is a significant, positive relationship between information quality and repeat visits.

H5: There is a significant, positive relationship service quality and affect repeat purchases.

H6: There is a significant, positive relationship between service quality and repeat visits.

H7: There is a significant, positive relationship between repeat purchases and repeat visits.

H8: There is a significant, positive relationship between repeat purchases and service performance.

H9: There is a significant, positive relationship between repeat visits and service performance.

H10: There is a significant, positive relationship between service performance and repeat purchases.

H11: There is a significant, positive relationship between service performance and repeat visits.
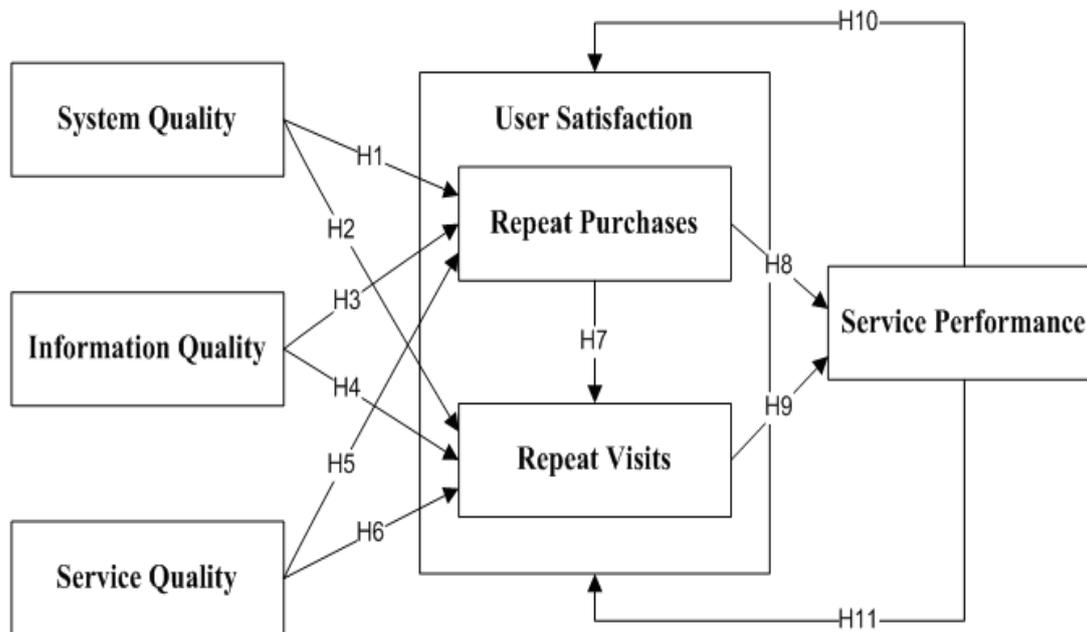
Figure 2: Research Model (Adopted from D&M IS Success Model
(DeLone & McLean, 2003)

4. Research Methodology

Literature reviews provides insights in assessing the results of empirical studies; however, they alone are unable to determine the strength of the relationship among the variables in the model. DeLone and McLean IS success model is a quantitative approach that aggregates research studies and takes into account the error inherent in all quantitative studies; it is a useful technique to reconcile conflicting results among research studies and to conclude about the data that have been measurement in information systems in the hotel success.

Population and sample

The unit of analysis is the information systems function in a Thai hotel sector organization. The study was conducted in five provinces in the northern part of Thailand. The sample was comprised of users who used eCRM Systems in the hotel sector of Thailand. The sample included 400 users who used eCRM systems in hotels. A total number of 241 completes were obtained to provide a response rate of 60.25 percent (241 out of 400 samples of population). Response rate based on the click through may represent a better measure for email surveys, because many bulk emails send out in this style end up as spam in the respondents' email and may never be retrieved or viewed by the target respondent.

Analyzing data

This research was survey based, used online questionnaires for collecting data. The end user survey collected data of the system quality, information quality, service quality, repeat purchases, repeat visits and service performance variables. The data was analyzed by using a statistical analysis software package. The statistics were used for percentage, mean, standard deviation, and multiple regressions. The measures for eCRM characteristics, relevant literature is reviewed to generate items for the eCRM characteristics scale.

Reliability of Measurement Instrument

In this study, several steps were taken to maximize the reliability of the data. First, the returned questionnaires were checked for completeness. All acceptable questionnaires were assigned with an identification number. The reliability of instrument is within the range of previous studies. Table 1 shows the Cronbach's Alpha coefficients for the measurement instrument. The reliability of all instruments is within 0.90, which indicates that all items are excellent.

Table 1: Validity and reliability analysis

Constructs	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Information quality	29.724	0.876	0.965
System quality	29.000	0.914	0.961
Service quality	28.449	0.940	0.958
Repeat purchases	28.156	0.895	0.963
Repeat visits	28.473	0.866	0.966
Service performance	28.601	0.903	0.962

Data analysis and results

Table 2 presents descriptive statistics of the study's sample. The gender of the majority of the respondents is female, comprising 66.4% (160 persons) with the remaining 33.6% (81 persons) being male. The highest percentage of 52.7% or 127 persons is the participant's age group of eCRM users between 21-30 years. 50.6% or 122 of the participants indicated they earned a bachelor degree. 192 or 79.7% of participants knew eCRM from search engine. The largest group of respondents used eCRM for viewing or searching a hotel, while the second largest group (64 or 26.6%) used eCRM for checking rates.

Table 2: Personal information results

Category	Range	Number of Respondent	Percent of Respondent
Gender	Male	81	33.6
	Female	160	66.4
Age	15-20 years	3	1.2
	21-30 years	127	52.7
	31-40 years	79	32.8
	41-50 years	24	10
	Above 50 years	8	3.3
Education	High school	5	2.1
	Diploma	10	4.1
	Bachelor degree	122	50.6
	Master	87	36.1
	PhD	16	6.6
	Other	1	0.4
eCRM known	Websites with hotel business	153	63.5
	Magazines, books	113	46.9
	TV, radio	35	14.5
	Search Engine	192	79.7

Category	Range	Number of Respondent	Percent of Respondent
	Ask friends or acquaintances	97	40.2
eCRMGoods/Services	Check rates	64	26.6
	Reservation	13	5.4
	Payment	1	0.4
	To view or search the hotel	149	61.8
	The location of the hotel	11	4.6
	To communicate with the hotel	4	1.7

5. Hypothesis Testing Results

Multiple regression analysis was used in this study. Table 3 shows the hypothesis testing results of the multiple regression analysis. The results of the entry of system quality affect positively and significantly ($p < .001$) repeat purchases. It contributes positively and significantly to repeat purchases and explains 76% of the variance (R^2) in the repeat purchases by the F Change test, F($1, 239$) $= 737.079, p < .001$. As a result, the greater system quality, greater will be their repeat purchases ($\beta = 0.869$, t $= 27.149, p < .001$). Summaries the results of multiple regression of the entry of system quality affect positively and significantly ($p < .001$) repeat visits. It contributes positively and significantly to repeat visits and explains 55% of the variance (R^2) in the repeat purchases by the F Change test, F($1, 239$) $= 294.695, p < .001$. Thus, the greater system quality, greater will be their repeat visits ($\beta = 0.743$, t $= 17.167, p < .001$).

The result of the entry of information quality affects positively and significantly ($p < .001$) repeat purchases. It contributes positively and significantly to repeat purchases and explains 68% of the variance (R^2) in the repeat purchases by the F Change test, F($1, 239$) $=504.715, p < .001$. As a result, the greater information quality, greater will be their repeat purchases ($\beta = 0.824$, t $= 22.466, p < .001$). Information quality significantly ($p < 0.001$) impacts repeat visits. It contributes positively and significantly to repeat visits and explains 70% of the variance (R^2) in the repeat visits by the F Change test, F($1, 239$) $= 559.273, p < .001$. Thus, the greater information quality, greater will be their repeat visits ($\beta = 0.837$, t $= 23.649, p < .001$).

Service quality significantly ($p < .001$) affects repeat purchases. It contributes positively and significantly to repeat purchases and explains 61% of the variance (R^2) in the Repeat purchases by the F Change test, F($1, 239$) $= 372.409, p < .001$. Therefore, the greater service quality, greater will be their repeat purchases ($\beta = 0.780$, t $= 19.298, p < .001$). And, the results of multiple regression of the entry of service quality significantly ($p < .001$) affect repeat visits. It contributes positively and significantly to repeat visits and explains 71% of the variance (R^2) in the repeat visits by the F Change test, F($1, 239$) $= 587.135, p < .001$. Hence, the greater service quality, greater will be their repeat visits ($\beta = 0.843$, t $= 24.231, p < .001$).

Table 3 also shows the results of the entry of repeat purchases affect positively and significantly ($p < .001$) repeat visits. It contributes positively and significantly to repeat purchases and explains 68% of the variance (R^2) in the repeat purchases by the F Change test, F($1,239$) $= 513.562, p < .001$. Hence, the greater repeat purchases, greater will be their repeat visits ($\beta = 0.826$, t $= 22.662, p < .001$).

Table 3 presents the results of the entry of repeat purchases affect positively and significantly ($p < .001$) service performance. It contributes positively and significantly to repeat purchases and explains 68% of the variance (R^2) in the repeat purchases by the F

Change test, $F(1, 239) = 510.037, p < .001$. Thus, the more repeat purchases greater will be their service performance ($\beta = 0.825, t = 22.584, p < .001$). The results of the entry of repeat visits affect positively and significantly ($p < .001$) service performance. It contributes positively and significantly to repeat visits and explains 75% of the variance (R^2) in the repeat visits by the F Change test, $F(1, 239) = 729.836, p < .001$. Thus, the greater, repeat visits greater will be their service performance ($\beta = 0.868, t = 27.015, p < .001$).

Furthermore, Table 3 illustrates the results of the entry of service performance affect positively and significantly ($p < .001$) service performance. It contributes positively and significantly to service performance and explains 68% of the variance (R^2) in the service performance by the F Change test, $F(1, 239) = 510.037, p < .001$. Thus, the greater, service performance greater will be their repeat purchases ($\beta = 0.825, t = 22.584, p < .001$). And, the results of the entry of service performance affect positively and significantly ($p < .001$) repeat visits. It contributes positively and significantly to service performance and explains 75% of the variance (R^2) in the service performance by the F Change test, $F(1, 239) = 729.836, p < .001$. As a result, the greater, service performance greater will be their repeat visits ($\beta = 0.868, t = 27.015, p < .001$).

From the above discussion, it can be concluded that system quality, information quality, and service quality affect user satisfaction of repeat purchases and repeat visits and repeat purchases and repeat visits (user satisfaction) affect service performance, thus the 11 hypotheses are supported.

Table 3: Hypotheses Testing Results

Hypothesis	N = 241, df = 1				
	R^2	F-value	β	t-value	Result
H1: System Quality and Repeat Purchases	0.755	737.079	0.869*	27.149	Supported
H2: System Quality and Repeat Visits	0.552	294.695	0.743*	17.167	Supported
H3: Information Quality and Repeat Purchases	0.679	504.715	0.824*	22.466	Supported
H4: Information Quality and Repeat Visits	0.701	559.273	0.837*	23.649	Supported
H5: Service Quality and Repeat Purchases	0.609	372.409	0.780*	19.298	Supported
H6: Service Quality and Repeat Visits	0.711	587.135	0.843*	24.231	Supported
H7: Repeat Purchases and Repeat Visits	0.682	513.562	0.826*	22.662	Supported
H8: Repeat Purchases and Service Performance	0.681	510.037	0.825*	22.584	Supported
H9: Repeat Visits and Service Performance	0.753	729.836	0.868*	27.015	Supported
H10: Service Performance and Repeat Purchases	0.681	510.037	0.825*	22.584	Supported
H11: Service Performance and Repeat Visits	0.753	729.836	0.868*	27.015	Supported

Notes: Supported hypothesis at *p<0.001

6. Conclusion and Future Recommendations

Of the theoretical models, DeLone and McLean's (2003) model is one of the most comprehensive models as it received the most support from subsequent empirical studies. As a result, the current study used this model as the conceptual foundation for this research. The study's research question was: to what extent is DeLone and McLean IS success model applicable in eCRM of Thai hotel sector. 400 eCRM users in five provinces in the north part of Thailand were selected as the study's sample. An online survey questionnaire was chosen to collect data. A total of 241 usable questionnaires were obtained. Correlation analysis and regression analysis were used to analyze the study's model due to the applied nature of the research.

The correlation analysis was first used to analyze Delone and McLean IS success model. Findings indicated that there were significant direct associations among system quality, information quality, service quality, repeat purchases, repeat visits, and service performance.

Contribution of this study is analyzing and applying a model, a set of instruments, and a research process from the United States in an Eastern country (Thailand). This study arrived at the applicability of the use of the DeLone and McLean IS success model in Thai hotel sector.

This study has several implications for future research suggested by the findings. First, future research may analyze the applicability of the DeLone and McLean IS success model in different types of organizations and other societies. Second, the sample in this study was small. The data analysis was based on a total of 241 usable questionnaires. Organization impact had to be dropped due to the small sample in this study. Confirmatory factor analysis and structural equation modeling cannot be used due to the small sample size and we could attempt only an application of the model using correlation and regression analyses. Finally, future research could employ qualitative methods to obtain the benefits of triangulation. For example, actual observation of the use of eCRM or interviewing eCRM users may give valuable insights regarding their satisfactions with eCRM systems.

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