Evaluation Information System Success: Applied DeLone and McLean Information System Success Model in Context Banking System in KSA

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Abstract

This paper aims to expand the understanding of information system success dimensions as a critical factor through which information systems spread its influences on the banking success. This research empirically investigated the IS success evaluations in the banking sector in Saudi Arabia. By adopting information systems success (DeLone and McLean) model as for assessing the IS success in the banking system. The study will use a survey instrument to collect data to test the relationships shown in the research model. The sample of this study consisted of employees of the banking sector in KSA. Only 145 questionnaires used for analysis at 38% of total respondents. The study adopted measurement items from related studies of IS success. Different data analysis techniques will be used to validate the IS-Success model.The finding of the study provides empirical support for the existence of a positive relationship between the dimensions of IS success model.IS quality dimensions (information system, system quality, service quality) have a significant positive influence on user satisfaction and use. Just information quality has a significant positive influence on intention to use, but system quality and service quality, not signification. Also use and intention to use have a significant positive influence on user satisfaction. Finally user satisfaction, Use, and intention to use have a significant positive influence on net benefit.

Key Words: Information System, Success, Banking System, IS Model, KSA.

Introduction

The banking information system grows rapidly. Information systems (IS) Investments have a significant impact on the banking industry. IS plays a critical role in providing better services and competitive advantage. It is a challenge for the organization to continuous improvement the information systems success in the banking.

Organizations have a heavy investment in information systems (IS) to a chive benefit from these systems. The organizations are concerned with the evaluation, and to find out the impact of these systems on them as well as on individuals (Gable et al.,2008).

The failure of information systems (IS) is a major issue for the organization, that lead to over cost, over time, and not achieving their strategic objectives and goals miss competitive advantage. According to Chaos report, "the United States spend more than $250 billion each year on IT application development.

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The average cost of a development project for all size a company is 3,687,000. A great many of these projects will fail. The Standish Group research shows a staggering 31.1% of projects will be canceled before they ever get completed. Further results indicate 52.7% of projects over cost ". (The Standish Group research report chaos ,2015). Despite such failures, vast sums continue to be invested in IT projects. Amount of spending in 2016 the information technology (IT) forecast to total US$3. 54 trillion. (Mkoba & Marnewick,2016).

Evaluating the success of information systems is one of the critical issues in information systems field. The measurement of IS success is important for assessing the effectiveness of IS and to justified IS investments. It is argued, "If information systems research is to make a contribution to the world of practice, a well-defined outcome measure (or measures) is essential" (Delone & Maclean,1992 p. 61).

There is little agreement among researchers on how best to measure the impact of IS in organizations (Gable et al. ,2008). Sabherwal et al. (2006 p. 1849) observe, "Despite considerable empirical research, the results of the relationships among constructs related to information systems (IS) success, as well as the determinants of IS Success, are often inconsistent." A range of concerns with past attempts to measure IS Success have been suggested, including - poor measurement (DeLone & McLean 1992; 2003).

Despite many studies about IS success still organization facing a challenge by the lack of unified instruments to measure IS success, poor evidence to justify investment in IS, and which are factors lead to IS success. Still, managers need of further exploration is the information systems success in the banking sector. The work by DeLone and McLean was the earliest attempt to organize efforts at measuring IS performance. While there is strong evidence that the DeLone & McLean IS success model can explain and predict the factors that contribute to the success of IS. So still need to explore the relationship between success variables, Petter al et. said:" The IS field still suffers from a lack of research studies that test associations between success factors and the positive organizational effects or an outcome provided by specific IS" (Petter et al. 2013 p. 43).

A few study as test IS success model as empirical study such as Wang et al.(2011). Many scholars test meat analysis IS success model and test all relationship between dimensions as Petter &McLean (2009) , Petter et al.(2008), were found majority hypothesis supported .another study by Petter et al. (2013) indicate mixed results for relationship between dimensions of IS success model in meta analysis study found mixed results . On other hands , other study a model as partial such as Sedera et al.(2004), Lee(2012). Whereas a most studies tested IS success model through modified and extended IS model .

The main objective of IS research is Investigating the variables that find out the value of information systems (IS) in organizations . This study is being conducted to answer the following questions: What factors that affect the success of the banking system? Can it help us understand the relationship between the model variables as it exists in the banking sector? Is the model to measure IS success proposed in this study valid and reliable to evaluate banking systems from different points of view of users?

This paper aims to broaden the understanding of information system success dimensions as a critical factor through which information systems spread its influences on the banking success. In the context of Saudi Arabia (KSA) banking, and to measure the success of information systems in the banking sector using a DeLone & McLean IS success model (2003) as the theoretical framework

The objectives of the Study

This study proposes and tests an evaluation model that can be used to evaluate the success of information systems from the users' perspective. To reach this end, the following objectives were proposed:

1) Apply the DeLone & McLean (D& M) IS Model (2003).
2) Testing of the DeLone & McLean (D & M) IS Model empirically within the context of the banking sector.
3) Determine the effects of information system success dimensions in the banking sector.
4) Contribute new knowledge on the information systems role in the banking sector.
5) Verifying the proposed model based on the findings of the research to ensure its validity and reliability.

Theoretical Background

In this section, an attempt has been made to provide a brief overview of the IS success model and banking sector in KSA. A brief literature review would suffice as our research is applied in nature.

The DeLone and McLean IS Success Model (IS success models)

Researcher adopted IS success model because of the most comprehensive model used as a theoretical framework to study information systems success as to measure IS evaluation in IS field.In 1992, DeLone & McLean developed Information Systems (IS) success model as a comprehensive framework for measuring the performance of information systems (DeLone & McLean, 1992). This model consists of six interrelated dimensions of information systems success: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact.

The model is to be interpreted in the following ways: "Systems Quality and Information Quality singularly and jointly affect both use and user satisfaction. Additionally, the amount of USE can affect the degree of user satisfaction – positively or negatively -- as well as the reverse being true. Use and user satisfaction are direct antecedents of individual impact; and lastly, this impact on individual performance should eventually have some organizational impact" (Delone & Maclean 1992 P 83-87).

Based on the suggestions from some researchers, DeLone & McLean (2003) updated IS Success Model.Which is consists of six interrelated dimensions of information systems success: System quality (SQ), Information quality (IQ), Service quality (SerVQ), Use, intention to use User satisfaction, and Net benefits. The updated model, presented in Figure 1.
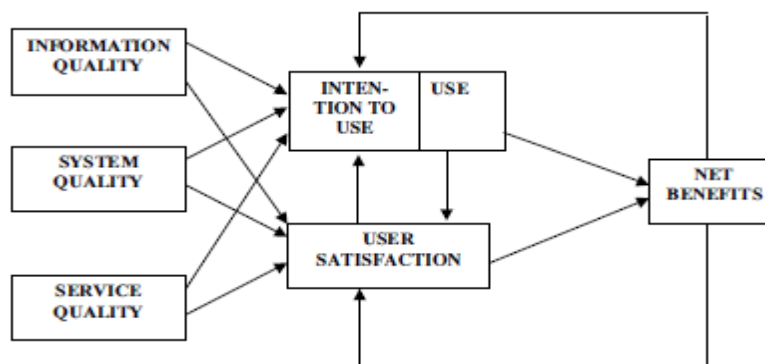

Figure 1. Updated DeLone & McLean IS Success Model (source: DeLone & McLean, 2003 P.33)

The primary improvements to the original model include (a) the addition of service quality to reflect the importance of service and support in successful IS systems, and (b) the collapsing of individual impacts and organizational impacts into a more parsimonious net benefits construct (DeLone & McLean ,2003P.32).

In the IS success model the dimensions of success included the following variables:

1: Information Quality

Information quality defined as "Desirable characteristics of the system outputs "Petter et al., 2013 p. 11). Information quality defined as "the desirable characteristics of the system outputs; that is, management reports and Web pages. For example, relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness, and usability "(Petter et al. ,2008 P.239). So that IQ is the output of the system that meets user needs and wants.

Information quality was measured in many terms the researcher summary based on rate of recurrence is IS research as following:

Accuracy (DeLone & McLean (1992); Petter & McLean (2009); Petter et al. (2013); Jaafreh (2012); Bailey & Pearson (1983); Lee (2012); Gable et al. (2008)). Availability(Petter et al. (2008); Sedera et al.(2004); Gable et al.(2008); Urbach & Müller (2011)). Completeness (DeLone & McLean (1992); DeLone & McLean (2003); Petter et al.(2013); Petter & McLean (2009); Jaafreh(2012); Bailey & Pearson (1983) ;Urbach & Müller (2011)). Conciseness (DeLone & McLean (1992); Petter et al. (2008); Petter et al. (2013); Urbach & Müller (2011); Sedera et al.(2004); Gable et al.(2008)). Format (DeLone & McLean (1992); Petter et al. (2008); Urbach & Müller (2011); Jaafreh (2012); Sedera et al. (2004); Gable et al.(2008); Bailey & Pearson (1983)). Precision (DeLone & McLean (1992); Petter et al.(2013); Urbach & Müller (2011); Bailey & Pearson (1983)). Relevance (DeLone & McLean (1992; 2003); Petter et al. (2008); Petter et al.(2013); Urbach & Müller (2011); Jaafreh (2012); Sedera et al. (2004); Gable et al. (2008); Bailey & Pearson (1983)). Reliability(DeLone & McLean (1992); Urbach & Müller (2011); Bailey & Pearson (1983)). Timeliness (DeLone & McLean (1992); Petter & McLean (2009); Petter et al. (2013) ; Jaafreh(2012); Urbach & Müller (2011);Bailey & Pearson (1983); Gable et al. (2008)). Understandability (DeLone & McLean (1992); Petter et al. (2008); Petter et al. (2013); Urbach & Müller (2011); Sedera et al.(2004); Gable et al.(2008)).

2: Systems Quality (SQ)

SQ as Technical side in IS model. DeLone & McLean (1992) defined SYSTEM QUALITY as: "the desired characteristics of the information system itself, which produces the information "(P.62). Also, System quality is: "Desirable characteristics of an IS. Ease of use, system flexibility, system reliability, and ease of learning, as well as intuitiveness, sophistication, flexibility, response time"(Petter et al.,2013). The researcher has adopted measurement of SQ and summary based on rate of recurrence is IS research as following :

Accuracy system (DeLone & McLean (1992); Petter et al. (2008); Gable et al. (2008); Sedera et al. (2004); Urbach & Müller (2011)). Adaptability & Availability (DeLone & McLean ,2003). Currency(DeLone&McLean (1992); Urbach & Müller (2011); Gable et al. 2008)). Ease of learning (DeLone & McLean (1992); Petter et al. (2013); Petter et al. (2008); Urbach & Müller (2011); Sedera et al.(2004); Gable et al. (2008)). Ease of use (DeLone & McLean (1992); Petter et al.(2008); Petter & McLean (2009); Petter et al.(2013); Urbach & Müller (2011); Sedera et al. (2004); Gable et al. (2008)). System features (Sedera et al. (2004); Urbach & Müller (2011); Petter et al. (2008); Gable et al. (2008)). Flexibility of system (DeLone & McLean (1992); Petter et al. (2008); Lee (2012);Petter et al.(2013);Urbach & Müller (2011); Sedera et al.(2004); Gable et al.(2008)). Integration of systems (DeLone & McLean (1992); Petter et al. (2008); Sedera et al.(2004); Gable et al.(2008); Bailey & Pearson (1983); Urbach & Müller (2011)).Reliability(DeLone & McLean (1992);DeLone & McLean (2003); Petter & McLean (2009); Petter et al. (2013); Urbach & Müller (2011);Gable et al. (2008)). Response time (DeLone & McLean (1992; 2003); Petter et al. (2013); Urbach & Müller (2011); Bailey & Pearson (1983)).

Accessibility(DeLone & McLean (1992 2003); Gable et al. (2008)). User friendly (Eldrandaly et al. (2015); Seddon & Kiew (1996)).

3: Service Quality

The third items in IS model are Service quality. Service quality defined as: "Quality of the service or support that system users receive from the IS organization and IT support personnel in general or for a specific IS. For example; Responsiveness accuracy, reliability, technical competence, empathy of the personal stuff" (Petter et al.,2013,P.11). Service quality refers" to the service quality provided by the IS department across all of its services" (Petter et al.,2013,P.30).

The researcher has adopted measurement of service quality based on rate of recurrence is IS research which is : Assurance , Empathy , Reliability, Responsiveness , and Tangibles(Parasuraman et al. (1985; 1988); DeLone & McLean (2003); Urbach & Müller (2011); Petter et al. (2013))

4: User Satisfaction

A common dimension in the IS model that used by most scholars to evaluate IS success.

Petter et al.(2013) defined User Satisfaction as: "Users' level of satisfaction with the IS. Single item to measure user satisfaction, semantic differential scales to assess attitudes and satisfaction with the system, multiattribute scales to measure user information satisfaction "(P.11). Delone & McLean (1992) defined User Satisfaction as: "recipient response to the use of the output of an information system" (P. 68). The researcher has adopted measurement of User Satisfaction based on rate recurrence in IS studies ,which as Overall satisfaction with IS applications (DeLone & McLean (1992); Petter et al. (2013); Petter & McLean (2009); Eldrandaly et al.(2015); Urbach & Müller (2011)), User information satisfaction (DeLone & McLean (1992), and Overall satisfaction as singles meatueemnt (Delone & Maclean (1992;2003); Gable et al. (2008) Seddon & Kiew (1996))

5: System use and Intention to use

The system uses as a success variable. Use is a behavior, while Intention to Use is an attitude. And the use is action by the user to operate and learning of IS.

Petter et al. (2013) defined" Intention to Use, or the users' belief about their likelihood to use the IS" (p. 31). Also, Petter & McLean (2009) defined "Intention to Use Expected future consumption of an IS or its output" (p. 161.) The most studied explain Intention to Use as is the user's attitude toward IS (Petter et al. 2013). System use refers to "Use Consumption of an IS or its output described in terms of actual or self-reported usage" (Petter & McLean ,2009 ,p.161.) System use is defined as: "the degree and manner in which staff and customers utilize the capabilities of an information system. For example amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use" (Petter et al.,2008, p. 239)

The researcher has adopted measurement of Intention to use and System Use based on rate recurrence in IS studies ,which as Frequency of use ,and Amount of use (DeLone & McLean (1992); Petter et al. (2013); Urbach & Müller (2011)), Number of reports generated or self-reported usage(DeLone & McLean (1992);Petter & McLean (2009)), Enjoyment(DeLone & McLean (1992); Petter et al.(2013)), Expected future consumption of an IS or its output,and willing to use (Petter & McLean,2009), and Number of requests for information for specific reports (DeLone & McLean,1992) .

6: Net Benefits

DeLone & MacLean (2003) grouped the two dimensions which are Individual impact and organization impact into one and called it Net Benefit. Net Benefits "Extent to which IS are contributing to the success of individuals, groups, organizations, industries, and nations". Improved decision making, improved productivity, increased sales, cost reductions, improved profits, market efficiency, consumer welfare, the creation of jobs, economic development (Petter et al.,2013,P.11).

Used net benefit indicated the Impacts of the IS on performance may be positive or negative. The effect IS measured in term performance, work practices, and perceived usefulness (Petter & McLean, 2009). The researcher has adopted measurement of Net Benefits based on. rate recurrence in IS research,which is: Cost reduction,Productivity improvement, Improved decision-making , and Time savings (DeLone & McLean (1992;2003); Gable et al. (2008); Petter et al. (2008); Urbach & Müller (2011); Petter et al. (2013)) .aslo researcher add Overall success as subjective measurement.

Saudi Arabian Banking Sector

The banking system in the Saudi Arabia has 12 national banks, 12 foreign banks, and 5 credit lending and financial institutions. The banking sector has a well-defined organizational structure, equipped with a reliable service network. There are 1,958 branches, 16,589 Automated Teller Machines (ATMs), and 189,727 Point of Sale (POS) machines as of August 2015.1 In 2014 and 2015, high level of Smartphone penetration has provided additional reliable channels to access mobile and internet banking services. In 2015 the number of banking sector staff are 49563 employees (Sama, 2015).

In August 2015, the total monetary assets for all the banks, including Sama, are estimated at United States Dollar (USD) 1.1 trillion, and the total assets owned by the Saudi Arabian commercial banks are valued at USD 588.9 billion. So that there are several attractive investment high-return investment opportunities within the Saudi Arabian banking sector (Sama, 2015).

 On the technological front, the Saudi Arabian banking sector has adopted innovative banking channels, well-developed and robust payment systems, and seamless information sharing systems. The total value of transactions in SARIE (Saudi Arabian payment system) has grown tremendously by 600% since 2003, to USD 14.4 trillion in 2014. (Sama 2015).

The banking sector has encouraged the implementation of advanced technology and the international policy standards to enable seamless trade with the global markets. The bank adopts most advanced technologies and provides innovative methods for accessing banking services (Sama, 2015).

In the modern banking era, adoption of advanced Information Technology (IT) systems are mandatory to reach out to a customer base that is increasingly characterized by the global digital revolution. The objective is to implement secure and accurate banking systems in a cost-effective way. Fast-growing penetration of broadband and mobile internet growth has opened a reliable channel for banks, to provide banking services for a larger market. The rapid adoption of technology has created demand for advanced technological tools and systems. With a rapid growth in the use of mobile and internet banking, the skill set that is of growing demand is a combination of financial knowledge and technology expertise to be able to cope with technological advancement.

Currently, banks remain profitable, however, in 2015 and beyond whereas Low oil prices, decline in oil-related exports; declining profits will intensify competition and encourage banks to adopt new technologies to grow sustainably in a cost-effective way (Sama, 2015).

Finally, the banking sector will focus on maximizing the reach by incorporating advanced technologies and offering innovative products. The Saudi Arabian banking sector will further improve monitoring and reporting systems, by incorporating new technology and reliable information exchange systems.

Conceptual Research Model and Hypothesizes

The Research Model

This study adopted information systems success (DeLone & McLean) model as for assessing the IS success in the banking system. In particular, the proposed model adopts all quality dimensions of the IS success model. as System quality, information quality and service quality, use, user satisfaction, and net benefits to the bank. Researcher adopted IS success model because of the most comprehensive model used as a theoretical framework to study information systems success model to measure IS evaluation in IS field. A theoretical framework to test information systems success shown above in figure 1.

Hypothesizes

Researchers have developed the following suggested hypothesizes to test the proposed Conceptual model. As DeLone & McLean (2003) note, "IS success is a multidimensional and interdependent construct and it is, therefore, necessary to study the interrelationships among or to control for, those dimensions". Thus, the following 14 hypotheses will be tested:

H1 There is a significant, positive relationship between Information Quality and User Satisfaction
H2 There is a significant, positive relationship between System Quality and User Satisfaction
H3 There is a significant, positive relationship between Service Quality and User Satisfaction
H4 There is a significant, positive relationship between Information Quality and Use
H5 There is a significant, positive relationship between System Quality and Use
H6 There is a significant, positive relationship between Service Quality and Use
H7 There is a significant, positive relationship between Information Quality and Intention to Use
H8 There is a significant, positive relationship between System Quality and Intention to Use
H9 There is a significant, positive relationship between Service Quality and Intention to Use
H10 There is a significant, positive relationship between Use and User Satisfaction
H11 There is a significant, positive relationship between User Satisfaction and Intention to Use
H12 There is a significant, positive relationship between Use and Net Benefits
H13 There is a significant, positive relationship between User Satisfaction and Net Benefits
H14 There is a significant, positive relationship between Net Benefits and Intention to Use

Research Methods

Population and Sample

The population of this study consisted of employees of the banking sector in KSA. The banking sector consists of 29 banks, and the total of staff in the banking sector is 49563employees. The unit of analysis for this study is the employees who used IS in banks. The sample size decision in order to ensure a good decision model is 381empolyees.

Data Collection

The study will use a survey instrument to collect data to test the relationships shown in the research model. The study was conducted in KSA from January to June 2016. The survey method was required to be the most appropriate method for this study to measure the factors investigated. The questionnaires were also

translated to the native language to supply for the lower job level group who were not that conversant in English such as the administrative support staff. A five-point Likert-scale was used to represent the responses of the subjects, whereas scale from 5 (highly agree or satisfied) to 1 (highly disagree or satisfied). A total of 381 questionnaires was distributed, As a result, 194 were returned, giving a 51% response rate. But only 145 questionnaires used for analysis at 38% from total questionnaires.

Measurement of the Variables

The study used perceptual measures to capture data on IS success and technological factors. A criterion for selection of constructs is that they have been employed frequently in IS research as a measure of IS success. The specific constructs included for measurement in the questionnaires are summarized in the previous Table, but most theses studied depended on few studied which is a mention below.

Based on DeLone & McLean's recommendations, the study adapted measurement items from related studies of IS success. System quality was measured using thirteen items adopted from DeLone & McLean (1992;2003), Gable et al.(2008)and Sedera et al. (2004): Accuracy system, Ease of learning, Ease of use, Accessibility, Flexibility of the system, And Integration of systems. Five items from DeLone & McLean (1992;2003): Adaptability, Availability, currency, Reliability, Response time. And from Sedera et al. (2004) and Petter et al. (2008): System features. Finally user-friendly from Seddon & Kiew (1996). Information quality adopted eleven items, whereas eight items from DeLone & McLean (1992) and; Bailey & Pearson (1983): Accuracy, Completeness, Format, Precision, Relevance, Reliability, and Timeliness. Understandability and Conciseness from DeLone & McLean (1992); Petter et al. (2008) and Petter et al. (2013). Clearly from DeLone & McLean (1992) and Seddon & Kiew (1996). Finally, Availability from Petter et al. (2008); Sedera et al. (2004) and Gable et al.(2008). Each scale was measured as proposed by the source authors.

Service quality adopted five items from Parasuraman et al. (1985; 1988), DeLone & McLean (2003): Assurance, Reliability, Responsiveness, Tangibles, And Empathy. User satisfaction will be measured using the three items and adopted from User information satisfaction (DeLone & McLean 1992), Overall satisfaction Gable et al. (2008), Seddon & Kiew (1996)), and Overall satisfaction with IS applications (DeLone & McLean (1992); Petter et al. (2013); Petter & McLean (2009); Seddon & Kiew (1996)). The user constructs (intention to use) measured by five items: Frequency of use, Enjoyment (DeLone & McLean (1992); Petter et al.(2013), Amount of use (Petter et al.,2013), Number of reports generated or requests for information for specific reports (DeLone & McLean (1992); Petter & McLean (2009)), and Expected future consumption of an IS or its output (Petter & McLean, 2009) and willing to use (Petter & McLean ,2009).

Finally, Net Benefit adopted five items to measure, whereas three adopted from DeLone & McLean (1992), Petter et al. (2008), and Sedera et al. (2004): Cost reduction, improved decision making, and Productivity improvement. And Time savings from DeLone & McLean (1992; 2003), and finally the researcher suggested items Overall success to measure success in general. Besides the above items, demographic factors (age, gender, educational level, job level, experience).

Data Analysis and Result

Different data analysis techniques will be used to validate the IS-Success model. For example, the reliability of all instruments will be measured using Cronbach's alpha coefficient. Additionally, Person's correlation coefficients will be used to assess whether or not there are significant direct associations between the constructs of the model. Finally, regression analysis will be used to further validate the relationships between the model's construct.

Reliability of the study tool

The data collection instrument of this study is designed based on previous studies, namely, Delone & Maclean (1992; 2003), Bailey & Pearson (1983) and other studies. In addition, to maintain the validity of the instrument, it was by expert panels including faculty members.

Alpha test for assessing reliability is conducted in this part of the study using the all the questions in the questionnaire. This test is mainly conducted to assess the consistency of the instrument. Cronbach's Alpha Equation of internal consistency was used to calculate the reliability of each tool for the study. Results are shown in below table.

Table 1. Reliability coefficients for each tool of the study

Items	Cronbach's Alpha
Information quality	.921
System quality	.924
Service quality	.924
Use	.925
Intention to use	.928
Satisfaction	.928
Net benefit	.940

The results indicate that the reliability coefficients for the dimensions of information system success ranged between (0.921-0.940), and the overall was (0.941). These values are considered acceptable for the purposes this study. If alpha is high (0.70 or higher), then this suggests that all of the items are reliable and the entire test is internally consistent.

Demographic Analysis

Descriptive Statistic Measures: used to describe the characteristics of the study sample. A summary of the demographic characteristics is shown in below Table.

Table 2. The demographic characteristics (N=145)

		Frequency	Percent
Gender	Male	128	88.3
	Female	17	11.7
Age	Less than 20 years	19	13.1
	20 – 30	36	24.8
	31 – 40	41	28.3
	41 – 50	33	22.8
	More than 50	16	11.0
Educational level	High school	8	5.5
	Diploma	26	17.9
	Bachelor's	90	62.1
	Postgraduate	21	14.5
Experience	Less than 1 year	26	17.9
	1 year to less than 5 years	38	26.2
	5 years to less than 10 years	55	37.9
	10 and more	26	17.9

Table (2) shows the distribution of the received sample according to gender (Men 88% and Women 12%) and educational level. The university degrees (undergraduate and postgraduate) represent 67% of the sample. Respondents to age ranged from 19 to more than 50 years of age approximately 33% above 40years, 53% between 20 to 40 years .And Respondents about experience approximately 56% above of 5 years, and 44% less than 5 years.

The Person's correlation coefficients will be used to assess whether or not there are significant direct associations (correlation) between the constructs of the model. The results are shown in below table that the correlation coefficients are between 0.240 and 0.949; it means that there is a positive correlation between framework variables as shown in below table. The correlation among variables is positive and statistically significant.

Table 3.   The correlation coefficients between the variables

		Net benefit	IQ	SQ	ServQ	Use	Intention to USE	user Satisfaction
Pearson Correlation	Net benefit	1.000						
	IQ	.366**	1.000					
	SQ	.403**	.949**	1.000				
	ServQ	.401**	.920**	.946**	1.000			
	Use	.446**	.871**	.876**	.800**	1.000		
	Intention to USE	.240**	.951**	.906**	.879**	.831**	1.000	
	User Satisfaction	.632**	.767**	.773**	.749**	.776**	.715**	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in the above table, the correlation matrix indicates that the highest coefficient of correlation in this research between Information quality and intention to use is 0.906. There was a significant positive relationship between Information quality and Intention to USE ($r = 0.906$, $n = 145$, $p \leq 0.01$). The weakest correlation was for intention to use and net benefit ($r = 0.240$, $n = 145$, $p \leq 0.01$).

Testing the Hypotheses

Multiple Regression Analysis: used to test the validity of the study model and the impact of the independent variable on the dependent variable. And to test the hypothesized associative relationships. Stepwise Multiple Regression Analysis: used to test the entry of independent variables in the equation to predict the dependent variable.

The multiple regression analysis was used to further explain the significance of the independent and dependent variables. Whereas, R^2 and its adjusted variant (R^2adj) were used to assess the total contribution of the independent variables. The ANOVA table presented the F-test and level of significance for each step generated, reporting the degree to which the relationship was linear. Finally, the set of coefficients was examined to consider the standardized coefficients (ß), the t values and significance values. And significance level of the path coefficients. Whereas the size of the Beta, weights indicate the strength of their independent relationships.

The relationship between IS quality with User Satisfaction, which is:

H1 There is a significant, positive relationship between Information Quality and User Satisfaction
H2 There is a significant, positive relationship between System Quality and User Satisfaction
H3 There is a significant, positive relationship between Service Quality and User Satisfaction

The results of the multiple regression analysis are reported in below Table.

Table 4. Multiple regression analysis of the relationship between IS quality with User Satisfaction

Model	R	R Square	Adjusted R Square	R Square Change	F Change	Sig. F Change	Standardized Coefficients Beta	Sig.	F-value	t-value
1	.773[a]	.598	.595	.598	212.75	.000	.460	.007	62.839	2.755
2	.780[b]	.609	.603	.011	3.927	.049	.331	.049	61.148	1.982
3	.749c	.561	.558	.561	182.53	0.047	.322	0.047	60.673	1.642
a. Predictors: (Constant), SQ										
b. Predictors: (Constant), SQ, IQ										
c. Predictors: (Constant), SQ, IQ, SerVQ										
d. Dependent Variable: User Satisfaction, p < 0.01; p < 0.05										

To evaluate the hypothesizes, a multiple regression analysis was conducted to determine whether there is any significant effect of the independent variables (IQ , SQ , and SerVQ) on predictors of User Satisfaction. Regression results show that the system quality, information quality, and service quality are significantly influential to customer satisfaction. Whereas Information Quality as significant predictors of User Satisfaction (R^2=.609, R^2adj=.603, and F=61.148, Sig.049) .This explains 60.9% of the variance in User Satisfaction. And System Quality as significant predictors of User Satisfaction (R^2=.598, R^2adj=.595, and F=62.839, Sig.007) .This explains 59.8% of the variance in User Satisfaction. Service quality is a significant predictor of User Satisfaction (R^2=.561, R^2adj=.558, and F=60.673, Sig.047) .This explains 56.1% of the variance in User Satisfaction.

While the system quality was shown as the most critical factor those determinants affecting customer satisfaction (ß =046, t=2.755, p<0.01). IQ is the second important variable (ß =0.331, t=1.982, p<0.01). The third dimension, service quality, has an effect on users' satisfaction (ß =0.322, t=1.642, p<0.01). So H1, H2, H3 are accepted. our results are comparable to those of Tajuddin (2015) and Jimmy (2014) , they show that the IS quality, which includes system quality, information quality, and service quality, positively impacts user satisfaction.

The relationship between IS quality with Use, which is:

H4 There is a significant, positive relationship between Information Quality and Use
H5 There is a significant, positive relationship between System Quality and Use
H6 There is a significant, positive relationship between Service Quality and Use
The results of the multiple regression analysis are reported in below Table.

Table 5. The multiple regression analysis the relationship between IS quality with Use

Model	R	R Square	Adjusted R Square	R Square Change	F Change	Sig. F Change	Standardized Coefficients Beta	Sig.	F-value	t-value
1	.876[a]	.767	.765	.767	469.621	.000	.775	.000	42.882	5.162
2	.885[b]	.782	.779	.016	10.334	.002	.481	.000	39.973	3.896
3	.892[c]	.797	.792	.014	9.786	.002	.376	.002	37.378	3.128
a. Predictors: (Constant), SQ										
b. Predictors: (Constant), SQ, IQ										
c. Predictors: (Constant), SQ, IQ, ServQ										
D. Dependent Variable: Use , p < 0.01										

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To evaluate above the hypothesizes, a multiple regression analysis was conducted to determine whether there is any significant effect of IQ, SQ, and SerVQ on Use. Regression results show that the system quality, information quality, and service quality are significantly influential to Use. Whereas system Quality as significant predictors of Use (R^2=.767, R^2adj=.765, and F=42.882, Sig.000) .This explains 76.7% of the variance in Use. Information Quality as significant predictors of Use (R^2=.782, R^2adj=.779, and F=39.973, Sig.000) .This explains 78.2% of the variance in Use. And service quality as significant predictors of Use (R^2=.797, R^2adj=.792 and F=37.378, Sig.002) (. While the system quality was shown as the most critical factor those determinants affecting Use (ß =.775, t=5.162 p<0.05). IQ is the second important variable (ß =0.481, t=3.896, p<0.01). And the third service quality (ß =.376, t= 3.128, p<0.01). So H4, H5, H6 are accepted.

The relationship between IS quality with Intention to Use, which is:

H7 There is a significant, positive relationship between Information Quality and Intention to Use
H8 There is a significant, positive relationship between System Quality and Intention to Use
H9 There is a significant, positive relationship between Service Quality and Intention to Use
The results of the multiple regression analysis are reported in below Table.

Table 6. The multiple regression analysis the relationship between IS quality with Intention to Use

Model	R	R Square	Adjusted R Square	R Square Change	F Change	Sig. F Change	Standardized Coefficients Beta	Sig.	F-value	T-value
1	.951[a]	.905	.904	.905	1363.186	.000	.951	.000	14.940	36.921
a. Predictors: (Constant), IQ										
b. Dependent Variable: intention to use , p < 0.01										

To evaluate above the hypothesizes, a multiple regression analysis was conducted to determine whether there is any significant effect of IQ, SQ, and SerVQ on Intention to Use. Regression results show that the information quality is significantly influential to Intention to Use. Whereas Information Quality as significant predictors of Intention to Use (R^2=.905, R^2adj=.904, and F=14.940, Sig.000) .This explains 90.5% of the variance in Intention to Use. While the information quality was shown as a critical factor that determinants affecting Intention to Use (ß =.951, t=36.921 p<0.01). But system quality and service quality are not significant predictors of Intention to Use. So H7 is accepted, but H8, H9 are rejected.

The hypotheses H10 and H11 tested:

 H10 There is a significant, positive relationship between Use and User Satisfaction
H11 There is a significant, positive relationship between User Satisfaction and Intention to Use
The results of the multiple regression analysis are reported in below Table.

Table 7. The multiple regression analysis of the hypotheses H10 and H11

Model	R	R Square	Adjusted R Square	R Square Change	F Change	Sig. F Change	Standardized Coefficients Beta	Sig.	F-value	t-value
1	.776[a]	.603	.600	.603	216.817	.000	.588	.000	62.129	6.321
2	.786[b]	.618	.613	.016	5.905	.016	.226	.016	59.649	2.430
a. Predictors: (Constant), Use										
b. Predictors: (Constant), Use, intention to use										
D. Dependent Variable: User Satisfaction , p < 0.01										

To evaluate above the hypothesizes, a multiple regression analysis was conducted to determine whether there is any significant effect of Use and intention to use on User Satisfaction. Regression results show that the Use and intention to use are significantly influential to User Satisfaction. Whereas use as significant predictors of User Satisfaction (R^2=.603, R^2adj=.600, and F=62.129, Sig.000).

This explains 60.30% of the variance in User Satisfaction. Intention to use as significant predictors of User Satisfaction (R^2=.618, R^2adj=.613, and F=59.649, Sig.016) .This explains 61.8% of the variance in User Satisfaction. While The Use was shown as the most critical factor those determinants affecting User Satisfaction (ß =.588, t=6.321 p<0.01). Intention to use is the second important variable (ß =0.226, t=2.430, p<0.01). So H10, H11 is accepted.

The relationship between Use, Intention to Use, and user Satisfaction With net benefit, which are:

H12 There is a significant, positive relationship between Use and Net Benefits
H13 There is a significant, positive relationship between User Satisfaction and Net Benefits
H14 There is a significant, positive relationship between Net Benefits and Intention to Use
The results of the multiple regression analysis are reported in below Table.

Table 8.   The multiple regression analysis of H12, H13, H14

Model	R	R Square	Adjusted R Square	R Square Change	F Change	Sig. F Change	Standardized Coefficients Beta	Sig.	F-value	t- value
1	.632[a]	.399	.395	.399	94.996	.000	.825	.000	137.652	8.680
2	.700[b]	.491	.483	.091	25.473	.000	.607	.000	116.714	5.642
3	.717[c]	.514	.503	.023	6.747	.010	.310	.010	111.385	2.597
a. Predictors: (Constant), User Satisfaction										
b. Predictors: (Constant), User Satisfaction, Intention to USE										
c. Predictors: (Constant), User Satisfaction, Intention to USE, Use										
D. Dependent Variable: Net benefit , p < 0.01										

To evaluate above the hypothesizes, a multiple regression analysis was conducted to determine whether there is any significant effect of Use , intention to use and User Satisfaction on net benefit . Regression results show that the Use, intention to use and User Satisfaction are significantly influential to a net benefit. Whereas User Satisfaction as significant predictors of net benefit(R^2=.399, R^2adj=.395, and F=137.652, Sig.000).

This explains 39.9% of the variance in a net benefit. Intention to use as significant predictors of net benefit (R^2=.491, R^2adj=.483 and F= 116.714, Sig.000) .This explains 49.1% of the variance in a net benefit. Use as significant predictors of net benefit (R^2=.514, R^2adj=.503, and F=111.385, Sig.010).

While The User Satisfaction was shown as the most critical factor those determinants affecting net benefit (ß =.825, t=8.680, p<0.01).   Intention to use is the second important variable (ß =0.607, t=5.642, p<0.01).and Use a third important variable (ß =0.310, t=2.597, p<0.01). So H12, H13, H14 is accepted.

Most of the hypotheses proposed are positive and significant, and the results confirm the main goals of this study. These results are consistent with the prior literature. And provide empirical support for the existence of a positive relationship between the dimensions of IS success model.

Table 9. Summary results of test of hypothesizes

H	No.	result	R Square	Sig.	Beta	Pearson Correlation
Information quality →User satisfaction	p<0.01)	Support	0.609	0.049	0.331	.767**
System quality →User satisfaction	p<0.01)	Support	0.598	0.007	0.46	.773**
Service quality →User satisfaction	p<0.01)	Support	0.561	0.047	0.322	.749**
Information quality → Use	p<0.01)	Support	0.782	0	0.481	.871**
System quality → Use	p<0.01)	Support	0.767	0	0.775	.876**
Service quality → Use	p<0.01)	Support	0.797	0.002	0.376	.800**
Information quality → intention to use	p<0.01)	Support	0.905	0	0.951	.951**
System quality → intention to use		Not	-	0.551	-	.906**
Service quality → intention to use		Not	-	0.581	-	.879**
Use →User satisfaction	p<0.01)	Support	0.603	0	0.588	.776**
Intention to use →User satisfaction	p<0.01)	Support	0.618	0.016	0.226	.715**
Use → net benefit	p<0.01)	Support	0.514	0.01	0.31	.831**
Intention to use → net benefit	p<0.01)	Support	0.491	0	0.607	.240**
User satisfaction → net benefit	p<0.01)	Support	0.399	0	0.825	.632**

The Finding and Discussion

Based on the data gathered from the respondents, the following were the findings:

1. The influence of IS quality (Information Quality, System Quality, Service Quality) on user satisfaction and use was positive significant and strong correlation. It means that the IS quality affects the user satisfaction of the system banking technology and usage the system. Thus the IS quality needs a critical analysis and proper adjustment to further enhance the users experience and satisfaction.
2. The influence of IS quality (Information Quality, System Quality, Service Quality) on intention to use. Just information quality has a significant positive influence on intention to use . It means that the information quality affects the intention to use the system banking technology. But system quality and service quality, not signification that may be because of many reasons as this negative finding may be explained by the mandatory nature of the system, which may inflate the significance of actual use in the model. So we can say that system quality and service quality did not influence intention to use.
3. The influence of use and intention to use on user satisfaction was positive significant and strong correlation. It means that the use and intention to use affect the user satisfaction of the system banking technology.
4. The influence of user satisfaction, Use, and intention to use on net benefit was positive significant and strong correlation.

This research empirically investigated the IS success evaluations in the banking sector in KSA. In general, the results support partially the DeLone-McLean model as a predictive model. Our results also confirm the previous research results regarding variables in IS success models. Overall, our results are comparable to those of Petter et al. (2008) and Petter et al.(2013), they show that the IS quality, which includes system quality, information quality, and service quality, positively impacts user satisfaction , use and net benefit. Also use and intention to use have positively impacted user satisfaction, and finally use, intention to use, and user satisfaction has positive impacted net benefits. results are comparable to those of Tajuddin (2015)and Jimmy (2014) they show the IS quality have positivity impacts on user satisfaction and use .Also Our results are only in partial agreement with those of Thumsamisorn & Rittippant(2011)) as they show that system quality and service quality has no significant relationship with intention to use ,or Because of respondents looking to intention to use might be as the willingness of the user towards accepting Information technology, but they used system as mandatory.

Conclusion

A huge investment and poor IS quality motivation top management of Increased attention toward IS quality improvement. As IS quality is a multidimensional measure, it is important to determine which aspects of IS quality are critical for organizations to help top management to devise effective IS quality improvement.

This research explores the relationship between IS quality (system quality, information quality, service quality) and user satisfaction, Use, intention to use, and user satisfaction with a net benefit. Our results indicate that most variables provided a sufficient contribution for prediction of the dependent variable.

IS quality dimensions (information system, system quality, service quality) have a significant positive influence on user satisfaction and use. Just information quality has a significant positive influence on intention to use, but system quality and service quality, not signification. Also use and intention to use have a significant positive influence on user satisfaction. Finally user satisfaction, Use, and intention to use have a significant positive influence on net benefit.

The improvement of an information system through enhancing information quality; system quality, service quality, intention to use, use, and user satisfaction. The proposed model and its variables proved that it can be used as a useful tool for decision makers in banks in evaluating the implementation of information systems.

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 better quality of information. This study contributes to the body of knowledge in two ways. First, it presents a conceptual framework of the relationship between IS quality and user satisfaction, also among use, intention to use and user satisfaction with Net benefits, including empirical evidence regarding the validity of this model. Second, it provides empirical details regarding the nature of user perceptions of the relationship between the variables of the model.

These contributions are expected to benefit both researchers and practitioners. Researchers can benefit by applying the IS success model in the conduct of similar research in other organizational settings. This research reveals an important gap in the research literature, in that the linkage between IS quality and net benefits through user satisfaction and use. The power of system quality, information quality and service quality as predictors of user satisfaction suggests that they provide an effective diagnostic framework in which to analyze system features that may "cause" user satisfaction and dissatisfaction.

Top management can now use the results of this study with more confidence usability testing, when designing a new information system. Top management's main concern should be given to IS quality enhancements. Emphasis on training the IS staff to develop better attitudes toward service orientation. Top management should improve system quality and service quality to improve information quality. So, IS managers should emphasize update hardware and software. Also, Top management should improve IS capabilities that lead to improved IS quality. Our results provide a better understanding and help organizations to motivate users and customers to be interested in using IS. Researchers can use these findings to find the direction of future research in KSA regarding the end user satisfaction. Since the study observed that technological issues were impediments to user satisfaction; that lead to increased investment in internet infrastructure to a world class standard as well as the internet services.

Limitations and Future Research

Our research validates the model in an undeveloped country environment, there is a need for national cultural work in the field because of the importance of IS quality. On the other hand, this study can be used

as a benchmark for studying the impacts of IS quality on net benefit in other Arabs countries. The research may be repeated in different IS contexts.

This paper has its limitations. Empirical testing of the DeLone-McLean model should, therefore, be extended to cover a wider variety of systems. One limitation of this study is the lack of confidence in assessing the accuracy of the respondents' answers to the question in the questionnaire. The unwillingness of many firms to contribute in responding to the questionnaires is another limitation of this research.

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