An Evaluation of Information Systems Success: A User Perspective - the Case of Jordan Telecom Group

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Abstract.
Assessing the success of Information Systems (ISs) has been identified as one of the most critical issues in IS field. Several conceptual and empirical studies have been conducted to explore this confusing yet important issue. A huge debate continues concerning the appropriate set of variables that can be used to determine the users' perception of ISs success. However, studies relating to this issue within the context of Arab countries are few and lack the ability to propose an appropriate evaluation criterion for Arab organizations. This study is one step ahead and aims to propose and empirically test an evaluation model for ISs success from the users’ perspective. Accordingly, this study is of two folds including the theoretical fold which deals with the conceptual elements leading to the appropriate evaluation criterion and the empirical fold which deals with testing the proposed model. Among the five factors that were explored in this study, four factors were determined as influential factors including system's usefulness, user's technical capabilities, information quality and management support. System's ease of use was excluded from our proposed model. The findings of this study are expected to add value to ISs' investments as well as to increase the rate of success for costly ISs initiatives.

Keywords: IS success, usefulness, ease of use, management support, information quality, technical capabilities.

1. Introduction
Today's business organizations are described as a changing entity that is largely driven by the implementation of modern information systems which becomes an inevitable concern that can deliver valuable benefits. However, gaining of such benefits needs an extensive consideration for a number of factors that can determine the success or failure of these systems. This study attempts to investigate some of these determinant factors for ISs success.

In the first part of this study, the theoretical foundation is discussed leading to the formulation of the study model and hypothesizes. In the second part, the analysis of the data is conducted and finding are interpreted leading to the confirmation or rejection of the proposed model. The problem of the study and its objectives however should firstly be outlined.
2. Problem Statement
IS can be defined as a set of interrelated and interacted elements or components that collect, store, process, and report data and information that can be used to enhance the process of decision making (Al-adaileh, 2008). It is not a fiction that survival as well as organizational competitiveness rely heavily on efficient use of ISs. Therefore, implementation of ISs is not a choice in today's high-tech and tech-led environment. Moreover, IS initiatives are a costly investment and accordingly failure of IS is considered as an expensive failure.

According to CHAOS report (1994) and based on a study the involved 365 companies with a total of 8,380 IS applications under development, IS project is considered as successful if it is completed on time and budget, with all features and functions as specified. Only 16.2% of projects fell in this category. In addition, IS project is considered as a partial failure if the project was completed, but was over cost, over time, and/or lacking all of the features and functions that were originally specified. 52.7% of all studied projects fell into this category. Finally, IS project is considered as complete failure if the project was abandoned or cancelled at some point and thus became total losses. A disturbing 31.1% of all studied projects fell into this category.

However, the failure of ISs is still a major concern for organizations. In targeting this failure, evaluation of IS success emerges as a prerequisite to increase the rate of success in future ISs initiatives. In today’s customer-oriented organizations, users’ perception can be considered as a major determinant of the success of any IS project as the IS is mainly intended to enhance users’ ability to perform better and produce more. Through developing and testing an evaluation criterion for IS success, this study is considered as an attempt to target this important end.

3. The objectives of the Study
This study proposes and test an evaluation model that can be used to evaluate the success of ISs from the users’ perspective. To reach this end, the following objectives were proposed:
(1) A review of the available ISs evaluation studies.
(2) Development of an IS evaluation instrument based on a review of the available studies.
(3) Testing of the proposed instrument empirically within the context of (Jordan Telecom Group (JTG)).
(4) Verifying the proposed model based on the findings of the research to ensure its validity and reliability for use on broader settings.

4. Theoretical Background
4.1 The Importance of IS
An organization is best seen as a system that has inputs, processing and outputs. By processing of inputs we add value to them. This added value enables the organization to achieve its goals. In for-profit organizations, the goals are measured by the difference between the financial cost of the inputs and the value of the outputs which is called profit. The major function that is necessary to transform inputs into outputs is the decision making function. An organization makes decisions to get the inputs and makes decisions to decide on the mechanism of transformation and then makes decisions to export the outputs or transfer them into the environment. All these decisions can’t be made without information. Then, the value of ISs for an organization is generated from the value of information for the process of decision making.

According to Laudon & Laudon (2006), there are a number of factors that can further increase the importance of ISs nowadays including; the intense use of internet and communication technologies, transformation of business enterprise due to technology forces, globalization of business and huge
opportunities on the international level, rise of information and knowledge economy, and the emergence of the digital firm where almost all business relationships are digitally enabled.

The use of IS can achieve valuable benefits for an organization including but not limited to gaining competitive advantage, increase productivity, shorter product cycle, automation of operational decision and supporting of strategic and tactical decisions in addition to the overall impact on organizational forms and management paradigms (Al-adaileh, 2008). However, the achievement of these valuable benefits depends on the success of ISs which is the core focus of this study.

5. Literature Review
Johnson (et al, 2001) reported that the overall IS project success rate has increased from 16% in 1994 to 28% in 2000. He ordered the top 5 factors that have caused this significant increase as executive support, user involvement, experienced project manager, clear business objectives and minimized scope.

One of the most commonly cited models for IS success is the one developed by Delone & McLeon (1992). Their model proposed six interrelated variables to measure the success of IS including: system quality, information quality, system's use, user satisfaction, organizational impact, and individual impact (see figure 1).

Figure 1: ISs Success Model (DeLone & McLean 1992)

A related model is proposed by Seddon (1997) which includes: system quality, information quality, perceived usefulness, user satisfaction, and IS use.

Within the context of information technology diffusion literature, Technology Acceptance Model (TAM) is a well-respected model of IT adoption and operation that has been tailored to explain computer usage. This model specifies the causal relationships between system design features, perceived usefulness, perceived ease of use, attitudes toward using and actual usage behaviour (Davis, 1993). It is mainly used to explain the impact of system characteristics and end user behavior on the actual system use. Figure (2) outlines the major elements and relationships according to this model.
It is not clear however how cognitive response could be formulated and how personal characteristics may affect this response. This model assumes the rationality in the human behaviour through emphasizing the importance of perceived usefulness. Although this assumption might be correct when people have the level of proficiency which enables them to realize and evaluate the usefulness of the target system, people who do not have enough knowledge to realize the advantages of this system may only be motivated by the ease of system use. Also, the emphasis on the relationship between attitudes and behavior tends to ignore the fact that attitudes will not be related to behaviour when people are not free to act according to their attitudes (Winter et al, 1998).

Smithson & Hirschheim (1998) re-examined the issue of IS evaluation in light of recent developments in the field. They argued that IS evaluation is a ‘necessary evil’ but the context in which IS are developed and used has become much more demanding and complex.

Seddon (et al, 1999) proposed a two-dimensional matrix for classifying IS effectiveness measures. The first dimension is the type of system studied. The second dimension is the stakeholders’ interests. The matrix was tested by using classified IS Effectiveness measure from 186 empirical papers in three major IS journals. The results indicated that the classifications are meaningful. However, no details of both IS effectiveness and stakeholders’ interests where presented in their studies which undermines the usefulness of their research to measure IS success.

Rai (et al, 2002) empirically and theoretically assessed Delone & McLean's (1992) and Seddon's (1997) models of IS success. Their findings supported Delone & McLean's focusing on integrated IS success models. Their findings also supported Seddon's (1997) three construct categories (system and information quality, general perceptual measures about net benefits of IS use, and IS behavior).

Delone & McLean's (2003) in their later study revealed that IS quality has three major dimensions including: Information quality, system quality and service quality and each should be measured or controlled which will affect "use "and "user satisfaction. The primary differences between the original model of Delone & McLeon (1992) and updated model (2003) included the addition of services quality to reflect the importance of service and support in successful e-commerce system (see figure 3).
Diniz (et al 2005), based on a multiple case study in three large banks in Brazil proposed and tested a model of three dimensions to evaluate virtual business environments from the user's point of view including functionality, evaluates the offered services profile; reliability, investigates the security of a transactional site; and usability evaluates the quality of user interaction with the site. The findings of their study revealed that the three-dimensional evaluation approach can be useful to evaluate the quality level of Internet banking sites.

Khaddaj (2005) focused on software quality factors that have a potential impact on the system’s performance and that should be taken into account in very large ISs. In such systems, as Khaddaj revealed, many elements can fail which can have major impact on the system’s performance. He also revealed that portability and usability are major problems that need to be considered when considering the relevant factors that affect software quality.

Almutairi & Subramanian (2005), based on their empirical application of Delone & McLean model in private sector organization of Kuwait, identified certain direct association between the variables in the original Delone & McLean modal. They revealed that; information quality and system quality impact user satisfaction significantly, system usage has significant influence on individual impact.

Wixon & Todd (2005) developed an integrated research model that distinguish beliefs and attitudes about the system (object-based beliefs and attitudes) from beliefs and attitudes using the system (behavioral beliefs and attitude) to build a theoretical logic that links the user satisfaction and technology acceptance. The proposed model (figure 4) provided preliminary evidence that the two perspectives can and should be integrated. The integrated model helps bridging the gab between system characteristics (the core strength of the user satisfaction literature) and the prediction of usage (the core strength of technology acceptance literature).
Figure 4: Integrating System Characteristics to TAM, (Wixon & Todd 2005).

Figure 5: Study Model

Behrens (et al 2005), investigate Technology Acceptance Model (TAM) of Davis (1989) to provide a more holistic account of why a specific IS, an online assignment submission system, has become successful. Their findings revealed that TAM measures of perceived usefulness and perceived ease of use are effective predictors of IS success.

Elpez & Fink (2006) identified key IS success factors relevant to public sector. A full range of factors were identified and ranked according to their importance as follow: meeting user requirements, system usability and performance, information quality and use, user acceptance and IS ownership and interactions with the rest of IT infrastructure.

This study will attempt to derive an IS evaluation criterion that is based on the available studies in addition to some other factors that seem, from this study perspective, to have an influence upon users' perception for IS success. Accordingly, and based on the researcher’s understanding of the research context, this research proposed five factors to justify users’ perception for IS success including: Information Quality (IQ), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Management Support (MS) and User Technical Capability (UTC).

6. Study Model and Hypotheses
Based on the above discussion, the research conceptual model is shown in figure (5) below.

To test this model, the following hypotheses were proposed:

H1: Information quality has a significant statistical impact on the users’ perception of ISs success.
**H2:** User’s perceived ease of use has a significant statistical impact on the users’ perception of ISs success.

**H3:** User’s perceived usefulness has a significant statistical impact on the users’ perception of ISs success.

**H4:** Management support has a significant statistical impact on the users’ perception of ISs success.

**H5:** User’s technical capability has a significant statistical impact on the users’ perception of ISs success.

### 6.1. Variables Definitions

- **Information Quality (IQ)**
  Within the context of this research, ten characteristics were selected to represent the quality of information including: simplicity, relevancy, accuracy, verifiability, timely, security, completeness, reliability, accessibility, and flexibility.

- **Perceived Ease of Use (PEOU)**
  is seen as the degree to which a person believes that using a particular system would be free of effort and easy to be understood and used.

- **Perceived Usefulness (PU)**
  Refers to the degree to which using the systems enhances an individual's effectiveness and is perceived by users as useful (Chung et al. 2007, Lem et al 2005).

- **User Technical Capabilities (UTC)**
  UTC refers to the user’s level of technical knowledge and expertise.

- **Management Support (MS)**
  Management support refers to management approval and continuous support not only during the IS project implementation but also throughout the operational phase of the system.

- **Users’ perception of IS success**
  Refers to the degree to which the users of the ISs perceive the systems they use as a successful experience through matching of their needs, enhancement of their performance, achievement of their job aims, creating of an enjoying working environment, and improving of their prestige.

### 7. The Study Approach

The research approach used in this study is a quantitative approach which includes using numerical methods and statistical tools for collecting and analyzing data. Concerning the data that will be collected to investigate the research topic; it could be classified into secondary and primary data. The secondary data required for this study are available from different sources including textbooks, Journals and magazines such as journal of information technology, European journal of information systems, MIS Quarterly ...etc, in addition to On-line ISs evaluation studies and resources. The primary data involves collecting data required directly by the researcher through using some techniques such as interview (structured and semi-structured), case studies, questionnaires, or observation of the phenomena (direct or indirect observation). This study adopted a case study approach, the survey method was used to collect the necessary data to test the proposed model and hypotheses.

The form of survey used in this study could be classified as a descriptive survey, which usually aims to explore the nature of existing circumstances. However, there are some limitations for questionnaire survey method. Some of these limitations are; the difficulty of securing adequate responses especially as the motivation for answering the questionnaire is unknown. Also, responses should be accepted as given and incomplete or inaccurate information cannot be followed up. Other possible limitations for this method is the possibility of misunderstanding of the questions by the respondents. However, this was resolved through pre-testing the questionnaire through distributing it among selected testing sample.
7.1. Population and Sampling

The population of this study includes the employees of JTG. The JTG, in 2006, combined its four companies under one umbrella becoming the sole integrated operator in Jordan providing fixed, mobile, and internet services. In 2007, the Group adopted the Orange brand, the commercial brand of France Telecom Group, one of the world's leading telecommunications companies (www.orange.jo). The JTG now serves more than 2.4 million customers in Jordanian market. The number of employees within the group is 4,540 in its different branches and service centers.

A convenient sample was selected. Since the size of population within the context of this study is large, this sampling method seems to be appropriate. The sample size of 350 employees were determined as an appropriate using the sample calculator (available online on http://www.surveysystem.com/sscalc.htm). 255 questionnaires were collected, 8 were excluded. Accordingly, 247 questionnaires were analyzed. The sample characteristics are shown in table (1) below.

Table 1: Sample Characteristics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>111</td>
<td>44.9</td>
</tr>
<tr>
<td>female</td>
<td>136</td>
<td>55.1</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>51</td>
<td>20.6</td>
</tr>
<tr>
<td>30-39</td>
<td>107</td>
<td>43.3</td>
</tr>
<tr>
<td>40-49</td>
<td>77</td>
<td>31.2</td>
</tr>
<tr>
<td>50 or more</td>
<td>12</td>
<td>4.9</td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>less than 1</td>
<td>30</td>
<td>12.1</td>
</tr>
<tr>
<td>1-5</td>
<td>83</td>
<td>33.6</td>
</tr>
<tr>
<td>6-10</td>
<td>81</td>
<td>32.8</td>
</tr>
<tr>
<td>more than 10</td>
<td>53</td>
<td>21.5</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary</td>
<td>18</td>
<td>7.3</td>
</tr>
<tr>
<td>diploma</td>
<td>88</td>
<td>35.6</td>
</tr>
<tr>
<td>bachelor</td>
<td>112</td>
<td>45.3</td>
</tr>
<tr>
<td>postgraduate</td>
<td>29</td>
<td>11.7</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100.0</td>
</tr>
</tbody>
</table>

8. Analysis and Interpretation

The internal consistency reliability was measured by applying the Cronbach’s alpha test to the overall measure. According to this test, the overall reliability level was equal to (0.82) which is considered as an acceptable level of reliability (Sekaran, 2004).

Means of variables were extracted to enable exploration of the existence and importance of the independent and dependent variables. The instrument was scaled as follow:

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

If the means value of the variable is more than or equal to 3.5, then the level of agreement with the statements measuring the certain variable is high. If the mean value of the variable ranges between 2.5 and 3.49, then the level of agreement with the statements measuring the certain variable is medium. If the means value of the statement is equal to or less than 2.49, then the level of agreement with the statements measuring the certain variable is low. Table (2) shows the means and categories for independent and dependent variables.
Table 2: Means and Std. Deviation of The Study Variables

<table>
<thead>
<tr>
<th>Mean Category</th>
<th>Mean</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users’ perception of IS success</td>
<td>3.9831</td>
<td>High</td>
</tr>
<tr>
<td>Information quality</td>
<td>3.9777</td>
<td>High</td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>4.0054</td>
<td>High</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>4.0316</td>
<td>High</td>
</tr>
<tr>
<td>Management support</td>
<td>3.8205</td>
<td>High</td>
</tr>
<tr>
<td>User’s technical capabilities</td>
<td>4.0256</td>
<td>High</td>
</tr>
</tbody>
</table>

As shown in table (3):
- Users’ perception of ISs success within their company is high
- Users perception of the quality of information provided by the company's ISs is high.
- Users perception of the easiness of ISs use is high.
- Users perception of their the usefulness of ISs is high.
- Users perception of the level of management support is high.
- Users perception of their technical capabilities is high.

8.1. Hypotheses Testing

Multiple regression analysis was used to test our proposed model. However, to meet the assumptions of regression analysis, Variance Inflation Factor (VIF) and Tolerance statistics were extracted to insure the absence of high correlation between independent variables (multicollinearity). Table (3) shows these statistics.

Table 3: VIF and Tolerance Statistics

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>VIF</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information quality</td>
<td>1.364</td>
<td>.733</td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>1.605</td>
<td>.623</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>1.617</td>
<td>.619</td>
</tr>
<tr>
<td>Management support</td>
<td>1.104</td>
<td>.905</td>
</tr>
<tr>
<td>User's technical capabilities</td>
<td>1.068</td>
<td>.936</td>
</tr>
</tbody>
</table>

As shown in table (3), (VIF) value for all independent variables was less than 10 ranging from 1.104 to 1.617 and allowed variation (Tolerance) for each independent variable ranged from 0.619 to 0.936 which also indicates the absence of high correlation between independent variables. Accordingly, the data meet the assumption of regression analysis and multiple regression analysis was used to test our proposed model (see table 4).

Table 4: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.652*</td>
<td>.426</td>
<td>.414</td>
<td>.42407</td>
</tr>
</tbody>
</table>

Note: a. Predictors: (Constant) IQ, PEOU, PU, MS, UTC

R2 value of 0.426 indicates that the five factors proposed in our model including information quality, perceived ease of use, perceived usefulness, management support, and user's technical capabilities can explain 42.6% of the variance in IS success. To insure the validity of the model to test the main hypothesis of the study, table (5) shows the results of the regression analysis. Table (5) shows that the overall regression model is significant (F=35.717, α<0.000).
Table 5: The Results of The Regression Analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>32.116</td>
<td>5</td>
<td>6.423</td>
<td>35.717</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>43.341</td>
<td>241</td>
<td>.180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75.457</td>
<td>246</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), UTC, PEOU, MS, IQ, PU
b. Dependent Variable: UPOISS

Note: a. Statistically significant at the level of significance ($\alpha = 0.05$)

Table (6) also confirms that four of the causal relationships between the factors proposed by our model are well supported.

Table 6: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>.221</td>
<td>.331</td>
<td>.669</td>
<td>.504</td>
</tr>
<tr>
<td>Information quality</td>
<td>.229</td>
<td>.082</td>
<td>.159</td>
<td>2.790* .006</td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>.096</td>
<td>.055</td>
<td>.107</td>
<td>1.738 .084</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>.321</td>
<td>.059</td>
<td>.337</td>
<td>5.432* .000</td>
</tr>
<tr>
<td>Management support</td>
<td>.086</td>
<td>.024</td>
<td>.181</td>
<td>3.527* .001</td>
</tr>
<tr>
<td>User's technical capabilities</td>
<td>.210</td>
<td>.054</td>
<td>.196</td>
<td>3.884* .000</td>
</tr>
</tbody>
</table>

Note: a Dependent Variable: Users’ perception of IS success
*Statistically significant level ($\alpha \leq 0.05$)

Stepwise Multiple Regression analysis was used to determine the importance of each independent variable and its contribution to the mathematical model. Table (7) shows the results of Stepwise Multiple Regression analysis.

Table 7: Stepwise Multiple Regression Analysis

<table>
<thead>
<tr>
<th>Order of the entry of independent variables</th>
<th>Accumulative value of $R^2$</th>
<th>Calculated value of T</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness</td>
<td>.310</td>
<td>10.479</td>
<td>.000</td>
</tr>
<tr>
<td>User’s technical capability</td>
<td>.356</td>
<td>4.214</td>
<td>.000</td>
</tr>
<tr>
<td>Information quality</td>
<td>.389</td>
<td>3.613</td>
<td>.000</td>
</tr>
<tr>
<td>Management support</td>
<td>.418</td>
<td>3.489</td>
<td>.001</td>
</tr>
</tbody>
</table>

Table (7) revealed that the variable (Perceived usefulness) has been ranked first and explained 31% of the variation in the dependent variable, followed by variable (User’s technical capability) which explained with (Perceived usefulness) 35.6% of the variation in the dependent variable. The third variable was (Information quality) which explained with (Perceived usefulness) & (User’s technical capability) 38.9% of the variation in the dependent variable. The fourth and final variable was (Management support) which explained with other variables 41.8% of the variation in the dependent variable. Nonetheless, the other variable (Perceived ease of use) was out of the regression equation which provides confirmation of the previous analysis.

Consequently, our proposed hypotheses are tested and discussed below:

- **H1**: Information quality has a significant statistical impact on the users’ perception of IS success.

  Information quality has a significant direct impact on the users’ perception of IS success ($t = 2.790; \text{ sig } = 0.006$). As shown in table (6), the results of the first hypothesis shows that T value is
Accordingly, the first hypothesis was accepted. On the other hand, the Beta value was (0.159) which supports our hypothesis, and asserts that there is a strong trend among the individuals of the sample for the impact of information quality on Users’ perception of IS success. This agrees with some earlier studies including: Delone & McLeon (1992); Seddon (1997); Rai (et al, 2002); Delone & McLean's (2003); Almutairi & Subramanian (2005); Elpez & Fink (2006).

- **H2**: User’s perceived ease of use has a significant statistical impact on the users’ perception of IS success.

User’s perceived ease of use has no significant direct impact on the users’ perception of IS success ($t = 1.738; \text{sig} = 0.084$). As shown in table (6), the results of the second hypothesis shows that T value is (1.738) and the significance level is (0.084) which is more than the accepted significant level in this study ($\alpha \leq 0.05$). Accordingly, the second hypothesis was rejected. The Beta value was (0.107) which reject our hypothesis and supports the null hypothesis and asserts that there is no strong trend among the individuals of the sample for the impact of ease of use on users’ perception of IS success. This however does not agree with most of the earlier studies including Davis (1989, 1993) and some recent studies including Behrens (et al, 2005). It seems that the importance of system's ease of use is declining and the interest is given to integrating the IS development process into business development process and the added value concept. The earlier studies that emphasized on the ease of use factor seem irrelevant to this research context where the importance of other factors is emphasized and supported. The level of proficiency within the research context might support this finding.

- **H3**: User’s perceived usefulness has a significant statistical impact on the users’ perception of IS success.

User’s perceived usefulness has a significant direct impact on the users’ perception of IS success ($t = 5.432; \text{sig} = 0.000$). As shown in table (6), the results of the third hypothesis shows that T value is (5.432) and the significance level is (0.000). Accordingly, the third hypothesis was accepted. On the other hand, the Beta value was (0.337) which supports our hypothesis, and asserts that there is a strong trend among the individuals of the sample for the impact of system's usefulness on users’ perception of IS success. This agrees with Davis (1993); Seddon (1997); Behrens (et al, 2005); and Brown & Jayakody (2008). As shown in table (7), perceived usefulness of the ISs has been ranked first and explained 31% of the variation in the dependent variable which means that this variable is perceived by users as the most important determinant factor for IS success.

- **H4**: Management support has a significant statistical impact on the users’ perception of IS success.

Management support has a significant direct impact on the users’ perception of IS success ($t = 3.527; \text{sig} = 0.001$). As shown in table (6), the results of the fourth hypothesis shows that T value is (3.527) and the significance level is (0.001). Accordingly, the fourth hypothesis was accepted. On the other hand, the Beta value was (0.181) which supports our hypothesis, and asserts that there is a strong trend among the individuals of the sample for the impact of management support on users’ perception of IS success. In fact, few studies have explored management support as an important factor that can determine the success or failure of ISs. This is not only relevant to developing countries context but also to developed countries. Among those studies who emphasized this finding are Johnson (et al, 2001) and Al-adaileh & Al-Makhadmeh (2008). It seems that success requires a high level of management skills and support to ensure that all stages are completed to specification and time. This argument is also supported by Brown (2005).

- **H5**: User’s technical capability has a significant statistical impact on the users’ perception of IS success.

User’s technical capability has a significant direct impact on the users’ perception of IS success ($t = 3.884; \text{sig} = 0.000$). As shown in table (6), the results of the fourth hypothesis shows that T value is (3.884) and the significance level is (0.000). Accordingly, the fifth hypothesis was accepted. On the other hand, the Beta value was (0.196) which supports our hypothesis, and asserts that there is a strong trend among the individuals of the sample for the impact of user’s technical capability on users’ perception of IS success. As seen in table (7), user’s technical capability has been ranked second and explained with system's usefulness about 35.6% of the variation in the dependent variable. Previous
studies have not explored the importance of technical knowledge of users as a basis for users' evaluation of ISs success. Therefore, this study proved that a user of any IS will be influenced with his or her technical knowledge and expertise when set to evaluate the success or failure of the system. This research argues that this factor is particularly important in the implementation stage of the system's life cycle as well as in the beginning of the operational stage. However, the importance of this factor might be decreased when users get familiar with the system. This argument may increase the importance of formal education and organizational training especially in earlier stages of the system's life cycle.

9. Conclusions and Recommendations
This study aimed at determining some factors that can formulate the users' perception of ISs' success. These factors included some selected factors that were explored in different contexts (information quality, system's ease of use, and system's usefulness) in addition to other factors that have not been explored as evaluation criteria (including user's technical capabilities and management support). This study proposed these factors as evaluation criteria for ISs success. Among the five factors that were explored in this study, four factors were determined as influential factors including (according to their order): system's usefulness, user's technical capabilities, information quality and management support. System's ease of use was excluded from our proposed model which is an outcome that disagrees with most of the previous and particularly earlier studies of ISs evaluation.

One major reason for doing evaluations of ISs is to take actions based on the results of the evaluation to generate change and betterment (Lagsten & Goldkuhl, 2008). This is actually an important fact due to the expensive failure of ISs. Accordingly, and based on the findings of this study, the following recommendations are proposed to enhance the success of ISs:

1) Expected benefits of any proposed IS should be clearly and publicly discussed and established to improve the users' perception of the usefulness of the proposed system. Extensive users' involvement in the development of ISs might be used in this regard.

2) Since the findings of this study proved that users' technical capabilities is an influential factor that can form their perception of IS success, formal technical education should be considered when making of recruitment and promotion decision. In addition, formal and informal training policy should be established to encourage learning and skills exchange among organizational members.

3) Development of IS should consider the users' needs of information and the ability of the system to provide valuable information that match certain characteristics including simplicity, relevancy, accuracy, verifiability, timely, security, completeness, reliability, accessibility, and flexibility.

4) Effective and continuous management support should be available starting from the idea of the system, through approval, development and operational phases. This support can create a public vision that emphasizes the importance of the target IS.

5) As reported by Whyte (et al, 1997), it seems that there is no single overall set of attributes that relate to user perceptions of success, but it is possible to find subsets that do. The measurement and analysis of these attributes are helpful in setting management policies and guidelines for the improvement of perceptions of ISs success. Therefore, future research should consider other factors that might influence the users' perception of ISs' success. These factors might include other socio-cultural, technological, and organizational factors.

6) Since this study was conducted within a limited context, future studies are necessary to test the proposed model in other contexts.
References


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