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THE INFLUENCE OF INDIVIDUAL CHARACTERISTICS ON PER- CEIVED INFORMATION SYSTEMS QUALITIES AND EFFECTIVENESS AT THE MINISTRY OF COMMU- NICATIONS, KUWAIT⁽¹⁾

Key Words

*Individual
Characteristics;
Information Systems;
System quality;
Information Quality;
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Individual Impact;
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Kuwait.*

Abstract

Nowadays, information technology (IT) is indispensable for contemporary private and public organizations. Nevertheless, identifying the perceived qualities of the information systems (IS) being used, the influence of the systems on users job performance and the factors that affect such perceptions provide a foundation for decisions and policies aimed to improve IS effectiveness. This research explored the influence of a number of individual characteristics on the perceived system quality (SQ), information quality (IQ), IT service quality (SVQ), and the individual impact (IIM) of systems on users job performance at the Ministry of Communications (MOC) of Kuwait. Overall, the findings suggest that users hold low positive attitudes towards SQ, IQ, SVQ, and IIM. In addition, gender, education, and tenure have no effect on the perceived systems qualities and individual impact. However, the study shows that age affects SVQ; nationality affects SVQ and IIM; job type affects SVQ; and sector type affects SQ, IQ, SVQ, and IIM. These findings and their implications are further discussed in the paper.

Introduction

Information Technology (IT) has become indispensable for con-

temporary organizations to the point that it would be impossible for them to

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function or succeed without it (Pedain, 2003). If public or private organizations are to survive and prosper in today's competitive environment, they have to concentrate on their Information Systems (IS) products and services and develop proper strategies to help achieve their goals and provide users with the proper solutions and support they need. Therefore, a constant assessment of the information and service of IS in such organizations is crucial to the continuous improvement of IS effectiveness.

Most of the IT innovations are designed and produced in developed countries and, therefore, are culturally-biased in favor of those developed countries social and cultural systems (e.g., Straub *et al.*, 2001; Hill *et al.*, 1998). In addition, IS designers and adopters are not expected to follow the principle of one size fits all (Almutairi, 2011). It is important to understand the factors affecting information systems effectiveness so that better methods for designing, evaluating, and predicting how users will respond to new technology can be developed (e.g., Khalil and Alkordy, 1997; Dillon and Morris, 1996). The individualized perceptions and preferences of the quality characteristics of the systems, their produced information, and accompanying technical service should be considered when

making systems design and adoption decisions.

As a result, identifying and recognizing the demographic and situational factors (e.g., age, gender, education, experience, nationality, profession, organizational position, job type, system use, and information behavior) that could influence users perceptions of IS related quality characteristics in a particular setting is essential to the development of policies and managerial actions aimed to enhance the acceptance and utilization of such systems (e.g., Almutairi, 2011; Choudrie and Papazafeiropoulou, 2006; Choudrie and Lee, 2004; Venkatesh *et al.*, 2003; Dillon, 2001; Khalil and Alkordy, 1997; Alavi and Joachimsthaler, 1992; Zmud, 1979).

The IS Sector at the Ministry of Communications (MOC) of Kuwait is a relatively large organizational unit, which is responsible for providing more than two thousand users in eleven sectors with the needed support and assistance on hardware and software selection, acquisition and installation, trouble-shooting, network connections, systems development, systems backup, training, and maintenance of all computers and peripherals. Although IS plays an essential role in support of the internal operations of MOC, there is, thus far, no information available on whether or

not the systems in use are effective in providing users with the information service they need. The assessment of these systems and the information they provide is crucial to the continuous improvement of such systems. Appendix A comprises the main systems that were in use at MOC at the time of investigation.

This research is designed to assess the users perceptions of, and attitudes towards, systems quality (SQ), information quality (IQ), service quality (SVQ), and their individual impact (IIM) on users job performance, as well as the influence that the users individual characteristics (e.g., gender, age, education, nationality, tenure, job type, and sector type) may have on these perceptions at MOC. Arab beliefs are perceived to be a strong predictor of resistance to IT applications (Straub *et al.*, 2001). Individuals from cultures that have a polychronic understanding of time and prefer face-to-face communications tend to have low interest in using computer-based systems (Hill *et al.*, 1998; Rose and Straub, 1998). Systems in Arab organizations may be ineffective. The impetus for this research is to produce empirical evidence from an Arab/Islamic culture, which is different from the Western culture where most of the IT tools and systems were originally developed (House *et al.*, 2004; Hofstede, 1980,

1983, 1991), in order to guide decisions and actions designed to improve and sustain IS effectiveness at MOC, and contribute to the ongoing efforts aiming at building a general theory of trans-national information systems (Khalil and Alkordy, 1997; Palvia, 1993). Such a theory should help identify the culturally-neutral and culturally-specific determinants of global IS effectiveness.

Background

Information Systems (IS) Effectiveness

Both practitioners and researchers have a strong interest in understanding why people accept IS so that better methods for designing, evaluating, and predicting how users will respond to new technology can be developed (Khalil and Alkordy, 1997; Dillon and Morris, 1996). Therefore, explaining users acceptance of IS has been for long one of the main research areas in IS literature (Zhang *et al.*, 2009; Irani *et al.*, 2007; Grant, 2005; Venkatesh *et al.*, 2003). As a result, and over the years, a number of models have been adopted to investigate factors affecting the acceptance of IS by individuals and organizations.

The theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), for instance, assumes that the actual use of a system is a motivational result of the intention to use that system, which, in

turn, depends on the users attitude towards that system. Similarly, the theory of planned behavior (TPB) (Taylor and Todd, 1995; Ajzen, 1991) emphasizes the relations among users beliefs, attitudes and intentions in the adoption of IT applications. The social cognitive theory (SCT) also proposes a number of factors (e.g., personal characteristics, outcome expectations, performance, self-efficacy, affect, and anxiety) that can be used to investigate and interpret individuals adoption of systems (Compeau and Higgins, 1995). Likewise, the motivational model (MM) has been used in IS research to understand and explain the adoption and usage of new IT applications based on intrinsic and extrinsic motivations (e.g., Davis *et al.*, 1992).

Moreover, the innovation diffusion theory (IDT) helps interpret the adoption of innovations such as IT/IS applications (Rogers, 1995; Moore and Benbasat, 1991). It proposes that factors such as usefulness, ease of use, image, visibility and results demonstrability may ultimately affect innovations adoption decisions. The task-technology fit (TTF) model, on the other hand, hypothesizes that IT can have a positive impact on individual performance and can be used if the IT capabilities match the tasks that the individual must perform (Dishaw *et al.*, 2002; Goodhue and Thompson, 1995). TTF can be measured using

factors such as quality, locatability, authorization, compatibility, ease of use/training, production timeliness, systems reliability and relationship with users.

The Technology Acceptance Model (TAM), which is a widely used model in IS adoption research, explains how users accept and use IT (Venkatesh and Davis, 2000; Davis, 1989; Davis *et al.*, 1989). TAM posits that perceived usefulness and ease of use can predict attitudes towards technology, which, in turn, can predict the intention and use behavior of that technology. Later, Thompson *et al.* (1991) developed a PC utilization model that is an extension of the TAM model to take into account several new constructs such as performance expectancy, effort expectancy, and social influence that are believed to influence the intention and use of IT. Also, Venkatesh *et al.* (2003) developed a new model, the unified theory of acceptance and use of technology (UTAUT), that incorporates constructs from a number of other theories/models (e.g., IDT, TRA, TPB, TAM, MM, the PC utilization model, and SCT) to explain IT adoption by individuals.

While the above-mentioned research models can be used to explain IS adoption, others have been developed and used to assess IS effective-

ness/success. Perhaps DeLone and McLean's 1992 and 2003 models are the most cited research models that aim at measuring IS effectiveness and its determinants (Scott and DeLone, 2009). DeLone and McLean's 1992 original model included six interrelated factors to measure IS success (Appendix B, Figure 1): system quality (SQ), information quality (IQ), system use (SU), user satisfaction (US), organizational impact (OIM) and individual impact (IIM). Ten years later, and based on feedback from a number of studies that evaluated the 1992's model, DeLone and McLean (2003) proposed an updated IS success model (Appendix B, Figure 2). The updated model consists of six interrelated dimensions of IS success: SQ, IQ, service quality (SVQ), intention to use (ITU), US and net benefits (NB). DeLone and McLean's 1992 and 2003 models have been widely adopted in IS research to investigate the success of different types of systems in various settings (Hu, 2003).

One may draw on the IS effectiveness literature in order to identify and investigate factors that are believed to influence the effectiveness of a specific system. As DeLone and McLean (1992) suggest, no single variable in their model is intrinsically better than another. The choice of a success variable is often a function of the objective of the investigation, the organiza-

tional context, the aspect of the information system to be evaluated, the independent variables under investigation, the research method, and the level of analysis.

Building on DeLone and McLean's (1992, 2003) IS success models and the findings of their earlier relevant research, a research model was developed and validated to evaluate the extent to which the systems provided and operated by the Information Systems Sector at MOC are successful in providing the needed information and service to their users. The adopted model includes five constructs, whereas SQ, IQ, and SVQ are hypothesized to influence US and IIM.

While partial findings of that research on the relationship between SVQ and US have been already reported (Khalil and Ghanim, 2013), this paper reports on users perceptions of the three IS qualities (SQ, IQ, and SVQ) and IIM, as well as the effect of a number of individuals characteristics (e.g., gender, age, education, nationality, tenure, job type, and sector type) on these perceptions.

Individual Characteristics and IS Effectiveness

The above-mentioned theories and research models and their relevant empirical studies suggest a vast range of factors that could explain IT/IS acceptance and use. These factors

include, among others, personal characteristics (e.g., Khalil and Alkordy, 1997; Igbaria, 1993, 1992; Mawhinney and Lederer, 1990; Ginzberg, 1981; Robey, 1979). Zmud (1979), for instance, identifies three groups of user-related variables including cognitive style, personality type, and demographic/situational factors. Also, in a meta-analysis on systems implementation research, Alavi and Joachimsthaler (1992) suggest that the most relevant user factors determining IT/IS acceptance are cognitive style, personality, demographics, and user-situational variables. However, Alavi and Joachimsthaler (1992) found the broad group of user-situational factors to be more important than the individual difference variables.

The demographic and situational factors that may influence IT/IS acceptance include, among others, age, gender, profession, education, experience, training, organizational position, and job type (e.g., Choudrie and Papazafeiropoulou, 2006; Choudrie and Lee, 2004; Venkatesh *et al.*, 2003; Igbaria, 1993, 1992; Mawhinney and Lederer, 1990; Ginzberg, 1981; Robey, 1979). These characteristics may influence one's perception of information, and the way one processes such information (Lucas (1982). Individuals with distinct characteristics and backgrounds are expected to have

unique ways of interacting with information systems and, consequently, have different attitudes and behaviors towards such systems (Khalil and Alkordy, 1997). In addition, the earlier relevant research examined the demographic and situational factors as direct antecedents of systems usage (Nilsson 2007; Chang and Samuel, 2004), beliefs and attitudes (Wu, 2003), and as moderators of the relationships of behavioral intention and use and their antecedents in the UTAUT model (Venkatesh *et al.*, 2003).

A person's willingness to accept a new technology or a change may differ with the person's age (Davis *et al.*, 1989), as the needs and concerns of the older computer users differ from those of younger users because of the natural changes associated with the aging process (Wagner *et al.*, 2010; Hawthorn, 2000). As age increases, attitude toward computers tend to become negative (Wagner *et al.*, 2010). Friedberg (2003) found that older users exhibited lower use of computers at the work place. Younger users were more ready to accept these systems and the change they brought. Age was also found to correlate positively with information use and negatively with information processing speed (Taylor, 1975). It was also found to positively associate with managers' attitudes towards a system

use and its influence on productivity (Schewe (1976). Igbaria (1993) found a positive and direct effect of age on microcomputers usage. Age, however, was found to have no correlation with the managers' use of microcomputers (Mawhinney and Lederer, 1990), and to negatively correlate with microcomputers use time (Igbaria, 1992).

In Egyptian banks, Khalil and Alkordy (1997) found age and tenure in the job to be positively correlated with user satisfaction. Age and education, however, were found to be negatively correlated with system usage. Age and education have been also shown to influence IT/IS use in some contexts. Higher educational achievement and lower age were found to have a weak positive influence on systems use (Dillon, 2001). Morris and Venkatesh (2000) found age to correlate negatively with attitudes toward computers. Kalmus *et al.* (2011) found age to be the strongest predictor of using the Internet for social networking and entertainment, with younger people using the Internet more than older people for social networking, content creation, and entertainment; and compared to men, women used the Internet less for social networking and entertainment and more for work and information.

Hupfer and Detlor (2006) asserted that women are greater information

seekers than men because of the traits associated with women. Zenger and Lawrence (1989) also argued that individuals from the same age or gender groups are expected to share a common language and possess a common group attitude and behavior towards the output of the available systems; and such attitudes and behaviors depend on the systems capability to interact with the users in a language that they can understand. Gefen and Straub (1997) found that gender, perceived social presence and information richness of the medium (e.g. e-mail, voice mail) are predictors of perceived usefulness (PU) in an e-mail setting. Morris *et al.* (2005) also found that old male workers were more likely to be more computer users than older female workers.

Higher levels of formal education may increase the individual's capability to manage work problems and to use more information sources (O'Reilly, 1982), which subsequently contributes to the development of positive attitude towards, and use of, information systems. In addition, education was found to have a direct influence on microcomputers use (Igbaria, 1993), and to positively correlate with the number of microcomputer application packages used (Igbaria, 1992). It was also found to correlate positively with the interactive and indirect use of systems (Cul-

nan, 1983), decision support systems impact on work performance (Vasarehelyi, 1977), use of verbal information sources (O'Reilly, 1982), and negatively with written information sources (O'Reilly, 1982) and system use (Schewe, 1976). Education level, however, was found to have no relationship with attitude towards system impact on organizational performance and work conditions (Schewe, 1976), users attitudes towards microcomputers (Igbaria, 1993), and microcomputer usage (Mawhinney and Lederer, 1990).

Almutairi (2011) found age, education, and information system use to make a difference in the three information dimensions of sources, types, and characteristics among Kuwaiti managers in the public sector. He found younger managers to use social activities as information sources more often than did their older counterparts; and male managers to use subordinates as information sources more frequently than did female managers. Moreover, individuals attitudes and behaviors towards IT/IS are expected to vary with their work experience, organization, or job (Khalil and Alkordy, 1997).

Users with longer tenure within the industry and organization were found to display a more positive attitude towards systems than did their coun-

terparts with shorter tenure (Lucas; 1978; Schewe, 1976). Culnan (1983) found work experience to negatively correlate with interactive and indirect use of database systems. O'Reilly (1982) found the relationship between tenure in the job and system use to vary with the investigated information source (e.g., written vs. oral information). Tenure in the job, however, was found to negatively correlate with system use (Lucas, 1975). On the other hand, Zviran (2003) reported that user satisfaction with systems did not significantly differ across departments.

Evidently, the demographic and situational characteristics may affect users perceptions of the qualities of the systems and the benefits that can be reaped from using such systems. However, the findings of the relevant research are inconclusive. Besides, IT is not culturally neutral (Coombs *et al.*, 1992), and culture has a powerful influence on information related behaviors and interactions with IT (Leidner and Kayworth, 2006; Martinsons and Davison, 2003; Straub *et al.*, 2001; Hill *et al.*, 1998). A lack of fit between users' values and the values embedded in a given system will likely lead to negative perceptions and behaviors regarding that system (Leidner and Kayworth, 2006; Loch *et al.* 2003; Myers and Tan, 2002). Subsequently, findings on systems effectiveness and its determinants in a

particular culture cannot be extended to explain systems effectiveness in other dissimilar cultures before externally validating them across different cultures.

Investigating the influence of the individual characteristics on users' perceptions of the qualities and effectiveness of specific systems in a particular context should provide evidence that would help managers to draw policies and take actions to augment the benefits of IT/IS investments, and extend the external validity of findings that have been reached in Western-based investigations (Aharoni and Burton, 1994; Palvia, 1993). This research is designed to answer two questions: (1) what are the users perceptions of SQ, IQ, SVQ, and IIM at MOC? and (2) what influence do demographic and situational factors of age, gender, education, nationality, tenure, job type, and sector type have on the users perceptions of SQ, IQ, SVQ, and IIM at MOC?

Methodology

Measurement

This research investigates the influence of the demographic and situational characteristics of age, gender, education, nationality, tenure, job type, and sector type on the perceived system quality (SQ), information quality (IQ), service quality (SVQ),

and individual impact (IIM) of systems. SQ refers to the quality of the technical performance of the system, and it is concerned with the measurement of the actual system which produces a certain output (DeLone and McLean, 1992). IQ refers to the quality of the output of the information system, and it is concerned with issues such as relevance, timeliness, and accuracy of the information generated by an information system (DeLone and McLean, 2003; 2002). SVQ refers to the overall support delivered by a service provider regardless of whether this support is provided by an internal IS department, a new organizational unit, or if it is outsourced to an internet service provider (DeLone and Mclean, 2003). Lastly, IIM, a measure of IS effectiveness, refers to the effect on the behavior of the recipient of the information from the systems (DeLone and McLean, 1992). DeLone and McLean (2003) posit that the performance of IS users and IIM are closely related, and improving the performance of a user indicates a positive impact of IS effectiveness/success.

Previously tested and validated multiple-item perceptual measures were used to measure SQ, IQ, SVQ, and IIM in order to add validity to the findings of this research and allow comparisons with earlier similar research findings (DeLone and

McLean, 2003). Six-items, including convenience of access, flexibility, integration of systems, response time, language, and confidence in systems, from Bailey and Pearson (1983) were used to measure SQ. To measure IQ, nine items, including accuracy, timeliness, precision, reliability, currency, completeness, format, conciseness, and relevancy, were adapted from Bailey and Pearson (1983). The 22-item SERVPERF of Cronin and Taylor (1992) was used to measure SVQ. The scale covers five SVQ dimensions: tangibles, responsiveness, assurance, empathy, and reliability. Lastly, ten items from Torkzadeh and Doll (1999), which were revised by AlMutairi (2001), were used to measure IIM. The items cover four task dimensions: task productivity, task innovation, customer satisfaction, and management control. The adapted measures used a seven-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree). Appendix C presents the sections (instructions and questions) of the data collection instrument that were used for collecting data on users perceptions on SQ, IQ, SVQ, and IIM.

The demographic and situational variables include gender, age, educational level, nationality, tenure, job type, and sector type. Each of these variables was measured using a single item.

Sampling

The context of this research is MOC. The targeted population includes all systems users who interact with the professionals in the IS Sector for help with technical service. MOC has eleven Sectors: Subscriber Services, Information Systems, Finance, Postal Services, International Services, Transportation Services, Legal and Auditing services, Telecommunications and Backing Services, Planning and Administration, the Office of the Minister, and the Under Secretary Office.

In order to assure an effective sampling, a stratified sampling method was used in this research. The method involved the division of the targeted population into smaller groups (strata) based on the sector they worked in. A sample from each stratum was taken in a number that is proportional to the stratum size. The sampling procedure indicated that a sample of 327 users would be adequate.

Data Collection and Sample Profile

Once the data collection instrument was finalized, it was piloted using a sample of 60 users at MOC in order to identify and eliminate any potential problems. A total of 457 questionnaires were later distributed to users in the eleven sectors within MOC. The subjects were briefed

about the purpose of the study and were told that participation in the survey was voluntary. They were also assured that all responses would be kept confidential and aggregately analyzed. Only 397 usable responses were returned.

The individual characteristics of the respondents were analyzed for gender, age, education, nationality, tenure, job type, and sector. The results indicate that 35% of the respondents are male, and the majority of the respondents (83%) are between the ages of 25 and 45. In addition, most of the respondents are well educated, as (77%) of them hold diplomas or bachelor's degrees. As for the nationality, approximately (96%) of the respondents are Kuwaiti nationals and only (4%) are non-Kuwaitis (i.e., expatriates).

In terms of the situational characteristics of the sample, approximately (80%) of the respondents hold non-supervisory jobs and only (20%) hold supervisory jobs. Approximately (50%) of the respondents have been employed with MOC for more than 12 years. This result suggests that the respondents have had sufficient experiences with the systems at MOC so that they should have been able to properly evaluate the different quality dimensions of the investigated systems. In addition, the distribution of the re-

spondents across the different sectors at MOC is as follows: Subscriber Services (15%), Information Systems (13%), Finance (12%), Postal Services (11%), International Services (9%), Transportation Services (6%), Legal and Auditing services (8%), Telecommunications and Backing Services (9%), Planning and Administration (14%), Minister Office (2%), and Under Secretary Office (3%).

Data Analysis

First, factor analysis was performed in order to identify the latent research variables (SQ, IQ, SVQ, and IIM). Although all questions in the data collection instrument were used in data collection, only the ones that satisfied several criteria (e.g., reliability coefficients of at least 0.70 (Hair *et al.*, 1998: 118), factor loadings of at least 0.50 (Hair *et al.*, 1998: 111), extracted variances of at least 0.50 (Hair *et al.*, 1998: 612), and communalities of at least 0.50 (Hair *et al.*, 1998: 113) were used for further analysis of the data set.

Table 1 presents the latent factors (SQ, IQ, SVQ, and IIM), factor loadings, Cronbach's reliability coefficients, and the explained variance for each of the four factors. As indicated in the Table, all explained variances are greater than 0.72 and all reliability coefficients are greater than 0.80.

Table 1
Latent Factors, Factor Loadings, Reliability and Variance Extracted

Research Model Constructs	Explained Variance	Factor Loadings	Cronbach's Reliability Coefficient
System Quality (SQ)	%72.617		80.9%
The system(s) allow the information to be readily accessible to me.		.853	
The interface used to interact with the system(s) is(are) understandable.		.853	
The system(s) is(are) reliable and dependable.		.850	
Information Quality (IQ)	81.8%		88.8%
The information provided by the system(s) is always up-to-date.		0.893	
The information provided by the system(s) is complete.		0.928	
The information provided by the system(s) is clear and well formatted.		0.890	
Service Quality (SVQ)	80.375%		91.8%
TSD's employees have the knowledge to do their job well.		0.873	
TSD's employees know what my needs are.		0.883	
The behavior of the TSD's employees instilled confidence in me.		0.91	
I feel safe in my transactions with the TSD's employees.		0.920	
Individual Impact (IIM)	80.183%		91.7%
The system(s) saves my time.		0.865	
The system(s) improves my services to the people I deal with.		0.926	
The system(s) helps me meet the needs of the people I serve.		0.901	
The system(s) improves the satisfaction of the people I serve.		0.888	

In addition, only the items that satisfied the above mentioned criteria were used to produce the four latent variables (SQ, IQ, SVQ, and IIM). Three items of the original six items were used for measuring SQ, three items of the original nine items were used for measuring IQ, four items of the original 22 items were used for measuring service quality SVQ, and

four items of the original ten items were used for measuring individual impact (IIM). The factor loadings, reliability coefficients and explained variances are relatively high, given the exploratory nature of this research. In addition, Gaski (1984) suggests that discriminant validity exists between two constructs if the correlation between them is not higher than their respective reliability estimates. Each

of the four constructs in Table 1 exhibits discriminant validity, since the reliability coefficients of the constructs are higher than their corresponding correlation coefficients: SQ/IQ (.71), SQ/SVQ (.40), SQ/IIM (.66), IQ/SVQ (.42), IQ/IIM (.61), and SVQ/IIM (.43).

Perceived IS Qualities and Effectiveness

Having identified the items that best explain each variable (construct), these variables are expressed as a linear combination of the original questions weighted by their corresponding factor loadings, Table 2 depicts descriptive statistics for each of the four variables.

The results in Table 2 are used to answer the first research question on the extent of the users perceptions of SQ, IQ, SVQ, and IIM. The respondents somewhat agree on the systems positive impact on job performance (IIM) (mean = 5.07), systems quality (SQ) (mean = 4.89) and the provided technical service (SVQ) (mean = 4.84). However, the respondents are

either uncertain or slightly agree on the quality of the information they get from the systems they use (IQ) (mean = 4.4802).

Effects of the Individual Characteristics

In order to answer the second research question on the effect of the demographic and situational characteristics of the respondents on their perceptions of the three systems-related qualities (SQ, IQ, and SVQ) and the systems impact (IIM) on job performance, the Kolmogorov-Smirnov non-parametric test of the validity of the normal distribution was first implemented. The purpose of the test was to check whether these surrogated opinions (e.g., responses) had followed the normal behavior (Table 3).

In Table 3, the Kolmogorov-Smirnov Z statistics for the four variables are greater than 2.00 and their associated levels of significance are less than 0.01. These results suggest that the four variables exhibit non-normal behavior. Therefore, non-parametric analysis was deemed appropriate to

Table 2
Summary Statistics of Research Constructs

Variables	Mean	Std. Deviation
System Quality (SQ)	4.8889	1.41807
Information Quality (IQ)	4.4802	1.50995
Service Quality (SVQ)	4.8437	1.49164
Individual Impact (IIM)	5.0745	1.40412

Table 3
Results of One-Sample Kolmogorov-Smirnov Test of Normality

		SQ	IQ	SVQ	IIM
N		396	394	396	394
Normal Parameters	Mean	4.8889	4.4802	4.8437	5.0745
	Std. Deviation	1.41807	1.50995	1.49164	1.40412
Most Extreme Differences	Absolute	.150	.129	.104	.130
	Positive	.073	.061	.074	.085
	Negative	-.150	-.129	-.104	-.130
Kolmogorov-Smirnov Z		2.990	2.569	2.078	2.587
Asymp. Sig. (2-tailed)		.000	.000	.000	.000

explore the effect of the demographic and situational characteristics of the respondents on SQ, IQ, SVQ, and IIM. The Mann Whitney test was applied when a demographic/situational characteristic (variable) included two independent groups, and the Kruskal-Wallis test was applied when a demographic/situational characteristic (variable) included more than two independent groups.

Table 4 summarizes the results of testing the effect of demographic and situational characteristics of the respondents on systems qualities and effectiveness (SQ, IQ, SVQ, and IIM). The Table depicts the means and standard deviations for each subgroup within each demographic/situational characteristic, as well as the significant level (P-value) for the effect of the individual characteristic on the research constructs.

Gender, education, and tenure at MOC have no effect on the perceived systems qualities (SQ, IQ, and SVQ) and effectiveness (IIM), as all the corresponding P-values are greater than 0.05. Age has an effect ($P = .031$) on only SVQ, as older respondents hold more positive attitudes towards SVQ than do their younger counterparts. Nationality also has an effect on both SVQ ($P = .028$) and IIM ($P = .010$), as non-Kuwaiti respondents hold more positive attitudes towards SVQ and IIM than do their Kuwaiti counterparts.

In addition, job type affects attitudes towards SVQ ($P = .006$), where supervisors hold more positive attitudes towards SVQ than do non-supervisors. Sector type has an effect on perceived systems qualities and effectiveness, as the corresponding P-values are SQ ($P = .004$), IQ ($P = .000$), SVQ ($P = .000$), and IIM ($P = .003$). These

Table 4
Effect of the Individual Characteristics on the Research Constructs

Demographic Characteristic	Levels of measurements	System Quality		Information Quality		Service Quality		Individual Impact	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Gender	Male (N = 137)	4.820	1.413	4.435	1.572	4.897	1.459	5.012	1.404
	Female (N = 259)	4.923	1.424	4.503	1.481	4.820	1.512	5.105	1.408
P-values		.380		.935		.598		.451	
Age	25 or less (N = 32)	4.656	1.576	4.519	1.383	4.867	1.514	5.046	1.467
	26-35 (N = 158)	4.812	1.395	4.281	1.610	4.643	1.485	5.053	1.480
	36-45 (N = 168)	4.922	1.471	4.577	1.481	4.899	1.546	5.055	1.335
	45 or older (N = 37)	5.360	0.983	4.954	1.135	5.418	1.020	5.335	1.147
P-values		.201		.256		.031		.919	
Education	Less than H. S. (N = 31)	5.247	1.265	4.401	1.697	4.916	1.549	5.049	1.435
	H. School (N = 57)	4.760	1.520	4.559	1.696	4.812	1.742	5.017	1.460
	Diploma (N = 192)	4.779	1.498	4.392	1.499	4.745	1.443	4.971	1.487
	Univ. Grad (N = 111)	5.042	1.235	4.621	1.352	5.031	1.393	5.329	1.170
	Masters (N = 5)	4.867	1.789	4.003	2.143	5.099	1.282	4.140	1.832
	PhDs (N = 0)	--	--	--	--	--	--	--	--
P-values		.630		.896		.450		.351	
Nationality	Kuwaiti (N = 378)	4.894	1.415	4.478	1.511	4.811	1.503	5.040	1.413
	Non-Kuwaiti (N = 14)	4.833	1.431	4.764	1.227	5.712	.934	5.930	.911
P-values		.860		.488		.028		.010	
Job Type	Non-Supervisory (N = 319)	4.846	1.465	4.445	1.545	4.747	1.505	5.047	1.458
	Supervisory (N = 78)	5.064	1.2027	4.623	1.361	5.237	1.377	5.185	1.164
P-values		.508		.535		.006		.908	
Tenure	Less than a year (N = 18)	4.815	1.681	4.182	1.436	5.069	1.311	5.055	1.785

Cont. Table 4
Effect of the Individual Characteristics on the Research Constructs

Demographic Characteristic	Levels of Characteristic measurements	System Quality		Information Quality		Service Quality		Individual Impact	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Tenure	1-4 years (N = 69)	4.821	1.681	4.319	1.320	4.723	1.534	5.077	1.222
	5-8 years (N = 71)	4.718	1.520	4.525	1.653	4.683	1.398	4.973	1.625
	9-12 years (N = 42)	5.222	1.306	4.683	1.294	4.918	1.410	5.175	1.357
	More than 12 years (N = 197)	5.000	1.418	4.507	1.570	4.907	1.546	5.090	1.364
P-values		.385		.506		.582		.961	
Sector	Subscribers services (N = 61)	4.191	1.421	3.562	1.654	3.869	1.772	4.349	1.599
	Information Systems (N = 52)	4.863	1.558	4.104	1.583	4.649	1.367	4.967	1.418
	Finance (N = 49)	5.027	1.286	4.772	1.109	4.563	1.282	5.234	1.126
	Postal services (N = 44)	4.985	1.480	4.726	1.680	4.979	1.686	5.209	1.446
	International services (N = 35)	5.438	0.976	4.912	1.072	5.563	0.871	5.465	1.159
	Transporta- tion services (N = 22)	5.199	1.130	4.440	1.091	5.250	1.048	4.874	1.456
	Legal & Auditing (N = 30)	4.534	1.772	4.565	1.551	5.249	1.439	5.376	1.274
	Telecomm. & Backing ser- vices (N = 34)	4.774	1.645	4.686	1.533	5.074	1.096	4.866	1.417
	Planning and Administration (N = 54)	5.222	1.114	4.816	1.504	5.094	1.448	5.378	1.309
	Minister's office (N = 6)	4.944	1.341	4.552	1.027	5.501	1.561	5.838	0.630
	Undersecre- tary's office (N = 10)	5.200	0.996	5.135	1.175	5.474	1.502	5.248	1.467
P-values		.004		.000		.000		.003	

values illustrate that users in Subscriber Services Sector hold the least positive attitudes towards systems qualities and effectiveness, whereas users in the International Services hold the highest positive attitudes towards SQ, SVQ, and IIM. Also, users in the Undersecretary Office hold the highest positive attitudes towards IQ.

Discussion

The objective of this study was to explore the perceived IS qualities (SQ, IQ, and SVQ) and effectiveness (IIM), as well as the influence of the individual characteristics of age, gender, education, tenure, nationality, job type, and sector type, on such perceptions at MOC. The results suggest that IS users hold varying levels of positive attitudes towards the systems quality characteristics - system quality (SQ), information quality (IQ), and service quality (SVQ) - and the systems' positive impact on the users performance on the job (IIM). In addition, with the exception of gender, education, and tenure, the demographic and situational characteristics have varying effects on the users perceptions of the investigated systems-related qualities and systems impact: age affects SVQ; nationality affects SVQ and IIM; job type affects SVQ; and sector type affects SQ, IQ, SVQ, and IIM.

IS users at MOC appear to hold varying levels of positive attitudes towards SQ, IQ, and SVQ and the effect of the systems usage on IIM. Users somewhat agree on the quality characteristics of the systems (SQ) and the technical service they receive from the technical staff of the IS Sector (SVQ). However, they either hold neutral or slightly positive attitudes towards the quality of the information (IQ) they receive from the systems they use.

Therefore, users at MOC believe that the systems, to some extent, allow the information to be readily accessible to them, the interfaces they use to interact with the systems are understandable, and the systems they use are reliable and dependable. In addition, users somewhat believe that the technical support employees in the IS Sector have the knowledge to do their job well, know what users' needs are, their behavior instills confidence in users, and users feel safe in transacting with them. Nevertheless, users are uncertain, or slightly believe, that the systems they use provide them with information that is always up-to-date, complete, clear, and well formatted.

Yet, the qualities of the existing systems-related technical characteristics (SQ), information attributes (IQ), and the associated technical service (SVQ) are only sufficient enough to

create relatively low positive perceptions of, and attitudes towards, the individual impact (IIM) of the systems. Subsequently, users agree, to some extent, that the systems being used have a positive influence on their performance on the job. In other words, they somewhat believe that the systems being used help them save time, improve their service to the people they deal with, meet their needs, and increase their satisfaction.

In addition, the individual characteristics (e.g., demographic and situational) of users have varying effects on their perceptions of the systems-related qualities and effectiveness. Gender, education, and tenure were found to have no effect on the perceived systems qualities (SQ, IQ, and SVQ) and IIM. Among these results, the lack of non-significant effect of gender is surprising, as Kuwaiti men hold more positive attitudes toward work (Ali and AL_Kazemi, 2007) than women and therefore were expected to hold more positive attitudes toward the systems that help them improve job performance. These findings are consistent with the findings of a number of earlier studies such as those of Zviran (2003), who reported that gender and level of education had no effect on users' satisfaction with an ERP system. They are also consistent with the findings of Igbaria (1993), Mawhinney and Lederer (1990), and

Schewe (1976), who found education level to have no relationship with attitude towards system impact on organizational performance and work conditions, with attitudes towards microcomputers, and with microcomputer usage.

These findings, however, are inconsistent with those of Dillon (2001), who found higher educational achievement to have a weak positive influence on systems use; Khalil and Alkordy (1997), who found education to negatively correlate with system usage; Cullen (1983), who found education to correlate positively with interactive and indirect use of systems; and Vasarhelyi (1977), who found education to correlate with decision support systems impact on work performance. They are also inconsistent with the expectation that attitudes and behaviors towards IT/IS vary with tenure (Khalil and Alkordy, 1997), and with those of Lucas (1978) and Schewe (1976), who reported positive correlation between tenure and attitudes towards systems.

Nevertheless, age and job type (supervisory vs. non-supervisory) were found to affect SVQ. Older and supervisory users appear to hold more positive attitudes towards the quality of the technical service provided to them by the technical support group within the IS Sector than do younger and non-supervisory users. Older users may be

less knowledgeable about the technical service support available at MOC, and therefore they do not know what service quality they should reasonably expect. Hence, they might be less critical and, consequently, hold more positive attitudes towards the experienced technical service. Also, in the Arab/Islamic culture of Kuwait, older users are expected to receive more attention and respect from the technical support employees than do younger users. This finding confirms the claim that differences in attitudes towards systems and systems acceptance are associated with age (e.g., Lee *et al.*, 2010; Dean, 2008; Chang and Samuel, 2004). However, it does not lend support to the claim that attitude toward computers tend to become negative as users get older (Wagner *et al.*, 2010; Friedberg, 2003; Morris and Venkatesh, 2000)), and age matters less with experience and wider dissemination of technology in ones everyday social and business life (Nilsson, 2007; Dabholkar *et al.*, 2003).

Furthermore, Kuwait is characterized by a relatively high power distance culture (House *et al.*, 2004; Kabasakal and Dastmalchian, 2001), as the community maintains inequality among its members with respect to power, authority, prestige, status, and wealth ((Hofstede, 1980, 1991). Such a culture is expected to influence the power relationships between the technical ser-

vice personnel and the supervisors at the different managerial hierarchy at MOC. The technical service personnel are expected to pay more attention to the service requests that they receive from supervisors than they do with the service requests that they receive from non-supervisors.

In addition, because of their different responsibilities, supervisors experience a relatively higher uncertainty level at the workplace than do non-supervisors. In the high uncertainty avoidance culture of Kuwait (House *et al.*, 2004; Kabasakal and Dastmalchian, 2001), supervisors are expected to be exceedingly concerned with information in order to reduce uncertainty. Subsequently, supervisors, compared to non-supervisors, are expected to hold more favorable attitudes toward technical services that help them to access information that they need for decreasing uncertainties at the workplace.

Although the representation of the non-Kuwaiti (expatriate) users in the sample is relatively small, nationality was found to affect both SVQ and IIM. Non-Kuwaiti users hold more positive attitudes towards the quality of the technical service provided to them by the technical service group within the IS Sector than do their Kuwaiti counterparts. In addition, non-Kuwaiti users believe that their

utilization of the available information systems has more positive impact on their job performance than do their Kuwaiti counterparts. One interpretation of this finding is that tenure, raises, and promotion decisions for Kuwaiti employees in the public sector may not be evidently linked to job performance (AL-Kazemi and Ali, 2002). Therefore, Kuwaiti users could have down-rated the quality of the technical service just because they didn't value its importance to job performance. On the other hand, non-Kuwaiti users could have fairly rated the quality of the technical service because they valued its importance to job performance, which is considered critical to contracts renewal and job security. Expatriates also appear to hold more positive attitudes toward work than their Kuwaiti counterparts (Ali and Al-Kazemi, 2007). Therefore, they may be more motivated to use the available systems and hold more positive attitudes toward them as long as these systems help improve job performance.

Furthermore, the sector type, where users work, was found to have an effect on SQ, IQ, SVQ, and IIM. Users' perceptions of the information systems qualities and systems impact on job performance vary across sectors. Whereas users working in the Subscriber Services Sector, for example, hold the least positive attitudes

towards the three systems-related qualities (SQ, IQ, and SVQ) and the systems positive impact (IIM) on job performance, users in the International Services Sector hold the highest positive attitudes towards SQ, SVQ, and IIM, and users in the Undersecretary Office hold the highest positive attitudes towards IQ. This finding can be interpreted in light of the task-technology fit (TTF) model, as systems can have a positive impact on performance if their capabilities match the tasks that the users need to perform (Dishaw *et al.*, 2002; Goodhue and Thompson, 1995). Users are expected to hold favorable attitudes towards the systems and their impact on job performance when a high level of congruence exists between the systems characteristics and the task and work environment characteristics. Further research, however, is needed in order to substantiate this interpretation.

Differences in work-related factors, such as job responsibilities, information needs, types of computer-based applications, and patterns of systems use, exist across the Sectors. Among all users, the users in the Subscriber Services Sector show the least favorable attitudes towards the quality of the information (IQ) produced by the systems being used in that sector. This finding may be attributed to the fact that the Billing

System, which is the mostly used system in that sector, does not properly produce the information that the users need to make decisions and carry out job responsibilities. On the other hand, the employees in the International Service Sector appear to hold the most positive attitudes towards the Commercial Service System, which provides them with the information needed to manage the communication and Internet lines for subscribers. This finding is inconsistent with those of Zviran (2003), who found user satisfaction with systems not to significantly vary across departments.

Overall, the findings of this research provide some empirical evidence on the perceived systems qualities (technical characteristics, information attributes and service quality), the systems effectiveness (as measured by the individual impact of the systems), and the influence of demographic and situational factors (age, nationality, job type, and sector type) on users perceptions and attitudes towards systems qualities and effectiveness in a public organization operating in an Islamic/Arab culture. These findings provide partial support for the relevant literature and the findings of the earlier relevant research which suggest that the users individual characteristics have unique ways of interacting with the informa-

tion systems and, consequently, users have different attitudes and behavior towards such systems ((e.g., Nilsson 2007; Chang and Samuel, 2004; Wu, 2003; Venkatesh *et al.*, 2003; Khalil and Alkordy, 1997).

Implications

Although some results have been produced from relatively small representations of certain individual characteristics (e.g., nationality and sector type) in the research sample, the findings of this research have both theoretical and practical implications. First, this research contributes to the growing body of knowledge on global IS effectiveness by providing empirical evidence on the perceived systems-related technical, informational, and service qualities; systems impact on job performance; and the influence of the users individual characteristics on such perceptions in a public organization operating in an Islamic/Arab culture. Understanding why people accept and use IT/IS in a particular culture is needed so that better methods for designing, evaluating, and predicting how users will respond to IT applications can be developed (Dillon and Morris, 1996). In addition, the findings of this research should strengthen the external validity (especially its international dimension) of similar research findings obtained from organizations operating in a

Western environment (e.g., Khalil and Alkordy, 1997; Aharoni and Burton, 1994).

Second, the findings highlight specific areas that need improvement and, therefore, may help MOC managers draw policies and take actions to augment the benefits of IS at MOC. Users in general hold relatively low positive attitudes towards the qualities of the systems being used and the systems' positive impact on their performance on the job. Therefore, IS managers should consider taking actions to boost users' positive attitudes towards the systems and encourage effective utilization of such systems in support of the Ministry operations.

More importantly, efforts should be made in order to improve the quality dimensions, especially the attributes of the produced information that the users believe is important to their formulation of positive attitudes towards the systems they regularly use. Resources must be committed in order to replace and/or upgrade the existing systems so that they become more reliable and dependable; the interfaces are better understandable; the information becomes more readily accessible, up-to-date, complete, clear, and well-formatted, as well as ensure that the technical support employees in the IS Sector have the knowledge to do their job well, know

users needs, and behave in a way that instills confidence and trust in users.

IS improvement efforts at MOC should also take into consideration the demographic and situational characteristics which influence users perceptions and attitudes towards the systems they use. For instance, in order to develop more positive attitudes towards the systems, the quality dimensions of technical service must be redesigned and managed in a way that fit the users characteristics of age, nationality (Kuwaiti nationals vs. expatriates), job type (supervisors vs. non-supervisors), and the sector type where users work. In addition, IS managers should use the findings of this research as a baseline for launching future longitudinal assessments in order to periodically assess and benchmark IS qualities and impact, so that informed policies and decisions for future IS improvements can be made.

Besides, MOC managers should consider investigating their current incentives systems and make the necessary changes in order to better motivate their employees to utilize the available systems for performance improvement. They should also consider assessing the employees' computer training needs and plan and execute training programs deemed necessary to boost the employees' computer skills. Such programs

should be designed based on the individual characteristics of the different users groups and the requisite skills for efficiently using the different systems.

Conclusions

Due to the ever growing investments in information technologies (IT), a constant assessment and improvement of information systems (IS) effectiveness in organizations has become indispensable. This research investigated the perceived systems quality (SQ), information quality (IQ), service quality (SVQ), and systems impact on job performance (IIM), as well as the influence of the individual characteristics of age, gender, education, tenure, nationality, job type, and sector, on such perceptions at MOC.

The perceived quality levels of the existing systems-related technical characteristics, information attributes, and the associated technical service are only sufficient enough to create low favorable perceptions of and attitudes towards the systems and their influence on job performance at MOC. In addition, age, nationality, job type, and sector type influence the employees' perceptions of the systems-related qualities and positive impact on job performance. Although drawn from a data set that

is perceptual, case-based and includes imbalanced representation of some of the investigated characteristics (e.g., nationality), these findings help understand why people accept and use IS in a public organization operating in an Islamic/Arab culture.

IS managers at MOC can use the research findings as a foundation for developing policies and taking actions aimed at boosting users' positive attitudes towards the existing systems and replace/upgrade them, if needed. These policies and decisions should take into consideration the individual characteristics (e.g., age, nationality, job type, and sector type) that may influence users perceptions of and attitudes towards the systems being used.

Nevertheless, this research has its own limitations, as the findings have been determined by the subjective perceptions of informants in a relatively unbalanced sample drawn from a single organization. They may, therefore, have specific components that vary across organizations and over time. In order to decrease the possible confounding effect of context and time variability, future research designs may use longitudinal data in order to investigate IS effectiveness and its determinants in public organizations in Kuwait and other Gulf Cooperative Council (GCC) coun-

tries. The findings of such investigations can be compared and conclusions can be drawn on IS effectiveness in the Gulf region. In addition, interested researchers may continue this line of research and carry out investi-

gations to assess the extent of the acceptance and use of the newly implemented Internet-based systems (i.e., e-government systems) and their adoption-determining factors in the Kuwaiti public organizations.

Appendix A

Main Information Systems at MOC at Time of Investigation

(Source: Khalil and Ghanim, 2013)

-
- | | |
|---|---|
| 1 | The Billing System--the major and the mostly used system in MOC--helps manage and store the data and the bills of the telephonic home subscribers and handle the telephone lines (land lines) operations and disconnections and all related functions. |
| 2 | The Phone Directory 101 (Data Query (DQ)) system provides callers with a wide range of information on the requested telephone number, such as home phones, companies, and other governmental and non-governmental organizations. |
| 3 | The Integrated System of Civil services is linked and managed by Civil Service Commission (CSC) to store and manage MOCs employees data related to their financial information, administrative information, and legal information. |
| 4 | The Integrated Financial System (IFS) is linked and managed by the Ministry of Finance and helps store and manage the details of the financial information of MOC employees such as basic salary, children allowances, social allowance, and all other salary details. |
| 5 | The Maritime Transport System (MTS) supports the transport and allied services in Kuwait such as registration of navigation lines or regular ships, investigation of maritime collisions, inspection and survey of small ships, and issuance of transport certificates for small ships, large ships, jet skis, etc. |
| 6 | The Telegram System facilitates the sending and receiving of telegrams among different sites internally or worldwide. |
| 7 | The Postal Services System helps store post offices boxes information, calculate incoming/ outgoing parcels, and manage and follow express mail services. |
| 8 | The Commercial Services System provides international E1 links, international leased lines, and internet fiber optics links. |
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Appendix B

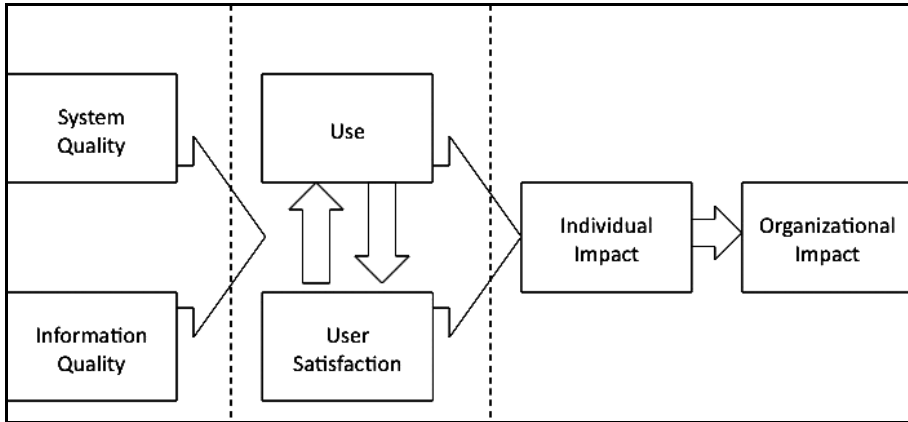


Figure 1: DeLone & McLeans 1992 IS Success Model (Source: DeLone & McLean, 1992: 87)

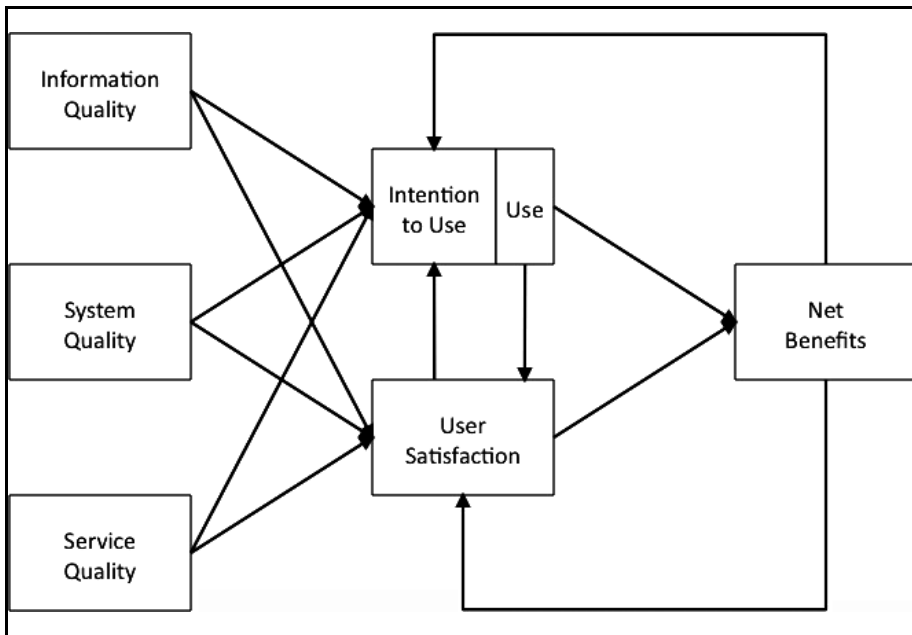


Figure 2: DeLone & McLeans 2003 IS Success Model (Source: DeLone & McLean, 2003:24)

Appendix C
Data Collection Instrument
(Questions and Instructions Related to SQ, IQ, SVQ, and IIM)

Section I: System Quality (SQ)

Please carefully read each of the following statements and circle the number that best describes your perception of the quality of the system(s) provided and supported by the Information Systems Sector (IS) and you use regularly in performing your work.

	1	2	3	4	5	6	7	0				
	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	Not applicable				
1	*The response time of the system(s) is appropriate to my use and needs.				1	2	3	4	5	6	7	0
2	The system(s) allow the information to be readily accessible to me.				1	2	3	4	5	6	7	0
3	The interface used to interact with the system(s) is(are) understandable.				1	2	3	4	5	6	7	0
4	The system(s) is(are) reliable and dependable.				1	2	3	4	5	6	7	0
5	*The system(s) can be easily modified, corrected or improved.				1	2	3	4	5	6	7	0
6	*The system(s) allows for integration with other existing systems.				1	2	3	4	5	6	7	0

Section II: Information Quality (IQ)

Please carefully read each of the following statements and circle the number that best describes your perception of the *quality of the information you receive from the systems* provided by the Information Systems Sector (IS) and you use regularly in performing your work.

	1	2	3	4	5	6	7	0				
	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	Not applicable				
1	*The information provided by the system(s) is accurate.				1	2	3	4	5	6	7	0
2	*The information provided by the system(s) is always available at a time suitable for its use.				1	2	3	4	5	6	7	0
3	*The information provided by the system(s) is exactly the same as expected.				1	2	3	4	5	6	7	0
4	*The information provided by the system(s) is reliable and trustworthy.				1	2	3	4	5	6	7	0
5	The information provided by the system(s) is always up-to-date.				1	2	3	4	5	6	7	0
6	The information provided by the system(s) is complete.				1	2	3	4	5	6	7	0
7	The information provided by the system(s) is clear and well formatted.				1	2	3	4	5	6	7	0
8	*The information provided by the system(s) is presented concisely.				1	2	3	4	5	6	7	0
9	*The information provided by the system(s) is relevant to my needs and requirements.				1	2	3	4	5	6	7	0

Section III: Service Quality (SVQ)

Please carefully read each of the following statements and circle the number that best describes your perception of the *quality of services you have received* from the Technical Support Department (TSD) of the Information System Sector (IS) which helps you to use the system(s) effectively and efficiently.

	1	2	3	4	5	6	7	0				
	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	Not applicable				
1	*Technical Support Department (TSD) has up-to-date equipment.				1	2	3	4	5	6	7	0
2	*TSD's physical facilities are visually appealing.				1	2	3	4	5	6	7	0
3	*TSD's employees are well dressed and neat in appearance.				1	2	3	4	5	6	7	0
4	*When TSD promises to do something by a certain time, it does so.				1	2	3	4	5	6	7	0
5	*When I have problems, TSD is sympathetic and reassuring.				1	2	3	4	5	6	7	0
6	*TSD is dependable for handling my problems.				1	2	3	4	5	6	7	0
7	*TSD provides its services at the time it promises to do so.				1	2	3	4	5	6	7	0
8	*TSD keeps its records accurately.				1	2	3	4	5	6	7	0
9	*TSD tells exactly when the services will be performed.				1	2	3	4	5	6	7	0
10	*TSD's employees are never too busy to respond to my requests.				1	2	3	4	5	6	7	0
11	*TSD's employees are polite.				1	2	3	4	5	6	7	0
12	TSD's employees have the knowledge to do their job well.				1	2	3	4	5	6	7	0
13	*TSD's employees deal with me in a caring fashion.				1	2	3	4	5	6	7	0
14	TSD's employees know what my needs are.				1	2	3	4	5	6	7	0
15	*TSD has my best interests in mind.				1	2	3	4	5	6	7	0
16	*TSD has convenient operating hours.				1	2	3	4	5	6	7	0
17	*The appearance of the physical facilities of TSD is in keeping with the type of services provided.				1	2	3	4	5	6	7	0

18	*TSD's employees provide me with prompt services.	1	2	3	4	5	6	7	0
19	*TSD's employees are always willing to help me.	1	2	3	4	5	6	7	0
20	The behavior of the TSD's employees instilled confidence in me.	1	2	3	4	5	6	7	0
21	I feel safe in my transactions with the TSD's employees.	1	2	3	4	5	6	7	0
22	*TSD gives me individual attention.	1	2	3	4	5	6	7	0

Section V: Individual Impact (IIM)

Please carefully read each of the following statements and circle the number that best indicate the extent to which the system(s) provided by the Information Systems Sector (IS) and you use regularly has/have *impacted your job performance*.

	1	2	3	4	5	6	7	0				
	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	Not applicable				
1	*The system(s) allows me to accomplish more work than would otherwise be possible.				1	2	3	4	5	6	7	0
2	*The system(s) increases my productivity.				1	2	3	4	5	6	7	0
3	The system(s) saves me time.				1	2	3	4	5	6	7	0
4	*The system(s) helps me try out innovative ideas.				1	2	3	4	5	6	7	0
5	The system(s) improves my services to the people I deal with.				1	2	3	4	5	6	7	0
6	The system(s) helps me meet the needs of the people I serve.				1	2	3	4	5	6	7	0
7	The system(s) improves the satisfaction of the people I serve.				1	2	3	4	5	6	7	0
8	*The system(s) helps management control the work process.				1	2	3	4	5	6	7	0
9	*The system(s) improves management control.				1	2	3	4	5	6	7	0
10	*The system(s) helps management control performance.				1	2	3	4	5	6	7	0

*Items that were excluded as a result of the factor analysis

References

- Aharoni, Y. and Burton, R. M. 1994. Is Management Science International: In search of universal rules. *Management Science*, 40(1): 1-3.
- Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2): 179-211.
- Alavi, M. and Joachimsthaler, E. A. 1992. Revisiting DSS Implementation Research: A Meta-Analysis of the Literature and Suggestions for Researchers. *MIS Quarterly*, 16(1): 95-116.
- Ali, J. A. and Al-Kazemi, A. A. 2007. Islamic work ethic in Kuwait. *Cross Cultural Management: An International Journal*, 14(2), 93-104.
- Al-Kazemi, A. A. and Ali, J. A. 2002. Managerial problems in Kuwait. *Journal of Management Development*, 21(5), 366-375.
- Almutairi, H. 2011. Factors affecting the information behaviour of managers in the Kuwaiti civil service: A relational model. *Information Research*, 16(2), paper 477.
<http://InformationR.net/ir/16-2/paper477.html>
- AlMutairi, H. 2001. Evaluating information systems success in public organizations: A theoretical model and empirical validation. PhD dissertation, the Pennsylvania State University, USA.
- Bailey, J. E. and Pearson, S. W. 1983. Development of a Tool for Measuring and Analyzing Computer User Satisfaction. *Management Science*, 29(5): 530- 545.
- Chang, J. and Samuel, N. 2004. Internet Shopper Demographics and Buying Behaviour in Australia. *The Journal of American Academy of Business*, September: 171-6.
- Choudrie, J. and Lee, H. 2004. Broadband development in South Korea: Institutional and cultural factors. *European Journal of Information Systems*, 13(2): 103-14.
- Choudrie, J. and Papazafeiropoulou, A. 2006. Lessons learnt from the broadband diffusion in South Korea and the UK: Implications for future government intervention in technology diffusion. *Electronic Government: An International Journal*, 3(4): 373-85.
- Compeau, D., Higgins, C. A. and Huff, S. 1999. Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly*, 23(2): 145-158.
- Coombs, R., Knights, D. and Willmott, H. C. 1992. Culture, control and competition: Towards a conceptual framework for the study of information technology in organizations, *Organization Science*, 13(1), 51-72.
- Cronin J. J. and Taylor S. A. 1992. Measuring service quality: A reexamination and extension. *Journal of Marketing*, 56(3): 55-68.
- Culnan, M. J. 1983. Chauffeured versus end user access to commercial database: The effects of task and individual differences. *MIS Quarterly*, 7(4): 55-67.
- Dabholkar, P., Bobbitt, L. and Lee, E. 2003. Understanding Consumer

- Motivation and Behavior Related to Self-Scanning in Retailing. *International Journal of Service Industry Management*, 14(1): 59-95.
- Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3): 319-339.
- Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. 1989. User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8): 982-1003.
- Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. 1992. Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22(14): 1111-1132.
- Dean, D. 2008. Shopper age and the use of self-service technologies. *Managing Service Quality*, 18(3): 225-38.
- DeLone, W. H., and McLean, E. R. 1992. Information Systems Success: the Quest for the Dependent Variable. *Information Systems Research*, 3(1): 60-95.
- DeLone, W. H. and McLean, E. R. 2002. Information Systems Success Revisited. *The 35th Annual Hawaii International Conference on System Sciences (HICSS'02)*, 8: 238-248.
- DeLone, W. H. and McLean, E. R. 2003. The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4): 9-30.
- Dillon, A. 2001. User acceptance of information technology. In W. Karwowski (ed.), *Encyclopedia of Human Factors and Ergonomics*. London: Taylor and Francis.
- Dillon, A. and Morris, M. 1996. User acceptance of new information technology: Theories and models. In M. Williams (ed.), *Annual Review of Information Science and Technology*, Vol. 31. Medford NJ: Information Today, 3-32.
- Fishbein, M. and Ajzen, I. 1975. *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading MA: Addison-Wesley.
- Friedberg, L. 2003. The impact of technological change on older workers: Evidence from data on computer usage. *Industrial and Labor Relations Review*, 56(3): 511-529.
- Gefen, D. and Straub, D. W. 1997. Gender differences in the perception and use of e-mail: An extension to the technology acceptance model. *MIS Quarterly*, 21(4): 389-400.
- Grant, G. 2005. Realizing the promise of electronic government. *Journal of Global Information Management*, 13(1): 1-4.
- Gaski, J. F. 1984. The Theory of Power and Conflict in Channels of Distribution. *Journal of Marketing*, 48, 9-29.
- Ginzberg, M. J. 1981. Early diagnosis of MIS implementation failure: Promising results and unanswered questions. *Management Science*, 27(4): 459-478.
- Hair, J. F., Anderson, R. E., Tatham, R. L. and Black, W. C. 1998. *Multivariate Data Analysis (5th ed.)*. Upper Saddle River, NJ: Prentice Hall.

- Hawthorn, D. 2000. Possible implications of aging for interface designers. *Interacting with Computers*, 12(5): 507-528.
- Hill, C. E., Loch, K. D., Straub, D. and El-Sheshai, K. 1998. A Qualitative Assessment of Arab Culture and Information Technology Transfer. *Journal of Global Information Management*, 6(3): 29-38.
- Hofstede, G. 1980. *Culture's consequences: International differences in related values*. Beverly Hills, CA: Sage.
- Hofstede, G. 1983. The dimensions of national cultures in fifty countries and three regions. In *Explications in cross-cultural psychology*, J. B. Derogowski, S. Daiurawiec and R. C. Annis (eds.). Swets and zeitlinger, Lisse, Netherlands.
- Hofstede, G. 1991. *Cultures and organizations: Software of the mind*. New York, NY: McGraw-Hill.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W. and Gupta, V. (eds.). 2004. *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Thousand Oaks, CA: Sage Publications.
- Hu, P. J. H. 2003. Evaluating Telemedicine Systems Success: A Revised Model. *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS 03)*, January 6-9, Big Island, Hawaii.
- Hupfer, M. E. and Detlor, B. 2006. Gender and Web information seeking: a self-concepts orientation model *Journal of the American Society for Information Science and Technology*, 57(8): 1105-1115.
- Igbaria, M. 1992. An examination of microcomputer usage in Taiwan. *Information and Management*, 22: 19-28.
- Igbaria, M. 1993. User acceptance of microcomputer technology: An empirical test. *OMEGA International Journal of Management Science*, 21(1): 73-90.
- Irani, Z., Love, P. E. D. and Montazemi, A. R. 2007. E-government: Past, present and future, *European Journal of Information Systems*, 16(2): 103-105.
- Kabasakal, H., and Dastmalchian, A. 2001. Introduction to the Special Issue on Leadership and Culture in the Middle East. *Applied Psychology: An International Review*, 50 (4), 479-488.
- Kalmus, V., Realo, A and Siibak, A. 2011. Motives for internet use and their relationships with personality traits and socio-demographic factors, *TRAMES*, 15(65/60), 4: 385-403.
- Khalil, O., and Ghanim, H. 2013. Perceived Technical Service Quality and Information Satisfaction at the Ministry of Communications, Kuwait, *Information Resources management Journal*, 26(2): 64-90.
- Khalil, O. and Elkordy, M. 1997. The relationship of some personal and situational factors to IS effectiveness: Empirical evidence from Egypt, *Journal of Global Information Management*, 5(2): 22-34.
- Lee, H., Cho, H., Xu, W. and Fairhurst, A. 2010. The Influence of Consumer Traits and Demographics on Intention to Use Retail Self-Service

- Checkouts. *Marketing Intelligence and Planning*, 28(1): 46-58.
- Leidner, D. E. and Kayworth, T. 2006. A review of culture in information systems research: toward a theory of information technology culture conflict, *MIS Quarterly*, 30(2): 357-399.
- Loch, K., Straub, D. and Kamel, S. 2003. Diffusing the Internet in the Arab World: The Role of Social Norms and Technological Culturation. *IEEE Transactions on Engineering Management*, 50(1): 45-63.
- Lucas, H. C. 1982. *Information Systems Concepts for Management*. New York: McGraw-Hill.
- Lucas, H. C. 1978. The use of an interactive information storage and retrieval system in medical research, *Communications of the ACM*, 21(3): 197-205.
- Lucas, H. C. 1975. Behavioral factors in systems implementation. In Schultz, R. L. and Slevin, D. P. (eds.), *Implementing Operations Research/Management Science*. NY: Elsevier.
- Martinsons, M. and Davison, R. 2003. Cultural issues and IT management. *IEEE Transactions on Engineering Management*, 50(1): 113-117.
- Mawhinney, C. H. and Lederer, A. L. 1990. A study of personal computer utilization by managers. *Information & management*, 18: 243-253.
- Morris, M. G., Venkatesh, V. and Ackerman, P. L. 2005. Gender and age differences in planned behavior. *IEEE Transactions on Engineering Management*, 52(1): 69-84.
- Morris, M. G. and Venkatesh, V. 2000. Age differences in technology adoption decisions: Implications for a changing work force. *Personal Psychology*, 53: 375-403.
- Myers, M. D. and Tan, F. B. 2002. Beyond models of national culture in information systems research, *Journal of Global Information Management*, 10(1): 24-32.
- O'Reilly, C. A. 1982. Variations in decision makers use of information sources: The impact of quality and accessibility of information. *Academy of Management Journal*, 24(4): 756-771.
- Nilsson, D. 2007. A cross-cultural comparison of self-service technology use. *European Journal of Marketing*, 41(3/4): 367-81.
- Palvia, P. 1993. Preface. *Journal of Global Information Management*, 1: 3-5.
- Pedain, C. 2003. Managing processes and information technology in mergers: The integration of finance processes and system. PhD dissertation, Cranfield University, School of Industrial and Manufacturing Science. <http://worldcat.org/oclc/59173118>
- Robey, D. 1979. User attitudes and management information systems use. *Academy of Management Journal*, 22(3): 527-538.
- Rose, G. and Straub, D. 1998. Predicting General IT Use: A Study in Arab Developing Nations. *Journal of Global Information Management*, 6(3): 39-46.
- Schewe, C. D. 1976. The MIS user: An exploratory behavioral analysis. *Academy of Management Journal*, 19(4): 577-590.

- Scott, M. and DeLone, W. H. 2009. Understanding net benefits: A citizen-based perspective on e-government success. The Thirtieth International Conference on Information Systems (ICIS), Phoenix, USA, 1-11.
<http://aran.library.nuigalway.ie/xmlui/bitstream/handle/10379/1560/ICIS2009Finalv3.pdf?sequence=1>
- Straub, D., Loch, K., and Hill, C. 2001. Transfer of information technology to developing countries: A test of cultural influence modeling in the Arab World. *Journal of Global Information Management*, 9(4): 6-28.
- Taylor, S. and Todd, P. 1995. Understanding information technology usage: A test of competing models. *Information Systems Research*, 6(2): 144-176.
- Thompson, R.L., Higgins, C. A. and Howell, J. M. 1991. Personal computing: Toward a conceptual model of utilization. *MIS Quarterly*, 15(1): 124-143.
- Torkzadeh, G. and Doll, W. J. 1999. The Development of a Tool for Measuring the Perceived Impact of Information Technology on Work. *Omega*, 27(3): 327-339.
- Vasarhelyi, M. A. 1977. Man-machine planning systems: A cognitive style examination of interactive decision making. *Journal of Accounting Research*, spring, 138-153.
- Venkatesh, V. and Davis, F. D. 2000. A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2): 186-204.
- Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F.D. 2003. User acceptance of information technology toward a unified view. *MIS Quarterly*, 27(3): 425-78.
- Wagner, N., Hassanein, K. and Head, M. 2010. Computer use by older adults: A multidisciplinary review. *Computers in Human Behavior*, 26(5): 870-882.
- Wu, S. 2003. The relationship between consumer characteristics and attitude toward online shopping. *Marketing Intelligence and Planning*, 21(1): 37-44.
- Zenger, T. R. and Lawrence, B. S. 1989. Organizational demography: The differential effects of age and tenure distributions on technical communication. *Academy of Management Journal*, 32(2): 353-376.
- Zhang, N., Guo, X., Chen, G. and Chau, P. 2009. Impact of perceived fit on e-government user evaluation: A study with a Chinese cultural context. *Journal of Global Information Management*, 17(1): 49-69.
- Zmud, R.W. 1979. Individual differences and success: A review of the empirical literature. *Management Science*, 25(10): 966-979.
- Zviran, M. 2003. User satisfaction in ERP systems: Some empirical evidence. *Journal of Academy of Business and Economics*, 2(1): 1-15.

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