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Integrating User Satisfaction and Performance Impact with Technology Acceptance Model (TAM) to Examine the Internet Usage Within Organizations in Yemen

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Abstract: Internet technology has become an essential technological tool for individuals, organizations and nations driving growth and prosperity. In today's rapidly changing commercial environment, the internet is playing a major role in enabling organizations to be flexible, networked and competitive. It is providing a platform for improving task efficiency, knowledge acquisition and communication and decision-making quality. Yet, half the world population is still not using the internet. A significant body of theory and a number of models have been proposed to understand this ambiguity about technology usage. Although, the Technology Acceptance Model (TAM) has achieved wide acceptance, it neglects to focus on evaluating technology usage, such as user satisfaction and performance impact. Therefore, the purpose of this study is to propose and verify that the TAM can be employed to explain and predict internet usage among employees in organizations, along with the extended TAM with its two output factors, namely user satisfaction and performance impact. In addtion, this study deals with performance impact as a second-order construct to enhance the explanatory power of the full model. A survey questionnaire was used to collect primary data from 530 internet users among employees within the head offices in all thirty government ministries in Yemen. The analysis includes Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) via. AMOS and the results show that the data fits the extended TAM model well. The findings of the multivariate analysis demonstrate the following four main results: first, perceived ease of use has a positive impact on perceived usefulness, actual usage and user satisfaction. Second, perceived usefulness has great influence on actual usage and user satisfaction. Third, actual usage has a strong positive impact on performance impact. Fourth, user satisfaction positively influences performance impact. The model proposed here explains 65% of the variance in performance impact and the theoretical and practical implications are also discussed.

Key words: User satisfaction, performance impact, perceived usefulness, perceived ease of use, TAM, Yemen

INTRODUCTION

Although, the number of internet users has increased from 14,161,570 in 1993 to 3,739,698,500 in 2017, half of the world population is still not using the internet (ILS., 2016) (Fig. 1). The internet has become one the essential technological tools to enhance growth and prosperity of individuals, organizations and nations and is even considered by some as one of the basic human rights (Negroponte, 2014). So, more than 3 billion people are missing out on the opportunity to make a significant difference in the way they live.

Unlike Yemen, most of neighboring Arab countries have a greater volume of internet technology usage with the internet penetration being recorded at 93.48% (Bahrain), 92.88% (Qatar), 91.24% (UAE), 82.08% (Kuwait), 74.17% (Oman) and 69.62% (Saudi Arabia). Yemen at 25.1% has one of the lowest internet usage rates in the world (Anonymous, 2016) (Fig. 2).

It is important to note that lack of technology usage can lead to low performance and low productivity (Delone and Mclean, 1992, 2003; Norzaidi and Salwani, 2009; Makokha and Ochieng, 2014). One of the main issues of this study is the lack of internet usage in Yemen, one of its main aims is to assist policy makers in Yemen to make decisions and devise strategies to widen internet usage and accelerate the diffusion of the internet.

Many studies indicate that information technology such as the internet can become a powerful platform for improving task efficiency, knowledge

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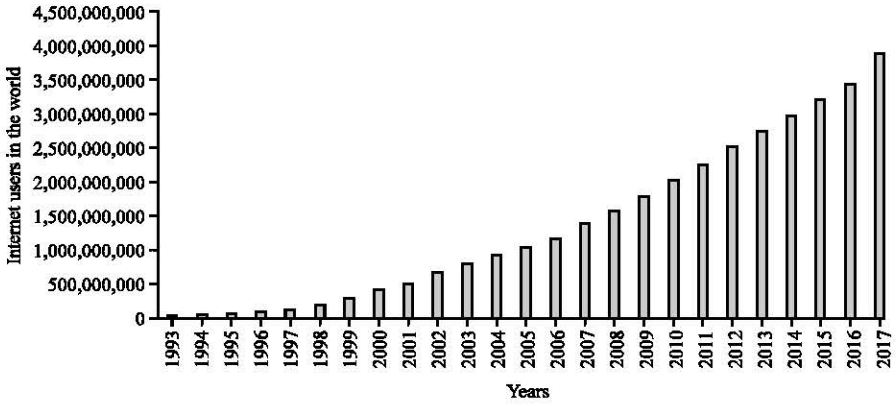


Fig. 1: Internet users in the world (ILS., 2016)

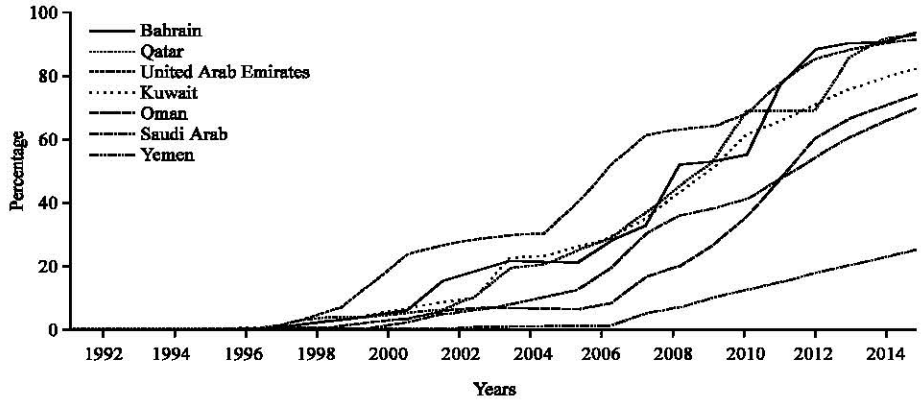


Fig. 2: Internet users as percentage of population: Yemen vs. neighbor Arab countries (Anonymous, 2016)

acquisition, communication quality and decision quality (D'Ambra *et al*., 2013; Hou, 2012; D'Ambra and Wilson, 2011; Cheng, 2011; Safar-Hasim and Salman, 2010; Norzaidi *et al*., 2007, 2009; Wu and Wang, 2006). There is a significant body of theories anmodels seeking to understand the ambiguity regarding technology usage. The Technology Acceptance Model (TAM) developed by Davis (1989) to explain computer usage behavior has achieved wide acceptance and been validated by numerous empirical studies as an accurate predictor of system usage and acceptance. TAM has becomes one of the most accepted technology usage and acceptance models for several reasons.

Firstly, scholars have obtained empirical support for the TAM Model across various contexts leading to TAM appearing in the Information System (IS) literature as one of the most widely used theories for investigating system usage. Moreover, the rapid rate of change in technology makes any study incompetent if it does not take the time seriously (Ridley, 2010). TAM is already validated and applied across contexts and time as follows:

- North American: Peng *et al.* (2015), Negahban and Chung (2014), Ha and Stoel (2009), Fagan *et al.* (2008), Park and Chen (2007), McFarland and Hamilton (2006)
- South American: Jan and Contreras (2011) and Singh *et al.* (2006)
- Europe: Tarhini *et al.* (2013), Pinho and Soares (2011), Liu *et al.* (2010), Sanchez and Hueros (2010), Hernandez *et al.* (2008), Singh *et al.* (2006) and Roca *et al.* (2006)
- Asia: Cheng (2014), Phua *et al.* (2012), Lee *et al.* (2011a, b), Ramayah *et al.* (2005), Shih (2004), Ramayah and Suki (2006), Lian (2015), Lee and Kim (2009), Kim *et al.* (2007), Joo and Sang (2013)
- Sub-Saharan Africa: Cudjoe *et al.* (2015), Mbogo (2010) and Anandarajan *et al.* (2002)
- Oceania: Wessels and Drennan (2010), Revels *et al.* (2010), Callum and Jeffrey (2013), Ryan and Rao (2008)

- Middle East and North Africa: Faqih (2016), Koksal (2016), Tarhini *et al.* (2016a, b), Sharma and Chandel, (2013), Seliaman *et al.* (2012), Farahat (2012), Mutahar *et al.* (2016) and Alrajawy *et al.* (2016)

While theories and models of technology usage do not serve equally across contexts (Al-Qeisi, 2009; Kripanont, 2007; Straub *et al.*, 1997), this study is probably one of few that applies in the context of Yemen.

Secondly, there is a diversity of applications which support the effectiveness of TAM to predict user behaviour. These include: internet technology usage (Jin, 2013), internet banking (Nasri and Charfeddine, 2012), mobile learning (Cheng, 2014), social media websites (Pinho and Soares, 2011), e-Commerce (Yayla and Hu, 2007), e-Government (Rahman *et al.*, 2016), e-Learning (Tarhini *et al.*, 2016), ERP system (Ramayah and Lo, 2007), course website (Ramayah, 2006), online shopping (Lin, 2007), intranet technology (Lee and Kim, 2009), smartphone (Kim, 2014), mobile payments (Mbogo, 2010).

Although, Venkatesh (2000) describes TAM as one of the most influential theories for predicting actual system usage and shows the robustness and effectiveness of the model which focuses on antecedent variables by proposing the two factors (ease of use and usefulness), TAM neglects to focus on evaluating technology usage such as user satisfaction and performance impact. Evaluating IS through user satisfaction and performance is strongly recommended to measure the success of IS (Montesdioca and Macada, 2014). Many previous studies on the usage and adoption of information technology focus only on actual usage as output construct (Cheng, 2014; Fusilier and Durlabhji, 2005; Hong *et al.*, 2006; Iqbal and Qureshi, 2012; Joo and Sang, 2013; Lee *et al.*, 2011). A few notable studies have filled the gap by addressing the link between actual usage and individual or organizational performance (Hou, 2012; Norzaidi *et al.*, 2007; Norzaidi and Salwani, 2009; Son *et al.*, 2012). This study extended TAM with two output factors, namely user satisfaction and performance impact and deal with performance impact as a second-order construct to enhance the explanatory power of the full model. The main objectives of this study as follows: to examine the effect of perceived ease of use on perceived usefulness. To examine the effect of perceived ease of use on actual usage. To examine the effect of perceived ease of use on user satisfaction. To examine the effect of perceived usefulness on actual usage. To examine the effect of perceived usefulness on user satisfaction. To examine the effect of actual usage on user satisfaction. To examine the effect of actual usage on performance impact. To examine the effect of user satisfaction on the performance impact. If the result of this study finds that the main proposed variables have a significant impact on user satisfaction and performance, recommendations on how users could use the internet more efficiently and effectively can be proposed. Moreover, this research would help to guide other sectors involved with or related to internet technology.

Literature review

Perceived ease of use: Many studies have proven that the perceived ease of use factor plays a major role in the IS context (Faqih, 2016; Koksal, 2016; Mutahar *et al.*, 2016; Tarhini *et al.*, 2013; Iqbal and Qureshi, 2012; Parveen and Sulaiman, 2008). Perceived ease of use is defined as the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). There is a claim in IS literature that the higher the perceived ease of use of any system, the higher the perceived usefulness (Elkhani *et al.*, 2014) and this is also supported by Lee *et al.* (2009) in the context of e-Learning. The relationship between perceived ease of use and perceived usefulness has also been studied many times in the context of IS and showed that there is a positive relationship between the two variables (Bhatiasevi and Yoopetch, 2015; Kim, 2014; Lee *et al.*, 2011a, b; Lee, 2009; Ha and Stoel, 2009; Luarn and Lin, 2005). This actually conflict with another study (Lee and Lehto, 2013) which found that perceived ease of use does not predict perceived usefulness. On the basis of the greater majority in favour, the hypothesis is proposed as follows:

- H_1: perceived ease of use significantly has a positive impact on perceived usefulness

There have been numerous studies conducted on the influence of perceived ease of use on actual system usage. While, Kim *et al.* (2007) consider that a positive relationship between the perceived ease of use and system usage seems to exist in the context of internet technology, many studies have emphasized in different contexts and technological applications that it positively influences actual usage (Elkhani *et al.*, 2014; Kripanont, 2007; Konradt *et al.*, 2006; McFarland and Hamilton, 2006; Teo *et al.*, 1999). However, there are other studies which obtained an opposite result that perceived ease of use does not influence actual usage (Lee and Kim, 2009). Following the majority, the following hypothesis is proposed:

- H_2: perceived ease of use significantly has a positive influence on actual usage

In a study conducted by Hong *et al.* (2006) perceived ease of use was found to have a positive influence on user satisfaction within the context of information technology usage and this is in agreement with other studies which found that perceived ease of use is able to predict user satisfaction (Rana *et al*., 2015; Dalcher and Shine, 2003; Sun *et al*., 2008; Roca *et al*., 2006) and according to Dalcher and Shine (2003), the higher the perceived ease of use, the higher the satisfaction. This is similar to Sun and Mouakket (2015) who indicated that system flexibility has a positive impact on user satisfaction. However, this contrasts with Venkatesh *et al.* (2011) who found no relationship between the user of effort and user satisfaction. The hypothesis is proposed as follows:

- H_3: perceived ease of use significantly has a positive influence on user satisfaction

Perceived usefulness: Perceived usefulness is one of the fundamental antecedent factors relating to technology usage and adoption (Tarhini *et al*., 2016; Alrajawy *et al*., 2016; Negahban and Chung, 2014; Callum and Jeffrey, 2013; Joo and Sang, 2013). Davis (1989) defined it as the degree to which a person believes that using a particular system would enhance his or her job performance. A previous study by Lee and Kim (2009) showed that perceived usefulness has a positive influence on actual usage within the context of intranet technology in Korea. This compares with Kim *et al.* (2007) who indicated that in the context of internet technology usage there is a positive relationship between perceived usefulness and actual usage and is in common with other results in a various other studies (Kripanont, 2007; Norzaidi *et al*., 2007; McFarland and Hamilton, 2006; Teo *et al*., 1999). Hence, it is hypothesized as follows:

- H_4: perceived usefulness significantly has a positive effect on actual usage

While, there have been few studies on the influence of perceived usefulness on user satisfaction, Sun *et al.* (2008) in the context of e-Learning found that perceived usefulness predicts user satisfaction, Dalcher and Shine (2003) noted that the higher the perceived usefulness, the higher the satisfaction, Doll and Torkzadeh (1998) indicated that perceived usefulness of IS is positively related to user satisfaction. Although, notable studies in the IS context emphasized that perceived usefulness positively influences user satisfaction (Sun and Mouakket, 2015; Kim, 2014; Barnes and Vidgen, 2014; Rana *et al*., 2015; Lee and Lehto, 2013; Revels *et al*., 2010; Roca *et al*., 2006; Konradt *et al*., 2006), there are some other studies which obtained an opposite result. For instance, Hong *et al.* (2006) found that in the context of information technology usage there is no relationship between perceived usefulness and user satisfaction, a finding similar to Venkatesh *et al.* (2011) who noted that belief that using a particular system would enhance the believer's job performance has no relationship with user satisfaction. Thus, it is hypothesized that:

- H_5: perceived usefulness significantly has a positive effect on user satisfaction

Actual usage: According to Kim *et al.* (2007), actual usage is defined as the usage frequency of technology and usage times. One of the most important directions for future research in the topic of technology usage is to investigate the impact of system usage on IS success factors such as user satisfaction and performance (Venkatesh *et al*., 2003). There are a few studies which have proposed a theoretical model considering the impact of actual usage on performance (Hou, 2012; Son *et al*., 2012). In a quantitative study Norzaidi and Salwani (2009) indicated that there is a positive impact of actual usage on individual performance. This is in common with other studies which found a significant relationship between system use and performance (Isaac *et al*., 2016; Makokha and Ochieng, 2014; D'Ambra *et al*., 2013; Hou, 2012; D'Ambra and Wilson, 2004; Wang and Liao, 2008; Fan and Fang, 2006; Lee *et al*., 2005). Conversely, there are studies which found that actual usage does not predict performance (Cho *et al*., 2015; Khayun and Ractham, 2011; Wu and Wang, 2006). Norzaidi and Salwani (2009) addressed the relationship between system usage and user satisfaction in the context of internet technology and found a positive impact of actual usage on user satisfaction, similar to other studies which emphasized the significant influence of system usage on user satisfaction (Hou, 2012; Khayun and Ractham, 2011; Anandarajan *et al*., 2002; Isaac *et al*., 2016). Consequently, the following hypotheses are proposed:

- H_6: actual usage significantly has a positive effect on user satisfaction
- H_7: actual usage significantly has a positive effect on performance impact

User satisfaction: One of the essential constructs in the context of IS is to evaluate if system usage success leads to user satisfaction (Delone and Mclean, 2003). User satisfaction in this study is defined as the degree to which

the internet user is satisfied with the decision to use the internet and if it met expectations (Wang, 2008; Wang and Liao, 2008; Roca *et al*., 2006). Although, many studies indicate that the higher the user satisfaction, the higher the performance impact (Fan and Fang, 2006; Makokha and Ochieng, 2014; Son *et al*., 2012; Wang and Liao, 2008; Isaac *et al*., 2016), some other studies found that user satisfaction does not predict individual performance (Daud, 2008). Thus, the basis of hypothesis eight in this study is stated as:

- H_8: user satisfaction significantly has a positive effect on performance impact

Performance impact: There are numerous studies in the literature in the context of IS which focus on system usage as output construct (Cheng, 2014; Cheung and Vogel, 2013; Fusilier and Durlabhji, 2005; Joo and Sang, 2013; Lee *et al*., 2011) and neglect to examine the consequences of that actual usage through its impact on performance (Shih and Chen, 2013), a construct recommended to measure the success of information systems (Montesdioca and Macada, 2014). However, there are few notable studies which focus on performance as an output variable in the context of IS (Hou, 2012; Norzaidi and Salwani, 2009; Son *et al*., 2012). These contribute to the body of knowledge and fill the gap by addressing the link between actual usage and individual performance within organizations. In this study, the construct of performance impact is defined as the degree to which system usage affects knowledge acquisition, communication quality and decision quality (Khayun and Ractham, 2011).

In the context of IS studies the definition and measurement of construct performance impact is done through different indicators. Wu and Wang (2006) define performance impact as the degree to which the system usage improves decision-making quality, enhance job efficiency, improves communication quality assists the acquisition of new knowledge and promotes innovative ideas, enhance job effectiveness, help accomplish tasks quickly and improves job performance and the quality of work life. Norzaidi *et al*. (2007) defined performance impact as the degree to which system usage improves the quality of work and job performance, help to accomplish task quickly, eliminates errors, improves control over work and enhances effectiveness on the job. According to Benedetto *et al*. (2003), the performance impact is measured through improved efficiency, enhanced effectiveness and increased productivity and problem identification. The construct of performance impact in the context of IS have been measured through different indicators.

While, previous studies have evaluated performance as a first-order construct with multiple indicators (Cheng, 2011; Safar-Hasim and Salman, 2010; Hou, 2012; McGill and Klobas, 2009; Norzaidi *et al*., 2007), this study move forward a step to deal with the performance impact construct as a second-order model which contains three first-order constructs, namely knowledge acquisition, communication quality and decision quality. Each one of these three variables has multiple indicators and this step is made in order to increase the power of explaining the output by the model of performance impact. Examining performance impact as a second-order model is one of the main contributions of this study.

MATERIALS AND METHODS

Overview of the proposed research model: While the TAM is a useful theoretical model for predicting an individual's usage of IS, notable studies have applied it to internet usage application (Ramayah *et al*., 2003; Gardner and Amoroso, 2004; Fusilier and Durlabhji, 2005; Parveen and Sulaiman, 2008; Jin, 2013) and strong evidence for the core assumptions of the TAM regarding the constructs of perceived ease of use and perceived usefulness has been repeatedly reported. However, there is lack of studies investigating the output from technology usage (D'Ambra *et al*., 2013). This study applied the TAM as the underpinning model and extended it by addressing the link between actual usage and individual performance among employees within public sector organization in the context of internet technology. Indeed, literature examining the success of IS implementation, recommends that user satisfaction should be considered as one the of the main constructs in topics related to technology usage (Delone and Mclean, 1992, 2003; Wixom and Todd, 2005). Based on this suggestion this study examined user satisfaction along with performance as a contribution to the TAM Model. In summary, the proposed extended TAM Model examined the perceived usefulness and perceived ease of use as antecedent variables to actual usage and user satisfaction and performance as an output variable with three dimensions (knowledge acquisition, communication quality and decision quality). The proposed model has 8 hypothesis to test as in Fig. 3.

Development of instrument: A questionnaire with 21 items was developed for this study. Because the

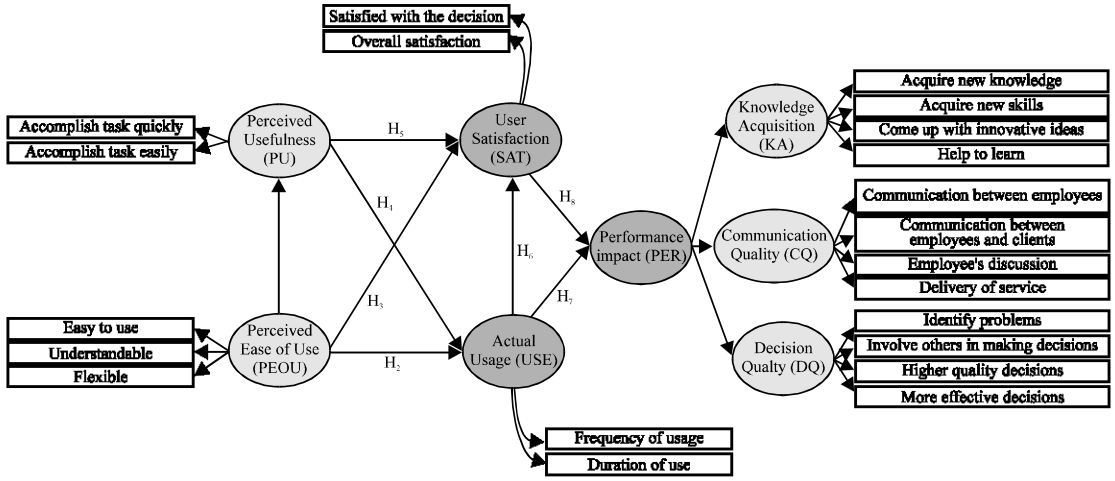


Fig. 3: Proposed extended TAM Model

respondents would be Arab-speakers, it was imperative that the questionnaire be accurately translated from English to Arabic. Back translation is used in this study, a procedure widely used to test the accuracy of the translation in a cross-cultural survey. Individual scale items are listed in Appendix A. Regarding the number of items for each construct, this study follows the suggestions by Hayduk and Littvay (2012) who asked the question, "Should researchers use single indicators (items) or multiple indicators (items) in structural equation models?". They suggested using the few best items that while two items are often adequate, three items may occasionally be helpful and that many items are rarely warranted because additional redundant items provide less research benefit.

The multi-item Likert scales applied in this study have been commonly used in questionnaire-based perception studies (Lee *et al*., 2009). Unlike, actual usage which measures using a 5-ranking scale, other variables were subjectively measured using the 7-point Likert scale with 7 being 'Strongly agree' and 1 being 'Strongly disagree'. The Likert scale and other types of interval-type scales are extensively used in organizational research since they lend themselves to more sophisticated data analysis (Sekaran and Bougie, 2013). For this study, a pre-testing was conducted among 25 university students from Yemen to assess any ambiguity associated with wording or measurement. Then the questionnaire items were pilot-tested to examine their internal consistency, 60 sample surveys were distributed among Yemeni employees in the Ministry of Communication and Information Technology and 58 were returned with complete and valid data. All the constructs had acceptable reliability as the individual Cronbach's alpha coefficients of the main five constructs exceed the recommended value of 0.7 (Nunnally and Bernstein, 1994) and this became the final questionnaire.

Data collection: The targeted population was approximately 6,090 of Yemeni internet users employed within the head offices of 30 government ministries (called Dwa'win). The adequate sample size for each Ministry was selected based on the total number of employees. The data for this study was collected using a self-administered survey questionnaire, distributed to each employee in-person to motivate them and clarify any concerns. Delivering a questionnaire in-person provides a high predictive value for assessing the efficiency of the individuals in the selected grouping, especially when the target subject under study is related to individual perception, belief and opinion (Yalcinkaya, 2007).

A total of 700 questionnaires were distributed and 530 replies were returned of which 508 were useful for analysis. A total of 22 responses were deleted: 12 because of missing data for more than 15% of the questions, 4 considered outliers and 6 straight lining. The final sample size was considered adequate (Tabachnick and Fidell, 2012; Krejcie and Morgan, 1970). The response rate of this study is 76% which is considered very good (Baruch and Holtom, 2008) in comparison to other studies found in the relevant literature.

Table 1 shows the demographic profiles of the respondents with 412 (81.1%) are being male and the remaining 96 (18.9%) female. In terms of age, 1.4% were younger than 20 years old, 28.3% were between 20 and 29, 53.9% between 30 and 39 years, 12.6% between 40 and 4 and finally 3.7% were aged 50 years and above. In terms of education background, 10.4% had a high school

Table 1: Summary of demographic profile of respondents

Demographic item/Categories	Frequency	Percentage
Gender		
Male	412	81.1
Female	96	18.9
Age (years)		
<20	7	1.4
20-29	144	28.3
30-39	274	53.9
40-49	64	12.6
50 years and above	19	3.7
Education background		
High school	53	10.4
Diploma	44	8.7
Bachelor degree	367	72.2
Master degree	44	8.7
Marital status		
Single	117	23.0
Married	380	74.8
Divorced	9	1.8
Widowed	2	0.4
Department		
IT Department	181	35.6
Not IT Department	327	64.4
Internet connection in house		
Yes	352	69.3
No	156	30.7

certificate, 8.7% had a diploma and 72.2% (representing the majority) had a bachelor degree while 8.7% had finished postgraduate studies.

RESULTS AND DISCUSSION

Descriptive analysis: Table 2 presents the mean and standard deviation for each variable in the current study. Respondents were asked to indicate their opinion in the context of internet usage based on the measurement of a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The perceived ease of use records the highest mean score of 5.88 out of 7.0 points with a standard deviation of 1.174, indicating that the respondents consider the internet as being easy to use, understandable and flexible. Perceived usefulness recorded a mean score of 5.33 out of 7.0 with a standard deviation of 1.545 indicating that the respondents believed that the internet helps them to accomplish tasks quickly and easily. The results also record the overall mean score of the respondents for user satisfaction as 5.16 with a standard deviation of 1.271, indicating that the level of satisfaction among respondents regarding the decision to use the internet is high. Performance impact recorded the mean score of 5.07 out of 7.0 with a standard deviation of 1.409, indicating that the respondents strongly agreed that using the Internet helped in better communication quality, knowledge acquisition and decision quality.

Measurement model assessment and Confirmatory Factor Analysis (CFA): As shown in Table 2 and Appendix B, all the goodness-of-fit indices exceeded their respective common acceptance levels as suggested by previous research, thus, demonstrating that the measurement model exhibited a fairly good fit with the data collected (χ^2/df = 2.649, CFI = 0.963, RMSEA = 0.057, GFI = 0.917, AGFI = 0.892, NFI = 0.941, TLI = 0.955, IFI = 0.963, PNFI = 0.789 and PGFI = 0.699). Therefore, the evaluation of the psychometric properties of the measurement model in terms of construct reliability, indicator reliability, convergent validity and discriminant validity could be proceeded with.

For the construct reliability, this study tested the individual Cronbach's alpha coefficients to measure the reliability of each of the five variables in the measurement model. The results indicate that all the individual Cronbach's alpha coefficients of the five constructs ranging from 0.74-0.91 were greater than the recommended level of 0.7 (Kannan and Tan, 2005; Nunnally and Bernstein, 1994). Additionally, for testing construct reliability all the Composite Reliability (CR) values ranging from 0.76-0.87 were higher than 0.7 (Kline, 2010; Gefen *et al*., 2000) which adequately indicates that the construct reliability is fulfilled as shown in Table 3. Therefore, the achieved Cronbach's alpha and CR for all constructs were considered to be sufficiently error-free.

Factor loading is used to test indicator reliability. High loadings on a construct indicate that the associated indicators seem to have much in common and this is captured by the construct (Hair *et al*., 2013). Factor loadings >0.50 were considered to be very significant (Hair *et al*., 2010). The loadings for all items exceeded the recommended value of 0.5 as shown in Table 3 and therefore have fulfilled all the requirements without being eliminated from the scale.

This study used the Average Variance Extracted (AVE) to test convergent validity which indicates that all AVE values are higher than the recommended value 0.50 (Hair *et al*., 2010). In this study, they ranged from 0.51-0.77, so, the convergent validity for all constructs has been successfully fulfilled and adequate convergent validity exhibited as Table 3 shows.

The discriminant validity of the measurement model was checked using the Fornell and Larcker (1981) criterion. As shown in Table 4, the correlations between the five main constructs range from 0.0384-0.700, smaller than the square root of the AVE as represented by the bolded values, estimates which are in the range of

Table 2: Goodness-of-fit indices for the measurement model

Fit indexes	Cited	Admissibility	Results	Fit (Yes/No)
χ^2			466.251	
Df			176	
p-value		>0.05	0.000	No
χ^2/DF	Kline (2010)	1.00-5.00	**2.649**	**Yes**
RMSEA	Steiger (1990)	<0.08	**0.057**	**Yes**
SRMR	Hu and Bentler	<0.08	0.053	Yes
GFI	Joreskog and Sorbom (2002)	>0.90	0.917	Yes
AGFI	Joreskog and Sorbom (2002)	>0.80	0.892	Yes
NFI	Bentler and Bonnet (1980)	>0.80	0.941	Yes
PNFI	Bentler and Bonnet (1980)	>0.05	0.789	Yes
IFI	Bollen (1990)	>0.90	0.963	Yes
TLI	Tucker and Lewis (1973)	>0.90	0.955	Yes
CFI	Byrne (2010)	>0.90	**0.963**	**Yes**
PGFI	James *et al.* (1982)	>0.50	0.699	Yes

χ^2 = Chi square, df = Degree of freedom, RMSEA = Root Mean Square Error of Approximation, SRMR: Standardized Root Mean Square Residual, NFI = Normed Fit Index, GFI = Goodness-of-Fit, AGFI = Adjusted Goodness of Fit Index, TLI = Tucker-Lewis coefficient Index, IFI = The Increment Fit Index, CFI = Comparative-Fit-Index, PNFI = Parsimony Normed Fit Index; the indexes in bold are recommended since they are frequently reported in literature (Awang, 2012)

Table 3: Loading, M, SD, Cronbach's alpha, CR and AVE

Construct	Items	Factor loading (>0.5)	M	SD	α (>0.7)	CR (>0.7)	AVE (>0.5)
PEOU	PEOU 1: Easy to use	0.67	5.88	1.174	0.837	0.845	0.648
	PEOU 2: Understandable	0.88					
	PEOU 3: Flexible	0.84					
PU	PU 1: Accomplish tasks quickly	0.92	5.33	1.545	0.871	0.872	0.744
	PU 2: Accomplish tasks easily	0.84					
USE	USE 1: Frequency of usage	0.75	3.36	1.012	0.744	0.761	0.614
	USE 2: Duration of use	0.82					
SAT	SAT 1: Satisfied with the decision	0.85	5.16	1.271	0.868	0.869	0.768
	SAT 2: Overall satisfaction	0.90					
PER	PER 1: Acquire new knowledge	0.87	5.07	1.409	0.910	0.768	0.513
	PER 2: Acquire new skills	0.93					
	PER 3: Come up with innovative ideas	0.89					
	PER 4: Help to learn	0.82					
	PER 5: Communication between employees	0.85					
	PER 6: Communication between employees and clients	0.85					
	PER 7: Employee's discussions	0.85					
	PER 8: Delivery of service	0.87					
	PER 9: Identify problems	0.90					
	PER 10: Involve others in making decisions	0.83					
	PER 11: Higher quality decisions	0.85					
	PER 12: More effective decisions	0.87					

M = Mean; SD = Standard Deviation, α = Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted; The measurement used is 7-point scale ranging from 1 (strongly Disagree) to 7 (strongly Agree), only actual usage used 5 ranking scale; All the factor loadings of the individual items are statistically significant ($p<0.01$); $CR = (\Sigma K)^2/((\Sigma K)^2+(\Sigma 1-K^2))$, $AVE = \Sigma K^2/n$; where K = Factor loading of every item, n = No. of item in a model; PEOU: Perceived Ease of Use, PU: Perceived Usefulness, USE: Actual Usage, SAT: User Satisfaction, PER: Performance impact

Table 4: Results of discriminant validity by fornell-larcker criterion for the model

Factors	USE (1)	PU (2)	PEOU (3)	PER (4)	SAT (5)
USE	**0.784**				
PU	0.541	**0.880**			
PEOU	0.384	0.484	**0.805**		
PER	0.629	0.700	0.441	**0.716**	
SAT	0.430	0.670	0.426	0.689	**0.876**

Diagonals (bolded values) represent the square root of the average variance extracted while the other entries represent the correlations; PEOU: Perceived Ease of Use, PU: Perceived Usefulness, USE: Actual Usage, SAT: User Satisfaction, PER: Performance impact

0.716-0.880. This indicates that the constructs are strongly related to their respective indicators, compared to other constructs of the model and thus suggesting a good discriminant validity (Hair *et al.*, 2013). In addition, the correlation between exogenous constructs is <0.85 (Awang, 2012). Hence, the discriminant validity of the overall quality construct is fulfilled.

Structural model assessment: The goodness-of-fit of the structural model was comparable to the previous CFA measurement model. In this structural model, the values are recorded as χ^2/df = 2.721, CFI = 0.961 and RMSEA = 0.058. These fit indices provide evidence of adequate fit between the observed data and the hypothesized model (Byrne, 2010). Thus, the path coefficients of the structural model could now be examined.

Hypothesis tests: The hypotheses of this study were tested using structural equation modeling via. AMOS as presented in Fig. 4. The structural model assessment as shown in Table 5 provides the indication of the hypotheses tests. Seven out of the eight hypothesis are supported. Perceived ease of use is significantly predicting the perceived usefulness, actual usage and

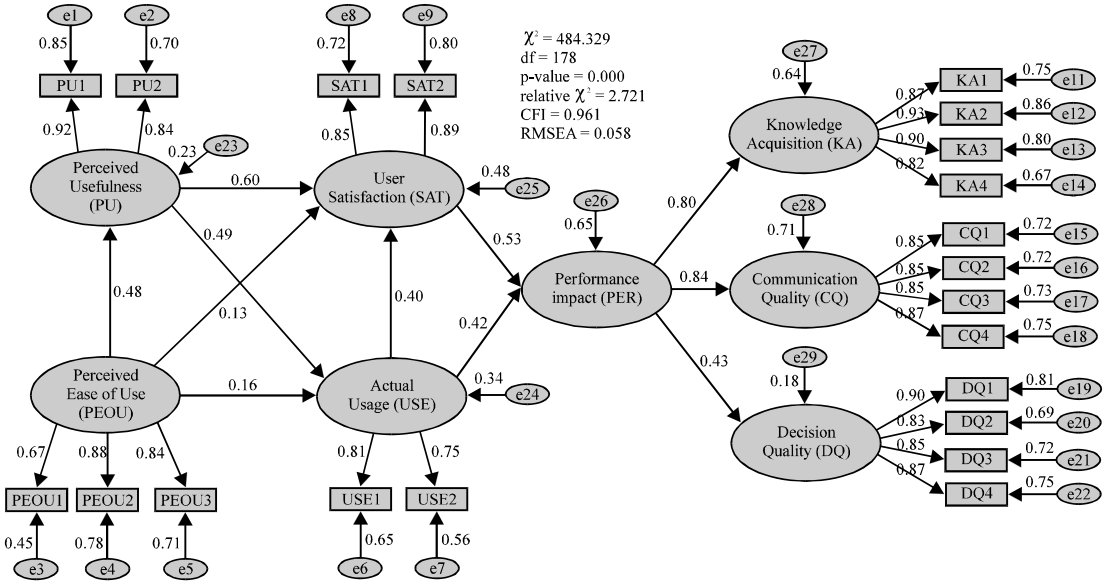


Fig. 4: Research Structural Model results

Table 5: Structural path analysis result

Hypothesis	Dependent and independent variables	Estimate B (path coefficient)	SE	CR (t-values)	p-values	Decisions
H_1	PU<---PEOU	0.48	0.083	8.904	0.001	Supported
H_2	USE<---PEOU	0.16	0.064	2.860	0.014	Supported
H_3	SAT<---PEOU	0.13	0.062	2.587	0.042	Supported
H_4	USE<---PU	0.49	0.044	8.170	0.001	Supported
H_5	SAT<---PU	0.60	0.051	9.855	0.001	Supported
H_6	SAT<---USE	0.04	0.065	0.719	0.340	Not supported
H_7	PER<---USE	0.42	0.032	5.910	0.001	Supported
H_8	PER<---SAT	0.53	0.030	6.958	0.001	Supported

SE = Standard Error, CR = Critical Ratio; PEOU: Perceived Ease of Use, PU: Perceived Usefulness, USE: Actual Usage, SAT: User Satisfaction, PER: Performance impact

user satisfaction, hence, H_1-H_3 are accepted (β = 0.48, $p<0.001$), (β = 0.16, $p<0.01$) and (β = 0.13, $p<0.05$), respectively. Perceived usefulness as well, significantly predicts actual usage and user satisfaction, so, H_4 and H_5 are supported (β = 0.49, $p<0.001$) and (β = 0.60, $p<0.001$), respectively. Likewise, H_7 and H_8 are supported as actual usage and user satisfaction significantly predict performance impact (β = 0.42, $p<0.001$) and (β = 0.53, $p<0.001$), respectively. However, H_6 is rejected, note that the direct effects of perceived usefulness on actual usage and user satisfaction are much stronger than perceived ease of use as evident from the values of path coefficient. This is consistent with the previous literature which indicates that perceived ease of use plays a less significant role than perceived usefulness in the actual usage of internet and user satisfaction. In addition, it is evident that user satisfaction has more influence on performance impact than actual usage.

Coefficient of determination R^2 (the variance explained): The R^2-value indicates the amount of variance of dependent variables which is explained by the independent variables. Hence, a larger R^2-value increases the predictive ability of the structural model. It is crucial to ensure that the R^2-values should be high enough for the model to achieve a minimum level of explanatory power (Urbach and Ahlemann, 2010). Falk and Miller (1992) recommend that the R^2-values should be equal to or >0.10 in order for the explained variance of a particular endogenous construct to be deemed adequate. Cohen (1988) suggests that R^2 is substantial when it is >0.26. with acceptable power above 0.02 while according to Chin (1998), R^2 is substantial when it >0.65 with acceptable power above 0.19. On the other hand, Hair *et al.* (2013) recommends that R^2 be larger than 0.75 in order to be deemed substantial with acceptable power above 0.25. Table 6 shows the result of R^2 from the structural model, indicating that all the R^2 values are high enough for the model to achieve an acceptable level of explanatory power.

Table 7 shows the results of R^2 and factor loading for the second-order model performance impact which load

Table 6: Coefficient of determination result R^2

Exogenous construct	Endogenous construct	R^2	Cohen (1988)	Chin (1998)	Hair *et al.* (2013)
PEOU	PU	0.23	Substantial	Weak	Weak
PEOU and PU	USE	0.34	Substantial	Moderate	Weak
PEOU, PU and USE	SAT	0.48	Substantial	Moderate	Moderate
USE and SAT	PER	0.65	Substantial	Substantial	Substantial

PEOU: Perceived Ease of Use, PU: Perceived Usefulness, USE: Actual Usage, SAT: User Satisfaction, PER: Performance impact

Table 7: R^2 and factor loading for the second-order performance impact model

1st and 2nd order constructs	Factor loading	R^2
KA<---PER	0.80	0.64
CQ<---PER	0.84	0.71
DQ<---PER	0.43	0.18

PER: Performance impact, KA: Knowledge Acquisition, CQ: Communication Quality, DQ: Decision Quality

Table 8: Effect size F^2

Exogenous construct	Endogenous construct	R^2 included	R^2 excluded	F^2	Effect size
PEOU	USE	0.34	0.31	0.046	Small
PU	USE	0.34	0.16	0.273	Medium
PEOU	SAT	0.48	0.47	0.019	None
PU	SAT	0.48	0.27	0.404	Large
USE	PER	0.65	0.54	0.314	Medium
SAT	PER	0.65	0.59	0.171	Medium

PEOU = Perceived Ease of Use, PU = Perceived Usefulness, USE = Actual Usage, SAT = User Satisfaction, PER = performance impact, F^2 = (R^2 included, R^2 excluded)/(1-R^2 included)

very well on two sub-constructs (knowledge acquisition and communication quality) and loads weak on decision quality. Based on Chin (1998) the R^2 for the two sub-constructs (knowledge acquisition and communication quality) is substantial while that for the decision quality is weak.

Effect size F^2: Effect size F^2 measures if an independent latent variable has a substantial impact on a dependent latent variable (Gefen and Rigdon, 2011). According to Hair *et al.* (2013), in order to do an assessment for the R^2 values of all endogenous constructs, the change in R^2 value when a particular exogenous construct is omitted from the model can be used to assess whether the omitted construct has a substantial effect on the endogenous constructs. This measure is referred to as the F^2 effect size where 'R^2 included' and 'R^2 excluded' are the R^2 values of the endogenous construct when a selected exogenous construct is included in or excluded from the model. The change in R^2 values is calculated by estimating the path model twice. First with the exogenous construct included (yielding R^2 included) and second with the exogenous construct excluded (yielding R^2 excluded). The F^2 is calculated using the given formula: F^2 = (R^2 included-R^2 excluded)/(1-R^2 included). According to Cohen (1988), F^2 of the exogenous latent variable is assessed as 0.02 small, 0.15 medium and 0.35 large. Table 8 shows the results of the effect size F^2 for the four exogenous latent variables, namely perceived ease of use, perceived usefulness, actual usage and user satisfaction.

In this empirical study, employee usage of internet technology within public sector organizations was analysed. This study developed an extended model of the original TAM by adding user satisfaction and performance. One of the major findings is that the TAM sufficiently predicts employee satisfaction and internet usage. This study also provides a good explanation of performance, explaining a significant amount of variance (65%) in performance impact. The following discussion is based on the eight main objectives of this study.

Findings related to objective 1: The 1st objective of this current study is to examine the effect of perceived ease of use on perceived usefulness and this was achieved by testing the Hypothesis 1 (H_1). The study found that the easier the internet is to use, the more useful Yemeni government employees feel the internet is. This finding is consistent with previous studies (Bhatiasevi and Yoopetch, 2015; Kim, 2014; Lee, 2009; Ha and Stoel, 2009; Luarn and Lin, 2005). However, the result of this study which relates to the positive effect of perceived ease of use on perceived usefulness is inconsistent and conflicts with Lee and Lehto (2013) who found that perceived ease of use does not affect perceived usefulness. The contradictory finding suggests that the effect of perceived ease of use on perceived usefulness may be different across context and technology applications.

Findings related to objective 2: The 2nd objective of this current study was to examine the effect of perceived ease of use on actual usage and was achieved through testing the Hypothesis 2 (H_2). The study found that perceived ease of use has a positive effect on actual usage of the internet. This impact is supported by previous studies (Elkhani *et al.*, 2014; Kripanont, 2007; McFarland and Hamilton, 2006) and the result suggests that the more employees perceived the internet as easy to use, understandable and flexible, the more was their actual usage of the internet (frequency of usage and duration of use). However, this result contradicts, Lee and Kim (2009) who found that there is no relationship between perceived ease of use and system usage. This paradoxical results may suggest that perceived ease of use in some contexts is not enough to drive someone to use the internet without the awareness of the usefulness of the internet.

Findings related to objective 3: The 3rd objective of this current study was to examine the effect of perceived ease of use on user satisfaction and was achieved through testing Hypothesis 3 (H_3). The study found that the perceived ease of use has a positive effect on employee satisfaction and this is compatible with the results of previous studies (Rana *et al*., 2015; Dalcher and Shine, 2003) indicating that the easier the internet is to use, the higher the satisfaction of employees. This result contradicts, Venkatesh *et al*. (2011) who indicate that there is no relationship between user effort and user satisfaction.

Findings relating to objective 4: The 4th objective of this current study was to examine the effect of perceived usefulness on actual usage and was achieved through testing the Hypothesis 4 (H_4). The study found that perceived usefulness has a positive effect on actual usage and this impact is supported by previous studies (Kripanont, 2007; Norzaidi *et al*., 2007; McFarland and Hamilton, 2006) and explained by the fact that when employees perceived the internet as a useful tool it led to increasing their frequency and duration of internet use.

Findings related to objective 5: The 5th objective of this current study was to examine the effect of perceived usefulness on user satisfaction and achieved this through testing the Hypothesis 5 (H_5). The study found that perceived usefulness has a positive effect on employee satisfaction, consistent with previous studies (Sun and Mouakket, 2015; Kim, 2014; Barnes and Vidgen, 2014; Rana *et al*., 2015; Lee and Lehto, 2013; Revels *et al*., 2010). The result suggests that the more employees think that the internet is a useful technological tool, the more satisfaction they are with the internet. However, this finding is not consistent with the result of Hong *et al*. (2006) who found that there is no relationship between perceived usefulness and user satisfaction.

Findings related to objective 6: The 6th objective of this current study was to examine the effect of actual usage on user satisfaction and was achieved through testing Hypothesis 6 (H_6). The study found that the hypothesis is not supported, contradicting previous studies (Hou, 2012; Khayun and Ractham, 2011; Anandarajan *et al*., 2002). The problem of inconsistent results here may be resolved when it is realized that models of technology usage do not serve equally across contexts (Al-Qeisi, 2009; Kripanont, 2007; Straub *et al*., 1995, 1997) and may be explained by the fact that this study is probably one of the first initiatives to examine the extended TAM in the context of Yemen. This result may be because actual usage is not critical for employees in Yemen in determining their satisfaction. Thus, they showed more concern about perceived usefulness and perceived ease of use to determine their satisfaction with the internet. This finding suggests that, in order to make employees satisfied with the internet, it is not enough to increase their actual use without promoting that using the internet reduce effort (perceived ease of use) and would enhance job performance (perceived usefulness).

Findings related to objective 7: The 7th objective of this current study was to examine the effect of actual usage on performance impact and was achieved through testing Hypothesis 7 (H_7). The study found that actual usage has a positive effect on performance and this impact is supported by previous studies (Wang and Liao, 2008; Hou, 2012; Fan and Fang, 2006; Makokha and Ochieng, 2014; D'Ambra *et al*., 2013; D'Ambra and Wilson, 2004; Norzaidi *et al*., 2007; Lee *et al*., 2005). It is also explained by the fact that when employees in Yemen government institutions increase their frequency and duration of internet usage, this leads to increasing their performance regarding knowledge acquisition (acquiring new knowledge and skills, coming up with innovative ideas, being helped to Learn), communication quality (communication between employees and between employees and clients, enhanced employee discussions and improved delivery of service) and moderately increasing decision quality (identifying problems, involving others in making decisions and making higher quality decisions). Although, many studies support the positive effect of actual usage on performance impact, Khayun and Ractham (2011) found the opposite that there is no relationship between actual usage and performance impact. In addition, Cho *et al*. (2015) indicated that overall actual usage does not predict performance impact.

Findings related to objective 8: The 8th objective of this current study was to examine the effect of user satisfaction on performance impact and was achieved through testing Hypothesis 8 (H_8). The study found that employee satisfaction has a positive effect on performance and this is corroborated by previous studies (Fan and Fang, 2006; Makokha and Ochieng, 2014; Norzaidi and Salwani, 2009; Son *et al*., 2012; Wang and Liao, 2008). The result suggests that prior user satisfaction in the context of internet technology usage by employees, increases their performance in two dimensions, knowledge acquisition (acquire new

knowledge and skills, come up with innovative ideas, be helped to learn) and communication quality (communication between employees and between employees and clients, enhanced employee discussion and improved delivery of service) and moderately increasing the third dimension which is improve decision quality (identifying problems, involving others in making decisions and making higher quality decisions). However, the result which relates to the positive effect of employee satisfaction on performance was inconsistent and conflicted with the result of Daud (2008), who found that user satisfaction does not affect performance. The contradictory finding suggests that the impact of user satisfaction on performance may be different, not only across study settings but also across variables which consider the components of user satisfaction and their measurements (Appendix A and B).

CONCLUSION

Internet technology has been described as most likely to be the greatest invention of our generation. Studies have shown that internet technology has the potential to improve all aspects of our social, economic and cultural life. It is also linked to national income and there is a significant impact of internet usage on organizational performance (Wang and Hou, 2003; Chen, 2008). As Yemen is facing a variety of challenges, the internet can contribute to overcoming some of these difficulties. This study proposes an extended original TAM Model with the evaluation of IS usage factors through user satisfaction and performance among employees in public sector organizations. With a total of 508 valid questionnaires (a 76% response rate) collected, this study used Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) via. AMOS as the data analysis method. The result found that perceived ease of use positively influenced perceived usefulness, actual usage and user satisfaction. Perceived usefulness predicts actual usage and user satisfaction and actual usage and user satisfaction have a significant impact on individual performance (knowledge acquisition, communication quality and decision quality). Therefore, it is evident from the empirical findings that internet usage seems to be fairly successful within organizations. Moreover, organizations should place emphasis on highlighting the usefulness and ease of use of the internet to make employees aware, be prompted to use and be satisfied with the result. Consequently, the finding of the study can provide policymakers with important insights on how to make a more successful approach in adopting information technology in organizations and how to encourage top managers to ensure that that employees are more likely to use the internet and thereby not only enhance professional practice but also encourage professional development and improve the quality of working life.

LIMITATIONS

One of the limitations of this study is that data was gathered by cross-sectional and is not longitudinal in nature. Therefore, there is ambiguity on whether usage is affected by expectations or vice versa. In addition, Straub *et al.* (1995) mentioned that there are biases when the researcher uses self-reported measures of usage, because these are generally found to differ from the true score of system usage.

Future research should also aim to apply the proposed extended TAM Model with other technology applications such as mobile learning, or other sectors such as the private sector. This will enhance the ability of the model to thoroughly explain user satisfaction and performance in the IS context. While actual usage was not found to be an important factor to predict user satisfaction in this study, it has been found to be a key factor influencing user satisfaction in countries other than Yemen such as Kenya (Makokha and Ochieng, 2014), Taiwan (Hou, 2012), Thailand (Khayun and Ractham, 2011) and Malaysia (Norzaidi and Salwani, 2009). Therefore, future research should be conducted to investigate the impact of actual usage on user satisfaction by conducting cross-cultural studies.

IMPLICATIONS

This study provided strong support for the premise that the TAM predicts system usage and user satisfaction with internet technology among employees. The present findings also add to the existing body of research by examining the effects of system usage and user satisfaction on individual performance through an extendtion of the TAM Model. In addition, this study contributes to the literature of IS by proposing a second-order model of performance in order to increase the power of explaining the model's output which contains three first-order constructs, namely knowledge acquisition, communication quality and decision quality. Thus, future research can use the proposed second-order model to develop better understanding of performance impact. The

extended TAM Model with consequences of usage through user satisfaction and performance enhances our understanding of Information Technology (IT) usage and lead to enhancing our efforts when promoting internet usage in organizations.

The variance explained by proposed model of the current study for the output performance is 65% (Table 6). The predictive power of the model in this study has a higher ability to explain and predict performance compared to those obtained from some of the previous studies which described the variance as; 37% (Hou, 2012), 40% (Wang and Liao, 2008), 42% (Xinli, 2015) and 46% (Khayun and Ractham, 2011). This study provides evidence that the proposed model can be more effective for predicting performance impact, particularly within the internet context, than other models in the literature.

Implication for practice: The results of this study will also help practitioners in Yemen to understand the factors that increase the employee satisfaction and performance. The findings should be very useful at both the individual and organizational level in highlighting the importance of the effect of IT on quality of work. Therefore, the information from these findings should encourage and support the formation of future policy, not only at an organizational level but also at the national level. If the government can utilize these findings by establishing strategies to promote internet usage, this may, in turn, improve professional practice, personal development and the quality of working life as well as promoting employees to make full use of the internet in their job. This research seems to be not only done at the right time but also in the right place and it is expected that key findings, especially, the proposed model will help supporting government and national policy, especially the increase Information and Communications Technology (ICT) usage as part of the job process at all levels. It may also support the national policy of e-Government as the evidence shows a link between ICT usage and better performance and productivity (Delone and Mclean, 2003; Norzaidi and Salwani, 2009; Son *et al*., 2012; Hou, 2012; Wang and Liao, 2008; Fan and Fang, 2006; Xinli, 2015; Khayun and Ractham, 2011). While Yemen is facing difficulties in many aspects, increased ICT usage lead to social, economic and political development (Oyedemi, 2012) and increased internet usage could be a major contributing factor for development as the studies showed that there is a link between internet usage and national income.

APPENDIX

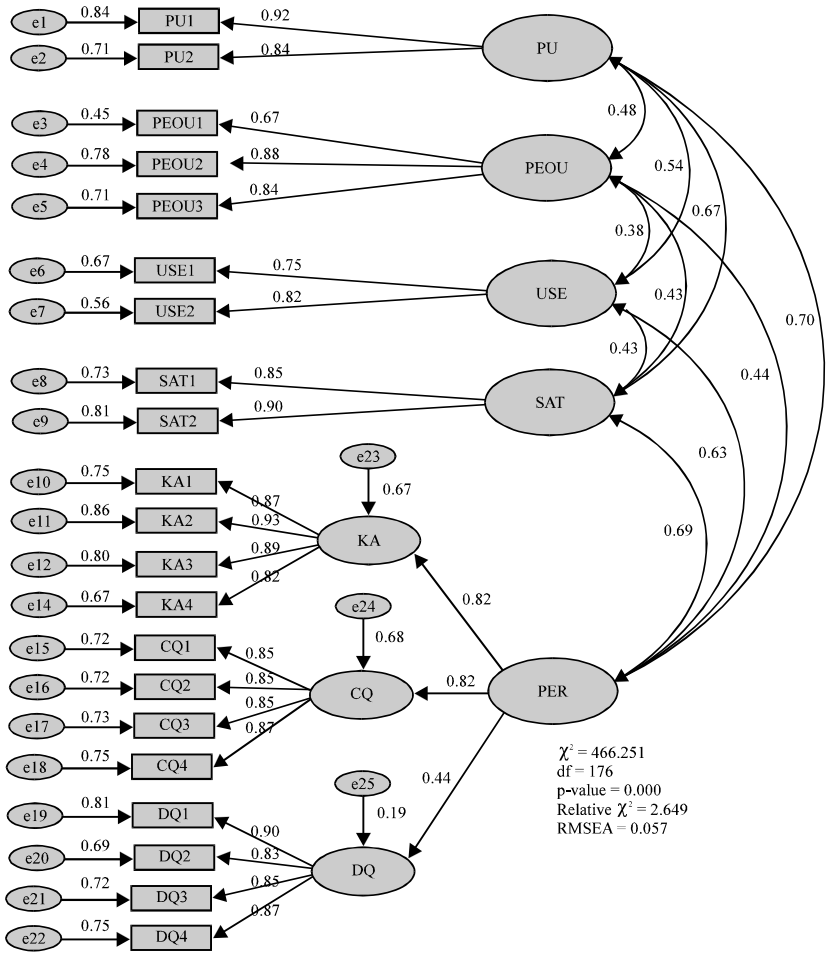
Appendix A: Instrument for actual usage

Items	Measures	Rating scales	Sources
Instrument for perceived ease of use			
PEOU1	Learning to use the internet is easy for me	7-point Likert scale:	Cheng (2014), Huang (2008)
PEOU2	My interaction with the internet is clear and understandable	(1) Strongly disagree to	and Shih (2004)
PEOU3	I find the Internet to be flexible to interact with	(7) Strongly agree	
Instrument for perceived usefulness			
PU1	Internet helps me to accomplish my tasks more quickly	7-point Likert scale:	Kim *et al*. (2007, 2008) and
PU2	Using Internet make it easier to complete my tasks	(1) Strongly disagree to	Shih (2004)
		(7) Strongly agree	
Instrument for user satisfaction			
SAT1	My decision to use the internet was a wise one	7-point Likert scale:	Wang and Liao (2008), Wang
SAT2	Overall, I am satisfied with the internet	(1) Strongly disagree to	(2008) and Roca *et al*. (2006)
		(7) Strongly agree	
Instrument for performance impact			
PER1	Internet helps me acquire new knowledge	7-point Likert scale:	Hou (2012), Norzaidi *et al*. (2007,
PER2	Internet helps me acquire new skills	(1) Strongly disagree to	2009), McGill and Klobas (2009)
PER3	Internet helps me to come up with innovative ideas	(7) Strongly agree	
PER4	Internet helps me to learn		
PER5	The use of internet improves communication between employees		
PER6	The use of internet improves communication between the employees and the clients		
PER7	The use of internet improves employee's discussions		
PER8	The use of internet improves the delivery of service		
PER9	Internet helps me identify problems		
PER10	Internet helps me involve others in making decisions		
PER11	Internet helps me make higher quality decisions		
PER12	Internet helps me make more effective decisions		

Instrument for actual usage

- Items measure of this variable as follow adapted from (Shih and Fang, 2004)
  - USE1 (frequency): How often do you use the internet?
    - □ Don't use ? Once each month □ Once each week □ once each day □ several times in day
  - USE2 (Time) : How often do you use the internet each time?
    - □ Don't use □ <1 h □ 1-2 h □ 3-4 h □ More than 5 h

Appendix B: Final result of CFA



REFERENCES

Al-Qeisi, K.I., 2009. Analyzing the use of UTAUT model in explaining an online behaviour: Internet banking adoption. http://www.researchgate.net/publication/49402230_Analyzing_the_use_of_UTAUT_model_in_explaining_an_online_behaviour_Internet_banking_adoption.

Alrajawy, I., N.M. Daud, O. Isaac and A.M. Mutahar, 2016. Mobile learning in Yemen public universities: Factors influence student's intention to use. Proceedings of the 7th International Conference on Postgraduate Education (ICPE7), December 1, 2016, Universiti Teknologi MARA Shah Alam, Malaysia, pp: 1050-1064.

Anandarajan, M., M. Igbaria and U. Anakwe, 2002. IT acceptance in a less-developed country: A motivational factor perspective. Int. J. Inform. Manage., 22: 47-65.

Anonymous, 2016. Internet users as percentage of population. World Bank, Washington, USA.

Awang, Z., 2012. Structural Equation Modeling Using AMOS Graphic. Penerbit UiTM Press, Shah Alam, Malaysia, ISBN-13: 9789673634187, Pages: 167.

Barnes, S.J. and R.T. Vidgen, 2014. Technology socialness and Web site satisfaction. Technol. Forecasting Soc. Change, 89: 12-25.

Baruch, Y. and B.C. Holtom, 2008. Survey response rate levels and trends in organizational research. Hum. Relat., 61: 1139-1160.

Benedetto, D.C.A., R.J. Calantone and C. Zhang, 2003. International technology transfer: Model and exploratory study in the people's republic of China. Intl. Marketing Rev., 20: 446-462.

Bentler, P.M. and D.G. Bonnet, 1980. Significance tests and goodness of fit in the analysis of covariance structures. Psychol. Bull., 88: 588-606.

Bhatiasevi, V. and C. Yoopetch, 2015. The determinants of intention to use electronic booking among young users in Thailand. J. Hospitality Tourism Manage., 23: 1-11.

Bollen, K.A., 1990. Overall fit in covariance structure models: Two types of sample size effects. Psychol. Bull., 107: 256-259.

Byrne, B.M., 2010. Structural Equation Modeling with AMOS: Basic Concepts, Applications and Programming. 2nd Edn., Routledge, Abingdon, UK., ISBN:9780805863734, Pages: 396.

Callum, K.M. and L. Jeffrey, 2013. The influence of students' ICT skills and their adoption of mobile learning. Austr. J. Educ. Technol., 29: 303-314.

Cheng, Y.M., 2011. Antecedents and consequences of E-learning acceptance. Inf. Syst. J., 21: 269-299.

Cheng, Y.M., 2014. Exploring the intention to use mobile learning: The moderating role of personal innovativeness. J. Syst. Inf. Technol., 16: 40-61.

Chin, W.W., 1998. Commentary: Issues and opinion on structural equation modeling. Manage. Inform. Syst. Q., 22: 7-16.

Cho, K.W., S.K. Bae, J.H. Ryu, K.N. Kim and C.H. An *et al*., 2015. Performance evaluation of public hospital information systems by the information system success model. Healthcare Inf. Res., 21: 43-48.

Cohen, J., 1988. Statistical Power Analysis for the Behavioral Sciences. 2nd Edn., Lawrence Erlbaum Associates, Hillsdale, Michigan, Pages: 567.

Cudjoe, A.G., P.A. Anim and J.G.N.T. Nyanyofio, 2015. Determinants of mobile banking adoption in the Ghanaian banking industry: A case of access bank Ghana limited. J. Comput. Commun., 3: 1-19.

D'Ambra, J. and C.S. Wilson, 2004. Explaining perceived performance of the World Wide Web: Uncertainty and the task-technology fit model. Internet Res., 14: 294-310.

D'Ambra, J., C.S. Wilson and S. Akter, 2013. Application of the task-technology fit model to structure and evaluate the adoption of E-books by academics. J. Assoc. Inf. Sci. Technol., 64: 48-64.

Dalcher, I. and J. Shine, 2003. Extending the new technology acceptance model to measure the end user information systems satisfaction in a mandatory environment: A bank's treasury. Technol. Anal. Strategic Manage., 15: 441-455.

Daud, N.M., 2008. Factors determining intranet usage: An empirical study of middle managers in Malaysian port industry. Ph.D. Thesis, Multimedia University, Malaysia.

Davis, F.D., 1989. Perceived usefulness perceived ease of use and user acceptance of information technology. MIS. Q., 13: 319-340.

DeLone, W.D. and E.R. McLean, 2003. The DeLone and McLean model of information systems success: A ten-year update. J. Manage. Inform. Syst., 19: 9-30.

DeLone, W.H. and E.R. McLean, 1992. Information systems success: The quest for the dependent variable. Inform. Syst. Res., 3: 60-95.

Doll, W.J. and G. Torkzadeh, 1998. Developing a multidimensional measure of system-use in an organizational context. Inf. Manage., 33: 171-185.

Elkhani, N., S. Soltani and A.M. Nazir, 2014. The effects of transformational leadership and ERP system self-efficacy on ERP system usage. J. Enterprise Inf. Manage., 27: 759-785.

Fagan, M.H., S. Neill and B.R. Wooldridge, 2008. Exploring the intention to use computers: An empirical investigation of the role of intrinsic motivation, extrinsic motivation and perceived ease of use. J. Comput. Inf. Syst., 48: 31-37.

Falk, R.F. and N.B. Miller, 1992. A Primer for Soft Modeling. The University of Akron Press, Akron, Ohio, ISBN-13: 9780962262845, Pages: 103.

Fan, J.C. and K. Fang, 2006. ERP implementation and information systems success: A test of DeLone and McLean's model. Proceedings of the Conference on Technology Management for the Global Future, PICMET 2006, Vol. 3, July 8-13, 2006, IEEE, New York, USA., ISBN:1-890843-14-8, pp: 1272-1278.

Faqih, K.M., 2016. An empirical analysis of factors predicting the behavioral intention to adopt Internet shopping technology among non-shoppers in a developing country context: Does gender matter?. J. Retailing Consum. Serv., 30: 140-164.

Farahat, T., 2012. Applying the technology acceptance model to online learning in the Egyptian universities. Procedia Soc. Behav. Sci., 64: 95-104.

Fornell, C. and D.F. Larcker, 1981. Evaluating structural equation models with unobservable variables and measurement error. J. Market. Res., 18: 39-50.

Fusilier, M. and S. Durlabhji, 2005. An exploration of student internet use in India: The technology acceptance model and the theory of planned behaviour. Campus Wide Inf. Syst., 22: 233-246.

Gardner, C. and D.L. Amoroso, 2004. Development of an instrument to measure the acceptance of internet technology by consumers. Proceedings of the 37th Annual Hawaii International Conference on System Sciences, January 5-8, 2004, IEEE, Big Island, Hawaii, pp: 1-10.

Gefen, D. and E.E. Rigdon, 2011. An update and extension to SEM guidelines for administrative and social science research. MIS. Q., 35: 1-7.

Gefen, D., D.W. Straub and M.C. Boudreau, 2000. Structural equation modeling and regression: Guidelines for research practice. Commun. Assoc. Inform. Syst., 4: 1-77.

Ha, S. and L. Stoel, 2009. Consumer e-shopping acceptance: Antecedents in a technology acceptance model. J. Bus. Res., 62: 565-571.

Hair, J.F., G.T.M. Hult, C.M. Ringle and M. Sarstedt, 2013. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publications, Thousand Oaks, California, USA., Pages: 311.

Hair, J.F., W.C. Black, B.J. Babin and R.E. Anderson, 2010. Multivariate Data Analysis. 7th Edn., Prentice Hall, Upper Saddle River, New Jersey, USA., ISBN:9780138132637, Pages: 785.

Hayduk, L.A. and L. Littvay, 2012. Should researchers use single indicators, best indicators, or multiple indicators in structural equation models?. BMC. Med. Res. Method., 12: 1-17.

Hernandez, B., J. Jimenez and M.J. Martin, 2008. Extending the technology acceptance model to include the IT decision-maker: A study of business management software. Technovation, 28: 112-121.

Hong, S., J.Y. Thong and K.Y. Tam, 2006. Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. Decis. Support Syst., 42: 1819-1834.

Hou, C.K., 2012. Examining the effect of user satisfaction on system usage and individual performance with business intelligence systems: An empirical study of Taiwan's electronics industry. Intl. J. Inf. Manage., 32: 560-573.

Huang, E., 2008. Use and gratification in E-consumers. Internet Res., 18: 405-426.

ILS., 2016. Internet users in the world. Internet Live Stats, New York, USA. http://www.internetlivestats.com/internet-users/.

Iqbal, S. and I.A. Qureshi, 2012. M-learning adoption: A perspective from a developing country. Int. Rev. Res. Open Distrib. Learn., 13: 147-164.

Isaac, O., Z. Abdullah, T. Ramayah, A.M. Mutahar and I. Alrajawy, 2016. Perceived usefulness, perceived ease of use, perceived compatibility and Net benefits: An empirical study of internet usage among employees in Yemen. Proceedings of the 7th International Conference on Postgraduate Education (ICPE7), Sep 8, 2016, Dewan Sri Budiman, Shah Alam, Malaysia, pp: 899-919.

James, L.R., S.A. Mulaik and J.M. Brett, 1982. Causal analysis: Assumptions, Models and Data. Sage Publications, Beverly Hills, CA., ISBN-10: 0803918682.

Jan, A.U. and V. Contreras, 2011. Technology acceptance model for the use of information technology in universities. Comput. Human Behav., 27: 845-851.

Jin, C.H., 2013. The effects of individual innovativeness on users' adoption of internet content filtering software and attitudes toward children's Internet use. Comput. Hum. Behav., 29: 1904-1916.

Joo, J. and Y. Sang, 2013. Exploring Koreans' smartphone usage: An integrated model of the technology acceptance model and uses and gratifications theory. Comput. Hum. Behav., 29: 2512-2518.

Joreskog, K.G. and D. Sorbom, 2002. LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language. Scientific Software International, Chicago, IL., USA., Pages: 226.

Kannan, V.R. and K.C. Tan, 2005. Just in time, total quality management and supply chain management: Understanding their linkages and impact on business performance. Omega, 33: 153-162.

Khayun, V. and P. Ractham, 2011. Measuring e-excise tax success factors: Applying the Delone and McLean information systems success model. Proceedings of the 44th Hawaii International Conference on System Sciences (HICSS) 2011, January 4-7, 2011, IEEE, California, USA., ISBN:978-1-4244-9618-1, pp: 1-10.

Kim, B.G., S.C. Park and K.J. Lee, 2008. A structural equation modeling of the internet acceptance in Korea. Electron. Commerce Res. Appl., 6: 425-432.

Kim, H.W., H.C. Chan and S. Gupta, 2007. Value-based adoption of mobile internet: An empirical investigation. Decis. Support Syst., 43: 111-126.

Kim, S.H., 2014. A study on adoption factors of Korean smartphone users: A focus on TAM (Technology Acceptance Model) and UTAUT (Unified Theory of Acceptance and Use of Technology). Adv. Sci. Technol. Lett., 57: 27-30.

Kline, R.B., 2010. Principles and Practice of Structural Equation Modeling. 3rd Edn., The Guilford Press, New York, USA.,.

Koksal, M.H., 2016. The intentions of Lebanese consumers to adopt mobile banking. Int. J. Bank Marketing, 34: 327-346.

Konradt, U., T. Christophersen and U. Schaeffer-Kuelz, 2006. Predicting user satisfaction, strain and system usage of employee self-services. Intl. J. Hum. Comput. Stud., 64: 1141-1153.

Krejcie, R.V. and D.W. Morgan, 1970. Determining sample size for research activities. Educ. Psychol. Meas., 30: 607-610.

Kripanont, N., 2007. Examining a technology acceptance model of internet usage by academics within Thai Business Schools. Ph.D. Thsis, Victoria University, Melbourne, Australia.

Lee, B.C., J.O. Yoon and I. Lee, 2009. Learners' acceptance of E-learning in South Korea: Theories and results. Comput. Educ., 53: 1320-1329.

Lee, D.Y. and M.R. Lehto, 2013. User acceptance of YouTube for procedural learning: An extension of the technology acceptance model. Comput. Educ., 61: 193-208.

Lee, K.C., S. Lee and J.S. Kim, 2005. Analysis of Mobile Commerce Performance by using the Task-Technology Fit. In: Mobile Information Systems, Lawrence, E., B. Pernici and J. Krogstie (Eds.). Springer, Boston, Massachusetts, ISBN:978-0-387-22851-8, pp: 135-153.

Lee, M.C., 2009. Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefits. Electron. Commerce Res. Applic., 8: 130-141.

Lee, S. and B.G. Kim, 2009. Factors affecting the usage of intranet: A confirmatory study. Comput. Hum. Behav., 25: 191-201.

Lee, Y.H., Y.C. Hsieh and C.N. Hsu, 2011a. Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use E-learning systems. J. Educ. Technol. Soc., 14: 124-137.

Lee, Y.H., Y.C. Hsieh and C.Y. Ma, 2011b. A model of organizational employees'E-learning systems acceptance. Knowl. Based Syst., 24: 355-366.

Lian, J.W., 2015. Critical factors for cloud based e-invoice service adoption in Taiwan: An empirical study. Int. J. Inf. Manage., 35: 98-109.

Lin, H.F., 2007. Predicting consumer intentions to shop online: An empirical test of competing theories. Electron. Commerce Res. Appl., 64: 433-442.

Liu, Y., H. Li and C. Carlsson, 2010. Factors driving the adoption of m-learning: An empirical study. Comput. Educ., 55: 1211-1219.

Luarn, P. and H.H. Lin, 2005. Toward an understanding of the behavioral intention to use mobile banking. Comput. Hum. Behav., 21: 873-891.

Makokha, M.W. and D.O. Ochieng, 2014. Assessing the success of ICT's from a user perspective: Case study of coffee research foundation, Kenya. J. Manage. Strategy, 5: 46-54.

Mbogo, M., 2010. The impact of mobile payments on the success and growth of micro-business: The case of M-Pesa in Kenya. J. Lang. Technol. Entrepreneurship Afr., 2: 182-203.

McFarland, D.J. and D. Hamilton, 2006. Adding contextual specificity to the technology acceptance model. Comput. Hum. Behav., 22: 427-447.

McGill, T.J. and J.E. Klobas, 2009. A task-technology fit view of learning management system impact. Comput. Educ., 52: 496-508.

Montesdioca, G.P.Z. and A.C.G. Macada, 2015. Measuring user satisfaction with information security practices. Comput. Secur., 48: 267-280.

Mutahar, A.M., N.M. Daud, T. Ramayah, L. Putit and O. Isaac *et al*., 2016. The role of trialability, awareness, perceived ease of use and perceived usefulness in determining the perceived value of using mobile banking in Yemen. Proceedings of the 7th International Conference on Postgraduate Education (ICPE7), December 1, 2016, Universiti Teknolo gi MARA (UiTM), Shah Alam, Malaysia, pp: 884-898.

Nasri, W. and L. Charfeddine, 2012. Factors affecting the adoption of internet banking in Tunisia: An integration theory of acceptance model and theory of planned behavior. J. High Technol. Manage. Res., 23: 1-14.

Negahban, A. and C.H. Chung, 2014. Discovering determinants of users perception of mobile device functionality fit. Comput. Hum. Behav., 35: 75-84.

Negroponte, N., 2014. A 30-year history of the future. TED, South Dakota, USA. https://www.ted.com/talks/ nicholas_negroponte_a_30_year_history_of_the_future.

Norzaidi, D.M., C.S. Choy, R. Murali and S.M. Intan, 2007. Intranet usage and managers' performance in the port industry. Ind. Manage. Data Syst., 107: 1227-1250.

Norzaidi, M.D. and M.I. Salwani, 2009. Evaluating technology resistance and technology satisfaction on student's performance. Campus-Wide Inf. Syst., 26: 298-312.

Norzaidi, M.D., S.C. Chong, R. Murali and M.I. Salwani, 2009. Towards a holistic model in investigating the effects of intranet usage on managerial performance: A study on Malaysian port industry. Maritime Policy Manage., 36: 269-289.

Nunnally, J.C. and I.H. Bernstein, 1994. Psychometric Theory. 3rd Edn., McGraw-Hill, New York, USA.

Park, Y. and J.V. Chen, 2007. Acceptance and adoption of the innovation use of smartphone. Ind. Manage. Data Syst., 107: 1349-1365.

Parveen, F. and A. Sulaiman, 2008. Technology complexity, personal innovativeness and intention to use wireless internet using mobile devices in Malaysia. Intl. Rev. Bus. Res. Pap., 4: 1-10.

Peng, W., R.A. Ratan and L. Khan, 2015. Ebook uses and class performance in a college course. Proceedings of the 2015 48th Hawaii International Conference on System Sciences (HICSS), January 5-8, 2015, IEEE, Kauai, HawaiiI, USA., ISBN:978-1-4799-7367-5, pp: 63-71.

Phua, P.L., S.L. Wong and R. Abu, 2012. Factors influencing the behavioural intention to use the internet as a teaching-learning tool in home economics. Procedia Soc. Behav. Sci., 59: 180-187.

Pinho, C.M.R.J. and A.M. Soares, 2011. Examining the technology acceptance model in the adoption of social networks. J. Res. Interact. Marketing, 5: 116-129.

Rahman, M.A., X. Qi and M.T. Islam, 2016. Banking access for the poor: Adoption and strategies in rural areas of Bangladesh. J. Econ. Financial Stud., 4: 1-10.

Ramayah, T. and M.C. Lo, 2007. Impact of shared beliefs on perceived usefulness and ease of use in the implementation of an enterprise resource planning system. Manage. Res. News, 30: 420-431.

Ramayah, T. and N.M. Suki, 2006. Intention to use mobile PC among MBA students: Implications for technology integration in the learning curriculum. Unitar E. J., 1: 30-39.

Ramayah, T., 2006. Course website usage does prior experience matter?. Wseas Trans. Inf. Sci. Appl., 3: 299-306.

Ramayah, T., J. Ignatius and B. Aafaqi, 2005. PC usage among students in a private institution of higher learning: The moderating role of prior experience. Educators Educ. J., 20: 131-152.

Rana, N.P., Y.K. Dwivedi, M.D. Williams and V. Weerakkody, 2015. Investigating success of an E-government initiative: Validation of an integrated IS success model. Inf. Syst. Front., 17: 127-142.

Rehman, M., V. Esichaikul and M. Kamal, 2012. Factors influencing E-government adoption in Pakistan. Transforming Government People Process Policy, 6: 258-282.

Revels, J., D. Tojib and Y. Tsarenko, 2010. Understanding consumer intention to use mobile services. Aust. Marketing J., 18: 74-80.

Ridley, M., 2010. When ideas have sex. TED, New York, USA. http://www.ted.com/talks/matt_ridley_when_ideas_have_sex/transcript#t-103000.

Roca, J.C., C.M. Chiu and F.J. Martinez, 2006. Understanding e-learning continuance intention: An extension of the technology acceptance model. Int. J. Hum. Comput. Stud., 64: 683-696.

Ryan, C. and U. Rao, 2008. Holiday users of the internet ease of use, functionality and novelty. Intl. J. Tourism Res., 10: 329-339.

Safar-Hasim, M. and A. Salman, 2010. Factors affecting sustainability of internet usage among youth. Electron. Lib., 28: 300-313.

Sanchez, R.A. and A.D. Hueros, 2010. Motivational factors that influence the acceptance of Moodle using TAM. Comput. Hum. Behav., 26: 1632-1640.

Sekaran, U. and R. Bougie, 2013. Research Methods for Business: A Skill-Building Approach. 6th Edn., John Wiley & Sons, Hoboken, New Jersey, USA., ISBN:9781119942252, Pages: 436.

Seliaman, M.E. and M.S.A. Turki, 2012. Mobile learning adoption in Saudi Arabia. Intl. J. Comput. Electr. Autom. Control Inf. Eng., 6: 1129-1131.

Sharma, S.K. and J.K. Chandel, 2013. Technology acceptance model for the use of learning through websites among students in Oman. Intl. Arab J. E. Technol., 3: 44-49.

Shih, H.P., 2004. Extended technology acceptance model of Internet utilization behavior. Inform. Manage., 41: 719-729.

Shih, Y.Y. and C.Y. Chen, 2013. The study of behavioral intention for mobile commerce: Via integrated model of TAM and TTF. Qual. Quantity, 47: 1009-1020.

Shih, Y.Y. and K. Fang, 2004. The use of a decomposed theory of planned behavior to study Internet banking in Taiwan. Int. Res., 14: 213-223.

Singh, N., G. Fassott, M.C.H. Chao and J.A. Hoffmann, 2006. Understanding international web site usage: A cross-national study of German, Brazilian and Taiwanese online consumers. Int. Marketing Rev., 23: 83-97.

Son, H., Y. Park, C. Kim and J.S. Chou, 2012. Toward an understanding of construction professional's acceptance of mobile computing devices in South Korea: An extension of the technology acceptance model. Autom. Constr., 28: 82-90.

Steiger, J.H., 1990. Structural model evaluation and modification: An interval estimation approach. Multivariate Behav. Res., 25: 173-180.

Straub, D., M. Keil and W. Brenner, 1997. Testing the technology acceptance model across cultures: A three country study. Inform. Manage., 33: 1-11.

Straub, D., M. Limayem and E. Karahanna-Evaristo, 1995. Measuring system usage: Implications for IS theory testing. Manage. Sci., 41: 1328-1342.

Sun, P., R. Tsai, G. Finger, Y. Chen and D. Yeh, 2008. What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. Comput. Educ., 50: 1183-1202.

Sun, Y. and S. Mouakket, 2015. Assessing the impact of enterprise systems technological characteristics on user continuance behavior: An empirical study in China. Comput. Ind., 70: 153-167.

Tabachnick, B.G. and L.S. Fidell, 2012. Using Multivariate Statistics. 6th Edn., Pearson, London, UK., ISBN:9780205956227, Pages: 1024.

Tarhini, A., K. Hone and X. Liu, 2013. User acceptance towards web-based learning systems: Investigating the role of social, organizational and individual factors in European higher education. Procedia Comput. Sci., 17: 189-197.

Tarhini, A., T. Elyas, M.A. Akour and Z. Al-Salti, 201a6. Technology, demographic characteristics and E-learning acceptance: A conceptual model based on extended technology acceptance model. Higher Educ. Stud., 6: 72-89.

Tarhini, A., T. Teo and T. Tarhini, 2016b. A cross-cultural validity of the E-learning Acceptance Measure (ElAM) in Lebanon and England: A confirmatory factor analysis. Educ. Inf. Technol., 21: 1269-1282.

Teo, T.S.H., V.K.G. Lim and R.Y.C. Lai, 1999. Intrinsic and extrinsic motivation in internet usage. Omega, 27: 25-37.

Tucker, L.R. and C. Lewis, 1973. A reliability coefficient for maximum likelihood factor analysis. Psychometrika, 38: 1-10.

Urbach, N. and F. Ahlemann, 2010. Structural equation modeling in information systems research using partial least squares. JITTA. J. Inf. Technol. Theor. ppl., 11: 5-39.

Venkatesh, V., 2000. Determinants of perceived ease of use: Integrating control, intrinsic motivation and emotion into the technology acceptance model. Inform. Syst. Res., 11: 342-365.

Venkatesh, V., J.Y. Thong, F.K. Chan, P.J.H. Hu and S.A. Brown, 2011. Extending the two-stage information systems continuance model: Incorporating UTAUT predictors and the role of context. Inf. Syst. J., 21: 527-555.

Venkatesh, V., M.G. Morris, G.B. Davis and F.D. Davis, 2003. User acceptance of information technology: Toward a unified view. MIS Quart., 27: 425-478.

Wang, Y.S. and Y.W. Liao, 2008. Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success. Govt. Inform. Quart., 25: 717-733.

Wang, Y.S., 2008. Assessing E-commerce systems success: A respecification and validation of the DeLone and McLean model of IS success. Inf. Syst. J., 18: 529-557.

Wessels, L. and J. Drennan, 2010. An investigation of consumer acceptance of M-banking. Int. J. Bank Marketing, 28: 547-568.

Wixom, B.H. and P.A. Todd, 2005. A theoretical integration of user satisfaction and technology acceptance. Inform. Syst. Res., 16: 85-102.

Wu, J.H. and Y.M. Wang, 2006. Measuring KMS success: A respecification of the DeLone and McLean's model. Inform. Manage., 43: 728-739.

Xinli, H., 2015. Effectiveness of information technology in reducing corruption in China: A validation of the DeLone and McLean information systems success model. Electron. Lib., 33: 52-64.

Yalcinkaya, R., 2007. Police officers' adoption of information technology: A case study of the Turkish POLNET system. Ph.D Thesis, University of North Texas, Denton, Texas.

Yayla, A.A. and Q. Hu, 2007. User acceptance of E-commerce technology: A meta-analytic comparison of competing models. Proceedings of the 15th International Conference on ECIS Information Systems, June 7-9, 2007, University of St. Gallen, St. Gallen, Switzerland, pp: 179-190.