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An Assessment Tool for E-Government System Performance:-A Citizen-Centric Model

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ABSTRACT

Governments worldwide have, increasingly, implemented e-government initiatives for their potential significant benefits; among which, delivering better services to citizens through increasing citizens' convenience, satisfaction, and independence; and saving their time, effort, and cost. Achieving each benefit is an objective to these governments and fulfilling each objective is considered a critical success factors. Hence, governments need to assess the extent to which they were able to obtain their preset goals. This study merely focuses on the citizens' perspective of the evaluation. However, the literature seems to lack studies that propose such a sufficient evaluation tool that has been reliably validated. Therefore, the purpose of this study is to fill this gap by proposing and validating a conceptual model and an associated evaluation tool which measures the e-government performance from citizens' perspective. The model includes factors which impact citizens' perceptions and their psychological and tangible benefits which, in turn, influence their adoption. The model was validated by a survey method and analyzed using PLS. The results support our model and shows that almost all paths in the proposed model are significant.

Keywords

E-government, e-government system evaluation, user satisfaction, tangible benefits, Partial least square (PLS).

INTRODUCTION

The concept of e-government has been defined in diverse ways (Yildiz, 2007, Verdegem and Verleye, 2009). The definitions were largely dependent on factors such as the objectives or priorities of a particular government, the various contexts in which it has been discussed, the discipline in which the research has been carried out, the regulatory environment, or on the dominance of a group of actors in a given situation (Yildiz, 2007). Earlier definitions of e-government focused primarily on e-government as an "inter-networked government", utilizing ICT and serving different stakeholders (Tapscott, 1996, Layne and Lee, 2001, Whitson and Davis, 2001). More recent definitions place more emphasis on the utilization of Web-based Information System (WIS) as means of this interaction (Moon and Welch, 2004, Akman et al., 2005, Evans and Yen, 2005, Wang and Liao, 2008, Luk, 2009).

Since the current notion of E-Government Systems (EGS) focuses mainly on internet utilization, we define an EGS as a Web-Based Information System (WIS) providing:

1- an online interaction channel, including the e-government portal and/or government agencies' websites,
2- which provides sufficient information and diverse e-service options that meet the needs of all stakeholders, and
3- the government employees in the "back office" who perform the necessary business processes, such as updating the system with the necessary information about each citizen's or business's status, and completing the business processes associated with any submitted e-service request.

By implementing EGS, governments aim to achieve benefits for both internal and external perspectives. The internal perspective refers to the benefits obtained by government employees, government agencies and the government as a whole. The strategic value that the government would gain from EGS is mainly enhancing performance and increasing efficiency by facilitating a better working environment for employees; reducing costs; and integrating government agencies to ease information sharing and reduce redundancy and inconsistency (Akman et al., 2005, Wang et al., 2005, Gil-Garcia, 2006).

The external perspective refers to the benefits that citizens and private businesses gain. These benefits include providing better services to the public, facilitating a good quality online channel, offering diverse kinds of information and e-service options that meet citizens' various needs, and increasing citizens' independence and efficiency. Such "good-quality" systems, would save users time and effort by not having to physically visit government agencies, wait in long queues, perform tedious administrative work, etc. (Akman et al., 2005, Wangpipatwong et al., 2005, Wang et al., 2005, Kumar et al., 2007)

Evaluating the success and the performance of an EGS depends on the perspective from which it is being assessed (e.g., employees' efficiency, financial performance (cost/benefit), customers' satisfaction, etc). Grimsley and Meehan (2008) and Gupta and Jana (2003) classified the alternative approaches to evaluating a particular e-government initiative into three groups:

- economic (e.g., cost/benefit analysis, Return on Investment (ROI), etc);
- tangible (e.g., WIS characteristics such as benchmarks, readiness and maturity stages), and
- psychometric (e.g., individuals' satisfaction, behavior and behavioral intention).

The next section of this paper presents the literature review focusing on the e-government citizen-centric studies, various evaluation models, their backgrounds, and their shortcomings. This is followed by the methodology which presents the proposed conceptual model, the guidelines by which it was developed and the validation process. Finally, the validation results are presented and discussed.

LITERATURE REVIEW

The most widely-used success measures in the IS literature employ "system use" (Swanson, 1974, Davis et al., 1989) and "user-satisfaction" (US) (Ives et al., 1983, DeLone and McLean, 1992) as proxies for the system success. Considering EGS is a form of IS and shares similar characteristic with e-commerce in terms of utilizing WIS as a service and an interaction channel and being directed mainly to external users (customers and citizens); almost all citizens-centric evaluation studies in the e-government domain borrow their models from the IS and e-commerce contexts (Devaraj et al., 2002, Wang and Liao, 2008, Palvia, 2009). These studies focus on measuring user satisfaction, behavior and behavioral intention to utilize the system. However, it is debatable whether these models or evaluation tools are really appropriate to the e-government domain as there is obviously a distinction between the nature of e-government context and the other two contexts (i.e., IS and e-commerce). For example:

1- The IS evaluation models were originally developed for the internal user context where system use is mandatory (Davis, 1989, DeLone and McLean, 2003), which is not the case in the e-government context.
2- Despite the similarity between the e-commerce and e-government contexts, as mentioned earlier, they still differ significantly. In e-commerce, the strategic objective for private organizations is profit-oriented. They are mostly interested in providing good services and products so that they have a competitive advantage, and subsequently attract more customers. Otherwise, customers would turn to competitors and choose those who provide better services and products (Wang et al., 2005). Hence, customers' satisfaction is an important indicator of the success of an e-commerce application (DeLone and McLean, 2004, Wang et al., 2005). Conversely, in the e-government context, government agencies don't compete with each other as each has it own specialty. They offer a variety of free public services targeting a bigger and more heterogeneous population (i.e., having, different characteristics, like literacy, gender, income, etc.) than that of e-commerce (Wang et al., 2005, Conklin, 2007). Moreover, each government agency provides a variety of services to the public. Hence, the purpose for which citizens use the EGS varies widely from that of an e-commerce system. In essence, it is important to consider the success determining factors that are appropriate for the e-government domain.

Since one core objective of facilitating EGS is to increase citizens' convenience and task efficiency (save time and effort) (Wangpipatwong et al., 2005, Wang et al., 2005, Kumar et al., 2007, Verdegem and Verleye, 2009, Akman et al., 2005), investigating citizens' adoption of EGS or their satisfaction as an indication to the success of the system is not reliable. DeLone and McLean (2003) suggest that the use of US to measure the success and increased efficiency of task performance is insufficient. We agree with the authors and argue that using the notion of US as a proxy for measuring the success in the e-government context, is insufficient on its own for assessing the degree to which the government was able to increase citizens' efficiency in performing their tasks. Citizens might use the EGS, simply, because it is a better option than the traditional face-to-face channel; for example, to avoid the burden of physically visiting the government agency, but not necessarily because it is of high-quality. Alternatively, citizens may not have another option but to use it, due to some personal constraint such as a health issue or being overseas.

Therefore, we propose to incorporate the notion of users' (citizens) obtained tangible benefits and psychological benefit (satisfaction) as the consequences for adopting an EGS when evaluating its success. By explicitly measuring citizens' efficiency in performing their tasks, governments will be able to asses the extent to which they were able to fulfill their objectives. Nonetheless, it appears that there are certain additional aspects that need to be considered when assessing the success in fulfilling a government's intermediate objective (i.e., providing high-quality system), and fundamental objective (i.e., providing values to citizens).

High-quality system performance is considered as an intermediate objective that governments aim to accomplish in order to attract individuals to utilize the system and adequately rely on it, which will presumably fulfill the fundamental objective of increasing individuals' efficiency (see Figure 1).

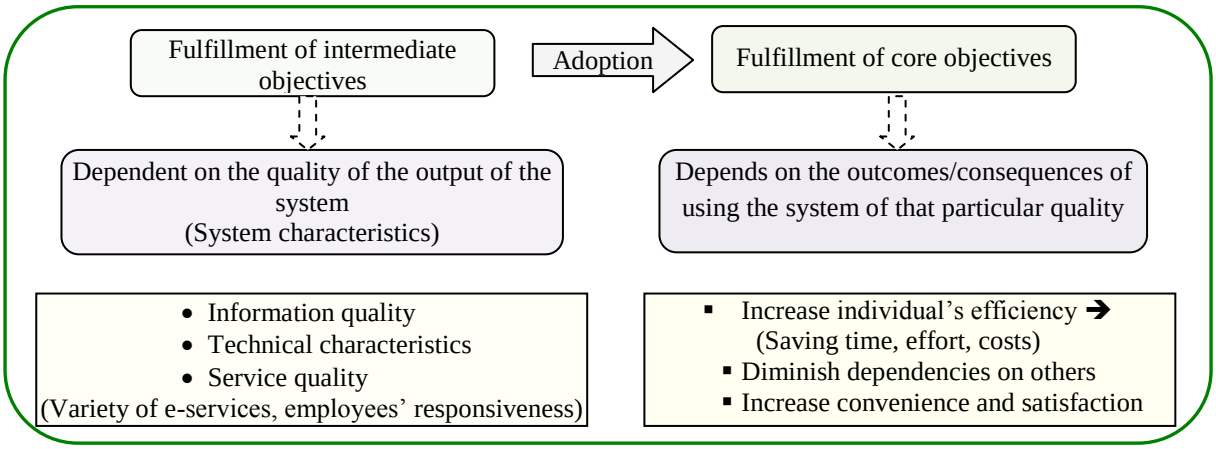

Figure 1. The relationship between intermediate and fundamental objectives

Actually using the EGS is a prerequisite to citizens' to obtaining both psychological and tangible benefits, utilizing the EGS is a (Wang et al., 2005, Kumar et al., 2007, Wangpipatwong et al., 2008). However, citizens' behavior and behavioral intention to adopt an EGS is dependent on factors including:

1- the output quality of the system's attributes which affect individual's perception of the online system characteristics (DeLone and McLean, 2003, Aladwani and Palvia, 2002, Petter et al., 2008, Wixom and Todd, 2005):

- Information quality, e.g., comprehensive, up-to-date, accurate, clear-to-understand, relevant, etc.
- The diversity of e-services that citizens can use either to complete an entire task independently online, or to place an online request for a task to be completed by government servants (e.g., passport or ID renewal).
- Technical quality such website loading time, availability/accessibility 24/7, security/privacy, and clarity of the website in terms of the design, navigation, consistency of layout, etc.

2- Individual attributes, such as their perceptions and cognitive beliefs about what they have received from the system, and what they would expect in the future.

- Individuals' trust in the
  - sufficiency and reliability of information (Nicolaou and McKnight, 2006).
  - operational competency of the government, i.e., receiving the online requests and completing them adequately and in the assigned timeframe (Balasubramanian et al., 2003).
  - security and privacy standards, i.e., trusting that the system is secure and that their confidential information, such as financial, credit card, and personal information are well protected from being accessed (viewed or manipulated) by an unauthorized person (Balasubramanian et al., 2003, Cullen and Reilly, 2007).
- Perceived Usefulness (PU): An individuals' belief that using the online system, will have positive consequences, such as conducting the task in an easier manner, saving time or effort, etc. (Davis et al., 1989, van Dijk et al., 2008, Verdegem and Verleye, 2009). PU is very-much related to individuals' circumstances, such as environmental and physical factors, e.g., having a work commitment or other engagements, physical or health conditions, being overseas, and other inconveniences or barriers.

Accordingly, we propose that a model which measures the fulfillment of a government's intermediate and fundamental objectives should incorporate:

1. The system's attributes.
2. The individuals' attributes that impact their cognitive beliefs about the system and subsequently their intention and usage behavior.
3. The obtained psychological and tangible benefits.
4. Individuals' intentions and behavioral intentions that are prerequisites for obtaining the final values. (see Figure 2)

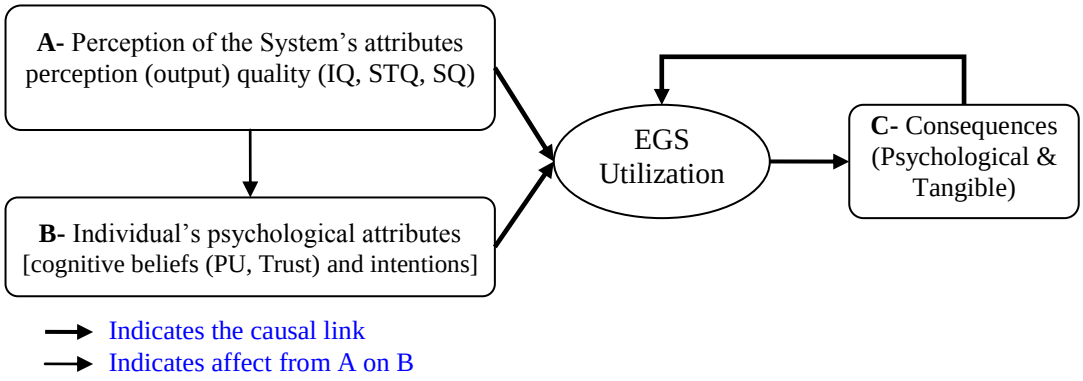

Figure 2: The determinants of EGS utilization and the attained benefits

A review of the literature, particularly of the e-government, revealed that most studies considered some attributes and ignored others. For example, in the WIS literature, presents models of system success primarily focused on US (psychological benefit) rather than the tangible benefits like in e-commerce.

In the e-government citizen-centric literature, few citizen-centric models have been introduced to evaluate the EGS. These models varied in terms of the dependent variable that was measured with most focusing on citizens adoption (i.e., intention and behavioral intention), e.g., (Hung et al., 2009, Carter and Belanger, 2005, Lean et al., 2009, Wangpipatwong et al., 2009). Few studies investigated users psychological benefit (satisfaction) in their models, e.g., (Kumar et al., 2007, Cenfetelli et al., 2008, Teo et al., 2008, Bwalya, 2009, Chae-Eon et al., 2009, Mohamed et al., 2009, Sung et al., 2009, Verdegem and Verleye, 2009). Yet, these citizen-centric studies lacked some aspects that made them incomprehensive, For instance, some of them focused on certain aspects and did not include other important ones that determine US or net benefit (NB), e.g., system's attributes or individual's trust (Prybutok et al., 2008, Wangpipatwong et al., 2008). In addition, several previous studies appear unreliable due to some methodological issues. For example, some lacked appropriate methodological instruments that are reliable and comprehensive enough to reflect the nature of the latent variable, such as (Kumar et al., 2007); or had inconsistent clustering of variables, e.g., (Sung et al., 2009).

Furthermore, very few researchers attempted to measure the NB (citizens obtained final values) in the e-government context incorporating both psychological and tangible benefits (Wang and Liao, 2008, Chae-Eon et al., 2009). These studies considered the realized benefits as indicators of the EGS success. However, these studies did not consider all the aspects we believe important to be included in the assessment instrument when evaluating EGS success from citizens' perspective (Al-Haddad and Hyland, 2011). On the other hand, the studies that did consider these aspects were very few (i.e., (Wang et al., 2005, Park, 2008, Alshawi and Alalwany, 2009)). These studies seem to have methodological issues including lack of depth in the evaluation criteria, redundancy of presenting similar notions in multiple variables or ambiguity of the proposed evaluation criteria (Al-Haddad and Hyland, 2011).

METHODOLOGY

1. Guidelines to developing the Citizen-Centric E-government Evaluation Model (CEM)

In order to avoid bias in choosing one model or theory over another, guidelines were imposed to determine the formulation of this model. The main focus of the study is to identify citizens' perception of the EGS's output and performance, and their attained benefits from utilizing that particular corresponding quality of the EGS. Naturally, individuals' perception of the system's output is reflected by their satisfaction. Since US, which reflects the psychological benefit, is determined by both

the system's output quality, and the tangible benefits (consequences) from utilizing the EGS. Therefore, US appears to be as the most important criterion.

Accordingly, a systematic literature review on US was conducted covering the empirical studies in three top ranking journals, namely, MISQ, JMIS, and ISR, for the period between 1995 and 2010.
- First, the significant antecedents to US were identified and clustered such that similar variables were integrated.
- Second, an exhaustive literature review was conducted on all the variables that were significant determinants of US. This required reviewing multiple disciplines, such as IS, business administration, management, psychology, e-government, marketing and e-commerce)

Finally, it was important to take into consideration the individuals' behavior in utilizing the system in order for them to obtain the final values (Wang et al., 2005, Kumar et al., 2007, Wangpipatwong et al., 2008). Hence, a great emphasis was put in exploring individual's intention and behavioral intention in the relevant literature, in particular, WIS and e-government contexts.

To ensure that the model was valid and reliable, the following guidelines were used when developing the model. That is:

a. Constructing the model to fit the e-government domain, and the scope of this study;
b. Taking into account the different dimensions and factors that influence individuals' behavior and behavioral intentions;
c. Ensuring the logical interrelations between the constructs in the conceptual model; and
d. Adding the variables that were found in most empirical studies to be significant antecedent to the other variable relevant to our study.

2. The proposed model

Based on the literature, the empirical studies, and the previously presented discussions, we present our conceptual model (CEM) with the net benefit in Figure 3.

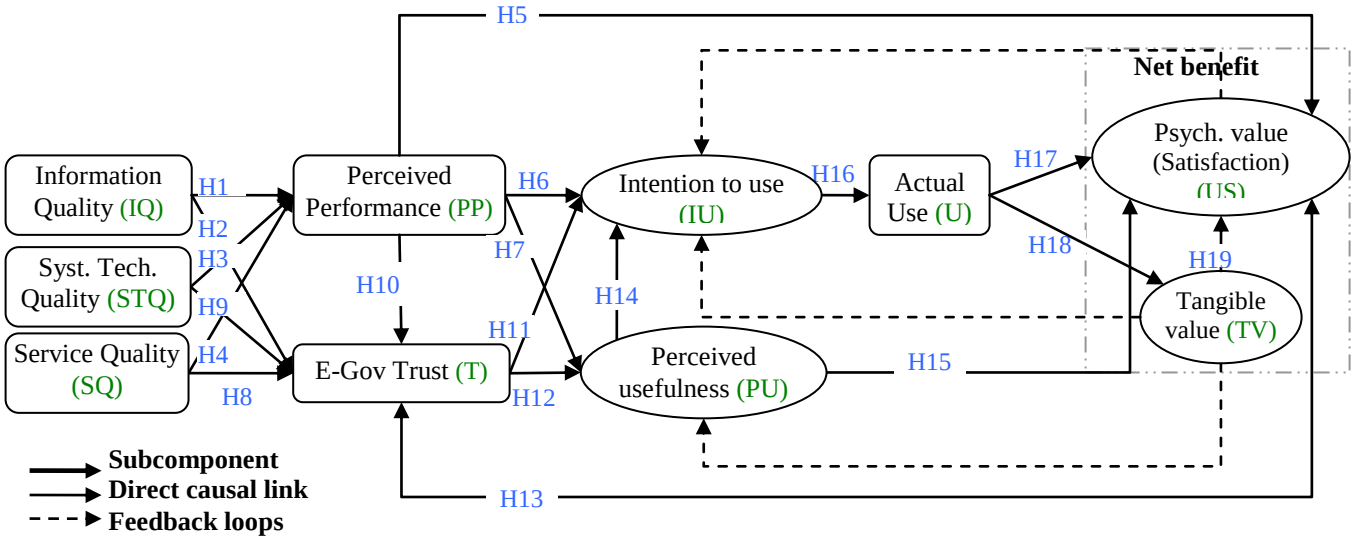

Figure 3. The proposed conceptual model CEM showing the hypotheses

Consistent with the literature, we also propose additional 'feedback' hypotheses presented in our model in Figure 3 as the dotted arrows. However, the scope of the current research is intentionally limited to exclude the feedback loops and only forward paths are tested. The feedback loops can only be tested using multiple samples taken over a period of time in longitudinal studies.

	Hypothesis	Sample of supporting references
H1	Information-quality has significant positive impact on the perceived-EGS-performance	(Chae-Eon et al., 2009, Au et al., 2008, Teo et al., 2008)
H2	Information-quality has significant positive impact on the level of trust	(Nicolaou and McKnight, 2006, Bliemel and Hassanein, 2007, Chiung-Ju and Hui-Ju, 2009)
H3	System-Technical-Quality has significant positive impact on the perceived-EGS-performance	(Au et al., 2008, Teo et al., 2008)
H4	Service-Quality has significant positive impact on the e- government system performance	(Au et al., 2008, Teo et al., 2008)
H5	Perceived-EGS-performance has significant positive impact on the user's satisfaction.	(Au et al., 2008, DeLone and McLean, 2003, Devaraj et al., 2002, Balasubramanian et al., 2003, Cenfetelli et al., 2008, Teo et al., 2008, Wang and Liao, 2008, Chiung-Ju and Hui-Ju, 2009)
H6	Perceived-EGS-performance has significant positive impact individual's intention to use the EGS.	(Cenfetelli et al., 2008, Tan et al., 2008, Parasuraman et al., 2005)
H7	Perceived-EGS-performance has significant positive impact on the individual's perceived-usefulness of the EGS.	(Cenfetelli et al., 2008, Tan et al., 2008)
H8	Service-Quality has significant positive impact on citizens' Trust in the EGS in general, and in the government operational competency in particular.	(Anderson and Weitz, 1989, Balasubramanian et al., 2003, Chiung-Ju and Hui-Ju, 2009)
H9	System-Technical-Quality has significant positive impact on the trust of the EGS.	(Aladwani and Palvia, 2002, Cyr, 2008, Chiung-Ju and Hui-Ju, 2009)
H10	Perceived-EGS-performance has significant positive impact on the level of trust	(Voss, 2000, Tan et al., 2008, Teo et al., 2008)
H11	Trust has significant positive impact on the intention to use the EGS.	(Cho, 2006, Hung et al., 2006, Pavlou and Fygenson, 2006, Lean et al., 2009)
H12	Trust has significant positive impact on the Perceived-Usefulness.	(Gefen, 2004, Horst et al., 2007, Tan et al., 2008, Yoon, 2009)
H13	Trust has significant positive impact on users' satisfaction from utilizing the EGS.	(Balasubramanian et al., 2003, Chiou, 2004, Bliemel and Hassanein, 2007, Teo et al., 2008, Palvia, 2009, Rai et al., 2009);
H14	Perceived-Usefulness has significant positive impact on the Intention to use the EGS	(Cho, 2006, Hung et al., 2006, Pavlou and Fygenson, 2006, Lean et al., 2009, Chiou, 2004, Horst et al., 2007, Wangpipatwong et al., 2008, Tan et al., 2008)
H15	Perceived usefulness has significant positive impact on individual's user's of satisfaction	(Seddon, 1997, Bhattacherjee, 2001)
H16	Intention to use the EGS has significant positive impact on the actual use.	(Venkatesh et al., 2003, van Dijk et al., 2008)
H17	The actual use of the EGS has a significant impact on user's satisfaction.	(Wang and Liao, 2008)
H18	Actual system use has significant positive impact on the obtained tangible values.	(Wang and Liao, 2008)
H19	The Tangible benefits that citizens obtain from utilizing EGS have significant positive impact on their satisfaction.	(DeLone and McLean, 2003, Teo et al., 2008, Chae-Eon et al., 2009)

Table 1: The tested hypothesis and some samples of supporting literature

3 Validating the model – Operational approach

To validate the model we chose to do the following:

First, consider the case of developing countries, and choose the state of Kuwait as a case study. It is well known that most government services in developing countries are tedious, problematic, and have many shortcomings such as corruption, nepotism, unmotivated government employees reluctant to work professionally and efficiently, and long routine processes which also require a lot of administrative work, etc. Accordingly, citizens of these countries are very dissatisfied with the services they receive while interacting with their government. Therefore, if implementing an e-government system would have a positive impact it will be most obvious within this group of countries.

Second, use the survey method because the constructs are well defined and the context to be examined is well structured. Given the perceptual nature of the construct measures, closed-ended questions using a seven-point likert scale are deployed. Many questions were extracted from the literature, and the questions to reflect the model constructs were added accordingly. In addition, due to the nature of multi-facet services among and within each government agency, the survey was controlled for the type of agency and the type of tasks for which users utilized the EGS. The survey was developed electronically and online using "SurveyGizmo". An English and Arabic version of the survey was available for non-Arabic speaking users to increase the response rate. A pilot study was conducted to ensure the suitability and easiness to understand the questions.

The data collected was comprised of 179 users of the Ministry of Interior (MOI). MOI is the most commonly used online agency and it provides all types of services.

DISCUSSION

1. Results

Figure 4 displays both factor loading of the measurement (outer) model and the path coefficient of the structural (inner) model. The measurement model reflects the relationship between each construct/latent variable (LV) and the items (yellow squares). The structural model reflects the relationships that originate from one LV and 'point' to another LV. All reported data is standardized, such that all loadings and coefficients represent ratios that may assume a value in the range from 0 to 1 (or from 0 to -1).

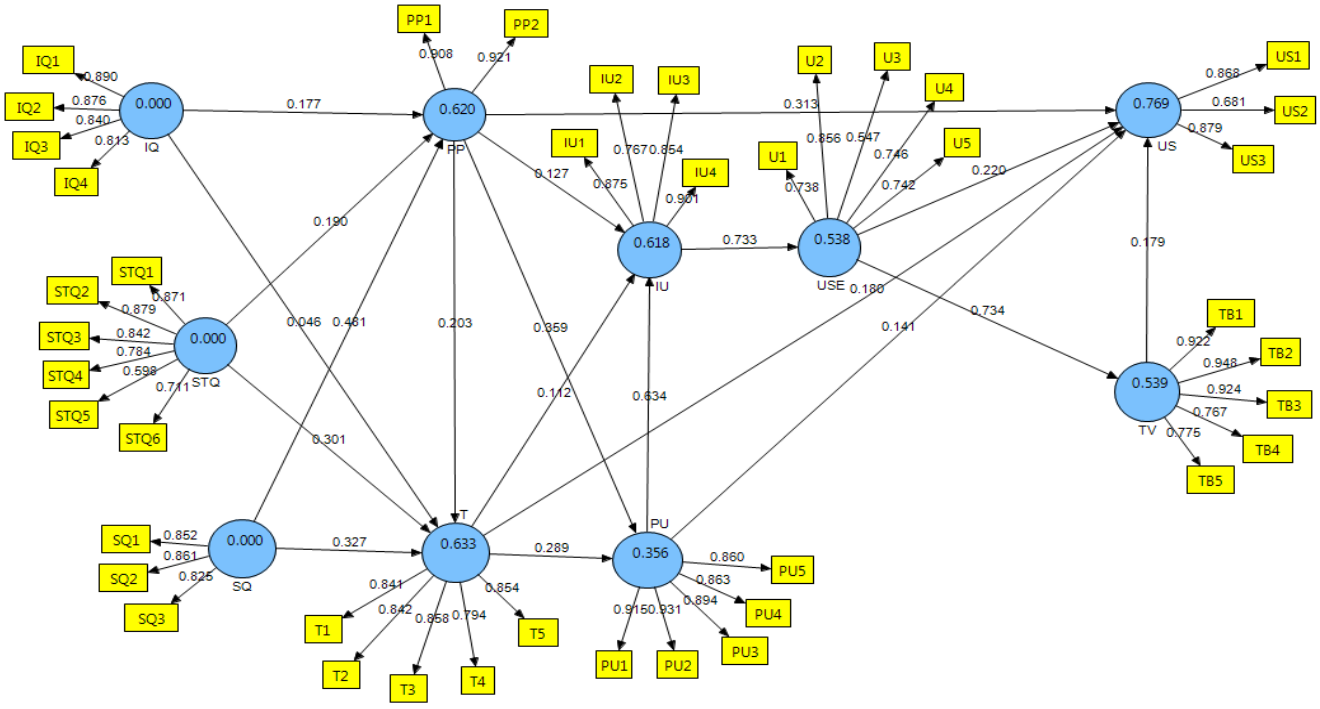

Figure 4. The Structural Model and Measurements

While doing the t-test, we found each of the inner model structural path coefficients are also significant (at a minimum of $p < 0.05$, one tailed) except for the two non-significant paths from PP to IU, and from IQ to T, as displayed in Figure 4. Also, the explained variances (R^2 values) for the predicted endogenous latent variables are displayed. It is evident that the amount of variance explained in the predicted latent variables ranges from a low of 36% (e.g. PU) to a high of 77% (e.g. US). These relative proportions of variance explained fall into the moderate (anything higher than 33%) to the high range (higher than 67%), according to W. Chin (1998).

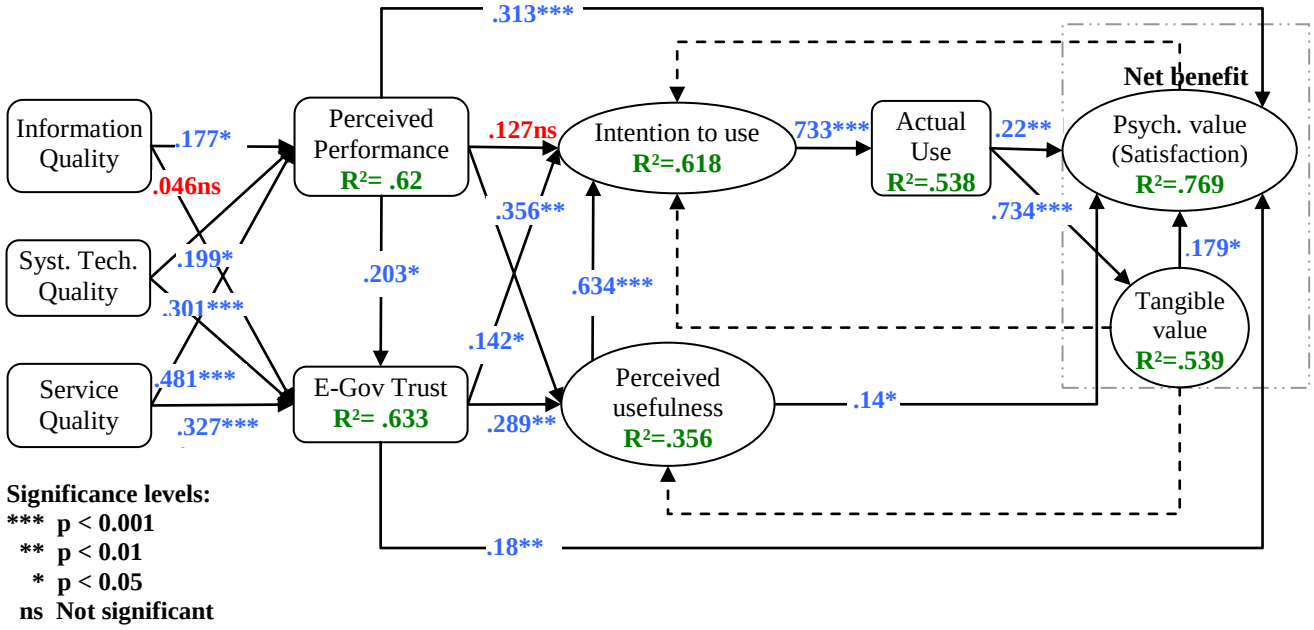

Figure 5. CEM showing R^2 and the path coefficients.

We also tested the convergent validity for all reflective measurement items using SmartPLS[1]. These factor loadings and cross loadings[2] reveal that all items loaded: (1) on their respective reflective latent construct (as shown in Figure 5) from a lower bound of 0.55 to an upper bound of 0.93; and (2) more highly on their own respective latent construct than they loaded on any other latent construct (with one minor exception). Furthermore, each item's factor loading on its respective construct is statistically significant at $p < 0.001$. The latent constructs' item loadings and cross loadings, and their levels of statistical significance, serve to affirm the convergent validity of these reflective indicators as representing distinct latent constructs in the research model.

Reliability results from testing the reflective measurement model are reported in Table 2. The data indicates that the reflective measures are robust in terms of their internal consistency reliability as indexed by the composite reliability. The composite reliabilities of the different measures in the model (Dillon Goldstein's Rho) range from 0.85 to 0.94, and all exceed the minimum recommended threshold value of 0.70 (Nunnally, 1978). Composite reliability assesses whether all of the indicators measure the same latent construct. In addition, consistent with the guidelines of Fornell and Larcker (1981), the average variance extracted (AVE) for each reflective measure well exceeds 0.50. AVE measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error.

[1] Ringle, C. M./Wende, S./Will A. (2005): SmartPLS 2.0 (beta), www.smartpls.de.

[2] Table of data was excluded due to the space constraints. It is available upon request.

Latent Constructs	Composite Reliability (Dillon Goldstein's Rho)	Average Variance Extracted/Explained
IQ	0.92	0.73
IU	0.91	0.72
PP	0.91	0.84
PU	0.95	0.80
SQ	0.88	0.72
STQ	0.91	0.62
T	0.92	0.70
TV	0.94	0.76
US	0.85	0.66
USE	0.85	0.54

Table 2: Assessment of the Reflective Measurement Model

Table 3 presents the results of testing the discriminant validity of the reflective measurement scales. The bolded elements in the matrix diagonals, representing the square roots of the AVEs, are greater in virtually all cases than the off-diagonal elements in their corresponding row and column, providing evidence of the discriminant validity of the scales (Fornell and Larcker, 1981).

	IQ	IU	PP	PU	SQ	STQ	T	TV	US	USE
IQ	**0.855**	0	0	0	0	0	0	0	0	0
IU	0.450	**0.851**	0	0	0	0	0	0	0	0
PP	0.692	0.560	**0.915**	0	0	0	0	0	0	0
PU	0.483	0.766	0.559	**0.893**	0	0	0	0	0	0
SQ	0.758	0.473	0.760	0.469	**0.846**	0	0	0	0	0
STQ	0.784	0.489	0.694	0.553	0.759	**0.787**	0	0	0	0
T	0.670	0.541	0.692	0.538	0.744	0.726	**0.838**	0	0	0
TV	0.526	0.686	0.597	0.728	0.455	0.611	0.567	**0.871**	0	0
US	0.661	0.662	0.767	0.703	0.662	0.719	0.716	0.731	**0.814**	0
USE	0.574	0.733	0.656	0.730	0.598	0.670	0.651	0.734	0.776	**0.733**

Table 3: Discriminant Validity (Inter-correlations) of the Reflective Constructs/Latent Variable

2. Analysis

We proposed and tested a model (CEM) consisting of ten latent variables. By using the PLS technique, we validated CEM and the results supported 17 of our 19 hypotheses. Hypotheses H2 and H6 were not supported.

The literature and empirical studies suggest that system performance as perceived by the users significantly impacts their intention to use the system. However, as we expected, the results indicate otherwise, given the distinctions between public services from commercial ones. The non-significance of H6 can be attributed to the fact the citizens, in many cases, use EGS because there is no other better option and simply to avoid traveling and interacting directly with the government agency. Especially in developing countries where corruption or other shortcomings exist in face-to-face encounters, citizens are more inclined to use an EGS.

We attribute the non-significance of H2 to two possibilities: (1) that information quality does not relate to Trust; or (2) because the measurement of Trust did not contain any questions that are directly relevant to information quality.

LIMITATION AND FUTURE STUDIES

We believe that future studies are required. Further validation is worthwhile to investigate the direct effect of information quality on Trust and to pin-point the actual reason for H2 non-significance. In addition, given that the data collected reflect a

"snap shot", these hypotheses were not tested. Thus, longitudinal studies need to be carried out in the future. Moreover, due to the cultural difference, H6 may still be valid in developed countries. Thus, future studies are needed to validate CEM in both developing and developed countries.

CONCLUSION

The significance of the e-government projects, and the huge implications involved with implementing such initiatives, require critical analysis and evaluation of the level of their success. This can be accomplished by assessing each objective as a success factor. Since one core objective of implementing an EGS is to provide an accessible tool which better serves the public, it is imperative to assess citizens' perception of what they receive and the consequences of using this particular system on them. Using a reflective and reliable evaluation instrument is vital for governments in order to assess their ongoing progress, performance, and service quality while using the online system. A model has been presented and empirically validated in this paper to serve this purpose.

The results of this study have important implications both for practice and for human-computer studies. This research highlights the importance of simultaneously considering dimensions introduced by IS researchers in general and e-government researchers in particular to evaluate the success of an EGS from an external user perspective. It aids in understanding how citizens perceives the performance of a particular EGS and how it eventually impacts their obtained psychological and tangible benefits. This research is also important because it particularly emphasizes the need to incorporate citizens' tangible benefit in the assessment which was significantly lacking in the e-government literature.

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