Journal of Theoretical and Applied Information Technology
15th February 2020. Vol.98. No 03

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

E-GOVERNMENT TRUST MODEL (EGOV-TRUST) THAT ENHANCES THE USAGE OF E-GOVERNMENT SERVICES AMONG USERS IN IRAQ

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ABSTRACT

The widespread usage of ICTs has led to the inevitable evolution of services provided by the government to the emergence of e-government. The success of the e-government requires the usage of these electronic services by citizens. Several challenges have been identified that limit the usage of e-government. In this context, many researchers argued that trust is one of the most important determiners of the usage of e-government among users. An investigation of trust in relation to the use of e-government among users is still lacking, especially in Iraq. The purpose of this research proposal is to propose a research work that provides a nuanced understanding of the constructs of trust that influence the usage of e-government among users. For this purpose, the factors that contribute to trust analyzed using an integration of two theories UTAUT2 and TOE, the integration of UTAUT2 and TOE is known as I-TOE. This study adopted a survey method, in which questionnaires were analyzed from 694 respondents derived from a stratified random sampling method. Four main hypotheses have been tested and CB-SEM and PLS-SEM have been used for testing and validating the measurement and structure of the EGOV-TRUST model. The study found that there has been a positive relationship between the individual, technological, organizational, environmental dimensions of trust and these factors have positive effects on the use of e-government. It can be concluded that the EGOV-TRUST model has the potential to enhance the usage of e-government among its users. This research contributes to the knowledge of adopting e-government, focusing on deconstructing the element of trust that enhances the usage of e-government. The model can be used as guidelines for governments, especially the developing countries for enhancing the usage of e-government among users.

Keywords: *Usage of e-government, Trust of e-government, Trust, UTAUT2, I-TOE.*

1. INTRODUCTION

In almost every sector, whether in the private or public, the rapid development of ICT has resulted in the broad usage of web-based technologies. In relation to this, e-government has been adopted by government worldwide for the purpose of disseminating information and conducting daily transactions with its stakeholders.

The common definition of e-government is the use of ICT as an instrument to provide government information and services to users and stakeholders [1]. The fundamental objective of e-government is to facilitate citizen communication through G2C initiatives to the government E-government can be classified into four categories which are: i) government to citizen or customer (G2C); ii) government to business (G2B); iii) government to government (G2G) and iv) government to employee (G2E). Government web sites offer services to citizens through easy communication of services between government and beneficiaries [2].

While e-government has become a global key communication platform, its usage among citizens, particularly in developing countries have been restrictive [3, 4]. Although multiple types of e-government services are increasingly available, there

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

are growing concerns on the limited usage of e-government services by a certain group of citizens only [3]. Issues and challenges related to the use of e-government among end users have been identified. Specifically, governments are still slow to implement and develop electronic processes [4, 6, 7, 8]. There has also been a lack of awareness among the community about e-government services and the lack of trust in the internet and the government among citizens [9].

The successful adoption of e-government is reflected by the widespread usage of e-government services by its citizens. A country such as Iraq has spent a huge budget and time for the provision of e-government services to its citizens. A study that evaluated the government portal claimed that the weak agreement by national e-government services as the reason for the failure to deal with usability [4]. According to [5], who examined the global index of the readiness of e-government, Iraq is experiencing challenges for the successful adoption of e-government and trust is considered as one of Iraq's major challenges.

Further, drawn from a systematic literature review [12] that identified trust as one of the main determinants to enhance the usage of e-government, this study aims to propose a trust model that can enhance the usage of e-government among users.

Unlike the previous studies that investigate trust as a taken for granted determiners for the usage of e-government, this study aims to deconstruct the element of trust based on four dimensions, namely the individual, technological, organizational and environment. It is anticipated that the deconstruction of trust according to the four dimensions provide a nuanced understanding of the trust that enhances the usage of e-government; hence, contribute to the successful adoption of e-government.

There are numerous theories and models used to understand the use of technology among users. However, there have been very few efforts to integrate more than one theory for the understanding on the use of technology. In particular, there have been very limited studies that combine UTAUT2 and TOE theories to understand the use of technology. This study, therefore, adopted a conceptual model combining two theories, namely I-TOE [1]. The theory (TOE) and the (I) are similar to the individual aspect in the unified theory of technology acceptance and use (UTAUT2) [6]. UTAUT2 integration with TOE, called I-TOE has been adopted [7] to investigate the relationships of the determinants of trust to the usage of e-government. The framework explains the factor of trust from various aspects of people and organizations (technology, organization, environment), and provides a more holistic understanding of the determinants of trust in the use of e-government by users [1].

2. CONCEPTUAL FRAMEWORK

Aiming to develop the EGOV TRUST model, this study investigated the determiners of trust that have significant relationship to the use of e-government. Figure 1 shows the conceptual framework of the study that focuses on testing 20 hypotheses for the development of the EGOV Trust Model.

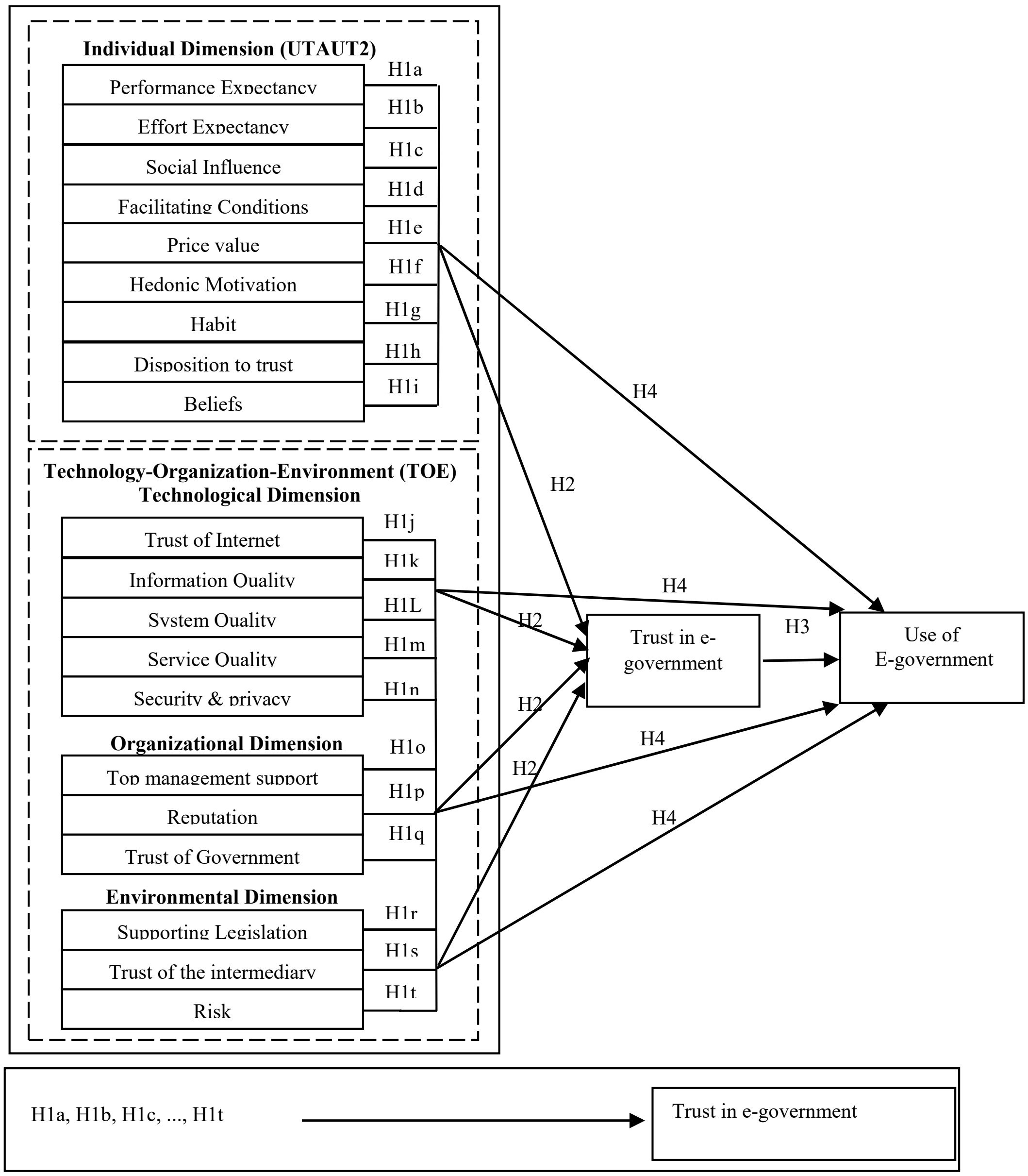

Figure 1: The Conceptual Framework of the Study

Underpinned by the I-TOE framework, this study deconstructed the construct of trust according to four dimensions: individual, technical, organizational and environmental. The determiners of trust is assumed to have significant relationship in enhancing the usage of "e-government". This integration produces an exhaustive I-TOE, which is a highly explainable predictive model [8]. 20 determinants were identified to deconstruct the concept of trust and those determinants were derived from a literature review system conducted in previous studies [9] and 20 hypotheses have been tested for the development of the model. As shown in the Figure, the determinants are performance expectation, effort expectation ns, social influence, facilitating conditions, price value, hedonic motivation, habit, disposition to trust, beliefs, trust of internet,

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

information quality, system quality, service quality, security & privacy, top management support, reputation, trust in government, legislation supports, trust in intermediary and risk. Although some studies have taken on one or more of the above factors, the analysis of the relationship between I-TOE and e-government trust addresses the gap in the literature [9]. This is the first time this relationship has been investigated.

3. RESEARCH METHOD

Contextualized the study in Iraq, this study adopted a survey questionnaire distributed to 694 respondents who were identified as the users of e-government services. A stratified sampling strategy was adopted for the data collection. Specifically, the three groups of respondents were selected which are Iraqi students and employees of the Ministry of Higher Education and Research.

In 2018, a total of about 13,400 Iraqi students were studying abroad. Malaysia, with 1,230 students, was the highest number of students in the other countries. 844 employees are in the Ministry of Higher Education and Research. Around 13,430 students studied abroad in Iraq and N (1230) were students studying in Malaysia, using the table of [10], the sample is 297 in size. The Ministry is composed of 844 employees, refer to N (850) on 844. The number of employees sample sizes (265) [10].

The questionnaire was designed with eleven-point possible responses on a scale range from totally acceptable (10) to disagreeable (0). The items of the questionnaire were adapted from several studies related to the usage of technology.

Since this research is a quantitative research, three programs, SPSS, SmartPLS, and AMOS were used to analyze the empirical data and ensure high accuracy of the results of the research. Data were cleaned in terms of errors during data collection before the data analysis was conducted. In addition to the incomplete data, abnormal and extreme data are examined. This process is called data monitoring, which eliminates unusable answers. As suggested by [17, 18,] data preparation was conducted before the final analysis. Reliability analysis of the 20 trust factors were also conducted.

This research used structural equation (SEM) modeling to test and confirm a given link through the application of a multivariate technique, using SPSS version 23.0, AMOS and SmartPLS, Confirmative Factor Analysis (CFA) [11]. All measurement scales were, however, tested for reliability and construct validity by the CFA. The confirmatory analysis was selected because of the number of factors and the relation between factors and measuring variables as previously described [12].

To assess whether the design model offers an acceptable fit to the empirical data, it would be necessary to build up the structural model to explore the proposed causeways (path model test). The hypotheses were tested through a multiple Regression Test, the relationship among several independent variables we have here as a dependent variable the driving force of the trust and trust in e-government and there is a different relation between trust and the use of e-government as a dependent variable. Multiple regression analyses provide useful information on the model in its entirety. It enables the researcher to test if the prediction of the model can improve by adding a variable over the variables already included. Finally, a multi-dimensional trust model was developed based on SEM analysis results [21].

Given that this model contains several variables and indicators, SEM analysis was adopted in the study including validity analysis, model testing, and hypothesis testing, considering the complexity of our proposed model. SEM is the most common and suitable techniques deemed useful in recent decades in social sciences for advanced statistical analyses. As stated by [13], it is a multivariate technique which combines the aspects of factor-analysis and regression, enabling researchers, in parallel, to examine the relationship between measured and latent variables (measurement theory evaluation) and between latent variables (structural theory assessment), to integrate in observable variables measured indirectly by indicator variables.

The relation between non-directly measured hidden structures was detected, the SEM variables were treated in two groups: the endogenous and exogenous distinction between latent and observed variables, and a variable that can simultaneously take on the role of both the dependent and an independent variable. These equations show all the relationships between the endogenous and exogenous variables. Possible errors were taken into account when measuring the observed variables. It is a useful way of analyzing highly complex multiple models and revealing direct and indirect relations between variables [14].

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4. RESULTS AND DISCUSSION

This section discusses the results of the study according to the following sub-sections.

4.1 Descriptive Analysis

The means and standard deviations of the 20 items related to this study is shown in Table 1. All the descriptive statistics were based on the number of participants received. As discussed in Table 1, the mean of 7.8794 ratings among other factors was the highest.

Table 1: Mean Score for Each Factors and Dimension (Descriptive Statistics)

Variables	Mean	Std. Deviation	%
Performance Expectancy	7.1892	2.74700	71.892
Effort expectancy	7.5298	2.41488	75.298
Social Influence	6.4745	2.74901	64.745
Facilitating Conditions	7.5202	2.46101	75.202
Price Value	6.9308	2.52530	69.308
Hedonic Motivation	6.6076	2.67463	66.076
Habit	5.7608	2.70631	57.608
Disposition to Trust	6.1811	2.62846	61.811
Beliefs	7.8794	2.22979	78.794
Individual Dimension (UTAUT2)	**6.8971**	**2.25990**	**68.971**
Trust of Internet	6.3295	2.45387	63.295
Information Quality	6.7181	2.42675	67.181
System Quality	6.7459	2.41467	67.459
Service Quality	5.9481	2.43601	59.481
Security and Privacy	6.7488	2.46999	67.488
Technological Dimension	**6.4981**	**2.31781**	**64.981**
Top Management Support	6.8698	2.42056	68.698
Reputation	6.4020	2.55494	64.02
Trust of Government	6.1715	2.55945	61.715
Organizational Dimension	**6.4811**	**2.41366**	**64.811**
Support Legislation	6.2027	2.39057	62.027
Trust of the intermediary	6.6350	2.62222	66.35
Risk	6.6907	2.57684	66.907
Environmental Dimension	**6.5094**	**2.40815**	**65.094**
Trust in e-Government	6.6019	2.35537	66.019
Use of e-Government	6.7219	2.44247	67.219

As shown in Table 1, 68.971% of those surveyed indicated that the "Individual Dimension" e-government is the highest and most important aspect of trust. The following rankings (by importance) resulted in the aggregation of the answers: 68.971% of the respondent score for the individual dimensional dimension, 65.094% of the respondents' score for the environmental dimension, 64.981% of the respondents ' score in the technical dimension, and 64.811 of the respondents for the organization. Indeed, e-government trust is equal to 66.019 and e-government usage is 67.219. It can be concluded that trust is an important factor that influence the use of e-government were important.

To measure the consistency of the data collected, alpha coefficient of Cronbach was used [15]. The outcome of Cronbach varied from (0.967) for Facilitating Conditions items to (0.988) for trust of the intermediary construct items. Each factor showed that the construction is internally consistent with the results of the reliability analysis. The reliability test shows an excellent inner consistency for all structures, indicating high reliability of the used structures and their internal composition.

4.2 The measurement of the structural model using PLS SEM and CB-SEM

We also tested the measurement and structural model using two approaches: PLS-SEM and CB-SEM. Figure 2 shows the visual representation of the EGOV trust model drawn from analysis of Smart PLS.

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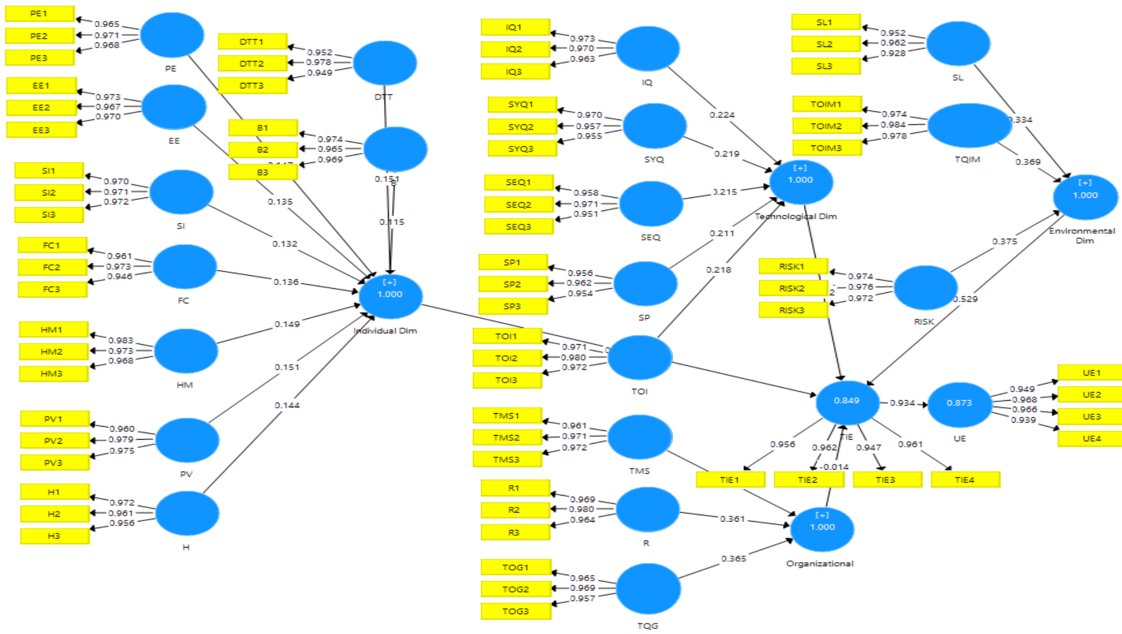

Figure 2: Measurement Model in SmartPLS

The CFA measuring model was used to assess the overall model suitability by testing the convergent and discriminatory validity of measures to provide valuable information. Fit indicators or fit-statistics were used to assess the compliance of models with data. It is used to explain the degree of variation and covariance in the model that fits perfectly should have the fit indices of the value 1. The model requires a value of at least 0.90 in which a value of at least 0.95 is necessary to conclude that the model is "good"[16]. The fit index of the standard (NFI) should also be above and below 0.90, the index fit (IFI), the index of Tucker – Lewis (TLI) should be above or equal to 0.92, and the comparative fit index (CFI) should be above or above 0.90. [17].

The Root Mean Square Approximation Error (RMSEA) is a fitness measure comparing with each other the mean difference between the population of each expected degree of freedom' [14]. Values from 0.05 to 0.08 typically show an acceptable fit, which provides further evidence that the model fits the data correctly [14, 18].

CMIN is the chi-square test probability ratio. Chi-squared value (X^2) is equal to 4607.052 with freedom of 2108 degrees and a likelihood of 0.000. However, Chi-square X^2 is over-sensitive to sample size and p-value testing of the absolute model fit. The study thus also used X^2 in degrees of freedom because the measurement is considered to be adequate. It is suggested that the X^2 be between 1 and 3, while the CMIN / DF= 2.186 be inside the range.

For each of these indices, the results of the measured model fit indicators show a good model: (GFI=0.903), (Tucker-Lewis Index= 0.984, Comparative Fit Index= 0.900, Standardized Fit Index= 0.905 and RMSEA= 0.05), see Table 2. The results show the model fit indicators for measurement. The unstandardized loads appear under the Regression weights along with standard errors, a critical ratio, and p-values. To assess statistical significance, critical ratio and p values can be used. A critical ratio above 1,96 or a p-value of less than 0,05 is important [18].

It was found that all latent variables have high R^2, with R^2 variations of 0.753 to 0.976, all above 0.20 for R^2, a good estimate, indicating that this model is valid. Figure 3 illustrates the data factor model. This shows the indicators in a model are capable of measuring the relationship among variables and therefore it is acceptable as an estimate of loading of each item, the values of the validity coefficients or the loading of items controlling acceptance or rejection.

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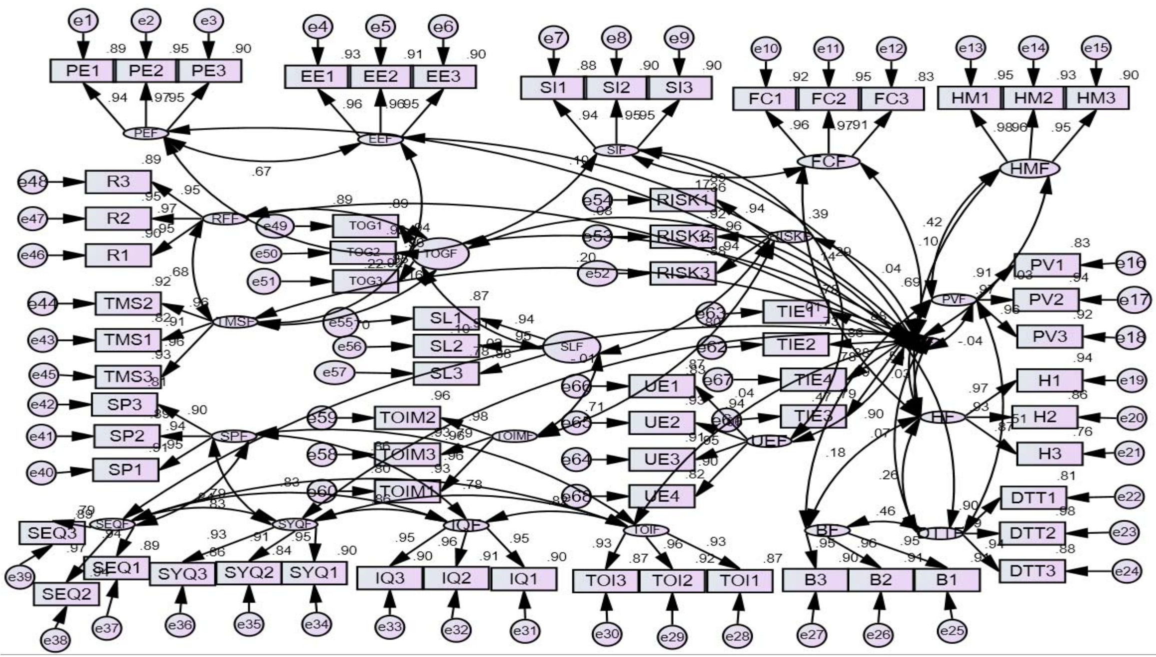

Figure 3: Confirmatory Factor Model for Data Collected in AMOS

Table 2: Baseline Comparisons, GFI, CFI.

Model	NFI Delta 1	IFI Delta 2	TLI rho2	CFI	GFI	RMSEA
Default model	.905	.963	.984	.900	.903	.050
Saturated model	1.000	1.000		1.000	1.000	
Independence model	.000	.000	.000	.000	.036	.354

The results of the confirmatory factor analysis were also examined in the structural equation modeling method (CB-SEM and PLS-SEM). There should be high correlations between issues for each structure to achieve a convergent validity. The level of association between the indicators (scale items) and a single latent variable is indicated by normalized factor loadings. The standard question factor loads should be 0.50 or higher for each conceptual variable [14].

Table 2 shows that all the factor load estimates are higher than 0.5 and show the results of AMOS and SmartPLS. The reliability of the construction for this study ranges from 0.948 to 0.978 as shown in Table 3 with AMOS and from 0.963 to 0.985 via SmartPLS. The structures of this study are therefore internally coherent and above the generally accepted 0.70 estimates [19, 20].

Average variance extracted (AVE) is the third measure used to explain the convergent validity. According to [28], "The variance level captured by construction is measured against that level by a measuring error, the values above 0.7 are considered very good, whereas 0.5 level is acceptable". The study's estimates ranged from 0.882 to 0.968 in AMOS, from 0.898 to 0.958 in SmartPLS, exceeding what is indicated in Table 3 as a minimum threshold. Therefore, all results have verified the convergent validity of the scales in the measurement model on basis of the results of the previous three ad-hoc tests (standardized factor loading, reliability, average variation extracted). Table 3 shows the approximate values derived from the two programs (Smart PLS and AMOS).

Table 3: Convergent Validity using AMOS and SmartPLS

Construct	**Std. Loading**		**Composite Reliability**		**Average Variance Extracted**	
	AMOS	**SmartPLS**	**AMOS**	**SmartPLS**	**AMOS**	**SmartPLS**
Performance Expectancy			0.968	0.978	0.954	0.938
PE1	0.941	0.785				

Construct	Std. Loading		Composite Reliability		Average Variance Extracted	
	AMOS	SmartPLS	AMOS	SmartPLS	AMOS	SmartPLS
PE2	0.974	0.824				
PE3	0.947	0.793				
Effort Expectancy			0.970	0.98	0.957	0.941
EE1	0.964	0.973				
EE2	0.956	0.967				
EE3	0.951	0.97				
Social Influence			0.963	0.98	0.947	0.942
SI1	0.94	0.97				
SI2	0.951	0.971				
SI3	0.951	0.972				
Facilitating Conditions			0.964	0.972	0.947	0.921
FC1	0.957	0.961				
FC2	0.975	0.973				
FC3	0.91	0.946				
Price value			0.962	0.98	0.945	0.943
PV1	0.909	0.823				
PV2	0.968	0.824				
PV3	0.959	0.824				
Hedonic Motivation			0.974	0.983	0.963	0.95
HM1	0.976	0.983				
HM2	0.964	0.973				
HM3	0.948	0.968				
Habit			0.945	0.975	0.923	0.927
H1	0.967	0.972				
H2	0.926	0.961				
H3	0.875	0.956				
Disposition to trust			0.959	0.972	0.941	0.921
DTT1	0.898	0.952				
DTT2	0.988	0.978				
DTT3	0.936	0.949				
Beliefs			0.967	0.979	0.953	0.94
B1	0.954	0.974				
B2	0.957	0.965				
B3	0.948	0.969				
Trust of Internet			0.959	0.982	0.942	0.949
TOI1	0.933	0.971				
TOI2	0.957	0.98				
TOI3	0.935	0.972				
Information Quality			0.965	0.978	0.950	0.938

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Construct	Std. Loading		Composite Reliability		Average Variance Extracted	
	AMOS	SmartPLS	AMOS	SmartPLS	AMOS	SmartPLS
IQ1	0.949	0.973				
IQ2	0.956	0.97				
IQ3	0.946	0.963				
System Quality			0.951	0.973	0.93	0.923
SYQ1	0.95	0.97				
SYQ2	0.914	0.957				
SYQ3	0.926	0.955				
Service Quality			0.954	0.973	0.934	0.922
SEQ1	0.945	0.958				
SEQ2	0.968	0.971				
SEQ3	0.888	0.951				
Security & privacy			0.932	0.971	0.932	0.916
SP1	0.953	0.956				
SP2	0.943	0.962				
SP3	0.901	0.954				
Top management support			0.960	0.978	0.942	0.937
TMS1	0.906	0.842				
TMS2	0.957	0.856				
TMS3	0.964	0.881				
Reputation			0.969	0.98	0.955	0.943
R1	0.946	0.905				
R2	0.974	0.931				
R3	0.945	0.91				
Trust of Government			0.960	0.975	0.942	0.929
TOG1	0.939	0.922				
TOG2	0.965	0.969				
TOG3	0.923	0.932				
Supporting Legislation			0.948	0.963	0.926	0.898
SL1	0.936	0.952				
SL2	0.952	0.962				
SL3	0.889	0.928				
Trust of the intermediary			0.978	0.985	0.968	0.958
TOIM1	0.962	0.974				
TOIM2	0.98	0.984				
TOIM3	0.963	0.978				
Risk			0.963	0.982	0.947	0.949
RISK1	0.943	0.974				
RISK2	0.961	0.976				
RISK3	0.938	0.972				
Trust in e-government			0.951	0.977	0.882	0.915
TIE1	0.888	0.956				
TIE2	0.867	0.962				

Journal of Theoretical and Applied Information Technology
15th February 2020. Vol.98. No 03

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Construct	Std. Loading		Composite Reliability		Average Variance Extracted	
	AMOS	SmartPLS	AMOS	SmartPLS	AMOS	SmartPLS
TIE3	0.895	0.947				
TIE4	0.878	0.961				
Use of e-government						
UE1	0.938	0.949				
UE2	0.963	0.968	0.974	0.977	0.939	0.913
UE3	0.947	0.966				
UE4	0.907	0.939				

Based on the results of the previous three tests (standardized factor loadings, construct reliability, and average variance extracted), all the results verified the convergent validity of the scales in the measurement model. Table 3 shows that the values extracted from both programs (SmartPLS and AMOS) are approximately similar.

The extent to which measures of a latent variable differ from others is examined by discriminating validity. To evaluate the discriminatory validity of these two structures, by comparing the squared correlation estimates (latent variables) of two constructs with their mean extracted variance (AVE) values. The variances extracted should be higher than the square estimates of correlation. As shown in Table 4, there were no problems with discriminatory validity.

Table 4: Convergent Validity Using AMOS

			Correlation	Correlation squared	AVE1 AVE2 AVES SHOULD BE >R^2		Discriminant Validity
PEF	<-->	EEF	0.669	0.447561	0.954	0.957	Established
SIF	<-->	FCF	0.364	0.132496	0.947333	0.947333	Established
HMF	<-->	PVF	0.421	0.177241	0.962667	0.945333	Established
PVF	<-->	HF	0.538	0.289444	0.945333	0.922667	Established
HF	<-->	DTTF	0.258	0.066564	0.922667	0.940667	Established
DTTF	<-->	BF	0.467	0.218089	0.940667	0.953	Established
HF	<-->	BF	0.191	0.036481	0.922667	0.953	Established
PVF	<-->	BF	0.469	0.219961	0.945333	0.953	Established
HMF	<-->	HF	0.692	0.478864	0.962667	0.922667	Established
FCF	<-->	HF	0.006	0.000036	0.947333	0.922667	Established
TOIF	<-->	IQF	0.818	0.669124	0.941667	0.950333	Established
IQF	<-->	SYQF	0.861	0.741321	0.950333	0.93	Established
SYQF	<-->	SEQF	0.844	0.712336	0.93	0.933667	Established
TOIF	<-->	SEQF	0.8	0.64	0.941667	0.933667	Established
IQF	<-->	SEQF	0.834	0.695556	0.950333	0.933667	Established
SEQF	<-->	SPF	0.832	0.692224	0.933667	0.932333	Established
SYQF	<-->	SPF	0.788	0.620944	0.93	0.932333	Established
IQF	<-->	SPF	0.856	0.732736	0.950333	0.932333	Established
TOIF	<-->	SPF	0.792	0.627264	0.941667	0.932333	Established
TOIF	<-->	SYQF	0.782	0.611524	0.941667	0.93	Established

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

			Correlation	Correlation squared	AVE1 AVE2 AVES SHOULD BE >R^2		Discriminant Validity
TMSF	<-->	RFF	0.679	0.461041	0.942333	0.955	Established
RFF	<-->	TOGF	0.892	0.795664	0.955	0.942333	Established
TMSF	<-->	TOGF	0.695	0.483025	0.942333	0.942333	Established
TOIMF	<-->	SLF	0.715	0.511225	0.968333	0.925667	Established
RISKF	<-->	SLF	0.797	0.635209	0.947333	0.925667	Established
RISKF	<-->	TOIMF	0.827	0.683929	0.947333	0.968333	Established
TIEF	<-->	UEF	0.912	0.831744	0.882	0.93875	Established
PEF	<-->	TIEF	0.075	0.005625	0.954	0.882	Established
EEF	<-->	TIEF	0.142	0.020164	0.957	0.882	Established
SIF	<-->	TIEF	0.399	0.159201	0.947333	0.882	Established
FCF	<-->	TIEF	0.095	0.009025	0.947333	0.882	Established
HMF	<-->	TIEF	0.024	0.000576	0.962667	0.882	Established
PVF	<-->	TIEF	-0.045	0.002025	0.945333	0.882	Established
HF	<-->	TIEF	0	0	0.922667	0.882	Established
DTTF	<-->	TIEF	0.055	0.003025	0.940667	0.882	Established
TOIF	<-->	TIEF	0.035	0.001225	0.941667	0.882	Established
SYQF	<-->	TIEF	-0.007	0.000049	0.93	0.882	Established
SEQF	<-->	TIEF	-0.015	0.000225	0.933667	0.882	Established
TMSF	<-->	TIEF	0.2	0.04	0.942333	0.882	Established
TIEF	<-->	TOGF	0.158	0.024964	0.882	0.942333	Established
RFF	<-->	TIEF	0.102	0.010404	0.955	0.882	Established
RISKF	<-->	TIEF	0.029	0.000841	0.947333	0.882	Established
SLF	<-->	TOGF	0.09	0.0081	0.925667	0.942333	Established
PVF	<-->	DTTF	0.512	0.262144	0.945333	0.940667	Established
SIF	<-->	UEF	0.283	0.080089	0.947333	0.93875	Established
DTTF	<-->	TOGF	0.138	0.019044	0.940667	0.942333	Established
EEF	<-->	TMSF	0.157	0.024649	0.957	0.942333	Established
PEF	<-->	SIF	0.218	0.047524	0.954	0.947333	Established

While the discrimination in Smart PLS was assessed, two measures were used to measure the validity: 1) Fornell-Larcker and 2) cross-load. When (1) square root of the AVE exceeds the correlation between measurement and all other measures, and (2) the loading of the indicators is more pronounced than that of the other structures. The AVE values for each construct have been determined by using the SmartPLS algorithm function, and all correlations between the measures are less than AVE's square roots. The results, therefore, confirmed that the criterion of Fornell and Larker was met. The second discriminatory validity evaluation, calculated using the SmartPLS algorithm, is cross-loads. Cross-loading between constructions and indicators showed that the specific latent variable of every measuring element was higher than other variables. The result of cross-loading has therefore confirmed the discriminant validity.

The structural model shows how the latent variables are linked to one another, visually showing relationships between constructs in a diagram. The validity of the structural model in SmartPLS is evaluated using R^2 for its measures; the ratio of latent variables to the total (explained variance), f2 (effect size) values below 0.02, indicates the non-effect value; Q^2 for endogenous reflexive constructs to predictive relevance (predictive relevance) and path coefficients, indicates the predictive relevance.

A coefficient of determination R^2 value is the most commonly used measure for evaluating the structural model, ranging from 0 to 1. The value of R^2 shows the exogenous variability, explained by the endogenous variables. The R^2 value is based on the complexity of the model and discipline of research. R^2 values of 0.25, 0.50 and 0.75 can be described respectively as small, medium and large effects for endogenous latent variables as a general rule [13, 20]. A larger R^2 value, therefore, increases the structural model's predictive capacity. The R^2 values are obtained using the SmartPLS algorithm function. With this result, 85% of the variance in trust in e-government can explain the individual, technological, organizational and environmental dimensions. In the meantime, e-government trust can explain the difference in the use of e-government by 87 percent.

All factors with a value of f^2 are 0.35; this means that the endogenous variable affects all factors. Q^2 indicator of the predictive strength or predictive relevance of the model, Q^2 trust in e-government is 0.724 and the usage of e-government is 0.748, the value Q^2 was obtained with the smartPLS blindfold, values greater than zero for the specific endogenous latent variable indicate the path model's predictive relevance for a certain dependent structure [21].

Analyzing the structural model in this thesis has enabled the hypothesis and strength of the relationship between exogenous and endogenous variables to be confirmed or rejected. The relationship between independent and dependent variables has been investigated using the SmartPLS algorithm output. In SmartPLS, however, t statistics are produced for all paths using the bootstrapping function SmartPLS to test the significant level. The important degree of each relationship, also from e-government trust to e-government use, is determined based on the T-statistic results.

Table 5: Path Coefficients Using SmartPLS

Relation	Std. Beta	Std. Error	T-Value	P-Value
B -> individual Dim	0.115	0.11	10.336	0.000
DDT-> individual Dim	0.151	0.007	20.570	0.000
EE-> individual Dim	0.135	0.008	16.529	0.000
FC-> individual Dim	0.136	0.008	17.849	0.000
H-> individual Dim	0.144	0.008	17.694	0.000
HM-> individual Dim	0.149	0.008	18.135	0.000
individual Dim -> TIE	0.321	0.151	2.119	0.000
PE-> individual Dim	0.147	0.008	18.978	0.000
PV-> individual Dim	0.151	0.008	18.836	0.000
IQ-> Technological Dim	0.224	0.005	42.412	0.000
Environment Dim-> TIE	0.529	0.103	5.108	0.000
R ->Organizational Dim	0.361	0.007	49.665	0.000
RISK-> Environment Dim	0.375	0.009	43.218	0.000
SEQ-> Technological Dim	0.215	0.005	39.278	0.000
SI-> individual Dim	0.132	0.009	15.111	0.000
SL-> Environment Dim	0.334	0.006	60.149	0.000
SP-> Technological Dim	0.211	0.006	37.558	0.000
SYQ-> Technological Dim	0.218	0.005	43.845	0.000
TIE-> UOE	0.934	0.014	66.727	0.000
TMS -> Organizational Dim	0.350	0.007	53.409	0.000
TOI-> Technological Dim	0.218	0.005	43.845	0.000
TOG-> Organizational Dim	0.365	0.007	49.438	0.000
TOIM-> Environment Dim	0.369	0.008	45.929	0.000

The results supported the 20 hypotheses on the determinants of trust. The risk variable has the highest relationship according to the correlation test with trust in e-government 0.916. However, there are other equally important factors and correlation coefficients are significant; the trust of government in terms of its strong relationship 0.892, followed by system quality 0.891, legislation supporting 0.882, quality of information 0.878 and safety and priesthood, is followed up with a strong relationship between government and e-government disposition to trust 0.854, performance expectancy 0.843, price

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value 0.820, hedonic motivation 0.811, habit 0.811, facilitating conditions 0.795, social influence 0.771, effort expectancy 0.754 and the lowest one 0.720 for beliefs. This suggests that further prediction can be achieved to increase trust in e-government through risk investigation and all these 20 factors. Therefore, the providers of e-government should take care of these factors, especially the risk factor and seek to avoid risks such as time, security, performance, money, and social risks.

4.3 The Relationship of the Individual, Technical, Organizational and Environmental factor of trust and the use of e-government

In this study, the four dimensions of trust determinants were also analyzed, namely the individual, technological, organizational and environmental dimensions which form the building of trust. This analysis aims to identify the relationship between these dimensions in influencing trust, to detect any of them having an important impact on trust to find EGOV-TRUST model of trustworthiness. In this case, four hypotheses have been tested. There are nine variables (performance expectancy, effort expectancy, social influence, facilitating condition, price vale, hedonic motivation, habit, disposition to trust, beliefs), as shown in Figure 4.

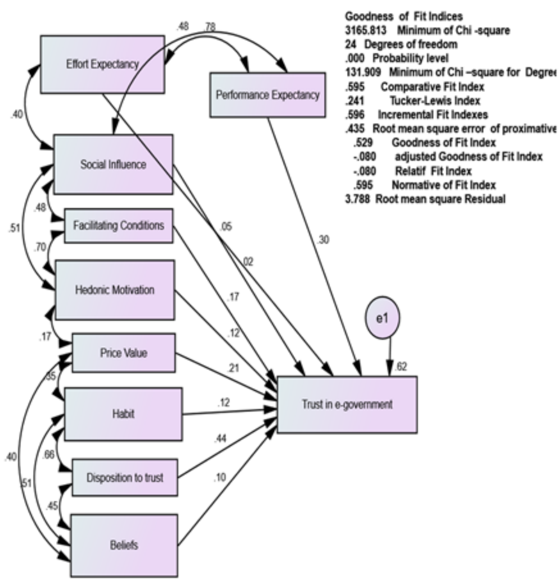

Figure 4: SEM for Individual Factors and Trust in E-government

The model has a moderately high correlation between the two factors (0,167-0,777). It was concluded that the model needs to be improved statistically, considering the value of chi-square are 3165,8 (Df= 24, p= 0,000), TLI=0.241, GFI=0.529, CFI= 0.595, RMSEA= 0.435). This leads to a pattern that is poorly fit.

All hypotheses have been accepted, as the relationships between structural models are positive (β) and important (consider p-value= 0.05), except effort expectancy and social influence. In that model, all independent variables have a significant and positive coefficient, which means higher levels of performance expectancy, facilitator conditions, price value, hedonic motivation, habits, deposition to trust, and beliefs. The hyper activities in each link are hypothesized by the path (β) and p-value coefficients.

The results showed that the efforts expectancy and social influence have no impact on e-government trust. R^2 has greater predictive accuracy in the range between 0 and 1, R^2 value larger than 0.67 shows high predictive precision, with a range of 0.620 indicating a moderate effect. For this pair of approximate index fits, the range of values is usually 0–1.0, whereas 1.0 is the most appropriate one. Moreover, the results showed that individual dimension has a positive effect on trust in e-government. The multiple correlation is 0.916; the value of R^2 is 0.840 in the best model (stable model) for all factors in individual dimension except effort expectancy and social influence. This is interpreted as a percentage of 84.0 % from the dependent variable of trust in e-government.

Table 6: Coefficients and Distributed T (Coefficients[a])

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Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.242	.140		1.729	.084
	Performance Expectancy	.166	.029	.194	5.800	.000
	Effort expectancy	.035	.027	.036	1.279	.201
	Social Influence	.017	.025	.019	.667	.505
	Facilitating Conditions	.106	.028	.111	3.775	.000
	Price Value	.131	.029	.141	4.583	.000
	Hedonic Motivation	.071	.029	.081	2.495	.013
	Habit	.076	.028	.087	2.679	.008
	Disposition to Trust	.254	.027	.283	9.247	.000
	Beliefs	.077	.026	.073	2.932	.003

a. Dependent Variable: trust in e-government

Figure 5 shows the relationship of the use of e-government and the five variables including internet trust, information quality, system quality, quality of service and security & privacy.

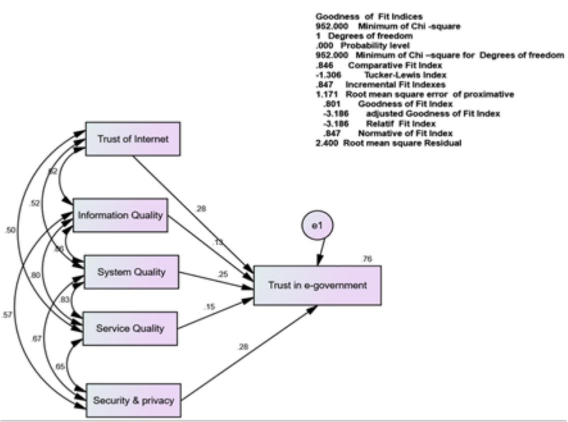

Figure 5: SEM for Technological Factors and Trust in E-government

The result shows that a model has to be improved: the chi –square is 952 (Df=1, p=0.00), TLI=0.847, GFI=0.801, CFI=0.846, RMSEA= 1.17). However, all assumptions were accepted because the positive (β) and meaningful (considering the p-value=0.05) relationships of all structural models are as shown in Table 7. Besides, the results demonstrate the positive effect of a technological dimensional factor on e-government trust. The value of R^2 is 0.924 in the best model (stable model). R^2 is a value of 0.853. This is interpreted 85.3% of the dependent e-government trust variable.

Table 7: Coefficients and Distributed T (Coefficients[a])

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.480	.106		4.548	.000
	Trust of Internet	.214	.033	.223	6.440	.000
	Information Quality	.124	.041	.128	3.035	.002
	System Quality	.246	.043	.253	5.744	.000
	Service Quality	.141	.035	.146	4.021	.000
	Security and Privacy	.212	.034	.223	6.158	.000

a. Dependent Variable: trust in e-government

Moreover, the results showed that a technological dimension factor has a positive effect on trust in e-government. The multiple correlation is 0.924; the value of R^2 is 0.853 in the best model (stable model). This is interpreted as a percentage of 85.3 % from the dependent variable of trust in e-government.

Figure 6 shows the relationship of the use of e-government and three variables of the organization factors: are the support for top management, reputation and trust of government,

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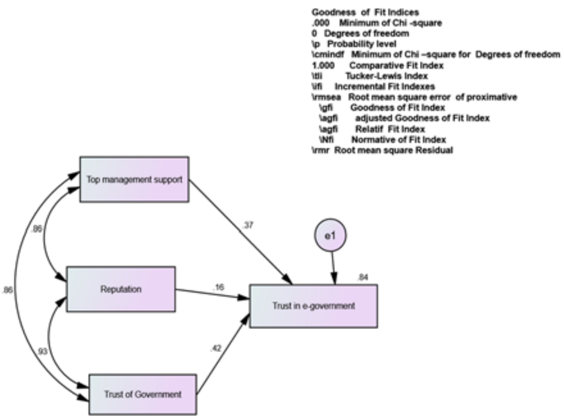

Figure 6: SEM for Organisational Factors and Trust in E-government

The result of the test is a model that fits well: 0 chi-square, TLI=1, GFI=1, CFI=1, RMSEA= (0). Moreover, all hypotheses was accepted because of the positive (β) and significant (considering a p-value=0.05) of all the structural model relations. In this model, all the independent variables have an important and positive coefficient of support, which means that the high level of top management support, reputation and trust of government is shown in Table 8.

Besides, the results have shown that organizational dimensions have a positive impact on e-government trust. In the best model (stable model), the multiplayer correlation is 0.917, R^2 is 0.840. This is considered to be an 84.0 percent share of the dependent e-government trust variable.

Table 8: Coefficients and Distributed T (Coefficients[a])

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.778	.109		7.164	.000
	Top Management Support	.364	.031	.374	11.876	.000
	Reputation	.143	.040	.155	3.544	.000
	Trust of Government	.390	.042	.424	9.395	.000

a. Dependent Variable: trust in e-government

Figure 7 shows the relationship of the use of e-government and three variables of the environmental factor: legislation support, trust of intermediary, and risk.

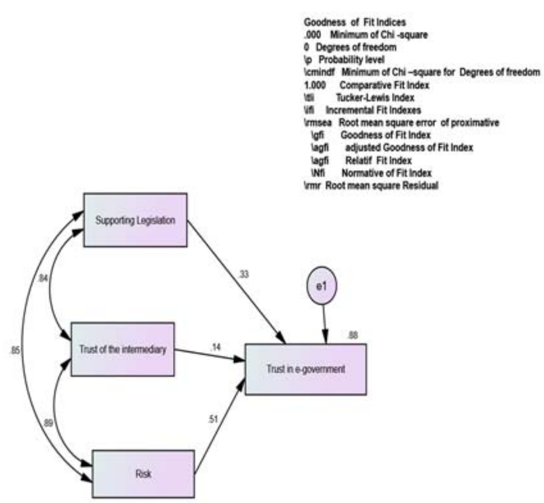

Figure 7: SEM for Environmental Factors and Trust in E-government

The result is a good fit model: TLI=1, GFI=1, CFI=1, RMSEA=0.00, as per the results. All of the hypotheses have been accepted because of their positive (β) and significant (p-value= 0.05) relationship to all the structural model. Within the model, each link is a hypothesized path coefficient (β) and p-value relationship, with all independent variables having a significant and positive coefficient meaning higher standards of legislation, trust of intermediary, and risk, see Table 9. Moreover, the results showed that environmental dimension has a positive effect on trust in e-government. The multiple correlation is 0.940; the value of R^2 is 0.883 in the best model (stable model). This is interpreted as a percentage of 88.3 % from the dependent variable of trust in e-government.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Table 9: Coefficients and Distributed T (Coefficients[a])

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.616	.089		6.948	.000
	Support Legislation	.326	.026	.331	12.587	.000
	Trust of the intermediary	.129	.027	.144	4.744	.000
	Risk	.465	.028	.508	16.354	.000

a. Dependent Variable: trust in e-government

Figure 8 shows the relationship between the EGOV-TRUST model and the use of e-government should be analyzed. The e-government trust represents the dimensions of e-government trust, as shown in results H2a, H2b, H2c, and H2d, which have a significant impact. The results of the four assumptions show that the four dimensions have a positive effect on e-government trust except for effort expectancy and social influence were deleted because they are non-significant according to the result of individual dimension with trust in e-government.

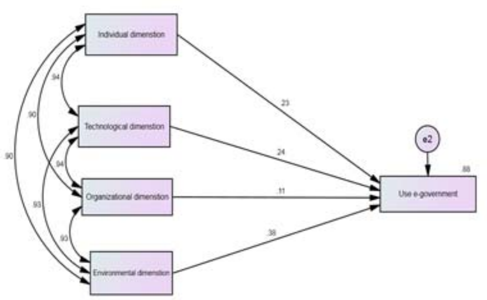

Figure 8: SEM for all Dimensions and Use E-government

The multiple square correlations of the variables are 0.876. Also, the model estimates the high interrelationship between the two factors (0.902- 0.939). The ability of SEM to make the correlation between factors in a key strength meaningful identification. Furthermore, a chi-square of 0.000 in freedom degrees 0, with a p –0.000. The model is the best fit statistically. The result is a best-fitting model (TLI=1, GFI=1, CFI=1, RMSEA=0.000). Besides, all hypotheses were accepted because of the positive (β) and important (considering the p-value= 0,05) of all structural model relations. Each link, in terms of the path coefficient (β) and the p-value, represents a hypothesized relation in the model, each independent variable had a significant and positive coefficient, meaning that all trust levels were higher.

5. CONCLUSIONS

This study aims to develop the EGOV TRUST model by investigating the determiners of trust that have significant relationships with the usage of e-government. For this purpose, the trust structures were classified into four categories: individual, technology, organization and environment considerations. Framed within the I-TOE theory, a conceptual model has been proposed and verified through empirical data collected from 694 users of e-government services in Iraq. The results show that every factor in e-government trust is significant except two factors of individual dimension for effort expectancy and social influence, hence they are eliminated from the model. All respondents agreed that individual dimension of e-government is important. The research has shown that the environmental dimension is the strongest relationship with the use e-government, followed by a technological dimension, followed by the individual dimension and organizational dimension. This indicates the importance of the four dimensions to enhance the usage of e-government.

The study further tested the validity and reliability of Confirmatory Factor Assessment (CFA), using AMOS and SmartPLS to prove the measurement model's reliability and validity. The results of SEM show that the use of electronic government has a positive impact on four aspects (EGOV-TRUST). The results demonstrate that the four-dimensional EGOV-TRUST model is a suitable model for increasing the use of e-government among users.

This study demonstrates that the four dimensions of trust are significant in enhancing the use of e-government. Considering this study was conducted in a hostile environment, generalizing the findings to other context needs to be done with caution. However, these findings show the need for countries of a similar environment to priorities the element of trust in an effort to ensure the widespread usage of e-government.

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