

A Structural Equation Modelling Analysis of Electronic-Government Services Acceptance Model

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Received 12th May 2017 and Revised 20th January 2018

Abstract:To understand and explain citizens' acceptance and usage of Electronic Government (e-Government) services, this research appliede-Government acceptance model. The model was empirically tested with 257 citizens in Pakistan. Structural equation modelling techniques were used to test proposed hypotheses. Results revealed that perceived usefulness and trust had strong impact on e-Government services acceptance, whereas usability shown significant impact on perceived usefulness. Overall the dependent variable in the model explained 70.8% of the variance, which establishes the external validity of the model.

Keywords: E-government acceptance model, TAM, Trust, Usability, Pakistan

INTRODUCTION

1.

The widespread applications of innovative technologies around the globe in almost all areas of use has generated interest of researchers and practitioners on how such technologies are perceived and accepted by the potential users. In this regard, several Governments across the world are compelled to take technological initiatives for delivering official services through the Internet and WWW, mainly for reducing time and cost spent on face to face interactions through administrative offices with their citizens (Chandio *et al.*, 2017; Jaeger *et al.*, 2009).

In this line, Federal, Provincial and Local governments have implemented or planning to implement various electronic government initiatives, such as online information gathering, online registration of first investigation report (FIR), inter-departmental collaborations, electronic communication and collaboration between law enforcing agencies, learning and training of state employees, online complaints registration of local government issues and health issues, electronic procurement, electronic human resource management, and so on. According Chandio et al. (2017) by the virtue of electronic government (e-Government) services, government can develop a strong connection between state and its citizens. This is so because e-Government services provide citizens a platform where they can use services offered by government instantly with a click of mouse. Lin et al. (2011) suggests that e-Government services offer various benefits to both government and citizens. For example, it helps government to reduce cost which otherwise would have spent on establishing several

physical administrative offices at various location across the country. Secondly, government can also improve its governance and efficiency of affairs through this e-Government services model.

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Despite the benefits offered by e-government model to the state and its citizens, it is observed (Chandio *et al.*, 2017) that this innovative model of governance has not been properly accepted and used by the large number of citizens in Pakistan. To address this issue Chandio *et al.* (2017) proposed a model of e-Government acceptance (**Fig. 1**). Their (Ibid) work, however, did not test the model in real world settings. To extend their work, this study empirically investigates and validates the e-Government acceptance model (ibid) by collecting data from the citizens in Pakistan.

2. <u>E-GOVERNMENT ACCEPTANCE MODEL</u>

The e-Government acceptance model (EAM) proposed by (Chandio *et al.*, 2017) was based on well-known information systems theory called TAM (i.e. technology acceptance model) (Davis *et al.*, 1989). EAM added usability, trust from information system, and human computer interfacing literature into the theoretical frame of TAM. EAM posits that usability will have an effect on e-Government services usage directly as well as indirectly though perceived usefulness. Whereas, trust was also postulated to have an effect on e-government services acceptance directly and indirectly through perceived usefulness. The hypothesis related to perceived usefulness (PU) was drawn from the TAM model. EAM model and its hypothesized paths are depicted **in (Fig. 1).**



Fig. 2. E-Government Services Acceptance Model (EAM)

Following hypotheses were proposed in EAM:

H1. PU will have a significant effect on e-government services acceptance

H2a. Trust will have a significant effect on e-government services acceptance.

H2b. Trust will have a significant effect on PU of e-government services.

H3a.Usability will have a significant effect on

e-government acceptance.

H3b.Usability will have a significant effect on PU of e–government.

3. <u>RESULTS AND ANALYSIS</u>

Data was collected using cross-sectional questionnaire survey. Total 400 questionnaires were distributed in major cities across the country i.e. Pakistan. Out of 400, 260 questionnaire were returned. However, 3 questionnaires were not filled properly, thus, were excluded from further analysis. Total number of final usable responses was 257.

Instrument Reliability

The instrument (i.e. questionnaire) was assed using internal consistency co-efficient measure known as Cronbach's alpha (Nunnally 1978). According to researchers (Hair *et al.*, 2006; Abbasi *et al.*, 2011; Naqvi *et al.*, 2016; Chandio *et al.*, 2017), the Cronbach's alpha value greater/or equal to 0.70 suggests that items are adequately reliable. The results, as presented in (**Table 1**), suggest that all the values of alpha are greater than 0.70, suggesting adequate reliability of the questionnaire.

Table 1. Constructs Kenability	Table	1.	Constructs	Reliability
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S. No	Construct	Instrument Reliability	
		(Cronbach's alpha)	
1	E-Government Acceptance	0.921	
2	Perceived usefulness	0.911	
3	Trust	0.884	
4	Usability	0.865	

Structural Equation Modelling

Structural equation modelling (SEM) analysis is a new and sophisticated mechanism of testing complex models (i.e. model which have multiple dependent and independent variables). Through SEM researchers can analyze multiple dependent and independent factors/ variables in parallel order. SEM involves two steps while performing analysis. In first step a measurement model is specified to examine the model validity and second step deals with hypotheses testing (Hair *et al.*, 2006). The results of measurement model fit indices are shown in (**Table 2**). All the estimates fulfill the required criteria; thus suggesting that model fits the data well.

Table 2. Measurement Model Fit Estimates

	AGFI	GFI	CFI	NFI	RMSEA
Criteria	≥0.90	>=0.90	≥0.90	≥0.90	< 0.05
Obtained	0.942	0.922	0.913	0.931	0.032

Note: AGFI - Adjusted goodness of fit index;

GFI = Goodness of fit index;

 $\label{eq:cfi} \textbf{CFI} = \textbf{Comparative fit index; NFI} = \textbf{Normated fit index;}$

RMSEA = Root mean square error of approximation

Another important concept to be examined in measurement model was the assessment of convergent validity (CV) and discriminant validity (DV). According to Hair et al (2006), if average variance extracted (AVE) of each latent factor is 0.5 or greater, the CV of that factor is established. The values in (Table 3) shows that AVE of each factor was greater than 0.5, thus confirming CV of all latent factors. In addition, this research also applied (Hair et al., 2006) criterion for DV assessment, which suggests that when the AVE of each construct is greater than the corresponding squared inter-construct correlation, then DV of the relevant construct is established. DV results are given in (Table 3). The results suggests that all AVE estimates are greater than corresponding SICC's, thus, confirming DV of all constructs/ variables.

Table 3. Validity Estimates

	PU	Trust	Usability	EGA
PU	0.732			
Trust	0.241	0.639		
Usability	0.243	0.219	0.850	
EGA	0.075	0.042	0.131	0.536

Note: Bold values are AVE; off diagonal values are squared interconstruct correlations.

The second step widely applied in SEM is the structural model, which is used to examine the level of significance of each hypothesis proposed in the model. The results are presented in table 4. Results revealed that out of 5 hypotheses, 4 wereproven as significant,

while 1 hypothesis was found insignificant. Among these, PU showed strong influence (.607) on EGA. The second strongest influence found was of usability on PU (.454). Although, the construct usability was hypothesized to have an influence on both EGA and PU. Usability did not found to have an influence directly on EGA, however, its strong influence on PU suggests an indirect effect on EGA. Finally, trust was had also shown a significant impact on both EGA and PU. Overall EAM model explained 70.8% of variance (i.e. R^2), which establishes the validity of the model.

Table 4. Structural Model and Hypotheses Testing

Hypotl	heses					
Depe ndent Varia ble		Independ ent Variable	Estim ate	S.E.	C.R.	Р
PU	<	Usability	0.454	0.106	4.266	***
PU	<	Trust	0.317	0.087	3.633	***
EGA	<	PU	0.607	0.073	8.366	***
EGA	<	Trust	0.305	0.078	3.919	***
EGA	<	Usability	0.066	0.095	0.7	0.484

*EGA= E-Government Acceptance, PU = Perceived Usefulness

4. <u>CONCLUSION</u>

This research applied e-Government acceptance model to understand citizens' acceptance of electronic government services. Structural equation modelling analysis revealed that PU, trust and usability are strong predictors of e-government services acceptance and usage. Although these findings are encouraging and sufficiently address the purpose of this research, it is however, recommended that care needs to be taken while generalizing these findings to other contextual settings (e.g. technologies/application) and user group.

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