Antecedents to Continuance Intention to Use eGovernment Services in India

Brinda Sampat, Kali Charan Sabat

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Ms. Brinda Sampat [1][0000-0001-7561-2536] and Mr. Kali Charan Sabat[2][0000-0002-7810-776X]

[1] NMIMS Global Access School for Continuing Education, NMIMS University, V. L. Mehta Road, Vile Parle West, Mumbai, Maharashtra, India
brinda.sampat@nmims.edu
[2] GD Goenka University, G D Goenka Education City, Sohna - Gurgaon Rd, Sohna, Haryana, India
kalicharan.sabat@gmail.com

Abstract. There are several studies that have examined the factors that determine users' attitude to adopt eGovernment services. However, there are not many studies that have explored what makes users continue to use these services. The purpose of this paper is to identify the most salient factors that influence users to continue to use eGovernment services in India. To achieve this, the paper examines the role of confirmation and satisfaction in influencing citizens' attitude leading to intention to continue using eGovernment services. In order to investigate the key factors that affect an individual's use of Information and Communication Technology (ICT) within the context of electronic government, a framework combining Expectation Confirmation Theory and Technology Acceptance Model is used to investigate satisfaction and continuity of use of eGovernment services.

Keywords: eGovernment, Satisfaction, Continuance Intention, Trust, Attitude, India, Expectation Confirmation Theory, Technology Acceptance Model.

1 Introduction

The term electronic Government or eGovernment refers to the use of Information and Communication Technology (ICT) to disseminate information and services to the citizens, businesses' and government agencies [16]. eGovernment is an initiative that provides a single point of access to all digital services [3]. eGovernment initiatives provide enormous benefits, but to realize these benefits citizens need to adopt these initiatives and continue to use them [11, 17]. Lack of adoption of these services hinders the benefits these services aim to provide [13]. There are certain challenges in implementing and rolling out eGovernment initiatives in India. There are a few studies that have empirically examined the factors influencing citizens' adoption of eGovernment systems [14]. Realizing a research gap in terms of an inclusive Information Technology (IT)/ Information Systems (IS) research model that can help to understand the factors that help in continued usage of eGovernment services, this study aims to fill the gap. The

present study attempts to identify the various factors which influence the intention of users to continue using eGovernment services.

The rest of the paper is organized as follows: The following section covers the literature review from recent studies in the context of eGovernment implementation. The next section covers the research methodology, analysis of the results and discussion. It also provides an agenda for future research.

2   Literature Review

The IS Continuance Model has been used to explore users continued use of an IS. A study by Bhattacherjee [14] revised the expectation confirmation theory (ECT) and included Perceived Usefulness from the Technology Acceptance Model (TAM) and users' satisfaction to predict continuance of eGovernment services. The TAM is the most extensively and dominant theoretical model for examining the individual's acceptance of information systems [12]. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have consistently shown of having a positive and significant effect on shaping users' attitude, thereby affecting continuance intention. These two constructs have been included in the research model. Perceived Usefulness (PU) of an eGovernment service is the extent to which a citizen believes that using the online service will enhance his/ her performance and efficiency. PU and PEOU have shown a positive effect on Attitude [13] leading to continuance Intention and Satisfaction [10]. This leads the researchers to hypothesize,

H1: Perceived Usefulness has a positive and significant effect on Satisfaction
H2: Perceived Usefulness has a positive and significant effect on Attitude
H3: Perceived Usefulness has a positive and significant effect on Continued Intention

Perceived Ease of Use (PEOU) of an eGovernment service is the extent to which a citizen believes that using an eGovernment service will be easy and will require less effort in performing any tasks. Many researchers have established a positive relation between PEOU and Perceived Usefulness [1] and PEOU and Attitude [6]. Thus, the researchers hypothesize,

H4: Perceived Ease of Use has a positive and significant effect on Perceived Usefulness
H5: Perceived Ease of Use has a positive and significant effect on Attitude

In ECT it has been proved via empirical studies that confirmation leads to satisfaction. His results suggested that it was feasible to apply ECT to the web context. Some related hypotheses were therefore formulated based on the baseline model of ECT.

H6: Confirmation has a positive and significant effect on Perceived Usefulness
H7: Confirmation has a positive and significant effect on Satisfaction

Satisfaction (SAT) is referred to as Users' feelings about prior eGovernment services use. Welch [19] found that government website use is positively associated with e-government satisfaction. Thus, the following hypotheses are proposed

H8: Satisfaction has a positive and significant effect on Attitude to use eGovernment services
H9: Satisfaction has a positive and significant effect on Continuance Intention to use eGovernment services

Attitude (ATT) is defined as "one's overall evaluation of self-performance regarding a particular behaviour". The favorable or unfavorable attitude affects the users' adoption intention regarding the outcome. BI was originally developed in the Theory of Planned Behavior (TPB) and Theory of Reasoned Action (TRA). When citizens hold a positive attitude towards using online service, they are more likely to express their willingness to use it. Hence, the researchers hypothesize,

H10: Attitude has a positive and significant effect on Continued Intention to use eGovernment services

Self-efficacy is the ability to carry out a task without anyone's help. It means a user is confident of carrying out his tasks of using the system on his own and that he need not depend on anyone. A citizen would thus choose to use eGovernment services, if he believes he has the knowledge and skills to carry out tasks using eGovernment services. This leads the researchers to hypothesize,

H11: Self-efficacy has a positive and significant effect on Continued Intention to use eGovernment services

Trust in eGovernment refers to the overall individual's reliability on eGovernment services. Lack of trust in an online system may hinder the adoption and continued use of online services. If a user trusts an eGovernment services, he/she will be more willing to avail the service and carry out transactions on it online. Studies in online adoption of services have demonstrated that trust enables people to exchange information online, share their personal details which will lead to greater adoption [2, 20]. Thus the researchers hypothesize,

H12: Trust in eGovernment has a positive and significant effect on Continued Intention to use eGovernment services

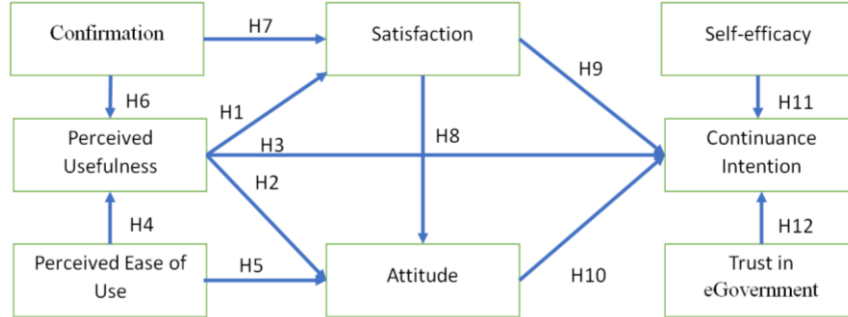Fig. 1 presents the conceptual model.

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Fig. 1. Proposed Research Model

3 Methodology

This study aims to identify the factors that lead to users' continuance intention to use e-government services in India. To identify the drivers for the usage e-government services a conceptual model was developed by extending TAM to include confirmation, trust and social influence. The research process comprised of three steps. In the first step, a comprehensive literature review was performed to find appropriate variables that could extend TAM to better understand the consumers' continuance intention to use e-government services. Followed by the review of literature in the second step, an online survey instrument was developed and sent to randomly selected participants across the country. In the third step, a Partial Least Squares Structural Equation Model (PLS-SEM) was developed and tested using the Smart PLS 3 software.

For developing the data collection instrument for this study, established scale items were adopted from existing literature on online government services and TAM. These adopted scale items were further refined to fit into the context of this study. Before launching the survey the data collection instrument was pilot tested with few selected respondents. Based on the feedback received during the pilot testing the instrument was simplified for the better understanding of scale items by the respondents. After excluding a few items the final survey tool comprised of 32 items related to eight constructs were retained. All the items were measured using a five - point Likert scale, with anchors ranging from "Strongly disagree" (1) to "Strongly agree" (5).

The online survey was randomly distributed to 2000 individuals across the country. To improve the response rate, the initial mailing of surveys was followed by periodic reminder e-mails. Finally, 243 responses (a 12 per cent response rate) were obtained. After rejecting 34 inappropriately filled responses, 209 filtered responses were separated for the purpose of data analysis. There are seven predictor variables (independent variables) in this study. According to Stevens [18], the sample size for social science

research should be greater than 15 times the number of predictor variables. Hence, the required sample size should be greater than 105 (7 x 15). The number of filtered responses was twice the required sample size.

After screening the data, the study constructs were tested for the presence of multicollinearity, reliability and validity. To inspect if multicollinearity exists amongst the independent variables the inner and outer VIF values were calculated. All the VIF values for both the inner and outer model were well below the threshold value of 5 [16]. The inner VIF values are presented in Table 1 and the outer VIF values are presented in Table 2.

Table 1. Inner VIF

	Attitude	Continuance Intention	Perceived Usefulness	Satisfaction
Attitude		1.944		
Confirmation			1.648	
Continuance Intention				
Perceived Usefulness	1.575	2.417		1.000
Perceived ease of use			1.648	
Satisfaction	1.575	1.816		
Self Efficacy		2.006		
Trust in eGovernment		1.768		

Table 2. Outer VIF

Items	VIF
ATT1	3.277
ATT2	3.721
ATT3	3.404
BI1	2.663
BI2	3.477
BI3	3.365
BI4	2.437
CON1	1.790

CON2	2.206
CON3	2.127
PEOU1	3.040
PEOU2	2.876
PEOU3	2.346
PEOU4	2.628
PEOU5	2.604
PU1	2.814
PU2	3.458
PU3	3.074
PU4	1.967
PU5	2.305
SAT1	2.651
SAT2	3.277
SAT3	3.171
SAT4	3.147
SEF1	2.221
SEF2	2.182
SEF3	2.180
SEF4	2.843
TRG1	2.857
TRG2	3.641
TRG3	2.707
TRG4	3.230

The evidence of construct reliability and validity is demonstrated in Table 3. The measure for consistent reliability coefficient Rho_A vary from 0.847 to 0.923 was consistently greater than the recommended value of 0.7, which indicates acceptable internal reliability for the dimensions [5]. The reliability levels (Cronbach's Alpha (CA) and Composite Reliability (CR)) of all the individual constructs exceeded the acceptable level greater than 0.75 demonstrating high internal consistency of the constructs [9]. The average of the item-to-factor loadings are higher than 0.70 [9] and the constructs indicated an Average Variance Extracted (AVE) value varying from 0.725 to 0.866, greater than the threshold value of 0.5, indicating convergent validity [7].

Table 3. Construct reliability and Validity

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Attitude	0.923	0.923	0.951	0.866
Confirmation	0.841	0.847	0.904	0.759
Continuance Intention	0.915	0.915	0.940	0.796
Percieved Usefulness	0.907	0.910	0.931	0.730
Percieved ease of use	0.908	0.909	0.932	0.732
Satisfaction	0.916	0.916	0.941	0.799
Self Efficacy	0.874	0.878	0.913	0.725
Trust in eGovernment	0.915	0.921	0.940	0.797

To prove Discriminant validity the correlation between any two latent variables should be lower than the reliability of each of those variables [8]. The square root of AVE is used as the measure of reliability. All the latent variables for the conceptualized model had reliabilities greater than the correlations between any two constructs, indicating that each construct in the model was unique and distinct (Refer to Table 4).

Table 4. The Fornell-Larker criterion for Discriminant Validity

	Attitude	Confirmation	Continuance Intention	Perceived Usefulness	Perceived ease of use	Satisfaction	Self Efficacy	Trust in eGovernment
Attitude	**0.931***							
Confirmation	0.365	**0.871***						
Continuance Intention	0.620	0.527	**0.892***					
Perceived Usefulness	0.633	0.606	0.759	**0.855***				
Perceived ease of use	0.437	0.627	0.594	0.652	**0.855***			
Satisfaction	0.367	0.744	0.569	0.604	0.687	**0.894***		
Self Efficacy	0.578	0.467	0.661	0.610	0.658	0.517	**0.852***	
Trust in eGovernment	0.503	0.443	0.494	0.533	0.500	0.528	0.564	**0.893***

* Square root of AVE

After establishing the reliability and validity of constructs, the hypothesized relations in the model were tested using PLS-SEM. The path coefficients and the corresponding p-values are presented in Fig. 2.
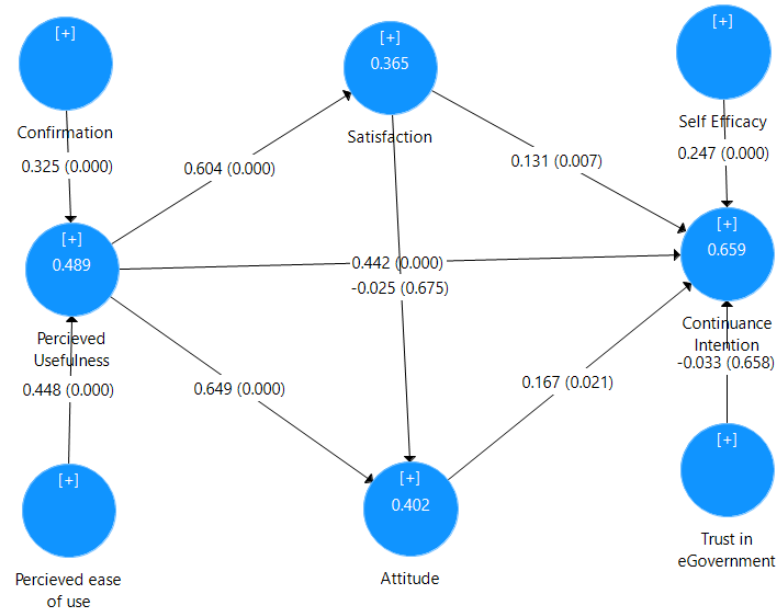

Fig. 2. Hypotheses testing and path analysis

The results support the hypotheses 4 and hypotheses 6 which indicated confirmation and perceived ease of use positively and directly influence perceived usefulness. It further establishes the role of perceived usefulness in shaping the users' attitude and satisfaction from the use of egovernment services (hypotheses 1 and 2). Perceived usefulness also directly leads to users' continuance intention (hypothesis 3). The results fail to support the relationship between satisfaction and attitude (hypothesis 8). But, attitude and satisfaction together with perceived usefulness and self efficacy can support the users' intention to continue with egovernment services (hypotheses 3, 9, 10 and 11). The results also fail to establish any relationship between trust in egovernment and continuance intention (hypothesis 12).

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