The Influences Of Cognitive Factors And Trust On E-Government Acceptance: Evidence From A Two-Stage Model

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ABSTRACT

This paper reviews literature in related research in information systems, social psychology, management science, communications and marketing, and develops a two-stage model of factors influencing e-government acceptance. The model proposes that a number of cognitive factors influence perceived usefulness of e-government services while this perceived usefulness, along with trust online and several personal traits, further influence a user's intention to return and use such e-services in the future. The model is put to a test via a survey instrument. Results show that perceived informativeness, perceived ease of use and trust significantly influence perceived usefulness of the e-government site, while perceived usefulness, trust and compatibility have a significant impact on a user's intention to return. This study sheds light on areas website designers should pay attention to in order to increase the number of online users of e-government services.

Keywords: E-Government; Technology Acceptance; Trust

INTRODUCTION

The most recent UN global e-government survey shows that most countries continue to make progress in improving efficiency of online government services (UN Survey, 2012). Current research in this field has adapted theories and models in disciplines including management science, information technology, social psychology, communications and marketing. Much like an online consumer in e-commerce, an online government service user interacts with a government service website to obtain needed information, submit inquiries, and complete transactions such as renewing licenses, making payments, and filing taxes, etc.

In the absence of a face-to-face interaction, a user's cognitive perception of this virtual agency can influence the perceived value or perceived usefulness of an e-government service website, as well as the user's intention to obtain services through this online channel in the future.

This paper proposes a two-stage model relating influencing factors to perceived value of and user intention to use e-government services. Theories and models contributing to this integrative framework include consumer behavior in marketing and advertising research, (TAM) the technology acceptance model (Davis, Bagozzi, & Warshaw, 1989), (IDM) the innovation diffusion model (Moore & Benbasat, 1991), the (UTAUT) unified theory of acceptance and use of technology (Venkatesh, Morris, Davis, & Davis, 2003), and current literature in online trust.

Perceived Informativeness and Perceived Enjoyment

Information and enjoyment in site presentation account for over 50% of the variance in attitude toward a website (Chen & Wells, 1999). The cognitive dimensions of perceived informativeness and perceived entertainment are significant influencers of perceived value of both traditional advertising and messages communicated in the hypermedia (Ducoffe, 1996; Gao & Koufaris, 2006).

Customers favor informative product or service presentations in an entertaining way, much like when they visit a brick-and-mortar store (Koufaris & Hampton-Sosa, 2004). Information is viewed as a major benefit that a consumer expects from engaging in an exchange with any media (Bartos & Dunn, 1974). To accept the paradigm of e-government, a user must feel comfortable or enjoyable interacting with the IT interface of an online agency. In the meantime, the user must also have a favorable impression of the informativeness of government services online. An informative e-government site enhances perceived value of online services offered.

Extended uses and gratifications theory posits that entertainment value originates from its ability to fulfill the audience's needs for escapism, diversion, aesthetic enjoyment, or emotional release (McQuail, 1983). Consumer research shows that perceived enjoyment enhances perceived value of a product (Batra & Ray, 1986). An enjoyable online experience adds value to a visitor's perception of e-government services.

Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and Intention to Use

The technology acceptance model (TAM) addresses factors influencing a user's attitude toward using technology and intention to use (Davis et al., 1989). TAM's highly reliable constructs and parsimonious nature have led to its wide adoption in studies exploring technology acceptance, including use of word processors (Davis et al., 1989), websites (Gefen, Karahanna, & Straub, 2003), instant messaging (Lu, Zhou, & Wang, 2008), and classroom learning technologies (Wu & Gao, 2011), among others. In TAM, perceived usefulness (PU) refers to a technology's perceived effectiveness in improving a user's productivity or performance, while perceived ease of use (PEOU) refers to how effortless a user perceives using the technology to be.

Even though the original TAM model considers PU and PEOU as two distinct factors influencing a user's intention to use technology, prior research has found that PEOU mostly influences intention indirectly through PU (Davis, Bagozzi, & Warshaw, 1992). Perceived usefulness in turn influences intention to use, which predicts actual usage of technology. This study retains the two propositions in the original TAM model, testing the effect of PEOU on PU, and both PEOU and PU on intention to use.

Relative Advantage (RA), Compatibility and Voluntariness

The innovation diffusion model (IDM) considers relative advantage (RA), complexity, compatibility, image, visibility and voluntariness as factors influencing user acceptance of a new technology (Moore & Benbasat, 1991). Diffusion here refers to how widespread technology is accepted throughout an organization or society.

Venkatesh et al. (2003) offered a comprehensive review of theories and models in technology acceptance, discussed possible overlaps of constructs in different models, and proposed a unified theory of acceptance and use of technology (UTAUT).

Based on review of literature and insights provided by prior research (Venkatesh et al., 2003; Carter & Belanger, 2005), this paper combines PEOU and PU with several above-mentioned variables from IDM in the second stage of the model, testing factors influencing intention to use e-government services. Aside from PU and PEOU, these factors include RA, compatibility, and voluntariness.

RA refers to "the degree to which an innovation is perceived as being better than its precursor" and compatibility is "the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters," while voluntariness refers to "the degree to which use of the innovation is perceived as being voluntary or of free will" (Moore & Benbasat, 1991, p. 195). This paper retains the propositions in IDM and UTAUT models where compatibility, RA, and voluntariness are hypothesized to positively influence intention to use.

Trust in Internet and e-Government

Trust formation involves reducing the complexity in decision making in uncertainty (Salam, Iyer, Palvia, & Singh, 2003). Existing literature in e-business research considers trust the defining attribute in an online consumer's interaction with an e-vendor (Reichheld & Schefter, 2000). Though online government services enjoy an advantage

when compared to commercial sites in terms of perceived trustworthiness of the agency, e-government sites still need to overcome privacy and security concerns of citizens and build constituents' confidence in the underlying technology used in e-government services.

There are four dimensions of user trust online – trust propensity, institutional trust, trust in specific sites, and trusting intentions (McKnight, Choudhury, & Kacmar, 2002). A user's trust in the Internet as a safe and reliable paradigm for carrying out transactions will likely correlate with the user's perceived value or perceived usefulness of websites of either firms or the government.

Broad acceptance of any online paradigm requires trust in the online agencies. Both an IT interface and a channel of interaction between a consumer and an online entity work together to influence a user's trust as well as intention to participate in an exchange (Gefen et al., 2003). This holds true in the case of e-government, just like in e-business. This paper hypothesizes a positive association between trust and PU, as well as trust and intention to use.

THE RESEARCH FRAMEWORK

In summary, this research proposes a two-stage model depicting how perceived informativeness, perceived enjoyment, perceived ease of use, and a user's trust online influence the perceived value or usefulness of the e-government site. Adding several factors identified in IDM and UTAUT to PU and trust, the second stage of the model further examines factors influencing a user's intention to use the site. This model of user acceptance of e-government services is outlined in the following diagram. Each hypothesized relationship is represented in the positive direction by an arc in Figure 1.
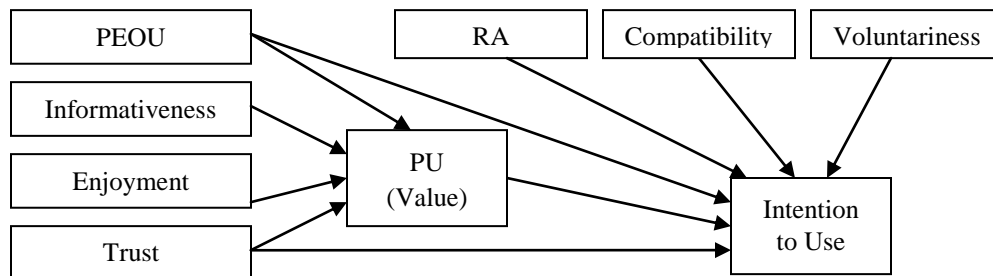

Figure 1: An e-Government Acceptance Model

METHODOLOGY

To test the proposed model, an exploratory field study was conducted through a survey administered among students in a northeastern college of the US. Scale items measuring variables outlined in the model were adapted from existing literature (Ducoffe, 1996; Koufaris & Hampton-Sosa, 2004; Carter & Belanger, 2005). The survey instructs participants to choose and visit one of several states' motor vehicle department websites or one of several states' tax department websites.

Participants filled out the questionnaire in response to an incentive for extra course credit. They indicate their agreement or disagreement with statements on a 7-point differential scale. The questionnaire contains no identifying information about individual participants. A total of 147 surveys were completed. Participants are all undergraduate students between the ages of 18 and 21, and most major in some discipline of business. Female participants accounted for 41% of the sample population.

RESULTS

All constructs exhibit acceptable level of reliability with Cronbach's alpha values exceeding the recommended 0.7 or fall within the accepted standard of 0.5 to 0.7 for exploratory research (Nunnally, 1978). Respective values are shown in Table 1.

Table 1: Scale Reliability

Scale	Cronbach's Alpha
Informativeness	0.7994
Enjoyment	0.6528
PEOU	0.7022
PU	0.7329
Trust	0.8471
RA	0.7521
Compatibility	0.6839
Voluntariness	0.6237
Intention	0.7681

Two multiple regression models were run to test the hypothesized relationships. In the first-stage model, PEOU, perceived informativeness, perceived enjoyment, and trust are the independent variables and PU is the dependent variable. This model explains 63% of variance (adjusted R-squared) in PU. Perceived informativeness, PEOU, and trust have a significant influence on PU at $p < .01$. Perceived enjoyment is not significantly related to PU.

The second-stage model is tested via another multiple regression treating PU, PEOU, trust, RA, compatibility, and voluntariness as independent variables and intention to use as the dependent variable. This model explains 61% of variance (adjusted R-squared) in intention to use. Three of the six independent variables – PU, trust and compatibility - are significantly correlated with intention to use at $p < .01$. PEOU, RA and voluntariness are not significant influencers of intention.

Both models had good fit as reflected in their R-squared and F values. VIFs were low in both models, indicating no concern for multicollinearity. Standardized residuals were normal, and scatter plots of standardized residual vs. predicted value gave no indication of heteroscedasticity in the data.

CONCLUSION

A slight majority of the hypothesized relationships are supported in this study. In the first-stage of the model, perceived enjoyment is the only non-significant factor. This seems to be explained by the fact that, unlike commercial or sometimes educational sites, government agencies do not generally see making the site entertaining as part of its mission, neither do users of e-government services seek such entertainment. At an average value of 3.2 on a 7-point scale, this is the lowest mean value of all variables measured in this study. On the other hand, perceived informativeness on the same scale has an average of 5.3, the highest mean value of all variables measured in this study. Results show that perceived informativeness, perceived ease of use and trust are major determinants of perceived value of such e-government sites.

As observed in prior TAM research, though a significant influencer of PU, PEOU does not influence intention directly, as evidenced in this study. Results from the second stage of the model suggest that personal traits are lesser influencers of a user's intentions. Making a site informative and easy to use, while building user trust in using Internet technology for online services, seems to be area sites that developers should focus on to enhance perceived usefulness and value of e-government, thus having an impact on a user's intention to return and use. Ultimately, increased online use of e-government services contributes to improved productivity and cost savings to the government agencies.

AUTHOR INFORMATION

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