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Citizens' Acceptance and Usage of Electronic-Government Services: A Conceptual Model of Trust and Technological Factors

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Abstract: Prior work suggests that despite electronic-government (e-government) services offers promising results on citizen's performance and competitive advantage, it is however observed that adoption and acceptance of E-Government services by the citizens has been lower than expected. To understand the acceptance behavior and the decision making process of potential users (i.e. citizens) towards e-government services acceptance and usage, this article proposes an extended model of technology acceptance. The model proposed in this work incorporates key variables from the information systems and social psychology domain. These variables are perceived usefulness, trust, and usability. It is expected that the systematic model developed in this work will be helpful for the policy makers in government sector.

Keywords: E-government Services, TAM model, Trust, Usability

1. INTRODUCTION

Governments around the globe are taking technological initiatives and showing a strong preference for delivering services via the Internet and World Wide Web (WWW) particularly as a means of improving cost-efficiency and reducing time spent on direct interactions (i.e. through administrative offices) with citizens (Jaeger *et al.,* 2009). In this regard, Federal, Provincial and Local governments have implemented or planning to implement various electronic government initiatives, such as data collection, management and analysis, online voting, electronic complaints, online FIR registration, e-procurement, inter-agency collaboration, electronic learning of state employees, intra- and inter- state agencies communication and collaboration, and human resource management etc. These electronic initiatives and services are beneficial to both Government and citizens. Governments realize cost reductions and improved efficiency, while citizens receive faster, convenient, smoother services anytime anywhere (Lin *et al.,* 2011).

In addition, e-government helps to develop a strong relationship between Government and its citizens due to ease of using it and its instant availability. The citizens remain updated by virtue of real time information made available through e-Government web portals. While, instant feedback from citizens will allow Governments to make timely management decisions, as a result set an example of good governance. Therefore, it is important for both academics and practitioners to explore the factors that influence citizens to adopt and make use of e-government services, and to understand the reasons why citizens accept or reject new technological initiatives.

To understand and explain user adoption and acceptance of new systems, technology acceptance model (TAM) has been widely applied in the prior work (Naqvi *et al.,* 2016, Chandio *et al.,* 2017; Abbasi *et al.,* 2011). Despite the popularity of TAM, some researchers claim that TAM model is not sufficient to explain users adoption of new technologies (in this case e-government), as the factors affecting adoption are likely to vary with system, context, and potential users (Abbasi *et al.,* 2011; Moon and Kim, 2001; Naqvi *et al.,* 2016). It is therefore, important to systematically investigate the adoption process of e-government services using an integrated model of influential factors, especially from citizens' perspective. In this line, the present article develops a model of influential factors based on TAM as foundation to understand citizens' adoption of e-government services. The rest of article is organized as follows. The next section discusses literature review, followed by model development process and finally ends with conclusion.

Trust

Trust has been considered as a central bond in almost all type of relationships (Morgan and Hunt, 1994). This is the reason trust has always remained thecenter of attention in various disciplines as well as applied as an important variable of study. For example, (Lewis and Weigert 1985) studied trust in management discipline, (Suh and Han 2002) applied it in online shopping, (Jarvenpaa *et al.* 2000) in information systems, whereas (Gefen *et al.* 2003) applied it e-

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commerce domain. Recent studies (Chandio *et al.,* 2013a, Chandio *et al.,* 2013b) used trust as a main construct of their model in web-based transactional systems' context to explain seller-buyer relationships.

Although literature on trust is quite vast and varied acrossnumber of domains, each of these disciplines has given its own conceptual definition of the trust construct. Nonetheless, following (Han, 2002) trust in this study is applied as trusting belief factor, who (ibid) describes trust as a belief that "the promise of another can be relied upon and that, in unforeseen circumstances, will act in a spirit of goodwill and in a benign fashion toward the trustor" From this definition, it can be implied that the user's trust is basically a confident belief on the service (e.g. e-government) provider. McKnight and Chervany (2002) claim that integrity, benevolence, ability, and predictability are main characteristics of trust beliefs, which positively influence and increase the intended usage behavior.

The concept of trust is very much relevant to e-government services context. This is so because the main medium of these services are WWW and internet, which create uncertainty among citizensregarding service providers that they can behave in opportunistic manner (Chandio *et al.,* 2013a).

Usability

According to (Naqvi *et al.* 2016), usable systems are believed to be accepted and used more by the potential users. This is the reason many studies have applied usability as an important part of their model to understand user acceptance. For instance, (McKnight *et al.,* 2002) developed a model to understand user' satisfaction with the web. The proposed model in their work (ibid) included usability related factors such as interactivity and navigation. Findings obtained from their studies revealed that usability factors significantly influenced user's satisfaction. Similarly work of (Naqvi *et al.,* 2016 and Devaraj *et al.,* 2002) also suggest that usability factors (e.g. supportability) have significant impact on users' acceptance as well as theirsatisfaction.

However, researchers (Wu, 2010) report that there are several interactive systems that contain usability issues. These issues include navigation difficulties, inconsistent formats, delayed response, content quality etc. It is to mention here that e-government services also are a kind of interactive systems that use WWW as a medium between users and the service providers. Therefore, it is reasonably important to investigate the impact of usability on the acceptance of e-government along with other crucial factors.

Conceptual Framework and Hypotheses

In order to understand e-government services acceptance by the intended users (i.e. citizens), this research proposes an integrated model based on Technology acceptance model (TAM) **(Fig. 1)** as foundation theory. The model incorporates trust, usability and core constructs form TAM model. The model developed in this study **(Fig. 2)** posits that perceived usefulness (PU), perceived ease of use, trust, and usability determine the acceptance and usage of e-government services. Trust is hypothesized to have an effect on e-government services acceptance both directly as well as indirectly through PU. Usability related factors are hypothesized to have an effect on e-government services acceptance directly and indirectly though PU and PEOU. Whereas, hypotheses related to PU and PEOU are drawn from TAM model.

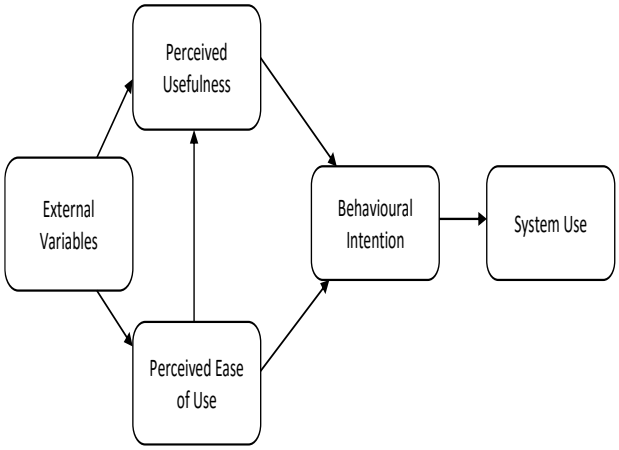


Fig. 1 TAM Model

Technology acceptance model or TAM is one of the most widely adopted models in the field of information systems to understand users' acceptance decision process. TAM model explains that when a user is encountered with a new information systems or software application (e.g SaaS), two main factors are important to explain his/her acceptance behavior. These factors are PU and PEOU. PU is defined as "the degree to which a person believes thatusing a particular system would enhance his/her job performance" (Davis, 1989). While, PEOU is referred as the degree to which a personbelieves that using a particular system would be free of efforts" (Davis, 1989).

As per TAM model PU and PEOU directly influence intended usage behavior. While intention to use determines the actual behavior of the users. Although in original TAM, the relationships of PU and PEOU were also hypothesized with attitude construct. However, in later studies (Abbasi *et al.,* 2011) it was found that attitude construct did not mediate between PU, PEOU and intention to use. Thus, this construct (attitude) was removed from the TAM model. In line with revised TAM model, this study proposes that PU

will have an impact on intention to use e-government services. It is noteworthy to mention here that this article applied ease of use as underlying construct of usability rather than as an independent factor. The hypothesis related to PU (as drawn from TAM) is given as under:

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

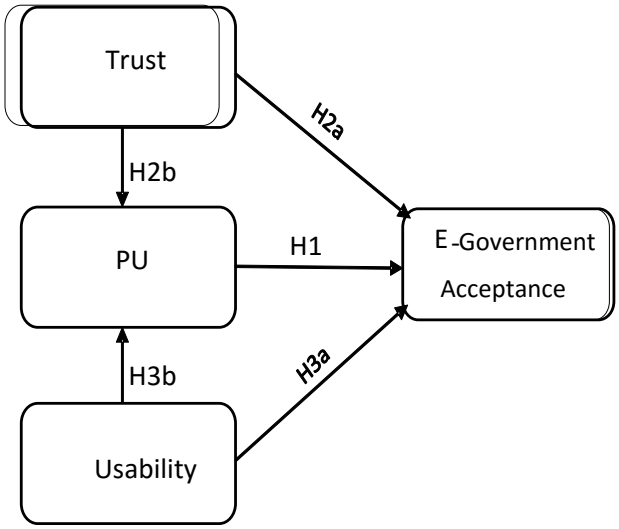


Fig. 2. E-government Services Acceptance Model Hypotheses related to trust

Gefen (2000) in his influential article claimed that online activates (involving confidential information) on WWW are hindered because of lack of trust by potential users in online services (e.g. e-government) and the service provider. The main reason behind this hindrance is due to uncertainty and risk associated with the virtual environment (WWW) (Han, 2002). This is so because e-government is a kind of operative situation that lacks face-to face interaction between citizens and service provider.

In this connection several studies (e.g. Chandio *et al.,* 2013b, Geffen *et al.,* 2003) have suggested that users' trust has always been found a significant determinant of intended acceptance and usage behavior. Similarly, studies also suggest that higher level of trust increases users' perception of usefulness of a given system or software application (Stewart, 2003). The work of (Alsajjan and Dennis2010) also reports that trust and PU were significantly correlated. Besides, (Chandio *et al.,* 2013b) found that trust was significant determinant of intended usage behavior as well as of PU in online banking information systems context. Agreeing to prior work,the researchers believe that trust is one of the crucial factors that determines SaaS acceptance by potential users. Thus following hypotheses are proposed in relation to trust.

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.

Hypothesesrelated to usability

The concept of usability as defined by ISO 9241 and reported byGreen and Pearson (2006)refers to "the extent to which a product/service (e-government in this case) can be used by specified users (citizens in this case) to achieve specified goalswith effectiveness, efficiency and satisfaction in a specified context of use" According to (Davis 1989) that likelihood of users' acceptance of any information system (or computer software application) depends on both the functionality and usability of such system. In view of (Wang and Senecal 2009), usability evaluation not only examines the ease of use of system's functions but also checks how well these functions support users in efficient task performance.

There exists an evidence in the literature that suggests a link between usability and attitude towards software systems acceptance. For example, (Wang and Senecal 2009) in their work found that usability had a positive significant effect on attitude towards website acceptance. In addition, (Naqvi *et al.* 2016) also hypothesized that usability related factors are likely to have an impact on web-based systems' acceptance. Based on the findings fromthe priorresearch studies, this research also hypothesizes that usability is expected to have an impact on SaaS acceptance by the intended users. Exact hypotheses are given as under:

H3a. Usability will have a significant effect on e-government acceptance.
H3b. Usability will have a significant effect on PU of e–government.

2. CONCLUSION

The widespread acceptance of E-government services depends on several factors. This research however, takes an analytical approach to systematically understand the influential factors that are likely to have an effect on e-government services acceptance. In this connection, this study developed an integrated model of influential factors based on the literatureavailable to understand and explain the potential citizens' decision making process toward e-government services acceptance through a causal chain. It is expected that future research will empirically validate the model developed in this study by collecting required and relevant data from the citizens.

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