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E-GOVERNMENT ADOPTION DETERMINANTS: A THEORETICAL OVERVIEW SUPPORTED BY LITERATURE REVIEW EVIDENCE

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Abstract

The process of technology acceptance in general, and e-Government adoption in particular, depends on various social, political, economic and cultural contextual circumstances that further shape the behavior and intention to use of users. To be able to identify what drives the intention to adopt and use e-Government, this paper first presents a theoretical overview of the ground theories and models found in academic literature. In the second part, through a literature review and qualitative analysis of 15 articles, the paper presents the practical application of theories and models in current research. The results show the rising influence of the socio-cognitive determinants in e-Government adoption. The methodological approach applied in the paper can serve as a direction on how to identify and cluster e-Government adoption determinants in a given context while relying on tested and well-examined theories and models. This approach could further support scholars and policymakers in developing approaches to identify drivers behind the behaviors of users and create a favorable environment for e-Government adoption.

Keywords**:** *e-Government, adoption determinants, theories and models, intention to use, socio-cognitive factors*

Introduction

In the quest of bringing public services closer to citizens, governments worldwide are transferring communication channels into the digital domain. In a constantly changing world, introducing online public services became necessary to provide better service delivery and more convenient access based on the good governance principles of user-centricity, efficiency, accountability and transparency. Many scholars have noted that effective e-Government should provide a wider framework for social inclusion, encourage civic participation and improve the communication between citizens and governments (Lee & Huang, 2014; Abu-Shanab, 2015). Moreover, the OECD has issued a recommendation aimed at bringing governments close to the citizens and businesses through the implementation of digital government, i.e. "the use of digital technologies as an integrated part of government's modernization strategies, to create public value" (OECD, 2014). Thus, public value and social development became embedded into technology which makes citizens' participation essential for a successful development of e-Government. In that regard, the benefits of e-Government would be twofold: strengthened public sector performance and productivity among civil servants on the supply side; and enhanced social inclusion and participation of citizens in governments on the side of users, the demand side. However, investing only in the supply side is not enough to make e-Government effective. In support of this claim, both governments and academic researchers recognize the problem of low-level adoption of e-Government services among citizens; the common problem in both developed and developing countries (Alhujran, 2009). The adoption determinants are often dependent on the social, political, economic and cultural context and users' behavior can be determined by their perceptions, attitude, social influence and other variables. In that regard, to be able to better explain e-Government adoption determinants this paper aims to:

- Present an overview of the ground technology acceptance and e-Government adoption theories and models

- Identify and cluster e-Government adoption determinants and predictors
- Display the practical application of elements from the presented theories and models in current research through a literature review.

By achieving the research objectives, this paper will provide a better overview of the adoption determinants which can serve as a base for further research in the pursuit of finding tailor-made solutions to an effective digital transformation process. The paper is organized in six parts: introduction; definition of concepts; overview of technology acceptance and e-Government adoption models; methodology where the process of literature search has been explained followed by results and lastly, discussion for summarizing the findings and connecting them to the research goals.

1. Definition of concepts

e-Government

In reference to improve efficiency on the side of service providers, e-Government is defined as the application of information technologies to provide higher standards of innovation in the administration of government operations and systems (Capistrano 2020; Mensah et al., 2022). Considering its inclusive role, e-Government is a strategic tool to enhance maximum participation of citizens in the political and social development of a country through effective participation, consultation, and empowerment process (Abu-Shanab, 2015; Lee & Huang, 2014; Mensah et al., 2021). What is noticeable from the definitions elements is that governance is guided towards enhanced communication between service providers and users aiming to advance overall social development.

Adoption determinants

As defined in the Merriam-Webster dictionary, the simplest explanation for a determinant is an element that identifies or determines the nature of something or that fixes or conditions an outcome. The Oxford Learner's dictionary denotes the term determinant as a factor which decisively affects the nature or outcome of something. In the field of technology acceptance, determinants are framed into models by researches that quest to explain adoption through empirical testing and validation.

Users

Within e-Government research, citizens and businesses are understood as users of e-Government who generate benefits through the use of digital public services (Scott et al., 2016). In this setting users are not only subordinated subjects as in former traditional public administration paradigms, but they engage in transactions with government and participate as co-creators of public policies (Distel & Lindgren, 2019). This approach is in line with the good governance principles to which modern public administrations are striving. This paper takes the perspective of citizens (not covering businesses) in the role of users of public services.

2. Overview of technology acceptance and e-Government adoption theories and models

Previous research has long studied processes related to technology acceptance resulting in the establishment of pioneering models (see more in Ajzen & Fishbein, 1975; 1980; Davis, 1986; 1989; Venkatesh et al., 2003; Dwivedi et al., 2017) that support research in practical contexts to date. After exploring the initial determinants of technology acceptance, in time the research evolved and focused on particular fields e.g. e-Government adoption. In addition, the most notable theories and models related to technology and e-Government adoption have been presented.

Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1975; 1980) is a widely studied model from the field of social psychology, with two unique factors that contribute to behavioral intention (BI): 1) attitude toward the behavior (ATT) and 2) subjective norm (SN). In aim to understand better the factors that influence the behavior, Ajzen and Fishbein argue that it is required to look into beliefs that individuals hold about themselves and their environment.

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior TPB extended from the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) due to the limitation of TRA to deal with behavior over which individuals have incomplete volitional control (Ajzen, 1991). According to TPB, grounded in social psychology, peoples' actions are determined by their intentions, which are influenced by their perceived behavioral control, besides attitude and subjective norm. Furthermore, behavioral intention to reuse e-Government determines a user's actual behavior directly, whereas intention is positively influenced by attitude, subjective norms (SNs) and perceived behavioral control (PBC).

Technology Acceptance Model (TAM, TAM2, TAM3)

The Technology Acceptance Model (TAM) developed by Davis (1986;1989) has two important factors: perceived usefulness (PU) and perceived ease of use (PEoU) determining the behavioral intention to use. The TAM is considered the extension of the TRA (Ajzen&Fishbein, 1975; 1980). Due to its few factors, the original TAM is easy to comprehend and yet has demonstrated a high level of predicting relationships between different variables in many contexts. However, the rise of diverse needs and contexts exposed TAM to criticism primarily due to lacking subjective norms and social impact. Therefore, Venkatesh&Davis (2000) extended the original TAM model into TAM2 including external social factors that influence the behavioral intention to use new technology. Furthermore,Venkatesh&Bala (2008) combined TAM2 and the model of the determinants of perceived ease of use (Venkatesh, 2000), and developed an integrated model of technology acceptance known as TAM3. The authors developed the TAM3 using the four different types including the individual differences, system characteristics, social influence, and facilitating conditions as determinants of perceived usefulness and perceived ease of use. Nowadays, scholars still use the original TAM as the base for further adaptation in different contexts despite its critique on not fully encompassing determinants that influence attitude and behavioral adoption.

Unified Theory of Acceptance and Use of Technology (UTAUT and UTAUT 2)

The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) is a theoretical framework that brings together alternative views on users and innovation acceptance. UTAUT consists of four main concepts: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). These four main concepts are independent variables which influence the dependent variables, behavioral intention and usage. Gender, age, experience, and volunteers of system use have indirectly influenced the dependent variables via the four main concepts (Nunes et al., 2017). The UTAUT2 (Venkatesh et al., 2012) is another powerful predicting framework derived from the TAM and the UTAUT model. The UTAUT2 includes the same four UTAUT constructs plus three new consumer specific constructs: hedonic motivation, price value, and habit. The applicability of the TAM and UTAUT models in the e-Government area has been proved by the many empirical studies that justify their accuracy (Yang, 2017).

Unified Model of Electronic Government Adoption (UMEGA)

The variety of contexts and complexities of e-Government adoption raised the need of further extension of the base TRA and TPB theories. To fill in the gap, Dwivedi et al., (2017) proposed and validated the Unified Model of Electronic Government Adoption (UMEGA) based on the principle of the UTAUT model (Venkatesh et al., 2003). The proposed UMEGA model is an e-Government specific unified model expected to outperform the other models, including the UTAUT. The integrating variables of UMEGA are performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), perceived risk (PR), attitude, and behavioral intention to use (BI). As the process of e-Government adoption is an ongoing process, scholars and researchers are adding different context-dependent variables to be able to even more precisely identify adoption determinants.

3. Literature search and evaluation

The literature search for identifying and grouping e-Government adoption followed the study review guidelines of Kitchenham&Charters (2007) and Wohlin et al., (2022). The keywords were selected based on the research questions and the aim of the paper to identify and cluster e-Government adoption determinants. The following key words search string in the Scopus database has been applied: e-government AND adoption AND determinants, articles in English, published in the period 2017 to 2022. To avoid content bias, the inclusion and exclusion criteria were defined before the start of further screening and selection of relevant articles.

Inclusion criteria (technical)

- Electronically available articles
- Written in English
- Open access articles
- Published in the period 2017-2022

Inclusion criteria (content related)

- Articles that focus on the users' perspective of adoption determinants
- Articles with research design based on technology acceptance models/theories

(for the purpose of unified methodological approach when grouping the determinants)

The process continued with screening and selection based on title and abstract in the first phase and full article text read in the second phase. To make sure that all relevant articles are covered, a further procedure of snowballing and manual search has been performed.

Table 1. Literature search methods and number of articles selected for the paper

Search method	**Number of identified articles**		
Database search Scopus (start set of articles)	**Keywords search**	**Phase I**	**Phase II**
	e-government AND adoption AND determinants n=75	Title and abstract n=21	Full text reading **n=10**
Snowballing from the start set	**BS Snowballing** (suitable articles cited as reference work in the start set) **n=5**		
			Total: 15

The paper will apply qualitative analysis of the selected articles in aim to identify and cluster the most frequent e-Government adoption determinants presented in the overview of theories and models.

3.1 Analysis of selected articles

According to the selection criteria, 15 articles have been selected for further qualitative analysis. Each of the selected articles was a subject to analysis of the methodological approach applied, data collection method and the theoretical background for building the conceptual approach. Table 4

contains the titles of the selected articles, along with author's name, year of publication, supporting theories and models from previous literature. The main findings are given in continuation in the narrative section following the table. This data is incorporated into the paper to provide empirical evidence and practical application of the presented theories and models.

Table 2: Summary of the selected articles
Source: own qualitative analysis

Authors and year of publication	**Article title**	**Supporting theories/models**
Xie Q., Song W., Peng X., Shabbir M. (2017) China	Predictors for e-Government adoption: Integrating TAM, TPB, trust and perceived risk	TAM and TPB
Nunes S., Martins J., Branco F., Goncalves R., Au-Yong-Oliveira M. (2017)	An initial approach to e-government acceptance and use: A literature analysis of e-Government acceptance determinants	UTAUT, UTAUT2, TAM
Rey-Moreno M., Medina-Molina C. (2017) Spain	Inhibitors of e-Government adoption: Determinants of habit and adoption intentions	TPB
Yang Y. (2017) China	Towards a new digital era: observing local e-government services adoption in a Chinese municipality	TAM and UTAUT
Jasimuddin S.M., Mishra N., A. Saif Almuraqab N. (2017) UAE	Modeling the factors that influence the acceptance of digital technologies in e-government services in the UAE: A PLS-SEM Approach	TAM
Joshi P.R., Islam S. (2018) South Asia	E-government maturity model for sustainable E-government services from the perspective of developing countries	Existing digital maturity models
Ejdys J., Ginevicius R., Rozsa Z., Janoskova K. (2019) Poland	The role of perceived risk and security level in building trust in e-government solutions	TAM, TAM 2, TAM 3, UTAUT TRA
Burhanudddin, Badruddin S., Yapid B.M. (2019) Thailand	Determinants of citizen's intention to use online e-government services: A validation of Umega model	UMEGA
Mensah I.K. (2019) China	Impact of Government Capacity and E-Government Performance on the Adoption of E-Government Services	TAM
Mensah I.K., Luo C., Abu-Shanab E. (2021) China	Citizen use of e-government services websites: A proposed e-government adoption recommendation model (EGARM)	UTAUT
Almuraqab N.A.S., Jasimuddin S.M., Mansoor W. (2021) UAE	Determining factors that influence smartphones purchasing intention in the United Arab Emirates: Empirical Research	UTAUT

Fu H., Mensah I.K., Wang R., Gui L., Wang J., Xiao Z. (2022) China	The predictors of mobile government services adoption through social media: A case of Chinese citizens	TAM
Zahid H., Ali S., Abu-Shanab E., Muhammad Usama Javed H. (2022) Pakistan	Determinants of intention to adopt e-government services in Pakistan: An imperative for sustainable development	UMEGA, TRA, TPB
Hassan B., I. Murad M.A.A., El-Shekeil I., Liu J. (2022) Malaysia	Extending the UTAUT2 model with a privacy calculus model to enhance the adoption of a health information application in Malaysia	UTAUT2
Eibl G., Lampoltshammer T., Temple L. (2022)	Towards Identifying Factors Influencing Mobile Government Adoption: An Exploratory Literature Review	Integrated approach of technology adoption models UTAUT, TAM, GAM

In terms of main findings, based on the presented theories and models, Xie et al., (2017) identify trust as a significant and positive antecedent of perceived behavior control (PBC), subjective norm (SN) and attitude. On the other hand, perceived risk (PR) has a significant negative impact on attitude and less of a tendency for citizens to use e-Government services. In the same line, Nunes et al., (2017), find that trust is an important variable that has a major impact on the adoption of e-Government through its influence on trust in the Internet and trust in government. Re-Moreno et al., (2017) focus on barriers and identify resistance to use, inertia and transaction costs as being the major challenges. In the research of Yang (2017), cognitive factors such as awareness, intention to use and citizens' satisfaction are positively related to e-Government adoption. Jasimuddin et al., (2017) find that social influence, perceived ease of use and perceived trust in technology to be the most important determinants. The research of Joshi et al., (2018) finds trust and awareness as being decisive in the intention of users to adopt e-Government services. Ejdys et al., (2019) take the perspective of security and find the level of perceived security in the system as a determinant of trust in e-services and future intention to use. Adding to the socio-cognitive determinants, Burhanudddin et al., (2019) identify attitude and trust as strong predictors of intention, with attitude mediating among the relationship of trust and intention. Mensah (2019) points out government capacity and government performance as significant determinants of e-Government adoption. In terms of predictors of the intention to use, Mensah et al., (2021) emphasize trust in government and trust in the internet as significant determinants. The work of Almuraqab et al., (2021) identifies performance expectancy, one of the main elements of the UTAUT model, as the strongest factor influencing adoption of e-Government, followed by trust in government, effort expectancy and social influence. Fu et al., (2022) take the perspective of perceived information quality and perceived security as significant in determining perceived usefulness and adoption behavior. The research of Zahid et al., (2022) finds that attitude, subjective norm, perceived behavior control and trust are predicted by effort expectancy and performance expectancy; mass media influence and family influence; self-efficacy; economic, structural and social bonds, respectively. Exploring socio-cognitive determinants, Hassan et al., (2022), find that habit, effort expectancy, performance expectancy, social influence, hedonic motivation, and price value are direct determinants that influence behavioral intentions to use, while behavioral intentions, facilitating conditions, habits, perceived risks, and privacy concerns are direct predictors of use behavior. Finally, the systematic literature review of Eibl, among other findings calls upon the influence of trust on adopting e-government.

Conclusion

The findings from the literature review present the base for answering the research questions posed in the beginning of the paper.

Identify and cluster e-Government adoption determinants

From the qualitative analysis of articles, it can be concluded that scholars have applied different methodological approaches, data gathering and data analysis methods to be able to identify the most significant e-Government adoption determinants in a given context. The findings indicate that cognitive factors rise in their role of predictors or determinants for e-Government adoption. In that regard, it is noted that trust and awareness are predictors of the intention to use and that social influence (SI) and the subjective norm (SN) play an important role. For other users, perceived usefulness (PU) and perceived ease of use (PEoU) are decisive in their choice for using e-Government services. In terms of factors that may block or slow down the process of e-Government adoption, scholars have identified habit, inertia, and resistance to use. In addition, the summary of identified determinants of e-Government adoption is presented.

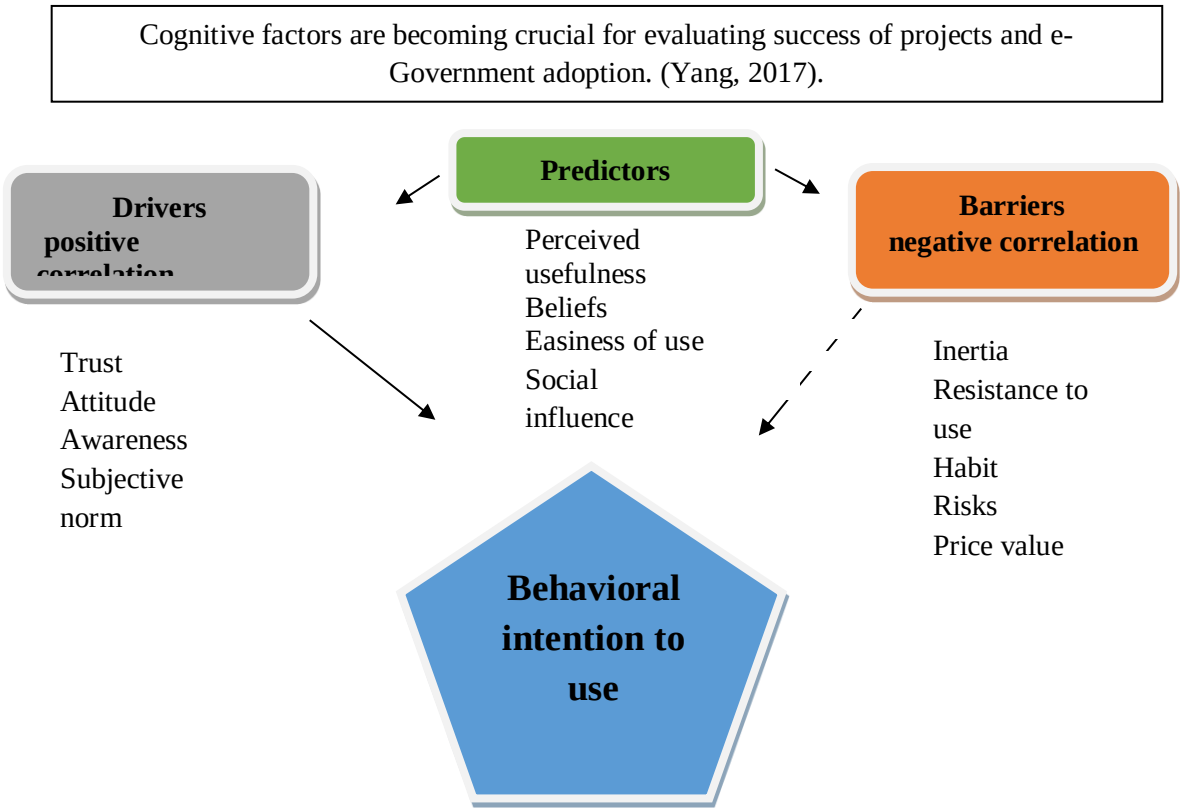

Figure 1: Summary of identified e-Government adoption determinants
Source: own, analysis of selected articles

Present an overview of the theories and models used in academic literature to explain the determinants and their correlation

The selected articles for this paper ground their methodology on the widely used and tested technology acceptance theories and models. Thus, TRA, TPB and DTPB were identified as the most

frequent theories applied in research in the field and TAM, TAM2, TAM3, UTAUT, UTAUT2 and UMEGA as supporting models to identify determinants of e-Government adoption. Due to the variety of contexts, some authors incorporated variables relevant to their local context, region or their narrower subject of study interest. While some of the scholars consider these theories and models to be sufficient to explain factors and determinants that influence e-Government adoption, others argue that they cannot explain well the reality (Alhujran, 2009). Rey-Moreno (2017) argues that although according to existing models high intentions to use e-Government tools should have led to widespread adoption that has not occurred yet. In addition, the role of the mediating factors needs to be further examined as influences (or relationships) can be direct or indirect through intermediate factors (such as intention to adopt) and many models indicate that some factors may mediate the relationships between factors rather than exert a direct influence.

What is notable is that the rise of the influence of the cognitive adoption determinants diminishes the influence of the traditional variables as age, gender, education or income. Explaining the weak influence on education over technology adoption in China, Yang (2017) discusses that within the development of digital society, people are getting used to digital devices and the Internet so using e-services is no longer a 'difficult task' for both educated and under-educated persons. This claim indicates that in the given setting cognitive factors displayed stronger influence on adoption rather than the traditional demographic research variables. Still, this is again a context dependent and not a general conclusion. To be able to clearly depict the adoption determinants landscape in a given context, policymakers and scholars should perform a tailor-made approach with a designed data gathering instruments suitable to the specific context's characteristics.

Limitations and future research

Further research could encompass quantitatively more articles depicting the different contextual realities of e-Government adoption. That would add to further confirming the practical relevance of existing theories and models and may also raise the need of upgrading these solid grounds with other relevant variables. Equipped with knowledge and experiences from current research, policymakers could implement specific policy items aimed to increase trust and awareness for using e-Government services. This approach would offer a wider participation platform that meets the specific needs of users. E-Government can keep its promises for transparent, inclusive, efficient and user-centered governance when recognizing the determinants that encourage citizens' participation in the process.

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