Factors Affecting Citizen Adoption of E-Government in Developing Countries: An Exploratory Case Study From Indonesia

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ABSTRACT

This study aims to examine the critical factors that could influence citizens in their decisions to adopt e-Government services. Based on the review of relevant literature, an extension of the UTAUT research model is developed. Through semi-structured interviews conducted in Indonesia with citizens who have adopted e-Government services, the research model is examined using thematic analysis. Results indicate that performance expectancy, effort expectancy, system quality, and perceived transparency are factors that significantly influence the adoption of e-government in Indonesia, whereas social influence, facilitating conditions, perceived security, information quality, and government encouragement are moderately significant factors. Meanwhile, ICT literacy is the least significant factor in the adoption of e-Government in Indonesia. Such findings are presented in the action priority matrix to offer public organisations with relevant suggestions on how the adoption of e-Government can be improved.

KEYWORDS

Adoption, E-Government, Factors, Indonesia, Qualitative UTAUT, Thematic Analysis

INTRODUCTION

Citizens are rapidly accelerating towards digital emersion in everyday life (Patil, Rana, & Dwivedi, 2018). Specifically, during the coronavirus (COVID-19) crisis, information and communications technology (ICT) has played a vital role in promoting the health and safety of people and keeping economies and societies working. ICT, through information sharing and online services provision, has kept governments and citizens connected during the pandemic. It has also enabled governments to make timely policy decisions based on real-time data and analytics, enhance the capacities of authorities for better coordination, and deploy evidence-based services to those who need them most (United Nations, 2020).

Electronic government (e-Government) is defined as the use of ICT for improving the delivery of public services to citizens and businesses (Kurfalı, Arifoğlu, Tokdemir, & Paçin, 2017; Mirchandani, Johnson Jr, & Joshi, 2008; Alvedi Sabani, 2021). The concept can be described in many ways. For example, e-Government refers to a way of improving communication between governments and
citizens (Pudjianto, Zo, Ciganek, & Rho, 2011) or as a process of enhancing the relationship between governments and their stakeholders (Nam, 2014). It is also considered the delivery of public services through digital technologies (Shuib, Yadegaridehkordi, & Ainin, 2019). e-Government improves the quality of public service delivery (Nam, 2014), and transparency of public decision-making (Deng, Karunasena, & Xu, 2018), while encouraging citizens’ involvement in public administration (Heeks & Bailur, 2007). It also enhances information sharing between government institutions (Puspitasari & Ishii, 2016). Furthermore, e-Government streamlines processes in public organisations, therefore improving their efficiency and effectiveness (Debjani, Umesh, & Gupta, 2012). Consequently, numerous countries have introduced various initiatives within e-Government (United Nations, 2020).

Despite this progressive development of e-Government across the world, the adoption of e-Government in developing countries is still far from satisfactory (United Nations, 2020). The unsatisfactory adoption of e-Government has been widely acknowledged in the literature. Prahono and Elidjen (2015), for example, show that there are only 15.6% of e-Government services in Indonesia that are fully accessible and work properly. Almukhlifi, Deng, and Kam (2019) find the adoption of e-Government in Saudi Arabia ineffective due to the strong presence of cultural elements such as Wasta. Meanwhile, Shuib et al. (2019) discover that the low uptake of e-Government in Malaysia is due to users’ low satisfaction. Shahzad, Xiu, Khan, and Wang (2019) show that citizens in Pakistan are reluctant to adopt e-Government due to security concerns. Rouibah, Qurban, and Al-Qirim (2022) uncover the fears and risk perceptions related to data privacy that might hinder the adoption and the re-use of e-Government services in Kuwait. Although several studies have been conducted to identify the problems relevant to the unsatisfactory adoption of e-Government as discussed above, limited literature has been devoted to the solutions; the current research thus addresses three specific research gaps.

First, extant studies have shown that there could be various issues with the adoption of e-Government in developing countries such as Indonesia, and there could be contextual factors related to improving the adoption of e-Government that have not been adequately investigated. Second, countries have reached different stages of e-Government development (Obi & Naoko 2016; United Nations 2020), and the factors affecting the acceptance and usage of e-Government might vary and have significant implications for adoption-diffusion strategies. There is a need for a specific model that captures all contextual and other relevant factors to better understand the adoption of e-Government services from the perspective of citizens in Indonesia. Third, there is a lack of solution-oriented evaluation of critical factors leading to citizens’ adoption and use of e-Government services. The majority of e-Government adoption studies only focus on identifying and testing the effects of individual factors on the adoption of e-Government services (Gupta, Bhaskar, & Singh, 2016; Rodrigues, Sarabdeen, & Balasubramanian, 2016). Against the backdrop, this study aims to answer the following research questions:

- **What is the model for evaluating the adoption of e-Government services from the perspective of citizens in Indonesia?**
- **How can the citizens’ adoption of e-Government in Indonesia be improved?**

**THE DEVELOPMENT OF E-GOVERNMENT IN DEVELOPING COUNTRIES**

The development of the e-Government follows certain paths, levels of maturity, stages, or phases (Dwivedi et al., 2017; Verkijika & De Wet, 2018). Different countries implementing e-Government have different missions and objectives; however, the progressive development of e-Government system in any country trails some unique levels of service maturity for evolution (Dwivedi et al., 2017; Nam, 2019; United Nations, 2020). Each of the service levels represents different service patterns, levels of technological sophistication, types of interaction, security requirements, and reengineering processes (Al-Soud, Al-Yaseen, & Al-Jaghoub, 2014; Debjani et al., 2012; Krishnan, Teo, & Lim, 2013; Shareef, Kumar, Kumar, & Dwivedi, 2011). It can also be inferred that these levels describe the development of service maturity sequentially.
A review of the development of e-Government in the literature (Al-Soud et al., 2014; Deng et al., 2018; Krishnan et al., 2013; Alvedi Sabani, Deng, & Thai, 2019; Shareef et al., 2011; United Nations, 2020) leads to the identification of four stages including (a) emergence, (b) enhancement, (c) transaction, and (d) connection, as shown in Figure 1.

The emergence stage of e-Government development is about facilitating information delivery from the government to the public (United Nations, 2016). It is the initial stage where the government provides static information online. This stage focuses on delivering information, such as government agencies’ contact information and policy announcements. The quality of information is the primary concern within this stage (Wangpipatwong, Chutimaskul, & Papasratorn, 2009). The development of technologies then raises the expectation of citizens for e-Government to deliver services beyond information delivery (Debjani et al., 2012). This urges governments to enhance their e-Government to the next stage.

The enhancement stage of e-Government is about facilitating simple communication between the government and the public (United Nations, 2016). It is an intermediate phase where the government provides dynamic information and basic one-way transactions. One of the most common examples is online feedback, where citizens can submit their complaints on official websites. In addition to the information quality, the timeliness of information becomes one of the main concerns within this stage (Mishra & Mishra, 2011).

The transaction stage of e-Government is about improving the delivery of public services through the adoption of e-Government (United Nations, 2016). Such a stage of e-government development focuses on the establishment of unlimited two-way interactions between e-Government stakeholders, including citizens and public organisations (Irani, Al-Sebie, & Elliman, 2006). Citizens begin to take an active role in their adoption of e-Government services (Beynon-Davies, 2007). A typical example is the online taxation portal, in which e-Government enables citizens to file their taxes online (Karunasena & Deng, 2012).

The connection stage of e-Government is about redefining the delivery of public services by providing a one-stop integrated e-Government system in which citizens can immediately access all kinds of public services (United Nations, 2016). This is the final stage of e-Government development which assumes that horizontal connections between government institutions as well as vertical connections among central and local governments are in place (Shareef et al., 2011).

Many developing countries are still struggling to fully attain the transaction stage of e-Government (Dias Gonçalo, 2020; Khosro Mohammad & John, 2015; Nam, 2014; N. P. Rana, Dwivedi, Lal,
& Williams, 2015; Alvedi Sabani, Deng, et al., 2019). Since this current research is engaged in developing a model of adoption of e-Government by citizens in developing countries, it focuses on the transaction stage of e-Government. The reason behind this is that the initial two stages are widely developed and adopted in most countries. The final stage of e-Government development requires vertical and horizontal integration that is generally absent in developing countries and, in fact, this stage is not fully achieved even by many developed countries (Dwivedi et al., 2017; Shareef et al., 2011). Therefore, this stage is also not the focus of this research.

From the citizens’ perspectives, the enhancement and transaction stages have significant differences in characteristics and functionality. In the enhancement stage, citizens can only view and collect government information or download some forms and publications. At this stage, citizens cannot communicate with the government service system through this interface, and the government authority does not respond to the user electronically (Gottschalk, 2009). In the transaction stage, two-way communication is established. Through the government’s websites, citizens can interact with public administrations to resolve any issues in different electronic ways, such as sending e-mails, using chatrooms as well as obtaining more sophisticated public services.

Countries with different development stages of e-Government might differ in their intention to adopt e-Government for successful implementation. The enhancement and transaction stages particularly offer different modes of service with different levels of association of technology. As a result, the adoption criteria for different stages by citizens might have significant implications. However, limited literature has investigated and considered these criteria while exploring models for e-Government adoption. Considering the citizens’ requirements for the adoption of e-Government at different levels of service maturity, a further study on the development of a specific model for evaluating the adoption of e-Government at the transaction stage from the perspective of citizens in developing countries is required.

The Case of Indonesia

This research takes Indonesia as the context of the study. Indonesia is one of the developing countries that pursue the development of e-Government. It is a Southeast Asian nation made up of thousands of volcanic islands and is one of the biggest developing countries with over 270 million citizens (World Bank 2020). According to a recent study, internet penetration in Indonesia reached over 73.3% of the total population in 2020 (APJII 2020). Due to the archipelagic nature of the country and the dispersion of population along with the rapid development of technologies, the Indonesian Government believes that e-government is a very suitable platform to serve a large number of citizens (Republik Indonesia, 2014). Figure 2 presents an overview of e-government development in Indonesia. This program aims to improve the efficiency, effectiveness and transparency of the delivery of public services through the implementation of various e-government services (Obi & Naoko, 2016; Republik Indonesia, 2014; Alvedi Sabani, Farah, & Sari Dewi, 2019; Waseda University, 2017).

E-Government program in Indonesia is supported by other development plans including the development of human resources in public organisations, investments in ICT infrastructure to distribute e-Government servers throughout the national broadband network, improvements of public participation to develop citizen-oriented e-Government, formulation of policies and institutional changes to further support the development of e-Government. These plans are expected to create a supportive environment for the effective development of e-Government in Indonesia.

Having the rapid development of e-Government and a large number of online citizens, Indonesia is a suitable context for this study. Understanding the factors for the adoption of e-Government can help the Indonesian Government to better plan its e-Government initiatives. Moreover, as several developing countries are also in the transaction stage of e-Government development (United Nations 2018), this research would provide a valuable reference for other developing countries.
RESEARCH MODEL

This study aims to develop a research model for evaluating the adoption of e-Government from the perspective of citizens in developing countries, using the case of Indonesia. To achieve this, a Unified Theory of Acceptance and Use of Technology (UTAUT)-based research model is developed. This is due to several reasons. Foremost, the UTAUT is a unified model that has incorporated and outperformed all other technology adoption models (Maruping, Bala, Venkatesh, & Brown, 2017; N. Rana, Dwivedi, Lal, Williams, & Clement, 2017; Venkatesh, Thong, & Xu, 2016). Specifically, it comprises the top eight adoption theories in the information systems domain (Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh et al., 2016). The key factors of the UTAUT are inherited from established factors that are proven to be prominent in prior models (Venkatesh et al. 2003). Performance expectancy, for example, is derived from the perceived usefulness of the Technology Acceptance Model (TAM), the relative advantage of the Diffusion of Innovation (DOI), and the outcome expectations of the Social Cognitive Theory (SCT). Similarly, effort expectancy is rooted in the perceived ease of use of TAM, and the complexity of DOI. Social influence is established from the subjective norm of the Theory of Planned Behaviour (TPB), social factors of the model of personal computer utilisation (MPCU), and the image of DOI. Meanwhile, the factor of facilitating conditions is adopted from MPCU and the behavioural control of TPB. The UTAUT is, therefore, the most appropriate choice to represent all other dominant theories of technological adoption. In addition, the UTAUT is also proven to be the most reliable model to provide useful insights into technology adoption from the perspective of users (Venkatesh et al. 2012). From the review of related literature, it is also evident that the UTAUT is the most robust theory for investigating the critical factors for the adoption of e-Government under various circumstances (Dwivedi et al., 2017; Verkijika & De Wet, 2018).

The UTAUT has been adopted in various e-Government adoption studies across the world. Gupta et al. (2016), for example, extend UTAUT with trust and citizen satisfaction factors to identify the critical factors influencing e-Government adoption in India. Bhuasiri, Zo, Lee, and Ciganek (2016) integrate UTAUT with self-determination theory (SDT) to examine e-tax filling acceptance in
Thailand. Rodrigues et al. (2016) apply UTAUT with user satisfaction factors to examine the adoption of e-Government services from the perspective of citizens in the United Arab Emirates. Lu and Nguyen (2016) combine UTAUT and IS Success Model (DeLone & McLean, 2003) to investigate the adoption of an online tax filing service in Vietnam. Furthermore, Rabaa’i (2017) adopt UTAUT to identify the cultural factors influencing e-Government adoption in Jordan. Hariguna (2017) extends UTAUT with information and service quality factors to study public behavioural intention on the use of e-Government services in Indonesia. Meanwhile, Kurfalı et al. (2017) investigate the role of trust in citizens’ decision to adopt e-Government in Turkey. Alharbi, Papadaki, and Dowland (2017) extend UTAUT with grounded theory to analyse the impact of security and its antecedents in behaviour intention of using e-Government services in Saudi Arabia. These studies show the UTAUT model is appropriate for examining the adoption of e-Government in various contexts. Table 1 presents a summary of these studies.

In addition to the UTAUT constructs, this research partially adopts the IS Success Model to better understand the perception of citizens toward e-Government services. Accordingly, two core constructs of the model, information quality and system quality, are adopted in the research model. Furthermore, this proposed model further integrates additional factors, including perceived security and ICT literacy that are essential to e-Government adoption research from the perspective of citizens in developing countries (Shareef et al., 2011). These factors are deemed to play a vital role in influencing citizens’ decision to adopt e-Government. The integration of the UTAUT and these factors would help achieve more robust explanations of the adoption of e-Government from the perspective of citizens. Figure 3 presents the proposed research model for investigating the critical factors for e-Government adoption from the perspective of citizens in Indonesia.

In sum, our research model includes performance expectancy, effort expectancy, social influence, facilitating conditions, perceived security, information quality, system quality, and ICT literacy. Performance expectancy refers to the extent to which an individual believes that adopting technologies such as e-Government services would attain better performance (Venkatesh et al., 2003). Effort

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**expectancy** refers to the amount of effort that individuals must make to learn technologies (Venkatesh et al. 2003), such as using e-Government. **Social influence** refers to the degree to which citizens perceive the importance of others’ perceptions in the decision to adopt and use a given technology (Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012). **Facilitating conditions** refer to individuals’ perceptions of the resources and support available to technologies (Venkatesh et al., 2003; Venkatesh et al., 2012). **Perceived security** refers to the extent to which citizens feel protected against security threats resulting from the adoption of e-Government (Debjani et al., 2012). **Information quality** refers to the value of the information retrieved from a system such as e-Government (Wangpipatwong et al., 2009). **System quality** concerns the degree to which e-Government can provide citizens with better public services. It improves the perception of the usefulness of e-Government from the perspective of citizens as the system users (Almukhlifi et al., 2019). **ICT literacy** is defined as the extent to which citizens believe in their ability to access public services through the adoption of e-Government. The citizens’ perception of the expected benefit of using e-Government very much depends on their familiarity and skills with the different functions of computers and other ICT devices (Helen & Henry, 2020).

**RESEARCH METHODOLOGY**

This study adopts the qualitative approach, using in-depth interviews to examine the research model. This approach is chosen due to various advantages including the ability to capture personal emotions, perceptions and opinions of participants about the adoption of e-Government; the opportunity to ask follow-up questions based on the participants’ response; and the capacity to attain an in-depth understanding of the reasons behind the answers. Furthermore, existing studies that applied UTAUT to investigate the citizen adoption of e-Government (see Table 1) have predominantly taken the quantitative approach to validate the research models. A qualitative study would provide a different perspective to enrich the body of literature and gain a deeper understanding than quantitative research.
The interview questions have been developed based on a comprehensive review of the related literature, addressing the research model and grouped into three parts. The first part focuses on the demographic information of the participant. The second part includes general questions about the experience and motivation of participants in their adoption of e-Government. The third part consists of specific questions about the critical factors for the adoption of e-Government from the perspective of citizens. In addition, interviewees were requested to rate each factor on a scale of 1 to 10 to widely measure the influence level of each factor on their decisions in using e-Government services. The 10-point rating scale is adopted because it tends to be familiar to most participants by thinking of it in terms of a percentage (Dawes, 2008).

Interview questions were refined with the help of two e-Government experts, seven academics and ten e-Government users in Indonesia. Each participant in pretesting was given draft questions typed with triple line space, which allowed them to write comments on each question. They were encouraged to check all the aspects of the questionnaire, such as question wording, question order, redundant questions, missing questions, inappropriate questions, or confusing questions. Positive feedback is received from the pretesting of the interview questions, and changes were made to ensure the interview questions were comprehensible and clear. The revised interview questions are presented again for further feedback and confirmation.

The purposive snowball sampling method was used to select a suitable population sample for the interview. The idea behind purposive sampling is to concentrate on recruiting participants with particular characteristics to assist the relevant research (Howitt, 2013). This study recruited 15 interviewees from three provinces in Indonesia, namely Banten, Jakarta, and West Java (Wijarnoko, Asy’ari, & Rouf, 2020). Such locations were chosen because the majority of e-Government projects in Indonesia were developed and tested in these three provinces. The selection criteria for the interviewees include Indonesian citizens above years of age who have previously used e-Government services. Specifically, the potential participants were selected based on their answers to the following screening questions:

- Have you ever used e-Government services?
- What kind of e-Government services have you used?
- How often do you use e-Government services?

Given the interviewees were chosen based on their knowledge and experience in using e-Government services, this helped the researchers gain a deep understanding of the problem to help adequately answer the research question (Howitt, 2013). The interview participants have diverse demographic characteristics, as shown in Figure 4.

Thematic Analysis

This research employs thematic analysis to study the qualitative data from fifteen semi-structured interviews. Thematic analysis is a systematic way of categorising complex qualitative data into several themes for increasing accuracy in understanding and interpreting people’s experiences of a phenomenon (Attride-Stirling, 2001; Howitt, 2013). This research adopts the theory-driven thematic analysis for analysing the interview data with the use of the research model. The use of thematic analysis in this research is due to four main features (Braun & Clarke, 2006). Firstly, the capacity of thematic analysis to summarise the key features of a complex and large volume of data is an advantage of using it. Secondly, thematic analysis can provide social interpretations of complex qualitative data by generating unanticipated insights and underlining similarities and differences across the data set. Thirdly, the fact that thematic analysis is a relatively easy and quick method to analyse large and complex data is another reason for using thematic analysis in this research. Fourthly, the ability to generate findings in a way that is accessible to a wide range of stakeholders is another advantage of thematic analysis. Miles, Huberman, and Saldaña (2018)’s method of qualitative data analysis was
followed to identify a list of themes. The subthemes in thematic analysis mapping were assigned by using Q-sort approach involving three researchers (Van Biesen, Van Cauwenberge, Decruyenaere, Leune, & Sterckx, 2022). It is worth noting that the sorting phase was predominantly based on qualitative analysis rather than on strict quantitative techniques (Akter, D’Ambra, & Ray, 2013; Straub, Boudreau, & Gefen, 2004). The results were reverted to past studies, field notes and assertions from interviewees to consolidate understandings and solve disagreements. Furthermore, the thematic analysis results were then presented and reconfirmed with participants. In addition, interviewees’ exact wording was provided as direct quotations in the thematic analysis findings (Shenton, 2004).

Validity and Reliability

The trustworthiness in terms of validity and reliability of the research findings is always critical in qualitative research (Nowell, Norris, White, & Moules, 2017). Five types of trustworthiness criteria are widely discussed in qualitative research, namely, (a) credibility, (b) transferability, (c) dependability, (d) confirmability, and (e) reflexivity (Korstjens and Moser 2018; Nowell et al. 2017; Shenton 2004). Various procedures were applied to ensure the credibility, transferability, dependability, confirmability, and reflexivity of the research. Credibility generally refers to the accuracy of the research findings reported by the researcher. To ensure credibility, the research notes taken during the interviews were cross-checked with the digitally recorded interviews. Furthermore, the recorded interviews were listened to many times before being transcribed (Braun and Clarke 2006). Transferability is about establishing the domain to which a study’s findings can be generalised. To ensure transferability, the identified themes were checked against each and every interview transcript during the data analysis stage to ensure generalisation of the themes across multiple interview transcripts (Attride-Stirling 2001; Braun and Clarke 2006; Nowell et al. 2017). Dependability refers to accurately describing the meaning given by the participants to the research phenomena which is being studied by the researcher. To ensure dependability, informal conversations were made with selected interviewees during the thematic analysis stage for clearing up the areas of miscommunication. Furthermore, feedback was obtained from the selected interviewees for the thematic analysis findings for making sure that their viewpoints, experience, thoughts, and feelings were interpreted and portrayed accurately in the research (Korstjens & Moser, 2018). Confirmability is concerned with establishing that the researcher’s interpretations and findings are derived from the data. To maintain confirmability during the thematic analysis process, pattern matching and explanation building were performed (Braun and
Clarke 2006). Reflexivity refers to the evidence of the decisions and choices made by the researcher regarding theoretical rationalisation developed from research fitting the data. Reflexivity is ensured in this research in several ways. Spending significant time collecting data by studying the interviewees and their backgrounds helps the researchers build more detailed theoretical explanations for the thematic analysis findings. Moreover, time spent discussing and explaining the research findings is extremely useful in this research for identifying specific problems that may occur in the thematic analysis process.

**RESEARCH FINDINGS**

Findings from the thematic analysis confirmed eight factors, including performance expectancy, effort expectancy, social influence, facilitating conditions, perceived security, ICT literacy, service quality and information quality as well as two emerging factors, including perceived transparency and government encouragement. In addition, the level of influence of each factor on the adoption of e-Government services was also assessed from the interviews. The summary of the thematic analysis network is presented in Figure 5.

The result suggests performance expectancy, effort expectancy, system quality, and perceived transparency are factors that strongly influence the adoption of e-government from the perspective of Indonesian citizens. Social influence, facilitating conditions, perceived security, information quality, and government encouragement are moderately significant. Meanwhile, ICT literacy is the least significant factor in the adoption of e-Government in Indonesia.
Performance Expectancy

Previous research established the influence of performance expectancy on the adoption of e-Government in developing countries including Pakistan (Ovais Ahmad, Markkula, & Oivo, 2013), Saudi Arabia (Alshehri, Drew, Alhussain, & Alghamdi, 2012), Turkey (Kurfalı et al., 2017), and India (Saxena, 2017). This research further confirms and adds that performance expectancy is the most influencing factor for nine interviewees to adopt e-Government in Indonesia. Interviewees believed that e-Government had enabled them to access public services without time and space constraints, as explained by an interviewee as follows:

“Improving performance and efficiency is the main reason why I am using e-Government. With e-Government, I do not have to take a day off to report my annual tax, as the online service is available 24/7 whereas taxation offices only open on standard working hours.”

It is also shown that e-Government streamlines public services to become simpler, faster and more cost-effective. Citizens can reduce the number of physical visits to government offices by using e-Government services. Interviewees, therefore, believed that e-Government saves their time and money, as well as makes their lives easier. This assertion was supported by an interviewee who noted that:

“E-Government makes it (government-related services) simpler, cheaper and faster, as we do not need to come and waste our time in the long queue. In that regard, it is very efficient.”

Effort Expectancy

Effort expectancy is asserted to play a significant role, especially in the early stage of e-Government adoption as humans by nature often hesitate to adopt a new system which has been acknowledged in the literature (Puspitasari & Ishii, 2016). In the context of Indonesia, the majority of the interviewees further confirmed that effort expectancy is an important component of supporting the adoption and continual use of e-Government services, as illustrated by an interviewee’s answer as follows:

“I have seen a few potentially great e-Government services without clear information on how to use it, thus I ended up not using the system, which is not good. The government should provide a clear procedure or a video to educate on how to use the particular service. Otherwise, it is a waste of development as no one will use it.”

Accessing public information and services through e-Government system is a direct way of accessing government information and an alternative to relying on third-party channels such as newspapers, radio and private television channels. This study shows that the government is considered a more reliable source of public information than alternative sources. However, many citizens often face difficulties in accessing e-Government websites due to poor navigation design, which may lead to a low uptake of e-Government as previously indicated in the literature (Li, 2021). This assertion was supported by an interviewee who noted that:

“I have been eager to use e-Government to renew my STNK (Vehicle Registration Certificate). However, the navigation of the system and the Traffic Police website, from my experience, were a nightmare, it was very difficult to use.

Social Influence

Apart from performance expectancy and effort expectancy that have been widely discussed in the literature (Deden, Teddy, Mohd Farhan, & Mohamad Aizi, 2017; Hermana & Silfianti, 2011;
Mirchandani et al., 2008), findings from this research also established that social influence significantly affects the adoption of e-Government. Social influence is defined as the compression by a person’s proximity to take specific actions or adopt certain values (Sabani, 2021). The findings suggest that the influence of family, friends and co-workers has some impact on an individual’s intention to adopt and use a socially acceptable system such as e-Government, which has not been explored in the Indonesian e-Government research. This is demonstrated by an interviewee who stated that:

“I use e-Government to report my income tax because coworkers recommend and help me to use the (e-filling) system. Now, I am actively encouraging the use of e-Government to my friends and families.”

Under these social pressures, individuals are encouraged to recognise the advantage of innovation and embrace the need to adopt e-Government to satisfy their needs for public services. This is a new finding that has not been fully examined in other e-Government adoption studies. The cultural aspect of collectivism which is featured in Indonesian society may play a significant role in this factor, and thus further research on a different context is required. This assertion is also echoed in a recent study that shows cultural dimensions are significant predictors of e-government (Kumar, Baishya, Sreen, Sadarangani, & Samalia, 2021).

Facilitating Conditions

In the context of e-Government, facilitating conditions refer to the quality of being able to reach e-Government services (Idris, 2016). This includes the ability to access e-Government from multiple devices including personal computers and mobile phones, and public places such as public libraries and government offices. It was found in this research that this factor also influences the adoption of e-Government, which is also in line with what was reported in the literature (Jaeger et al., 2007; Puspitasari & Ishii, 2016). The interest of citizens in accessing government systems through mobile phones is also revealed in this study. The delivery of government services and information through mobile phones is considered valuable due to the convenience, mobility and personalized nature of this mode of delivery. It was indicated through the thematic analysis that mobile phones are the preferred communication channel for the majority of the interviewees in accessing e-Government, as explained by an interviewee that “Mobile phone is my preferred device to access e-Government, as I spend most of the time away from computers.”

Due to limited internet data access and availability of ICT devices, the value of accessing e-Government systems through public access points including kiosks and front office counters is another important theme discovered in this study. Particularly, for specific services involving a significant amount of data entry such as online tax lodgement, citizens demand public access at libraries and government offices due to (a) time savings and monetary benefits that citizens receive by obtaining services from computerised counters, (b) convenience for citizens, and (c) reduction of corruption in the provision of public services. This is demonstrated by an interviewee who stated that:

“The government should provide computers for public use at immigration and taxation offices.”

Public access points in libraries and public organizations are very much valued. This can lead to a dramatic improvement in the performance of public organizations in delivering public services.

Perceived Security

Perceived security relates to the implementation of policies for securing the information in e-Government (Debjani et al., 2012), such as the protection of information from unauthorized access, by ensuring that information is only accessible to the right users (Posthumus & Von Solms, 2004). It is envisaged that issues relating to information security may ruin the trust of citizens in adopting
e-Government, since personal and sensitive information may be leaked out and used for malicious purposes if they are not securely protected through e-Government services. Many interviewees claimed that they are afraid to disclose their sensitive information such as bank and credit card details to public organizations. Taking necessary measures to prevent unauthorized access to citizens’ sensitive information in e-Government systems is important. Moreover, this study reveals that the disclosure of identifying information such as their names, telephone numbers, email and postal addresses is an issue for many citizens. Interviewees expected that people authorized to access their information would not misuse their sensitive information and disclose their identity. This is elaborated by an interviewee noting their experience:

“I have seen a potential misuse due to mishandling of data from the department of education. The department implemented an online database of students from primary to university level to subdue fake certificate issues. When my child was graduating from elementary school, I searched up by his name and school. The system somehow displayed all his details including home address and landline. It was a concern to me, although the department has now fixed it.”

It has been argued in the existing literature that citizens are concerned about the information security breach (AlKalbani, Deng, Kam, & Zhang, 2017; El-Haddadeh, Tsohou, & Karyda, 2012), such as the potential misuse of information stored in e-Government databases. Consequently, citizens may hesitate to adopt e-Government due to security concerns. The findings of this research, however, have shown another perspective noting that paper-based services also carry similar or even greater risks compared to online ones. This is reflected in the opinion of an interviewee as follows:

“I have no problem with submitting my sensitive information online, as sometimes you have to live with your personal data at risk. For example, if we are talking about the manual submission directly to the office, the file can be misplaced, misused and other problems.”

In addition, findings from the interviews highlight the importance of having an official account for information security confidence in using e-Government services. An interviewee, believing that establishing an official developer account for e-Government applications can increase citizens’ confidence and eliminate confusion from third-party applications, argued that “The government should have an official account at App Store, so we know the application is secured and legit”.

Information Quality
Information quality which refers to the value of the information provided by e-Government (Wangpipatwong et al., 2009) was also found to influence e-Government adoption and use. The value of information quality is an important organizing theme discovered in this study. It is abstracted from the basic themes of (a) accurate, (b) relevant, (c) up-to-date, and (d) simple and understandable information. It can be assessed by measuring the value of the supplied information, based on its accuracy, relevancy, and timeliness. Specifically, accuracy refers to the degree of errors relating to the information provided; relevancy is about the degree of match between the information provided, and that is requested; and timeliness measures if the information is provided at the right time (Wangpipatwong et al., 2009). In this research, the interviewees further confirmed the importance of information quality and how this factor positively influences the adoption of e-Government as it does in other studies (Almukhlifi, Deng, & Kam, 2018; Deng et al., 2018). An interviewee remarked as follows:

“For e-Government to be successful, it has to provide up-to-date and accurate information. I have to be able to trust the information I receive from e-Government before I want to use the system.”
This research also revealed that having access to the latest and accurate information, which is provided in an understandable manner increases citizens’ confidence in adopting e-Government as it could affect the level of trust and performance expectancy, which are crucial to the adoption of e-Government. An interviewee elaborated on this as follows:

“When I browse a government website, the first thing I check is whether they have a new post or announcement. If there is no recent update, I am very skeptical of using the service or believing that the information provided is still relevant.”

System Quality

The findings suggested and confirmed that system quality significantly influences the adoption of e-Government services through performance expectancy and effort expectancy. This research further shows that a bad experience using e-Government services can significantly demotivate citizens to adopt e-Government. This view is elaborated by an interviewee as follows:

“I have a horrible experience with using e-Government. For me, to use e-Government again, the system has to be proven to work properly; otherwise, I will not touch the system. When I tried to lodge my tax online last year, the server kept crashing, and I had to resubmit all my data as there was no autosave function. It was such a terrible experience. I ended up lodging it manually, which took me a whole day, but at least it got the job done.”

The functionalities of e-Government services are valued by the citizens. Specifically, complex e-Services that facilitate citizens to renew driver’s licenses, land permits, and vehicle registrations are appreciated by citizens. Simple e-Services that provide facilities to track the status of an application submitted, download forms, and search databases are also regarded as valuable. Both simple and complex functionalities of e-Services help citizens to save money and time due to the convenience that they provide to citizens. A majority of the interviewees stressed that the government should have a proper plan to make citizens aware of the available e-Government services and their value for citizens. In this relation, the findings show that there is a need for an integrated one-stop portal of all kinds of e-Government services, as elaborated by an interviewee in the following:

“I am not quite sure what e-Government services are available due to low publicity…. the government should create a one-stop portal for citizens to check and find all kinds of e-Government services available.”

It is also noted that interconnecting e-Government systems from multiple public organizations under one roof would create further benefits to citizens, improve effort expectancy, and thereby strengthen the uptake of e-Government services.

ICT Literacy

ICT literacy is the extent that citizens are confident in the ability to use ICT peripherals at an adequate level to perform a specific task (van Deursen & van Dijk 2011). This would potentially affect individuals’ perception of performance expectancy, effort expectancy and system quality. If a citizen is confident in his or her capability regarding computers, she or he is more likely to access public services through the adoption of e-Government (Susanto & Goodwin 2013). Such confidence can help to overcome specific difficulties in using e-Government. In the case of Indonesia, although the country has a high level of internet and technology usage, there are still many citizens, particularly older generations, who have a low level of ICT literacy and may not be able to fully utilise e-Government services. This is elaborated by an interviewee as follows:
“I believe the current e-Government is designed for intermediate ICT users, whereas it should be designed to cater to all kinds of people including those who are not literate with ICT.”

**Government Encouragement**

Government encouragement has emerged as a new factor from the thematic analysis that can be defined as the actions taken by the government to support the adoption of e-Government. Government encouragement can be assessed by measuring the level of effort taken and incentives provided by governments to encourage their citizens to adopt e-Government. In this respect, an interviewee shared his opinion about the poor awareness of e-Government services in Indonesia as follows:

“The socialization of e-Government services aside from e-filling for the tax is very poor, how are we supposed to adopt the service if we do not know the existence of them in the first place.”

This research also highlights the need for ICT training and the availability of support centres to encourage and help citizens to adopt e-Government. This is elaborated by an interviewee as follows:

“I found it quite difficult to use the e-filling system and there was a lack of support system. The government should provide training or at least a helpline such as a call center where I can get necessary help and support”

Furthermore, the respondents of this current research suggested that the government may encourage and inspire its citizens to use e-Government services through awareness building using social media (e.g. YouTube) and social networking sites (e.g. Facebook, Twitter). This is suggested by an interviewee as follows:

“The government might have provided several e-Government services, but the awareness is very low due to the lack of publicity. YouTube and social media advertising should be utilized to raise awareness.”

**Perceived Transparency**

Perceived transparency is defined as the degree to which the users perceive that the adoption of e-Government would increase the accountability of public organizations. It emerges from the thematic analysis as one of the most significant factors that influence the adoption of e-Government services from the perspective of citizens. It relates to the availability of relevant decision-making information and procedures to citizens through e-Government.

Informing citizens through the internet about public organizations’ activities, such as how a public organization’s budget is managed and how public funding is spent is valuable. Disclosing information relating to the issues such as on which projects the government is investing, on what basis tenders are awarded, to whom tenders are awarded, and the progress of the projects already undertaken is also appreciated by citizens. Such disclosure helps to fight corruption in public organizations, thereby increasing the transparency and accountability of the government. This is elaborated by an interviewee as follows:

“I have been paying tax for years, yet I have no idea how this fund is spent. The government has developed e-filling but not e-reporting.”

There is a strong demand for public organizations to disclose their decision-making processes online. The facilities for citizens to make online inquiries about various public services, for example, making online inquiries about the status of an application submitted or inquiring about the reasons why an application is rejected, are also valued. This is reflected in the opinion of an interviewee as follows:
“Before the introduction of e-Government, it was very difficult to find a clear procedure on how to upgrade my land and building development permits. Now, with this mobile application, I can track the progress of my application and contact the responsible personnel for my query easily.”

**REVISED MODEL**

From the thematic analysis, government encouragement and perceived transparency were emerged and added to the research model. Figure 6 presents the revised research model for investigating the critical factors of e-Government adoption and use from the perspective of citizens in Indonesia.

**Figure 6. The revised model**

In fulfilling the first research question, the revised model refines the established relationships among all factors and incorporates new factors including perceived transparency of public decision-making and government encouragement as contextual factors that are unique to Indonesia. Public organizations in Indonesia are often criticized for the lack of transparency and high level of corruption (Kristiansen, Dwiyanto, Pramusinto, & Putranto, 2009; Prahono & Elidjen, 2015). Promoting the transparency of public decision making by developing e-Government has become the main focus for the Government of Indonesia to fight corruption (Obi & Naoko, 2016; A. Sabani, Deng, & Thai, 2018).

Throughout the COVID-19 pandemic, governments have shared information through their national portals, mobile apps, and social media platforms. A review of the national portals of 193 United Nations Member States indicates that governments have exhibited increasing levels of transparency when reporting and sharing crisis-related information (United Nations, 2020). Governments have demonstrated great agility in developing dedicated COVID-19 portals and government-supported apps to provide continually updated information and resources. Several governments must be highly commended for rapidly developing and deploying innovative online services designed to contribute to the fight against COVID-19.

In relation to government encouragement, failures in the adoption of e-Government in Indonesia are often due to the lack of government support for citizens to adopt e-Government (Liang, Qi, Wei, & Chen, 2017; Nurdin, Stockdale, & Scheepers, 2012; Verkijika & De Wet, 2018). About 85% of e-Government initiatives in Indonesia suffer sustainable failures; these e-Government services may work at the beginning of the adoption, but then they are eventually left behind after a certain period (Hwang & Syamsuddin, 2008). Therefore, analyzing the significance of transparency and government encouragement in the revised model would be beneficial to better understand the adoption of e-Government in Indonesia.
IMPLICATIONS

Embracing digital transformation e.g., e-Government is increasingly prescribed as a key driver of sustainable development (Farah & Sabani, 2019; United Nations, 2020). Meanwhile, COVID-19 pandemic has exposed the need for improvement in e-Government services to ensure an effective provision of public service delivery. Given the noticeable success of e-Government services in developed nations, developing countries continually review and revise e-Government adoption strategies to best address their citizens’ needs. However, the adoption and eventual success of e-Government rely on citizens’ willingness to use e-Government services. It is crucial for governments and public organizations to review and prioritize factors which are perceived by citizens as having a strong influence on their decision to adopt and use e-Government services. For establishing priorities, derived from our analysis, Figure 7 summarizes the suggestions for public organizations to improve the citizens’ uptake of e-Government services based on the Action Priority Matrix (APM).

To fulfill the second research question, the APM is developed and assessed based on user value and feasibility. The user value is determined based on the thematic analysis of how significant the factors influence citizens’ decision to adopt and use e-Government services. The findings suggest that performance expectancy,

Figure 7. The action priority matrix
effort expectancy, system quality, and perceived transparency are factors that strongly influence the adoption of e-government from the perspective of Indonesian citizens. Alternatively, social influence, facilitating conditions, perceived security, information quality, and government encouragement are moderately significant. Meanwhile, ICT literacy is the least significant factor in the adoption of e-Government in Indonesia.

Feasibility can be classified as short-term or long-term depending on the level of effort required by public organizations to enhance and sustain the factors. Improving transparency, system quality, security, information quality, and government encouragement is highly feasible because these factors are within the direct control of public administrations to action within a short time. Improving ICT literacy and social influence is a long and challenging process for Indonesia, especially with large numbers of citizens (Puspitasari & Ishii, 2016; Urbina & Abe, 2017). Similarly, enhancing performance expectancy and effort expectancy may require improvement in system quality and information quality. These factors are less feasible as they are not within the direct control of public organizations.

Based on the feasibility and user value, the APM entails four quadrants namely sustain, nurture, grow and build. Sustain refers to high user value and short-term feasibility. Public organizations should prioritize sustaining their implementation of these factors. Sustain factors, including perceived transparency, system quality, perceived security, and information quality, are the most attractive, because they are highly valued by citizens for relatively less effort to sustain. The top priority should be given to these factors. Next, perceived transparency and information quality can be sustained by frequently updating e-Government services with relevant and up-to-date information, particularly in terms of public service delivery, public procurement, and budget expenditure. System quality and perceived security can be sustained by frequently updating e-Government system. The research findings further suggest there is a need for an integrated one-stop portal of all kinds of e-Government services for ease of access and standardizing public services. This is also an opportunity for the Government to consolidate and integrate e-Government databases across public organizations. This would improve the security of e-Government services from unauthorized access to citizens’ sensitive information that has been one of the main factors that discourse citizens from adopting and continuously using e-Government services.

Nurture refers to high user value and long-term feasibility. Nurture factors, including performance expectancy, effort expectancy, and social influence, are the second most attractive, because these factors are highly appreciated by citizens, but might not be as feasible in the short term as they require considerable effort and are perhaps time-consuming. Therefore, public organizations should aim to nurture the implementation of these factors so that they can become sustain factors in the long-run. In this vein, performance expectancy can be nurtured by constantly enhancing the quality and expanding the range of e-Government services. Similarly, effort expectancy can be nurtured by developing a more user-friendly system and providing education on how to use e-Government services. Positive feedback from the improved performance expectancy and effort expectancy would potentially pull social influence to the sustain quadrant.

Grow refers to low user value and short-term feasibility. Factors including government encouragement and facilitating conditions are feasible, but less impactful at the moment for Indonesia. Public organizations should aim to grow their implementation of these factors so that they can become more impactful and transform into sustain factors in the long-run. Government encouragement and facilitating conditions are within the direct control of public organizations. Several strategies can be taken to strengthen these two factors including investing in ICT infrastructure such as 5G network and adding financial incentives such as less expensive passport processing fees for online applications. These initiatives would support the adoption and motivate more citizens to use e-Government services.

Build relates to low user value and long-term feasibility. Public organizations should aim to build these factors so that they can become either grow then eventually sustain factors or directly to become Sustain factors in the long-run. Improving ICT literacy requires significant effort to achieve and takes a considerable process. The large number of citizens distributed in an archipelagic country leaves many people, particularly older generations, and those in remote areas, with limited ICT literacy and may not be able to fully utilize e-Government services. Investments in ICT infrastructure and education need to be made to improve ICT literacy. The result of closing this digital divide
might take several years to be impactful and decades to complete. Based on the above assessment, the priority for improving the citizens’ adoption of e-government should be in the order of Sustain factors (perceived transparency, system quality, and perceived security), followed by Nurture factors (performance expectancy, effort expectancy, and social influence), then by Grow factors (facilitating conditions and government encouragement) and finally Build factor (ICT literacy).

CONCLUSION

Although countries may have different and extensively diverged e-Government strategies, they share a fundamental goal i.e., to serve citizens better. While there is evidence for substantial growth, development, and implementation of e-Government services globally, it is not clear whether all citizens, particularly in a developing country like Indonesia are ready to embrace those services. The objective of this study is to develop a research model that explores the dimensionality of related constructs for future study as explained in the previous section, and to propose suggestions on how the adoption e-Government services in Indonesia can be improved, as presented in the APM. The research findings from the thematic analysis indicate that performance expectancy, effort expectancy, system quality, and perceived transparency are important factors adoption of e-government from the perspective of Indonesian citizens. In addition, social influence, facilitating conditions, perceived security, information quality, and government encouragement are moderately important. Meanwhile, ICT literacy is the least important factor in the adoption of e-Government in Indonesia.

The findings of this study make several contributions to theory building and management practice. From the theory-building perspective, this paper presents a research model for examining the adoption of e-Government from the perspective of Indonesian citizens. The use of the UTAUT model is extended by incorporating variables that are relevant to the adoption of e-Government in Indonesia. Apart from the common belief which focuses predominantly on performance expectancy and effort expectancy for examining the adoption of e-Government, findings from this study also suggest that it is necessary to capture the social influence factors, which are in line with the cultural aspect of collectivism evidenced in the Indonesian society. To address the identified research gaps, this study contributes to advancing the current understanding of the critical factors which influence the adoption of e-Government by emphasizing the effect of external factors such as those from the cultural perspective. In addition, two factors including perceived transparency of public decision making and government encouragement emerged from an exploratory qualitative study, which would have not been to be discovered in a confirmatory quantitative study. These two emerging factors are incorporated in the revised model.

In terms of managerial and policy implications, findings from this research provide the government and public organizations in Indonesia with relevant suggestions on how the uptake of e-Government can be improved that is by focusing on the factors which are perceived by citizens as having a strong influence on their decision to adopt e-Government services. Specifically, the suggestions in the Action Priority Matrix developed in this research can be used by policymakers to prioritise their policies in different phases. Such suggestions have not been adequately provided in previous studies. These suggestions can lead to the formulation of better strategies and policies for the continuous development of e-Government that would hopefully lead to improving the adoption of e-Government services in Indonesia.

In regard to future direction, since the framework of this research was only validated by fifteen in-depth interviews, its generalizability remains limited. As a result, future work would be to test the revised model with a large-scale quantitative survey. Similarly, this model can be tested in other developing countries and identify the similarities and contrasts to develop a unified e-Government adoption model in developing countries.

DISCLOSURE STATEMENT

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