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Cross-Country Determinants of Citizens' E-Government Reuse Intention: Empirical Evidence from Kuwait and Poland

EXTENDED ABSTRACT

Purpose: Despite the major IT investments made by public institutions, the reuse of e-government services remains an issue as citizens hesitate to use e-government websites regularly. In this study, we investigate the cross-country determinants of e-government reuse intention by proposing a theoretical model that integrates constructs from (1) the Delone and McLean IS success model (i.e., system quality, service quality, information quality, perceived value, and user satisfaction); (2) the trust and risk models (i.e., citizen trust, overall risk, time risk, privacy risk, and psychological risks); and (3) Hofstede's cultural model (i.e., uncertainty avoidance, masculinity, individualism, and cross-cultural trust and risk).

Design/methodology/approach: Based on data from interviews with 81 Kuwaiti citizens and surveys of 1,829 Kuwaiti and Polish citizens, we conducted comprehensive, cross-cultural, and comparative analyses of e-government reuse intention in a cross-country setting.

Findings: The results show that trust is positively associated with citizens' intention to reuse e-government services, whereas risk is negatively associated with citizens' perceived value. We also found that masculinity–femininity and uncertainty avoidance are positively associated with the intention to reuse e-government services and that individualism–collectivism has no significant relationship with reuse intention. This study's findings have important implications for researchers and practitioners seeking to understand and improve e-government success in cross-country settings.

Originality/value: We developed a parsimonious model of quality, trust, risk, culture, and technology reuse that captures country-specific cultural contexts and enables us to conduct a comprehensive, cross-cultural, and comparative analysis of e-government reuse intention in the cross-country setting of Kuwait and Poland.

KEYWORDS: D&M IS success model, e-government reuse intention, cross-country comparative analysis, trust, perceived risk, Hofstede's cultural model

1. Introduction

E-government is the use of information technology (IT) by public institutions to transform their interactions with citizens, businesses, and other government agencies through (1) reforming public administration, (2) improving the accessibility and quality of public services, (3) reducing dependence on paper-based services, (4) increasing the transparency of the management of public resources, and (5) strengthening public governance (Twizeyimana & Andersson, 2019). A variety of e-government models have been developed to provide services to different stakeholders, including G2C for citizens, G2B for businesses, G2G for government agencies, and G2NPO for nonprofit organizations. This study investigates citizens' intention to reuse G2C services.

Despite the significant IT investments made by public institutions, citizens' reuse of e-government services is still an issue, because citizens hesitate to use e-government websites on a day-to-day basis even though they regularly use social networks and e-commerce sites for everyday transactions (Pérez-Morote et al., 2020). This hesitation can also be partly attributed to the constant decline of public trust in federal governments and institutions due to issues such as "the partisan paralysis in government, the outsize influence of lobbyists and moneyed interests, the confusion arising from made-up news and information, the declining ethics in government" (Rainie & Perrin, 2019). For example, as a consequence of public distrust in governments arising from their poor responses to the COVID-19 pandemic, many citizens refused to provide information for contact tracing using the governments' COVID-19 mobile app (Jennings et al., 2021). Other reasons why citizens might hesitate to reuse e-government systems include difficulty to navigate the system, concerns about personal information privacy, limited access to reliable technology or internet service, preference for interacting with government agencies in person or via mail or phone, and language barriers (Khan et al., 2021).

Transactions on e-government websites, such as online payments and voting, occur in the absence of prior human interaction or previously established interpersonal relationships on which trust is normally built (Floropoulos et al., 2010). For example, when interacting with e-government websites, citizens gather information and make decisions about what to search for (information service) or pay for (transaction

service). This process can be associated with (1) uncertainty about whether a website fits one's needs, (2) the risk of data misuse or of the theft of confidential data, and (3) skepticism about the website's ability to provide information or execute transactions as promised (Beldad et al., 2011). E-government websites that are poorly designed and difficult to navigate can create additional uncertainties and risks related to locating relevant information or completing transactions, which in turn can lead to distrust in, low use of, or simply no use of e-government services (Kourouthanassis et al., 2016). Thus, identifying and understanding the mechanisms that reduce uncertainties and risks is crucial for increasing the reuse of e-government websites for day-to-day transactions.

The Delone and McLean (D&M) information systems (IS) success model (2003) is particularly relevant for studying e-government system reuse due to its comprehensive theoretical model and validated use in numerous research contexts. DeLone and McLean (1992) proposed the initial model, which included six variables: system quality, information quality, use/intention to use, user satisfaction, and net benefits. The D&M model was later revised to include service quality (Delone & McLean, 2003). Notably, the D&M IS success model incorporates design-artifact factors—information quality, system quality, and service quality—that can offer insights into ways of improving e-government websites to increase their adoption and (re)use. However, a few studies have adopted the D&M IS success model to investigate e-government adoption and (re)use behaviors (e.g., Kaisara & Pather, 2011; Rana & Dwivedi, 2015; Stefanovic et al., 2016; Teo et al., 2008; Veeramootoo et al., 2018; Wang & Liao, 2008) even though it is an especially good fit for this research context. Moreover, most related studies have been conducted in the US and China, leaving an open question on its applicability to other countries in an e-government context.

Despite the importance of citizens' perceptions of their trust in a website and of its riskiness, it is remarkable that no studies have incorporated both risk and trust into the D&M IS success model in an e-government context. Instead, studies have integrated either risk (Rana & Dwivedi, 2015; Veeramootoo et al., 2018) or trust (Teo et al., 2008), but not both, into the D&M IS success model. There are also significant differences in perceptions of trust and risk across demographics and contexts, and further construct development is necessary to fully capture their influence on e-government adoption and (re)use. For

example, studies conducted in Arabic contexts have offered conflicting results about both positive (Abu-Shanab, 2014, 2017) and negative (Alzahrani et al., 2018) influences of risk on trust, and only one study (i.e., Alzahrani et al., 2018) used a comprehensive risk construct comprising of performance risk, technical risk, and time risk. Furthermore, studies examining the relationship between trust and e-government adoption and (re)use have produced conflicting results. Some studies have found that trust has a positive influence on e-government adoption and (re)use (e.g., Munyoka & Maharaj, 2017; Schaupp & Carter, 2005; Teo et al., 2008), while other studies have found no relationship between trust and e-government adoption and (re)use or that trust has less effect on the intention to reuse e-government than other factors (e.g., Carter & Bélanger, 2005; Horst et al., 2007). Given that trust and risk are competing forces, with risk being negative and trust being positive, developing an integrated model that includes both constructs can lead to a more comprehensive and robust understanding of e-government adoption and (re)use.

Although e-government systems have been deployed in literally every nation and culture, adoption and (re)use studies have rarely addressed nation- and individual-level cultural considerations, and most studies have focused on the US and China. This is a significant research gap, because a substantial number of IS studies have indicated that cultural differences have a strong influence on the perception, use, and acceptance of IS in general (e.g., Leidner & Kayworth, 2006; Lowry et al., 2011; Srite & Karahanna, 2006; Yoon, 2009). Although all e-government systems are directly tied to the nation- and individual-level culture, only five studies have incorporated cultural considerations into their models. For example, Aladwani (2013) conducted a comparative analysis in Kuwait and the United Kingdom to examine e-government website quality across cultures rather than to investigate how individual-level cultural factors from well-established culture models affect e-government adoption. Hence, studies have generally overlooked the importance of performing cross-cultural comparisons from uncertainty avoidance, masculinity–femininity, collectivist–individualist, and trust and risk cultural perspectives.

We address these compelling research opportunities, by investigating the cross-country determinants of e-government reuse intention based on the constructs of quality, trust, risk, culture, and technology adoption. Considering the importance of designing and implementing e-government websites that

strengthen citizens' reuse intentions, we propose a theoretical model that integrates the (1) constructs of the D&M IS success model (i.e., system quality, service quality, information quality, perceived value, and user satisfaction); (2) constructs of trust and risk models (i.e., citizen trust, overall risk, time risk, privacy risk, and psychological risks); and (3) leverages the constructs of Hofstede's cultural model as controls (i.e., uncertainty avoidance, masculinity, individualism, and cross-cultural trust and risk). The development of our model was guided by the following research question: *What are the key cross-country determinants of citizens' e-government reuse intention?* To answer this research question, we developed a parsimonious model of quality, trust, risk, culture, and technology reuse that captures country-specific cultural contexts and enables us to conduct a comprehensive, cross-cultural, and comparative analysis of e-government reuse intention in the original cross-country setting of Kuwait and Poland.

2. Theoretical Development

Here, we provide an overview of the research on the D&M IS success model, trust and risk models, and Hofstede's cultural model in the context of e-government, which represents the theoretical foundation for our research. Appendix A provides full details of the related literature review for this section. In §2.1, we discuss the role of e-government service quality, its perceived value, and satisfaction in shaping citizens' adoption and reuse behaviors. In §2.2, we elaborate on the importance of trust and risk for citizens' decision to adopt and reuse an e-government system. In §2.3 , we elaborate on the influence of cultural constructs, trust, and risk on citizens' e-government adoption and reuse behaviors.

2.1. D&M IS Success Model

The D&M IS success model (2003) is a widely used model for evaluating the success of IS in organizations and can be used to identify areas for improvement and to guide the development and implementation of new IS. The D&M IS success model is based on the premise that the success of an IS should be evaluated based on its influence on three main areas: the individual user, the organization, and the wider society (DeLone & McLean, 1992). The model identifies six key constructs (Delone & McLean, 2003): system quality, information quality, service quality, user satisfaction, individual effects, and organizational effects.

After its initial proposal by DeLone and McLean (1992), the D&M IS success model has been critiqued

and improved by several researchers (e.g., Rouibah et al., 2018; Seddon, 1997; Wang, 2008). Wang (2008) argued that the model had three serious limitations because both the use and perceived usefulness constructs were inconsistent with the IS acceptance and consumer behavior research.[i] Accordingly, Wang (2008) proposed a respecified and validated model with six dimensions: system quality, information quality, service quality perceived value, user satisfaction, and intention to reuse. This newly proposed model specified that intention to reuse is influenced by perceived value and user satisfaction, which are in turn influenced by system quality, information quality, and service quality perceived value. , Rouibah et al. (2015) adopted and further expanded on the improvements by Wang (2008) to examine business-to-consumer e-commerce success in the Arab world after making several further enhancements. Rouibah et al. (2015) made three improvements: (1) expanded system quality, making it a second-order formative construct consisting of three reflective subconstructs: ease of use, reliability, and security; (2) conceptualized perceived value to account for monetary and nonmonetary value; and (3) improved service quality to include empathy (i.e., site intelligence), reliability (i.e., transparent order tracking), and responsiveness (i.e., customer-support responsiveness).

The D&M IS success model provides a comprehensive and multidimensional model for evaluating the success of e-government reuse. The model may be a better choice than other IS adoption models (e.g., TAM, UTAUT, DOI, and others) for studying e-government reuse for three key reasons. *First,* the D&M IS success model provides a comprehensive model for evaluating IS success by considering multiple constructs, including system quality, information quality, service quality, user satisfaction, individual effects, and organizational effects (Wang & Liao, 2008). This enables a more thorough evaluation of the success of e-government reuse, considering various influence dimensions. *Second,* the model considers the effects of IS on individual users, organizations, and wider society (Delone & McLean, 2003). This perspective is particularly relevant for e-government reuse, which has implications not only for the government agency implementing the system but also for citizens and businesses who interact with the system. *Third,* the D&M IS success model emphasizes the importance of long-term success, beyond just the initial adoption and implementation of an IS (Jeyaraj, 2020). This is important for e-government reuse,

which often involves long-term commitments to maintain and update the system.

The D&M IS success model has been extensively used to study e-government adoption and (re)use. Table A2 in Appendix A summarizes the research on e-government adoption and (re)use that uses the D&M IS success model. Information quality, system quality, service quality, and satisfaction are the most frequently used independent variables, whereas net benefit is the least frequently used independent variable from the D&M IS success model for examining citizens' e-government behaviors. Most of the studies adopted only a partial D&M IS success model, including quality, satisfaction, or benefit variables, to investigate citizens' e-government behaviors. Only a few studies (e.g., Akram et al., 2019) adopted the full D&M IS success model to investigate e-government adoption and (re)use behaviors.

2.1.1. e-Government Service Quality

Akram et al. (2019, p. 242) defined the *quality of an e-government website* as "citizens' overall evaluation of efficiency and effectiveness of its services." The perceived quality of a public service consists of two elements: (1) *technical quality*, that is, "what is delivered" (e.g., speed of response, offer updates, and site effectiveness) and (2) *functional quality*, that is, "how it is delivered" (e.g., interactive communication, personalization of communication and service, and new forms of customer access) (Alawneh et al., 2013, p. 280).

System quality refers to the technical aspects of an IS, including its reliability, functionality, and performance (Delone & McLean, 2003). It reflects users' perceptions of the system's ability to perform its intended functions without errors or malfunctions, as well as its ability to support the tasks and activities of its users (Sørum, 2011). An e-government system that is (1) difficult to use and has a high learning curve or (2) is not reliable or secure to perform its intended functions properly can lead to costly errors or downtime, which in turn could discourage citizens from reusing the system (Li & Shang, 2020). Thus, in our context *system quality* is citizens' perception of an e-government website's technical performance for the information retrieval and delivery (Teo et al., 2008, p. 107).

Service quality refers to the degree to which the system is able to provide the services and support that its users require, while also meeting their expectations for quality and responsiveness (Delone & McLean,

2003). It refers to users' perceptions of the reliability and responsiveness of an IS (Wang & Teo, 2020). By ensuring that e-government services are of high quality, governments can increase the likelihood of citizen adoption and satisfaction and trust in the government, which in turn leads to greater reuse of e-government systems and greater engagement and participation in the democratic process (Chan et al., 2021). Thus, in our context, *service quality* refers to "the perceptions [that] involve interactions between citizens and government officials." (Teo et al., 2008, p. 107).

Information quality refers to the degree to which the system provides users with the information they need, in a format that is easy to understand and use (Delone & McLean, 2003). It reflects the accuracy, completeness, and relevance of the information provided by an IS (Wang & Teo, 2020). Inaccurate or irrelevant information about government programs, services, and regulations to can lead to frustration, confusion, and ultimately lower adoption rates, while high-quality information can lead to greater citizen satisfaction and reuse of the e-government system (Wang & Teo, 2020). Thus, in our context, information quality refers to "citizens' assessment of whether the information on the [e-government] website is accurate, valid, and timely" (Teo et al., 2008, p. 106).

2.1.2. Perceived Value of e-Government Service

Perceived value refers to the overall worth or benefit that users perceive from using an IS (Delone & McLean, 2003). Perceived value is a function of the benefits that users receive from using the system in terms of system quality, service quality, and information quality, as well as the costs (including time, effort, and resources) that are required to use the system (Li & Shang, 2020). By enhancing the perceived value of e-government systems, governments can increase citizen and business adoption and reuse of the systems, leading to greater efficiency, effectiveness, and satisfaction with public services (Wang, 2014). Thus, in our context, *perceived value* refers to citizens' "overall judgment of the utility of [e-government] services or products based on perceptions of benefits gained in the trade-off between costs and benefits" (Li & Shang, 2020, p. 4).

2.1.3. Satisfaction with e-Government Service

Satisfaction refers to the extent to which users feel positive or negative emotions toward the use of an

IS (Delone & McLean, 2003). It is a multidimensional construct that reflects the user's emotional response to the overall experience of using the system, including the system's quality, service, and information (Chan et al., 2021). By enhancing user satisfaction, governments can increase the likelihood of adoption and reuse of e-government systems, leading to greater efficiency, effectiveness, and satisfaction with public services (Chan et al., 2021). Thus, in our context *satisfaction* refers to "citizens' feelings about the national e-government website after using government transactions" (Alawneh et al., 2013, p. 278).

2.2. Trust and Risk Models

Trust and risk have been extensively used constructs to study e-government adoption and (re)use, as detailed in Table A3. We leverage the trust and risk model proposed by Carter and Bélanger (2005) that explains how trust and risk influence individuals' decisions to engage in e-commerce transactions. The model proposes that trust and risk perceptions interact to influence consumers' intentions to engage in e-commerce transactions. That is, when consumers perceive high levels of trust and low levels of risk, they are more likely to engage in e-commerce transactions. Conversely, when consumers perceive low levels of trust and high levels of risk, they are less likely to engage in e-commerce transactions (Carter & Bélanger, 2005).

2.2.1. Trust in e-Government Service

Trust is "the willingness of a [trustor] to be vulnerable to the actions of a [trustee] based on the expectation that the [trustee] will perform a particular action important to the trustor, irrespective of the ability to monitor or control that trustee" (Mayer et al., 1995, p. 712). It comprises three key subconstructs: *competence* (a trustee's ability to do what a trustor needs), *benevolence* (a trustee's willingness and motivation to act in a trustor's interests), and *integrity* (a trustee's honesty and promise-keeping in relation to a trustor) (McKnight et al., 2002). Trust is needed to lessen the perceived risks, and it becomes a substitute guarantor that replaces relevant rules and procedures and ensures that the relationship's expected outcomes will materialize. Trust acts as a bonding mechanism in relationships between transacting parties (Mayer et al., 1995)—in our context, these parties are citizens and government agencies. It combines trust in a specific entity (i.e., trust in the e-government service) with trust in the reliability of the enabling

technology (i.e., trust in the Internet) (Teo et al., 2008). Thus, *trust* in an e-government website consists of users' trusting beliefs that a website will act responsibly when an individual visits or transacts with it (Teo et al., 2008).

Trust is an essential construct for e-government reuse because it establishes confidence and reliability in the government's ability to provide public services electronically. When citizens trust the e-government systems and the information they provide, they are more likely to reuse these systems, which results in increased efficiency and effectiveness in the delivery of public services (Beldad et al., 2011). The concept of trust is important for e-government reuse for three key reasons (Papadopoulou et al., 2010). *First*, citizens need to be confident that their personal information is secure when they use these systems. Governments can establish trust in their e-government systems by implementing appropriate security measures, such as data encryption, authentication protocols, and secure storage. *Second*, citizens need to have access to information about how their personal data is being collected, stored, and used by the government. By providing transparency, the government can establish trust and confidence in their e-government systems. *Third,* citizens need to have a sense of accountability from their government when using e-government systems, which may include the assurance that their data will not be used for purposes other than those for which it was collected.

2.2.2. Risk in e-Government Service

Risk is "the possibility of loss" (Yates & Stone, 1992, p. 4) and is "an inherently subjective construct" (Yates & Stone, 1992, p. 5). The perception of risk is related to the uncertainty caused by the likelihood that a service provider will engage in opportunistic behavior, and it results in the loss of a buyer (Ganesan, 1994). Gefen et al. (2003) conceptualized perceived risk as an individual subjective expectation of suffering a loss in the pursuit of a desired outcome. It consists of two elements: (1) behavioral insecurity related to the inauspicious nature of the internet and (2) environmental insecurity related to the unpredictable nature of the Internet-based technology (Zhang & Maruping, 2008). E-government risks are usually related to the probability that a system is not properly protected from various forms of attack and damage (Schaupp & Carter, 2010).

Risk is an important construct to consider when it comes to e-government reuse as it can negatively affect the success and sustainability of e-government initiatives. In our context, *risk* in e-government systems refers to the potential negative consequences that can arise from using or implementing technology-based solutions for delivering government services (Schaupp & Carter, 2010). It reflects the likelihood of an undesirable outcome and it can related to technical issues, security breaches, legal challenges, and public resistance of an e-government system (Featherman & Pavlou, 2003). Risk is an important construct for e-government reuse for three reasons (Horst et al., 2007). *First,* e-government systems can be complex and require sophisticated technologies to function correctly. Technical failures or glitches can result in system downtime, which can negatively affect the user experience and erode user trust. *Second,* e-government systems deal with sensitive information, and data breaches can have severe consequences for citizens' privacy and security. Security risks can include hacking, identity theft, and cyberattacks, which can result in financial losses and reputational damage for the government. *Third,* e-government initiatives must comply with legal and regulatory frameworks. Failure to do so can result in legal challenges and lawsuits, which can be costly and time-consuming for the government.

2.3. Hofstede's Cultural Model

Culture is "the collective programming of the mind which distinguishes one group or category (nation) from another" (Hofstede, 1984, p. 89). Hofstede (1984) used data from more than 100,000 IBM employees in more than 40 countries to propose the cultural value index, which includes five bipolar constructs of national culture that explain how a society operates: (1) *power distance* is the degree of typically perceived inequality among individuals; (2) *uncertainty avoidance* is the degree to which individuals prefer structured over unstructured situations; (3) *individualism* is the degree to which individuals prefer to act as individuals rather than members of a group; (4) *masculinity* is the degree to which tough values prevail over tender values; and (5) *long-term orientation* is the degree to which individuals' efforts are oriented toward the future rather than the present. These five constructs of cultural values have been validated and adopted by many cross-cultural studies undertaken in various disciplines (Jung et al., 2009).

Hofstede's cultural model is useful for studying citizens' e-government reuse because it provides a

model for understanding cultural differences and their consequences on citizen behavior and attitudes toward e-government systems (Cabinakova et al., 2013). Citizens' attitudes toward e-government reuse can be influenced by their beliefs about the role of government, level of trust in government institutions, attitudes towards technology and innovation, and expectations regarding the accessibility and usability of government services. By taking such cultural factors into account when designing and implementing e-government systems, governments can ensure that these systems are more likely to be accepted and used effectively by citizens, which can help to improve the efficiency and effectiveness of government services, increase citizen engagement and participation, and enhance overall satisfaction with government operations (Zhao & Khan, 2013). Hence, Hofstede's cultural model is a useful tool for developing more culturally-sensitive e-government systems.

Per our review, detailed in Table A3, only five studies (Al-Hujran et al., 2015; Aladwani, 2013; Cabinakova et al., 2013; Lean et al., 2009; Warkentin et al., 2002; Zhao et al., 2018) used variables from Hofstede's cultural model to examine the influence of culture on e-government adoption and (re)use.

2.3.1. Uncertainty Avoidance and e-Government Reuse

Uncertainty avoidance refers to the extent to which individuals or societies feel threatened by uncertainty and ambiguity when it comes to using technology and interacting with the government online (Yang & Wibowo, 2020). People in such cultures attempt to enhance predictability by establishing formal rules and structures in organizations, institutions, and relationships (Hofstede, 1984). They are highly resistant to change and seek heightened security in their personal and professional lives, whereas individuals in low-uncertainty-avoidance cultures seek more adventure and stimulation (Lowry et al., 2011).

Uncertainty avoidance is a crucial construct in the context of e-government reuse because it can help identify and address potential barriers to the adoption and successful implementation of e-government initiatives (Yang & Wibowo, 2020). High levels of uncertainty avoidance in a culture may lead to resistance to change and a preference for traditional methods of communication and interaction with the government. This in turn can create challenges for the adoption of e-government initiatives, which often require a willingness to embrace new technologies and ways of interacting with the government (Akkaya et al.,

2012). By understanding the level of uncertainty avoidance in a particular culture, governments can tailor their initiatives to better meet the needs and preferences of that culture including providing more guidance and support to users who are less comfortable with new technologies or designing interfaces and communication channels that are more familiar and intuitive to citizens with high levels of uncertainty avoidance (Papadomichelaki & Mentzas, 2012).

2.3.2. Masculinity and e-Government Reuse

Masculinity refers to the extent to which a society values traditionally masculine traits, such as assertiveness, competition, and achievement, over traditionally feminine traits, such as caring, cooperation, and quality of life (Hofstede, 1984). *Work goals* (aka *ego goals*) emphasize earnings, recognition, advancement, challenge, work centrality, and achievements related to wealth. *Quality-of-life goals* (aka *social goals*) include work collaboration, employment security, a friendly working environment, work de-centrality, and achievements associated with human relationships (Hofstede, 1984). It has been shown that such stereotypical differences manifest on an individual level in personality traits, and variation is seen on the national level likely because of the role differences between men and women in certain cultures (Costa et al., 2001).

In the context of e-government reuse, masculinity is an important construct because it can help identify gender-related barriers to the adoption and successful implementation of e-government initiatives. In societies with high levels of masculinity, men may be more likely to engage with e-government services, while women may face additional barriers due to cultural expectations around gender roles and the use of technology (Al-Hujran et al., 2015). By understanding the level of masculinity in a particular society, governments can design initiatives that are more inclusive and address gender-related barriers to adoption and use such as targeted outreach to women and girls, the development of gender-sensitive interfaces and communication channels, and the inclusion of gender perspectives in e-government policies and decision-making processes (Zhao, 2011).

2.3.3. Individualism and e-Government Reuse

Individualism refers to the extent to which individuals in society value personal independence,

autonomy, and self-expression over the needs and interests of the group (Hofstede, 1984). In individualistic cultures, social behavior is focused primarily on personal goals (Triandis, 1989). When there is a conflict in individualistic cultures between individual and collective goals, it is socially acceptable (or at least expected) for individual goals to gain predominance over collective goals. People from such cultures tend to be more independent and less loyal to certain groups than people from collectivist cultures. In individualistic cultures, one's "self" is perceived as separate from society, and identity is determined on the basis of personal achievement rather than membership in a certain group or the group's social position (Hofstede, 1984).

Individualism is an important construct in the context of e-government reuse because it can help identify cultural factors that influence attitudes and behaviors related to the adoption and successful use of e-government services. In societies with high levels of individualism, citizens may expect e-government services to be personalized and tailored to their individual needs and preferences, while in societies with low levels of individualism, citizens may place greater emphasis on the collective good and expect e-government services to be more standardized and uniform (Zhao, 2011). By understanding the level of individualism in a particular society, governments can design initiatives that are more responsive to the cultural values and expectations of citizens. This may involve strategies such as personalizing e-government services to meet the needs and preferences of individual users or designing interfaces and communication channels that emphasize the collective benefits of e-government services (Zhao & Khan, 2013).

2.3.4. Cross-Cultural Trust and e-Government Reuse

Cross-cultural trust in the context of e-government reuse refers to the extent to which citizens from different cultural backgrounds trust the reliability, security, and privacy of e-government systems (Cabinakova et al., 2013). High levels of uncertainty avoidance may hinder e-commerce use and may reduce trust levels associated with intentions to use e-commerce (Yoon, 2009) and with online interactions with others (Lowry et al., 2011). In general, e-commerce involves greater uncertainty than brick-and-mortar businesses; hence, high uncertainty avoidance weakens the perceived trustworthiness of an online store (Hofstede, 1984). In a study of the influence of national culture on trust in e-commerce services, Hallikainen

and Laukkanen (2018) found that a high level of uncertainty weakens perceptions of an online store's capabilities, integrity, and benevolence.

Cross-cultural citizens' trust is crucial for building a successful and sustainable e-government ecosystem that promotes efficient and effective governance, transparency, citizen participation, and international cooperation (Alzahrani et al., 2018). To foster cross-cultural citizens' trust in e-government reuse initiatives in high uncertainty avoidance cultures, it is important to address these concerns and provide clear and transparent information about the system's features, functions, and security measures. Governments may also need to engage in more extensive user testing and cultural analysis to ensure that the system meets the specific needs and expectations of citizens from high uncertainty avoidance cultures (Cabinakova et al., 2013).

2.3.1. Cross-Cultural Risk and e-Government Reuse

Cross-cultural risk in the context of e-government reuse refers to the potential risks and uncertainties that citizens from different cultural backgrounds perceive when using e-government systems (Beldad et al., 2011). In a collectivist culture, privacy is not important among in-group members because they are expected to share personal thoughts and feelings based on mutual trust (Taylor et al., 2000). For example, social life in Arab countries can be characterized by mutual interdependence, situation-centeredness, and collectivism (Feghali, 1997). Weber and Hsee (1998) identified a "cushion effect" in collectivistic cultures where they are more risk-seeking due to the expected help they receive from society, family, and other in-group members, which support reduces the potential negative consequences of risky choices. Jarvenpaa et al. (1999) noted that countries with collectivist cultures, such as Israel, exhibit lower risk perceptions regarding online shopping than countries with individualist cultures, such as Australia, due to a similar cushion effect.

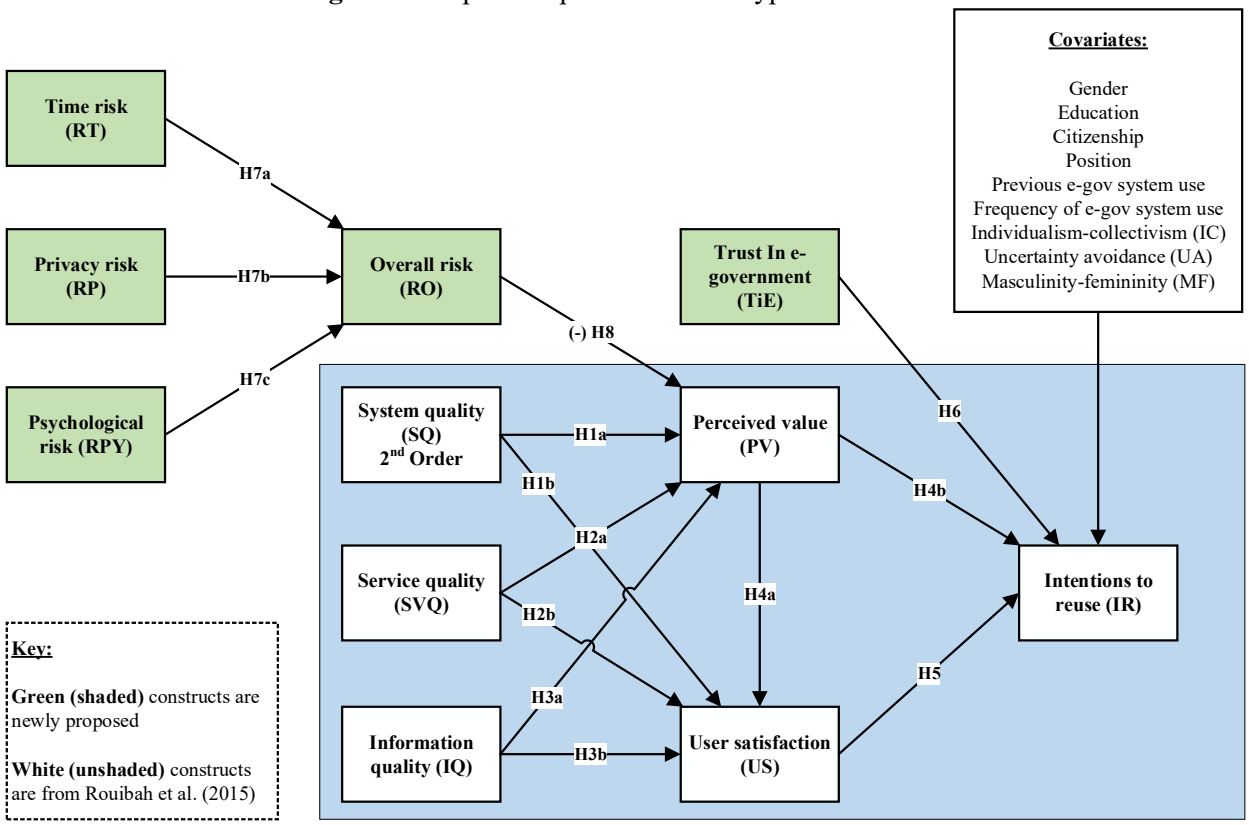
Cross-cultural citizens' risk in the context of e-government reuse is influenced by cultural values, such as collectivism and individualism and thus understanding these cultural factors is essential for governments to effectively manage and mitigate risks and to increase the likelihood of successful e-government reuse initiatives in diverse cultural contexts (Yang & Wibowo, 2020). To mitigate cross-cultural citizens' risk in the context of e-government reuse in individualist cultures, it is important for governments to prioritize

transparency, privacy, and security measures. Providing citizens with clear and transparent information about data collection, storage, and usage can help build trust and reduce perceived risks (Horst et al., 2007). Additionally, governments may need to offer greater levels of control over personal data to accommodate the needs and expectations of citizens from individualist cultures (Belanger & Carter, 2008).

3. Research Model and Hypotheses

Our hypothesis development proceeds in three sections: (1) the D&M IS success model, (2) trust and risk models, and (3) Hofstede's cultural model. In the first two sections, the hypothesis testing is based on path modeling; in the third section, it is based on direct comparisons, which reflects the cross-country nature of this study's data. Our research model builds on Rouibah et al.'s (2018) expanded D&M IS success model (see Figure 1).

Figure 1. Proposed Operationalized Hypothesis Model



3.1. Hypotheses Based on the D&M IS Success Model

3.1.1. System quality

A high-quality e-government website offers citizens (1) efficient services in terms of time, cost, and

communication and (2) effective services in terms of convenience, ease of information retrieval, and personalization (Akram et al., 2019). Prior research has validated the positive relationships between the quality of an e-government system and citizens' satisfaction and perceived usefulness (e.g., Lin et al., 2011; Veeramootoo et al., 2018; Wang & Liao, 2008). Hence, an e-government website perceived by citizens as high in system quality (e.g., Web, tablet, or mobile accessibility, 24/7 availability, interface user-friendliness, resume-any-time transaction flexibility, backup servers for the prevention of data loss) will more likely lead to positive value perception and satisfaction than will an e-government website with lower perceived system quality:

H1a. Perceived system quality—composed of (a) ease of use, (b) reliability, and (c) security—will be positively associated with citizens' perceived value of an e-government website.

H1b. Perceived system quality—composed of (a) ease of use, (b) reliability, and (c) security—will be positively associated with citizens' satisfaction with an e-government website.

3.1.2. Service quality

When citizens use an e-government website for online transactions, there is no face-to-face interaction between the citizens and their governments; thus, high-quality e-government services are necessary to compensate for the lack of human interaction, reduce citizens' risk perceptions, and increase citizens' satisfaction (Schaupp & Carter, 2005). Prior research has confirmed the positive relationship between an e-government website's service quality and citizens' satisfaction and perceived usefulness (e.g., Akram et al., 2019; Al-Hujran et al., 2013; Teo et al., 2008). Thus, an e-government website perceived by citizens as high in service quality (e.g., secure and encrypted transactions, personalized dashboard, instant e-mail confirmation) will more likely lead to high levels of satisfaction and positive perceived value among citizens than will an e-government website with lower perceived service quality:

H2a. Perceived service quality will be positively associated with citizens' perceived value of an e-government website.

H2b. Perceived service quality will be positively associated with citizens' satisfaction with an e-government website.

3.1.3. Information quality

One of the most common reasons for citizens' use of e-government services is information search and retrieval; thus, information dissemination is one of the essential objectives of an e-government website (Teo

et al., 2008). Prior research has provided evidence of the positive relationships between an e-government website's information quality and citizens' perceptions of the website's usefulness and satisfaction (e.g., Rana et al., 2015; Wang & Liao, 2008; Weerakkody et al., 2016). Thus, an e-government website that is perceived by citizens as having high information quality (e.g., its content is highly relevant, accurate, complete, personalized, and safely managed) will more likely lead to positive perceived value and high levels of satisfaction among citizens than will an e-government website with low perceived information quality:

H3a. Perceived information quality will be positively associated with citizens' perceived value of an e-government website.

H3b. Perceived information quality will be positively associated with citizens' satisfaction with an e-government website.

3.1.4. Perceived value

Meeting citizens' needs and creating value for the public are among the core promises governments make regarding the delivery of public services (Moore, 1995). Accordingly, e-government websites help governments create value by (1) enabling governments to share information, (2) offering public services in a convenient and efficient manner, and (3) providing a platform for public participation (Al-Hujran et al., 2015; Karunasena & Deng, 2012). Prior research has confirmed the positive relationships between citizens' perceived value/usefulness and satisfaction regarding an e-government website and their (re)use intention (e.g., Orgeron & Goodman, 2011; Sang et al., 2009; Zhao & Khan, 2013). Thus, citizens who perceive that an e-government website helps them interact with government agencies in a more efficient and effective manner than do face-to-face services are more likely to be satisfied with the website's utility and may consider reusing it:

H4a. Citizens' perceived value will be positively associated with their satisfaction with an e-government website.

H4b. Citizens' perceived value will be positively associated with their intention to reuse an e-government website.

3.1.5. Satisfaction

It is conceptualized as an object-based attitude that is an outcome of beliefs such as service value and quality. That is, citizens' assessment of how well e-government services have met their expectations can be

determined by both their perceived value and service quality (Sørum, 2011). Following this logic, citizens' continuous-use intention increases when they perceive that e-government service websites are (1) a valuable and useful channel for obtaining information, (2) a convenient and efficient public service, and (3) a platform for public participation (Li & Shang, 2020). Prior research has validated the relationships between citizens' satisfaction with an e-government website and their intention to (re)use it (e.g., Akram et al., 2019; Teo et al., 2008; Veeramootoo et al., 2018). Thus, citizens who are content with their current use of an e-government website are more likely to reuse the website than citizens who are discontented:

H5. Citizens' satisfaction will be positively associated with their intention to reuse an e-government website.

3.2. Hypotheses Based on Trust and Risk Models

3.2.1. Trust

Belanger and Carter (2008) noted that e-government service adoption depends on citizens' beliefs that an e-government website is a dependable medium, capable of providing accurate information and secure transactions. That is, for citizens to use or reuse an e-government website, they need to fundamentally trust the website's security measures, safety precautions, performance, and so on. Before considering using or reusing an e-government website, citizens also must trust that the related government agencies have the knowledge and resources necessary to implement and secure the website (Papadopoulou et al., 2010). Prior research has provided evidence for the positive relationship between trust in e-government websites and citizens' intention to (re)use them (e.g., Ahmed & Campbell, 2015; Alharbi et al., 2017; Gupta et al., 2016). Thus, fraud-free, seamless, and secure e-government transactions will strengthen citizens' trust and thus encourage their reuse of an e-government website. In contrast, unreliable and insecure e-government transactions will weaken citizens' trust and thus reduce their reuse, and such trust violations are particularly difficult to repair:

H6. Trust in an e-government website will be positively associated with citizens' intention to reuse an e-government website.

3.2.2. Time risk

Time risk is "the potential loss of time associated with making a bad purchasing decision by wasting time researching and making the purchase [online], only to have to replace it if it does not perform to

expectations" (Herrero-Crespo & Rodríguez-del-Bosque, 2010, p. 696). Time considerations play an important role in online purchase decisions (Vohs et al., 2018). Bellman et al. (2009) found that buyers who are in a rush are more likely to make an online purchase to save time. Time-conscious buyers may be concerned about devoting excessive time to implementing, learning to use, and troubleshooting an e-service and may consequently avoid online transactions (Bellman et al., 2009). Forsythe et al. (2006) argued that time risk has a negative influence on the intention to engage in online shopping. Prior research has validated the negative relationship between users' time risk and their intention to use online services (e.g., Lee, 2009; Martins et al., 2014; Yang et al., 2015). In our context, citizens who believe they need substantial time to learn, understand, or use an e-government website will have a higher overall perceived risk of using the website:

H7a. Perceived time risk will be positively associated with citizens' overall risk perception of an e-government website.

3.2.3. Privacy risk

Information privacy is the ability to control information about oneself (Stone et al., 1983). In general, individuals expect to have an appreciable influence on the handling of data about themselves, which is closely related to their perceived risk of information privacy (Clarke, 1999). Online settings heighten the privacy risk associated with the requirement of sharing personal information, such that there is an increased "perceived risk of opportunistic behavior related to the disclosure of personal information submitted by Internet users in general" (Dinev & Hart, 2006, p. 64). Agozie and Kaya (2021) found that informing citizens about how a government manages the personal information they disclose increases their perceived control over the associated privacy risks. Prior research has confirmed the negative relationship between citizens' privacy risk/concern and their intention to use an e-government website (e.g., Akkaya et al., 2012; Al-Sobhi et al., 2010; Sarabdeen et al., 2014). In our context, a citizen who has increased concerns about the privacy risk of using a particular e-government website will likely perceive a higher overall risk of using the website:

H7b. Perceived privacy risk will be positively associated with citizens' overall risk perception of an e-government website.

3.2.4. Psychological risk

Psychological risks are threats that create a potential loss of self-image or respect in a given society due to the purchase or use of a certain product or service (Forsythe et al., 2006). The risk of losing self-esteem can be attributed to the frustration of not achieving an intended goal and is associated with embarrassment, nervousness, and fear of appearing incompetent (Xu & Chen, 2006). Xu et al. (2010) investigated the influence of informational and relational motivations on source preference and sourcing frequency in a dyadic information-seeking context. The findings showed that social risk has negative relational implications for information seeking. Similarly, Yang et al. (2007) found that social risk has a negative influence on users' attitudes toward online purchasing. Prior research has provided evidence of the negative relationship between users' psychological risk and their intention to use online services (e.g., Featherman & Pavlou, 2003; Pennanen et al., 2006; San Martín et al., 2011). In our context, a psychological risk arises when e-government website users believe they may lose self-esteem as a result of failing to complete a task intended by the website. Hence, a citizen may experience ego loss due to the frustration of being unable to successfully renew his or her driver's licenses and such negative experiences will increase citizens' overall risk perception of the e-government website:

H7c. Perceived psychological risk will be positively associated with citizens' overall risk perception of an e-government website.

3.2.5. Overall risk

Risks can arise from a variety of sources, including technical issues, security breaches, legal and regulatory compliance, public resistance, and other factors (Akram et al., 2019). In e-government systems, risks can include the failure of technology infrastructure or software, data breaches and cyberattacks, legal or regulatory non-compliance, lack of user adoption or engagement, and reputational damage to the government. Risks can also be related to the privacy and security of citizen information, which is typically collected and stored in e-government systems (Featherman & Pavlou, 2003). Horst et al. (2007) validated the negative relationship between citizens' overall risk perception and their perceived value of an e-government website. Thus, a citizen who perceives an e-government website as highly risky to use (e.g., as unreliable and unsafe) will have a lower perception of the website's value than a citizen who perceives it

as less risky:

H8. Overall risk perception will be negatively associated with citizens' perceived value of an e-government website.

3.3. Hypotheses Based on Hofstede's Cultural Model

3.3.1. Uncertainty Avoidance

High uncertainty avoidance in society can manifest as a preference for traditional methods of communication and interaction with the government, resistance to change, and a desire for strict rules and procedures, which can lead to challenges as individuals may be less willing to try new technologies or interact with the government online (Akkaya et al., 2012). Conversely low uncertainty avoidance can lead to a more open and flexible attitude towards e-government services, with individuals being more willing to experiment with new technologies and ways of interacting with the government. Baptista and Oliveira (2015) noted that people from low-uncertainty-avoidance cultures are more risk tolerant and thus more inclined to adopt new technologies. In our context, Poland ranks higher than Kuwait on Hofstede's uncertainty-avoidance dimension (Hofstede, 1984) and thus Polish citizens will be more likely to reuse e-government systems in comparison to Kuwaiti citizens:

H9. Uncertainty avoidance will have a stronger positive association with Polish citizens' intention to reuse an e-government website than with Kuwaiti citizens' intention to reuse an e-government website.

3.3.2. Masculinity

A society's level of masculinity can influence attitudes and behaviors related to the adoption and use of e-government services. In societies with high levels of masculinity, men may be more likely to engage with e-government services, while women may face additional barriers due to cultural expectations around gender roles and the use of technology (Al-Hujran et al., 2015). Zhao (2011) argued that countries with high-masculinity cultures tend to embrace more recent technological innovations such as e-government systems for filling tax returns to renewing a driver's license to applying for a pet license. In our context, Poland ranks higher than Kuwait on Hofstede's masculinity dimension (Hofstede, 1984) and, therefore, Kuwaiti citizens will be less likely to reuse e-government systems in comparison to Polish citizens:

H10. Masculinity will have a weaker positive association with Kuwaiti citizens' intention to reuse an e-government website than with Polish citizens' intention to reuse an e-government website.

3.3.3. Individualism

In societies with high levels of individualism, citizens may expect more personalized e-government services; whereas, in societies with low levels of individualism, citizens may prefer e-government services that are more standardized as greater emphasis is placed on the collective good (Zhao, 2011). Bagchi et al. (2004) explored the role of national culture in IT adoption using 10-year-period data from 30 nations and found cultures that score higher on individualism had a greater diffusion of IT compared to others. In our context, Poland ranks higher than Kuwait on Hofstede's individualism dimension (Hofstede, 1984) and thus Kuwaiti citizens will be less likely to reuse e-government systems in comparison to Polish citizens:

H11. Individualism will have a stronger positive association with Kuwaiti citizens' intention to reuse an e-government website than with Polish citizens' intention to reuse an e-government website.

3.3.4. Cross-Cultural Trust

High uncertainty avoidance cultures are those that have a low tolerance for ambiguity, uncertainty, and risk, and therefore, may be more sensitive to issues related to trust and security (Hofstede, 1984). In the context of e-government reuse, citizens from high uncertainty avoidance cultures may be more skeptical and less likely to trust e-government systems relative to citizens from low uncertainty cultures, which may be due to concerns about the reliability and security of the system, as well as a perceived lack of transparency and accountability from government institutions (Zhao & Khan, 2013). Thus, in countries with cultures that rank high in uncertainty avoidance, such as Poland, individuals will be less likely to develop trust in an e-government website, which may in turn hinder their intention to reuse the website:

H12. Trust in e-government will have a stronger positive association with Kuwaiti citizens' intention to reuse an e-government website than with Polish citizens' intention to reuse an e-government website.

3.3.5. Cross-Cultural Risk

Individualist cultures emphasize individual autonomy and independence, and therefore, citizens from these cultures may have a heightened sense of risk and uncertainty when it comes to sharing their personal information and engaging with public institutions (Hofstede, 1984). In the context of e-government reuse, citizens from individualist cultures may perceive a greater risk when using e-government systems that do not offer sufficient levels of control over their personal data or provide clear and transparent information

about data privacy and security measures. These citizens may also be more likely to resist using e-government systems that they perceive as intrusive or that do not align with their personal values and preferences (Horst et al., 2007). Thus, in countries with highly individualistic cultures, such as Poland, people are more likely to develop risk aversion regarding the reuse of an e-government website, which might have a stronger negative effect on the perceived value of the website than in collectivistic cultures:

> **H13.** Citizens' overall risk perception will have a stronger negative association with Polish citizens' perceived value of an e-government website than with Kuwaiti citizens' perceived value of an e-government website.

4. Methodology

Our study involved two phases of research. The first consisted of a qualitative study in Kuwait that we conducted in combination with a literature review to select the key constructs of interest. We then conducted a quantitative study to validate the proposed model in the context of Kuwait and Poland.

4.1. Study 1: Qualitative Study

The initial study was a qualitative study combined with a literature review on e-government. This study aimed to answer the research question "Which important factors drive citizens and residents to use and to continue to use e-government systems?" After performing an in-depth literature review, we adopted a theory-improvement approach based on Hong et al. (2014) contextualization guidelines, using qualitative interviews and guided by the D&M IS success model. We gathered pertinent data using two sources—a literature review and interviews—to improve the D&M IS success model for our context.

To identify the most common drivers of citizens' intention to continue using e-government services, we selected the interviewees using a purposeful random sampling (Teddlie & Yu, 2007) with a sample of 81 Kuwaitis who represented key demographic groups. These interviewees included undergraduate university students (35), postgraduate students (15), unemployed stay-at-home spouses (2), full-time employees (23), job seekers (2), and retirees (4). Of these, 24 (29.6%) were male and 57 (70.4%) were female.

The study identified the factors that influenced the interviewees' intention to continue using Kuwait's official e-government website. The authors developed a short questionnaire consisting of open-ended

questions that asked the participants to state (1) whether they were aware of the e-government website (www.e.gov.kw) and its mobile application (EGOVKW) and whether they were using it and (2) what factors would lead them to use and continue to use the website. As an important intervention, if they were unaware of the website or application or did not use them, they were first introduced to the e-government website and its mobile application with an explanation of the available electronic services and electronic transactions. We also showed such participants how to navigate these services. This procedure ensured that all the interviewees had a baseline level of familiarity with the two systems. The minimum time for each interview was seven minutes and the maximum was 12 minutes; for those who needed training, another 10 minutes was required.

We followed the belief-elicitation method proposed by Limayem and Gabriele (2003) to analyze the qualitative data. Guided by a list of constructs and their definitions derived from prior studies, two IS researchers with technology-adoption expertise coded and classified the interview data independently. Two rounds of classification were carried out, and discussions were held following any disagreements until consensus was achieved. The qualitative analysis resulted in the identification of several key factors, which were largely validated by the separate literature review, as summarized in Table 1.

Table 1. The Most Common Drivers of E-Government Use and Continuance of Use

Drivers of use and continuance	Frequencies
Satisfaction	64
System quality	57
Perceived value	53
User satisfaction	52
Information quality	48
Service quality	43
Trust in public institutions	35
Intention to reuse	33
Trust in e-government	27
Privacy risk	25
User interface design	20
Ease of Use	18
Trust in internet technology	18
Time risk	15
Psychological risk	13
Perceived risks (overall risk)	12

4.2. Quantitative Study

4.2.1. Study Procedures

All final validated instruments (in English, Polish, and Arabic) were distributed using an identical questionnaire for data collection in both Kuwait and Poland. In these countries, data were collected from university students using a mix of purposeful and snowball sampling (Biernacki & Waldford, 1981). We targeted university students because they represent vital e-government service users. Moreover, current university students can be characterized as digital natives (Margaryan et al., 2011), an excellent segment for understanding the latest trends in online activities. The respondents were asked to rate the questions by the extent to which they agreed with statements related to the e-government websites in Kuwait (www.e.gov.kw) and Poland (https://obywatel.gov.pl). Each questionnaire item was anchored in a 5-point Likert-type scale ranging from strongly disagree to strongly agree. The questionnaires also contained a few nominally scaled background questions.

In Kuwait, the respondents consisted of students from the College of Business Administration at Kuwait University as well as their family members and friends. We collected 2,000 answers, of which 418 were incomplete, leaving 1,582 valid responses, which we used for the validation of the proposed research model. The valid responses corresponded to 388 male and 1,194 female respondents, with the following educational distribution: high school or lower (375), diploma degree (two-year associate's degree) (282), bachelor's degree (873), master's degree (40), PhD (12).

In Poland, the sample included students of business administration at the Faculty of Economic Sciences at Warsaw University of Life Sciences. A total of 300 questionnaires were distributed among the students, and 247 returned the complete survey. The students were also invited to distribute the survey among their nonstudent family members and friends who worked for companies in Warsaw. Thus, an additional 108 surveys were collected, leading to a total of 355 complete questionnaires, which were used for data analysis. These questionnaires corresponded to 255 male and 105 female respondents, with the following educational distribution: high school or lower (2), diploma degree (two-year associate's degree) (2), bachelor's degree (258), master's degree (87), PhD (6).

4.2.2. Measures

Again, we built on the factors drawn from our extensive literature review and our qualitative study to develop a preliminary questionnaire, and we borrowed established, valid items and constructs from previous studies. Based on the qualitative study, we slightly modified several of the items to fit our research context. Because these items were originally published in English, we further improved the survey by translating and back-translating all the survey items, following procedures (e.g., Lowry et al., 2011) established by a researcher fluent in both English and Arabic and a researcher fluent in both English and Polish. Then, two additional IS researchers gave further feedback on the conceptual fit of the translations, a process that was repeated until both sets of measures were judged to be cross-culturally equivalent. We also pretested the instrument with 18 master's students from an e-government course at a leading business school. They were asked to check the instrument's validity, readability, and completeness. Accordingly, they made changes in the wording of the questions and added a new item for system quality, SQ7: "The e-government website depicts short response time for online inquiry." In this process, all the measures were retained, except for trust in public institutions, which was removed because it had multiple validity and reliability issues. Appendix B details all the measures.

5. Analyses and Results

5.1. Pre-analysis and Validation

For model analysis, we used a partial least squares (PLS) regression using SmartPLS version 3.7.2 (Ringle et al., 2015). PLS is especially useful for the validation of complex models, provides the best support for mixed models with formative and reflective measurement, and is more appropriate than covariance-based structural equation modeling for preliminary model building (Chin et al., 2003; Gefen et al., 2011; Lowry & Gaskin, 2014; Sarstedt et al., 2016). Furthermore, SmartPLS provided the added advantage of being able to report model-fit statistics, execute advanced moderation and mediation analysis, and perform robustness checks with a multigroup analysis (Ringle et al., 2015).

We conducted pre-analyses and data validation for five purposes: (1) to establish the factorial validity of the reflective measures through convergent and discriminant validity, (2) to establish that

multicollinearity was not a problem for any of the measures, (3) to establish the validity of the formative measure (i.e., system quality), (4) to check for common-method bias, and (5) to establish strong reliabilities. Appendix C provides these details.

All the reflective latent constructs exhibited high levels of reliability. To establish reliability, PLS computes a composite reliability score as part of its integrated model analysis. This score is a more accurate measurement of reliability than Cronbach's alpha because it does not assume that the items' loadings or error terms are equal, a fundamental flaw of Cronbach's alpha (Chin et al., 2003; Gefen et al., 2011; Lowry & Gaskin, 2014). Table 2 summarizes the collinearity statistics and reliabilities.

Table 2. Collinearity Statistics and Reliabilities

Latent construct	rho_A	CR	AVE	sqrt(AVE)	inner VIF
TiE (Trust in e-government)	0.824	0.882	0.651	0.807	2.116
IC (individualism-collectivism)	0.795	0.887	0.798	0.893	1.146
IR (intention to reuse)	0.859	0.897	0.637	0.798	*
IQ (information quality)	0.856	0.886	0.528	0.727	1.000
MF (masculinity-femininity)	0.671	0.855	0.748	0.865	1.047
OR (overall risks)	0.877	0.882	0.652	0.807	1.106
PV (perceived value)	0.891	0.916	0.646	0.804	2.337
RP (privacy risks)	0.904	0.938	0.834	0.913	2.987
RPY (Psychological risks)	0.882	0.943	0.892	0.944	2.915
RT (time risks)	0.733	0.877	0.781	0.884	1.449
SQE (SQ ease-of-use)	0.655	0.814	0.594	0.771	2.508
SQR (SQ reliability)	0.748	0.783	0.549	0.741	1.433
SQS (SQ security)	0.810	0.888	0.725	0.851	1.672
SVQ (service quality)	0.933	0.941	0.613	0.783	1.962
UA (uncertainty avoidance)	0.797	0.860	0.672	0.820	1.140
US (user satisfaction)	0.789	0.873	0.696	0.834	2.482

* IR was used as the dependent variable to calculate the inner variance inflation factors (VIFs); thus, the VIF cannot be calculated for IR; AVE = average variance extracted; CR = composite reliability; rho_A = Rho value (composite reliability calculated on unstandardized indicators).

Our pre-analyses show that our data exhibit strong factorial validity of the reflective constructs, little multicollinearity, and strong reliabilities and that they lack common-method bias. In summary, the results of our validation procedures show that our model data meet or exceed the rigorous validation standards expected in modern research (Straub et al., 2004)—particularly for PLS analysis for reflective constructs (Gefen & Straub, 2005) and formative constructs (Cenfetelli & Bassellier, 2009; Diamantopoulos & Siguaw, 2006; Petter et al., 2007).

5.2. Final Model Analysis

In running SmartPLS 3.7.2 for our final analysis, we chose the default path weighting scheme, with a

maximum iteration of 300 and stop criterion of 7. We chose "mean replacement" as the algorithm for missing values. The nonparametric procedure of bootstrapping was employed, using 500 subsamples, no sign changes, and the bias-corrected and accelerated value for the confidential interval calculations. Aside from producing beta coefficients, *t*-statistics, and R^2 values, we produced the standard model-fit statistics that SmartPLS is able to produce. These details are summarized in Table 3. Figure 2 shows the results of all the paths and covariates.

Table 3. Final Path Modeling Results

Tested path	β	*t*-statistic	p-values	Support
H1a. SQ (system quality) → PV (perceived value)	0.479***	11.987	0.000	yes
H1b. SQ (system quality) → US (user satisfaction)	0.192***	4.822	0.000	yes
H2a. SVQ (service quality) → PV (perceived value)	0.023	0.797	0.426	no
H2b. SVQ (service quality) → US (user satisfaction)	0.281***	11.453	0.000	yes
H3a. IQ (information quality) → PV (perceived value)	0.214***	7.194	0.000	yes
H3b. IQ (information quality) → US (user satisfaction)	0.118***	4.203	0.000	yes
H4a. PV (perceived value) → US (user satisfaction)	0.371***	11.901	0.000	yes
H4b. PV (perceived value) → IR (intention to reuse)	0.398***	9.549	0.000	yes
H5. US (user satisfaction) → IR (intention to reuse)	0.205***	4.876	0.000	yes
H6. TiE (Trust in e-government) → IR (intention to reuse)	0.214***	5.353	0.000	yes
H7a. RT (time risks) → OR (overall risks)	0.194***	6.770	0.000	yes
H7b. RP (privacy risks) → OR (overall risks	0.556***	15.421	0.000	yes
H7c. RPY (psychological risks) → OR (overall risks)	0.127***	3.767	0.000	yes
H8. OR (overall risks) → PV (perceived value)	-0.183***	8.982	0.000	yes
Covariates				
age → IR (intention to reuse)	0.004	0.196	0.845	no
citizenship → IR (intention to reuse)	0.063**	3.234	0.001	yes
education → IR (intention to reuse)	0.062***	3.562	0.000	yes
frequency of use → IR (intention to reuse)	0.049	1.839	0.066	no
gender → IR (intention to reuse)	0.000	0.005	0.996	no
IC (individualism-collectivism) → IR (intention to reuse)	-0.029	1.420	0.156	no
MF (masculinity-femininity) → IR (intention to reuse)	0.109***	6.577	0.000	yes
position → IR (intention to reuse)	0.028	1.402	0.162	no
UA (uncertainty avoidance) → IR (intention to reuse)	0.117***	6.119	0.000	yes
used e-gov system before? → IR (intention to reuse)	-0.015	0.541	0.588	no
PLS model fit statistics (saturated model)				
SRMR	0.080			
d_ULS	15.589			
d_G	2.991			
Chi-square	35708.439			
NFI	0.642			

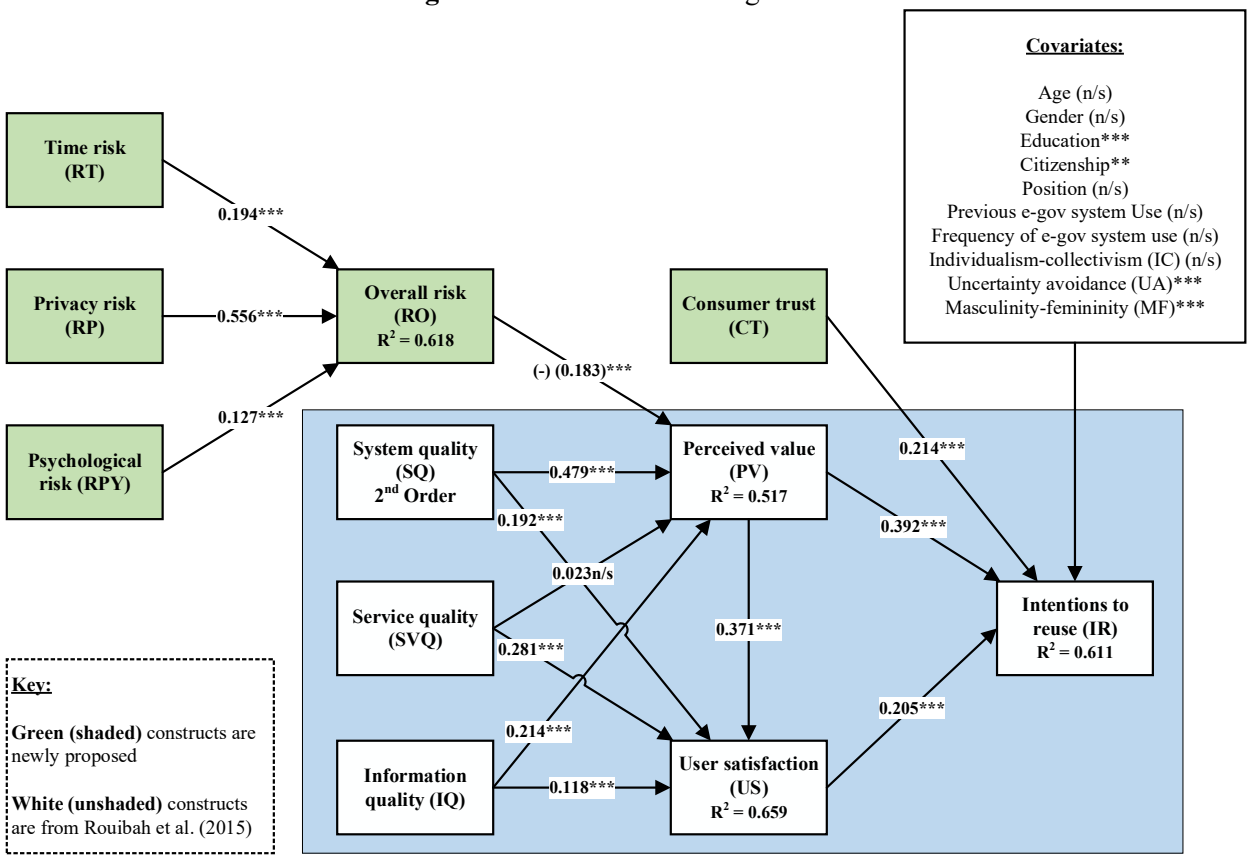
*** = p < 0.001; ** = p < 0.01, * = p < 0.05, n/s = not significant; d_G = geodesic distance; d_ULS = the squared Euclidean distance; NFI = normed fit index; SRMR = Standardized Root Mean Square Residual

5.3. Mediation Bootstrapping Analyses

Because our model infers multiple levels of partial mediation, we also tested these relationships. The classical tests for mediation were developed by Baron and Kenny (1986) and Sobel (1982), but advances

in computing power have allowed for the adoption of less-biased methods. The bootstrapping method represents one such approach that has gained popularity (Hayes, 2009; MacKinnon, 2008); it has been introduced into IS research and is now fully supported by SmartPLS. This method has several advantages (Vance et al., 2015): it has greater statistical power, allows for the direct measurement of direct versus

Figure 2. Final Path Modeling Results



*** = $p < 0.001$; ** = $p < 0.01$, * = $p < 0.05$, n/s = not significant; the R^2 for IR before adding the covariates was 0.575 (covariates increase variance explained (R^2) by 6.6%).

indirect effects, and does not assume a normal distribution, as does the Sobel (1982) method. Table 4 summarizes these results, which were produced with 5,000 resamples. These results were generally as expected, with a couple of unexpected results. This analysis demonstrated that the three forms of risk that influence overall risk (time risk, privacy risk, and psychological risk) also influence perceived value. Moreover, it showed that there is no mediation relationship in SQ → PV → IR, SQ → US → IR, or PV → US → IR. It demonstrated full mediation, however, in four relationships: SVQ → PV → IR, IQ → PV → IR, SVQ → US → IR, and IQ → US → IR.

5.4. Multivariate Analysis of Variance and Multigroup Analyses

The strongest significant covariates are related to nation- and individual-level culture: citizenship, masculinity–femininity, and uncertainty avoidance. Thus, we proceeded to conduct post hoc cross-cultural comparisons to identify any important patterns. Given the results of our covariate analysis, and because our

Table 4. Bootstrapped Confidence Interval Tests for Full and Partial Mediation for Model 3

		Mediation Test (*ab*) [Indirect Effects]			**Full/Partial Test (*c'*) [Direct Effects]**			
Relationship	**Mediator**	**2.5% lower bound**	**97.5% upper bound**	**Includes zero?**	**2.5% lower bound**	**97.5% upper bound**	**Includes zero?**	**Type of mediation**
RT → PV	OR	-0.020	0.004	Yes	0.141	0.250	No	Partial
RP → PV	OR	-0.056	0.010	Yes	0.482	0.624	No	Partial
RPY → PV	OR	-0.015	0.002	Yes	0.059	0.197	No	Partial
OR → IR	PV	-0.042	0.008	Yes	-0.143	-0.055	No	Partial
SQ → IR	PV	0.120	0.215	No	0.011	0.181	No	None
SVQ → IR	PV	0.003	0.047	No	-0.086	0.039	Yes	Full
IQ → IR	PV	0.063	0.122	No	-0.072	0.040	Yes	Full
SQ → IR	US	0.013	0.057	No	0.011	0.181	No	None
SVQ → IR	US	0.029	0.082	No	-0.086	0.039	Yes	Full
IQ → IR	US	0.011	0.041	No	-0.072	0.040	Yes	Full
PV → IR	US	0.037	0.107	No	0.332	0.497	No	None

IR = intention to reuse; IQ = information quality; OR = overall risks; PV = perceived value; RP = privacy risks; RPY = psychological risks; RT = time risks; SQ = system quality; SVQ = service quality

data-collection process involved participants who used e-government systems in both Kuwait and Poland, we determined that it was crucial to conduct post hoc cross-cultural comparisons in the event that differences in the modeling results were observed due to (1) national cultural differences (e.g., participants from Kuwait versus Poland); (2) differences in the systems used (e.g., Kuwaiti e-government versus Polish e-government); and (3) individual-level cultural differences (e.g., differences based on IC, UA, or MF).

5.4.1. Multivariate Analysis of Variance

To examine these differences, we first split the dataset between Kuwaiti participants (n = 1582) and Polish participants (n = 355). We then compared the means of all the latent variables by these two groups and ran a multivariate analysis of variance (MANOVA). The overall MANOVA test was significant at $F = 115.038_{(14, 1372)}$, $p = 0.000$. Every construct subjected to comparison was significantly different between the two countries, as summarized in Table 5.

5.4.1. Post Hoc Multigroup Analyses

Moreover, through advanced multigroup analysis (MGA), SmartPLS 3.7.2 affords a more advanced

method for the robustness checking of data models. SmartPLS MGA enabled us to test whether various kinds of predefined data groups had significant differences in their group-specific parameter estimates—including outer weights, outer loadings, and path coefficients (Ringle et al., 2015). We thus explored whether various kinds of group distinctions in our data could cause differential or contingent results

Table 5. Means by Country and Results of MANOVA Comparisons

	Kuwait		Poland			
Construct	**Mean**	**SD**	**Mean**	**SD**	***F*-statistic**	**Result**
TiE	3.485	0.645	3.959	0.693	80.678	Kuwait **lower** TiE than Poland
IC	3.462	0.835	2.648	1.374	88.493	Kuwait **higher** IC than Poland
IQ	3.415	0635	3.283	0.582	17.032	Kuwait **higher** IQ than Poland
IR	3.695	0.744	3.772	0.508	12.712	Kuwait **lower** IR than Poland
MF	3.326	0.010	3.358	0.061	159.184	Kuwait **lower** MF than Poland
PV	3.645	0.708	3.599	0.542	11.674	Kuwait **higher** PV than Poland
OR	2.775	0.802	2.548	0.878	13.667	Kuwait **higher** OR than Poland
RP	2.884	0.839	2.238	1.244	16.657	Kuwait **higher** RP than Poland
RPY	2.585	0.851	2.290	1.354	62.104	Kuwait **higher** RPY than Poland
RT	2.699	0.833	2.186	0.601	61.590	Kuwait **higher** RT than Poland
SQ	3.363	0.541	3.481	0.523	12.541	Kuwait **lower** SQ than Poland
SVQ	3.264	0.623	3.451	0.903	12.631	Kuwait **lower** SVQ than Poland
UA	3.913	0.731	4.412	0.446	76.376	Kuwait **lower** UA than Poland
US	3.476	0.736	3.481	0.674	8.104	Kuwait **lower** US than Poland

IC = individualism-collectivism; IQ = information quality; IR = intention to reuse; MF = masculinity-femininity; OR = overall risks; PV = perceived value; RP = privacy risks; RPY= psychological risks; RT = time risks; SVQ = service quality; SQ = system quality; TiE= citizen trust in e-government; UA = uncertainty avoidance; US = user satisfaction.

that might call into question the applicability of the model for certain groups or require a more nuanced interpretation that would illuminate current or future theory building.

In the first MGA, we tested our model paths to determine whether there were country-based differences (see Table 6). Indeed, there were statistically significant differences in at least 14 of the model paths. These differences were most likely due not only to differences in nation- and individual-level culture but also to fundamental differences in the e-government systems these two countries use. We then tested for model differences based on gender (see Table 7). In this case, only two path differences were observed: males had higher β values for SQ → US than did females, and males had lower β values for OR → PV than did females.

In summary, our covariate, robustness, and MGA analyses lead us to conclude that our full model is a useful basis for explaining intentions to reuse e-government systems. The model is particularly robust to

differences in services used, gender, and previous e-government system use. Although the model served usefully for different nation- and individual-level cultures, major differences in these were observed. This indicates that cultural and implementation differences in e-government systems require further research and that all such research needs to be carefully contextualized.

Table 6. MGA on Datasets of Respondents from Kuwait vs. Poland

Path	β Kuwait	β Poland	β-diff	*t*-value (diff)	*p*-value	Result
Hypothesized MGA path differences						
H9. UA → IR	0.101	-0.199	0.300	4.819	0.000	Kuwait > Poland (H9 confirmed)
H10. MF → IR	0.028	0.161	-0.134	2.603	0.009	Kuwait < Poland (H10 confirmed)
H11. IC → IR	-0.001	-0.326	0.325	3.197	0.001	Kuwait > Poland (H11 confirmed)
H12. TiE → IR	0.193	-0.035	0.227	2.209	0.027	Kuwait > Poland (H12 confirmed)
H13. OR → PV	-0.100	-0.507	0.408	6.301	0.000	Kuwait > Poland (H13 confirmed)
Exploratory MGA path differences						
IQ → PV	0.220	0.061	0.158	2.157	0.031	Kuwait > Poland
IQ → US	0.136	-0.074	0.210	3.356	0.001	Kuwait > Poland
PV → IR	0.378	1.027	-0.649	5.581	0.000	Kuwait < Poland
PV → US	0.428	-0.742	1.170	15.382	0.000	Kuwait > Poland
RP → OR	0.593	-0.823	1.416	8.832	0.000	Kuwait > Poland
RPY → OR	0.119	1.633	-1.513	9.375	0.000	Kuwait < Poland
RT → OR	0.166	0.161	0.005	0.058	0.953	No difference
SQ → PV	0.395	0.663	-0.268	2.612	0.009	Kuwait < Poland
SQ → US	0.106	1.639	-1.533	19.093	0.000	Kuwait < Poland
SVQ → PV	0.145	-0.091	0.237	2.909	0.004	Kuwait > Poland
SVQ → US	0.238	-0.033	0.271	4.448	0.000	Kuwait > Poland
US → IR	0.233	-0.123	0.356	2.110	0.035	Kuwait > Poland

Table 7. MGA on Datasets of Male vs. Female Respondents

Path	β female	β male	β-diff	*t*-value (diff)	*p*-value	Result
TiE → IR	0.195	0.177	-0.018	0.254	0.799	No difference
IC → IR	-0.011	-0.016	-0.005	0.123	0.902	No difference
IQ → PV	0.174	0.305	0.131	1.979	0.048	Females < males
IQ → US	0.139	0.076	-0.063	1.109	0.267	No difference
MF → IR	0.058	0.192	0.134	3.431	0.001	Females < males
OR → PV	-0.127	-0.292	-0.165	3.629	0.000	Females > males
PV → IR	0.402	0.461	0.060	0.726	0.468	No difference
PV → US	0.376	0.344	-0.033	0.491	0.624	No difference
RP → OR	0.581	0.511	-0.070	0.870	0.385	No difference
RPY → OR	0.111	0.186	0.076	0.988	0.323	No difference
RT → OR	0.184	0.207	0.024	0.385	0.700	No difference
SQ → PV	0.497	0.394	-0.103	1.273	0.203	No difference
SQ → US	0.117	0.342	0.225	2.753	0.006	Females < males
SVQ → PV	0.048	0.009	-0.039	0.652	0.514	No difference
SVQ → US	0.313	0.223	-0.090	1.727	0.084	No difference
UA → IR	0.110	0.133	0.023	0.575	0.565	No difference
US → IR	0.211	0.227	0.017	0.200	0.842	No difference

6. Discussion

Given the importance of designing and implementing e-government websites that strengthen citizens' reuse intention to build the public's trust in government and institutions, we investigated the cross-country

predictors of e-government reuse intention based on quality, trust, risk, culture, and technology adoption. Our comprehensive model integrates constructs from the D&M IS success model, trust and risk models, and Hofstede's cultural model. We empirically tested the proposed model with qualitative and quantitative data by conducting a cross-cultural and comparative analysis of e-government reuse intention in the cross-country setting of Kuwait and Poland.

6.1. Summary of Results

First, we found support for most of the hypotheses based on the D&M IS success model, which is in line with the results of Wang and Teo (2020), Agozie and Kaya (2021), and Chan et al. (2021). Namely, we found positive associations between (1) e-government system quality and information quality, on the one hand, and citizens' perceived value and satisfaction, on the other (H1a,b and H3a,b), (2) e-government service quality and citizens' satisfaction (H2b), (3) citizens' perceived value and their satisfaction and intention to reuse (H4a,b), and (4) citizens' satisfaction and their intention to reuse (H5). However, we did not find support for the relationship between e-government service quality and perceived value, which can be explained by the interplay between received value and actual costs when using a service (Tam, 2004). Customers will perceive a service as higher in value when they perceive that the service quality exceeds the costs they incur. Accordingly, service quality is not associated with citizens' perceived value, because the costs associated with using an e-government website are greater than the value received.

We also found support for the full mediation effects of e-government system quality and information quality on citizens' intention to reuse via citizens' perceived value and use satisfaction, which is congruent with the findings of Li and Shang (2020). Surprisingly, we did not find support for the mediating effect of e-government service quality on citizens' intention to reuse via citizens' perceived value and satisfaction. Again, this may be due to the possibility that the perceived costs of an e-government website use outweigh its perceived value (Tam, 2004), which may in turn reduce e-government service quality's influence on citizens' perceived value and satisfaction.

Second, all the hypotheses based on trust and risk models were supported, which is in line with the results of Horst et al. (2007) and Alzahrani et al. (2018). The confirmed hypotheses include (1) the positive

association between citizens' trust and intention to reuse (H6), (2) the positive associations between citizens' perceived time, privacy, and psychological risks, on the one hand, and their overall risk, on the other (H7a,b,c), and (3) the negative association between citizens' overall risk and their perceived value (H8), which is negatively associated with intention to reuse through partial mediation. Notably, the results showed that perceived time, privacy, and psychological risks have partial mediation effects on citizens' perceived value via overall risks, which has yet to be investigated in e-government studies.

Third, the hypotheses based on Hofstede's cultural model were largely supported, which is congruent to the results of Cabinakova et al. (2013) and Zhao and Khan (2013). Namely, uncertainty avoidance (H9), masculinity (H10), and perceived risk (H13) all had a stronger influence on citizens' reuse intention in Poland than in Kuwait. By contrast, individualism (H11) and perceived trust (H12) both had a stronger association with reuse intention in Kuwait than in Poland. However, these findings cannot be directly compared to those of any previous studies that have used Hofstede's cultural variables to examine e-government (re)use, because they have been conducted in single-county or cross-country settings (e.g., Malaysia, Jordan, and Slovakia vs. Germany, Kuwait vs. the United Kingdom) that differ from our cross-country setting.

Furthermore, we found country- and gender-based differences across several variables and relationships, which can be attributed to differences in nation- and individual-level cultures. For example, the results showed that e-government information quality has a stronger influence on citizens' perceived value and satisfaction in Kuwait than in Poland, whereas e-government service quality has a stronger influence on perceived value and satisfaction in Poland than in Kuwait. Studies of e-government (re)use in cross-country settings (e.g., Aladwani, 2013; Cabinakova et al., 2013; Rufín et al., 2014) have also found model differences based on nation-level culture.

6.2. Contributions to Theory

This study makes a twofold contribution to theory. *First*, several studies have used the D&M IS success model (e.g., Stefanovic et al., 2016; Teo et al., 2008; Wang & Liao, 2008) as well as its improved versions (e.g., Akram et al., 2019; Rana & Dwivedi, 2015; Veeramootoo et al., 2018). We found that most of these

studies were inconsistent with the IS acceptance literature as addressed by Wang (2008) and Rouibah et al. (2015). This study is the first to extend the D&M IS success model to the e-government reuse context by incorporating variables from the trust and risk models. Although prior e-commerce research has examined risk antecedents, our study is the first to investigate them in the e-government context. Specifically, our research model considers a comprehensive risk construct that comprises citizens' perceived time, privacy, psychological, and overall risks. We also confirmed the positive influence of time, privacy, and psychological risks on overall risk as well as their negative influence on citizens' perceived values through overall risk as a mediator, which properly captures the role of risk in e-government reuse.

Second, our study is among the few that have investigated the role of nation-level culture in e-government success by testing the differential effects of Hofstede's national culture dimension in terms of uncertainty avoidance, masculinity, and individualism. We contribute to this emerging research stream by developing a research model that captures the unique cultural context of two countries, thus enabling us to conduct a comprehensive, cross-cultural, and comparative analysis of e-government reuse intention in Kuwait and Poland. We found key differences between the two countries, confirming that culture affects e-government reuse, as found by Zhao et al. (2018). Moreover, this study enhances the D&M IS success model by exploring individual-level differences in a cross-county setting; this approach offers valuable insights into e-government reuse behaviors and lays the foundation for future investigations of and theory building for cross-cultural phenomena. Specifically, we found strong support for cross-cultural differences in e-government reuse for variables such as services used, gender, and previous e-government system use.

6.3. Implications for Practice

This study has two implications for e-government practice. *First*, the study provides e-government entities with a model (and measures) that explains how to strengthen end users' satisfaction and intention to reuse e-government websites. Citizens who perceive e-government services as valuable are more likely to reuse the e-government website in the future. This finding showed that when citizens found an e-government website easy to navigate, secure, and reliable, when it could be accessed from multiple devices, and when it offered a personalized interface, they were more likely to reuse it. We also found that when citizens

perceived less overall risk associated with using an e-government website, they were more likely to reuse this government service.

Considering the key roles of quality and risk in citizens' perceived value of e-government websites, we suggest that governments invest resources to improve the quality aspects (i.e., system, service, and information quality) and mitigate the risk aspects (i.e., time, privacy, and psychological risk) of e-government services in an effort to encourage citizens to continue using those services. Namely, to improve the e-government system quality, governments should focus on performance and reliability (e.g., the website loads quickly and does not crash during peak traffic hours), user interface (e.g., the website is user-friendly, easy to navigate, and understand), and compatibility (e.g., the website is compatible with different devices and operating systems). However, to minimize the psychological risk associated with using an e-government website, governments should focus on clear instructions (e.g., the website provides clear instructions on how to use the website and complete tasks), feedback mechanisms (e.g., Q&A forums to help users identifying issues and receiving support), and use of chatbots and AI assistants (e.g., chatbots and AI assistants to guide users through the website and complete tasks).

Second, to ensure that citizens understand the value and usefulness of e-government services, governments should pursue projects and strategies that provide value-added services relative to what is being offered through traditional channels of service delivery. Thus, factors such as the speed, efficiency, and effectiveness of e-government services are crucial from the government's process-improvement perspective and the citizen's convenience perspective. Namely, to provide value-added services for their e-government website relative to traditional channels of service delivery, governments should consider focusing on personalization (e.g., customized notifications, alerts, and recommendations based on user behavior and preferences), integration (e.g., a one-stop-shop for users to access different services), convenience (e.g., online payment and submission of documents), accessibility (e.g., sign language interpretation or voice recognition for people with disabilities), transparency (e.g., real-time updates on the status of requests or applications), and collaboration (e.g., online discussion forums, feedback mechanisms, and social media platforms). Furthermore, community forums and local-government council meetings can

be used to promote debate and a better understanding of transformative e-government services among citizens They can, for example, (1) invite citizen participation allowing citizens to ask questions, provide feedback, and share their opinions on transformative e-government services and (2) promote awareness through community outreach efforts, social media campaigns, and other communication channels. The free computer facilities offered in local libraries can also offer a useful platform for increasing e-government awareness and perceived value among citizens.

6.4. Limitations and Future Research

This study has several limitations that point to several compelling research opportunities. *First*, our sampling approach prevents us from claiming broad generalizability. Moreover, the responses from Kuwait and Poland focus on only one city in each country, limiting the diversity and thus the generalizability of our sample. Thus, to establish a more representative sample for each country, researchers are encouraged to collect responses from more locations in Kuwait and Poland. Extending and testing our model in other cultural contexts is also important for further generalizability. A good starting point may be to extend the research model to nearby countries, such as Gulf Cooperative Arab countries (Qatar, Saudi Arabia, Oman, Bahrain) and Central European countries (Czech Republic, Hungary, Slovakia, Romania), to perform cross-cultural analyses to test whether these countries exhibit the same patterns. Moreover, future studies could further investigate the model differences presented in this study to develop a better understanding of these cross-cultural patterns and include other cultural constructs, such as power distance (strength of the social hierarchy).

Second, our study involved cross-sectional self-reported data. Thus, we cannot make causal inferences even though our underlying theorization involves causal mechanisms. Formal experimentation is likely too artificial for this setting; however, it would be a reasonable extension of our study to conduct longitudinal field surveys, which would facilitate causal inferences. Likewise, triangulation to actual system use data over time could yield richer insights.

Third, although we controlled for endogeneity by extending the nomological network of the well-established IS success model and used many covariates, other factors could further explain the results. For

example, we did not measure whether participants are affected by news about e-government websites from social media or traditional media. We also filtered out citizens who had never used e-government services, a demographic it is important to better understand. Hence, future research should focus on examining other salient factors, such as awareness of e-government and trust in government, digital literacy, and the digital divide, which may influence e-government (re)use in Kuwait and Poland. E-government is still an emerging trend in Kuwait and Poland. We recommend including the effects of *awareness* of the e-services provided by the e-government website and its perceived value, comparing the effects of two different forms of media—traditional media (e.g., TV) and social networks (Twitter, Facebook, Instagram, and WhatsApp) (Alawneh et al., 2013)—and testing how behavior changes over time. Moreover, there might be other economic, legal, political, and social environments in Kuwait and Poland for which our model did not account, such as GDP per capita and the rule of law.

7. Conclusion

This study proposes a model that extends the D&M IS success model by incorporating variables of trust and risk models and variables of Hofstede's cultural model, thus capturing the unique cultural contexts of Kuwait and Poland. We develop a parsimonious model of quality, trust, risk, culture, and technology reuse that enables us to conduct a comprehensive, cross-cultural, and comparative analysis of e-government reuse intention in the cross-country setting of Kuwait and Poland. It represents (1) an initial attempt to understand the cross-country predictors of e-government reuse intention based on quality, trust, risk, culture, and technology adoption conducts and (2) a response to the pressing need to further extend the D&M IS success model by considering other factors that affect the reuse of e-government services.

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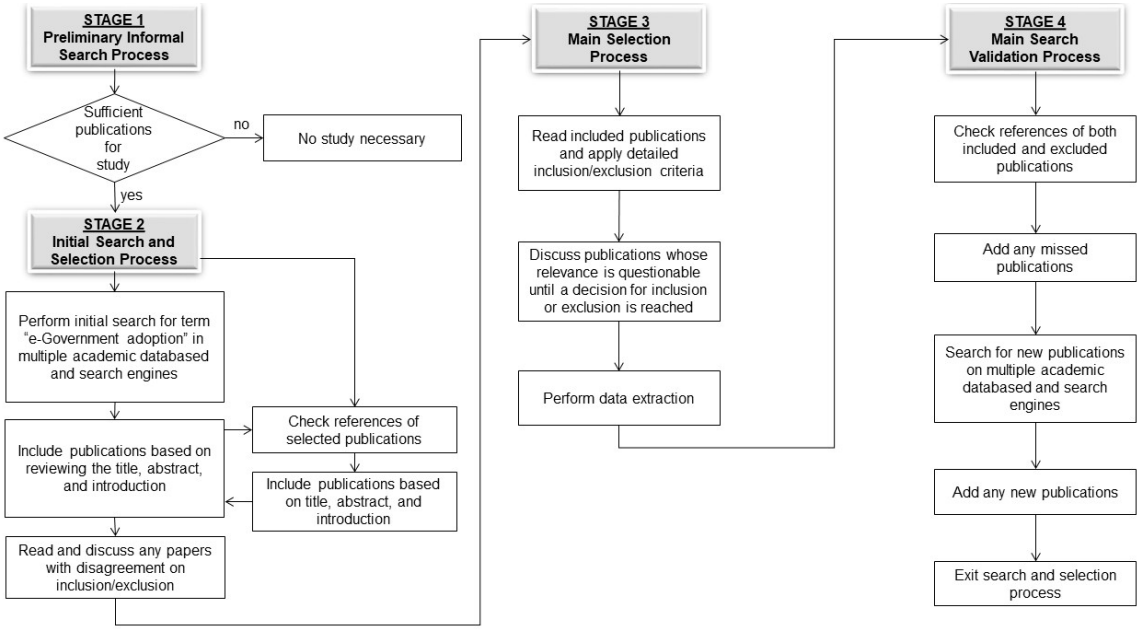
[i] *First*, from an IS acceptance perspective, Wang explained that DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, *3*(1), 60-95. did not reconcile their model with the technology acceptance model's causal chain, according to which attitude influences belief and then belief affects actual behavior. Further, the model did not incorporate the measures of perceived usefulness suggested by Seddon, P. B. (1997). A respecification and extension of the DeLone and McLean model of IS success. Ibid., *8*(3), 240-253. . *Second*, from a consumer-behavior perspective, Wang, Y. S. (2008). Assessing e‐commerce systems success: A respecification and validation of the DeLone and McLean model of IS success. *Information Systems Journal*, *18*(5), 529-557. pointed out that the D&M IS success model did not exhibit consistency with the proposed causal chain in which quality influences value and value then affects satisfaction, which has an effect on loyalty. *Third*, the net benefit construct of the D&M IS success model was too broad to be defined and tested.

Appendix A. Literature Review Process and Outcome

The tensions in the literature that motivated our paper and guided our research model were derived from a systematic literature review (SLR), which we believe to be the most comprehensive review conducted in this discourse. To conduct the SLR, we followed the guidelines provided by Tranfield et al. (2003), Rousseau et al. (2008), Watson (2015), and Ali et al. (2021) to (1) identify existing publications, (2) select and evaluate their contributions, (3) analyze and synthesize the data, (4) report on the findings, and (5) propose the research agenda that guides this study.

Our systematic review process consisted of (1) searching for publications for potential inclusion, (2) selecting publications for inclusion or exclusion, (3) synthesizing selected publications in textual, tabular, or graphical form, and (4) critically analyzing contributions in terms of e-government themes and methods (Ali et al., 2021; Watson, 2015). Figure A1 illustrates the review protocol we followed in our search, selection, and validation process and our application of this protocol to the e-government literature. In Stage 1, we conducted a preliminary informal search on Scopus™ for studies published between 2010 and 2021 to identify whether enough publications existed to support an insightful review that could inform our study. We identified more than 200 publications that included the term "e-government adoption", "e-government use", and "e-government reuse" in their title, abstract, or keywords; thus, we concluded that the number of publications was sufficient.

Figure A1. SLR review process for e-government adoption and (re)use



In Stage 2, we conducted a search for e-government adoption publications using multiple popular academic databases (i.e., ProQuest, EBSCO, Emerald, Google Scholar, and Scopus). We limited our initial search to academic databases and academic search engines, because we sought to include only high-quality publications. We searched for the key terms "e-government adoption", "e-government use", and "e-government reuse" in the publications' titles, abstracts, and introductions. We selected 2000 as the base year because it was around this time that e-government adoption and (re)use began to attract significant interest from the academic community, and we searched through 2021. We then conducted the initial selection by reviewing publications' titles, abstracts, and introductions. We included publications that explicitly dealt with e-government adoption and (re)use and excluded those that addressed other aspects of e-government, such as physical infrastructure or the computer hardware of e-government systems. The included studies focused on intention to use or reuse or actual use. When the authors disagreed about whether to include or exclude a study, they read and discussed the publication in question until an agreement was reached. If no agreement was reached, the publications were provisionally included and later reassessed in the main selection process. Furthermore, we checked the references of the selected publications to identify additional publications for inclusion, which were also discussed among all the authors.

In Stage 3, we conducted the main selection process, which involved fully reading each of the included publications and making a final decision about whether to include or exclude it. To strengthen the consistency of our main selection

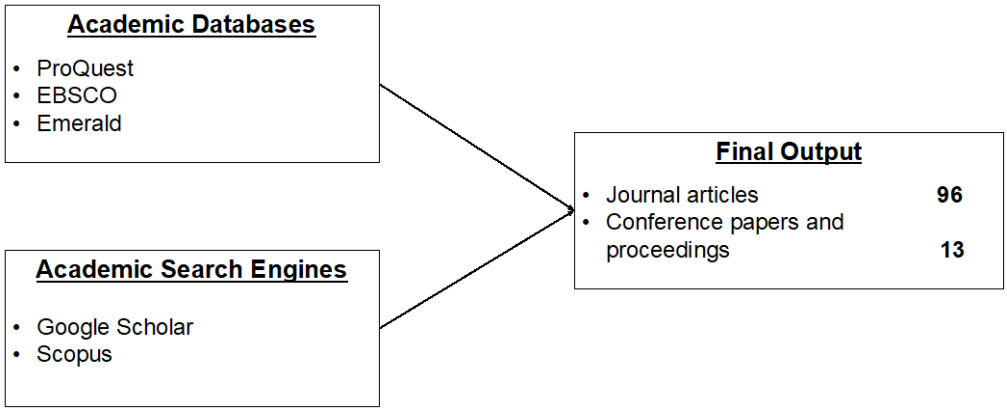
process among all the authors, we created a set of inclusion and exclusion criteria that were carefully applied when reading the publications (see Table A1). Whenever the relevance of a certain publication was questionable, we notified each other and explained why the inclusion criteria were not met. We either agreed to exclude the publication or engaged in further discussion until an agreement was reached. In addition, we extracted data from the included publications and organized the information in a tabular format (see Tables A2, A3, and A4). Specifically, we extracted and organized data on each publication's author(s) and year, outlet, contributions, theory, independent variables, dependent variables, research methodology, and country of investigation. Data extraction was conducted by one of the authors and then checked for completeness by the others.

Table A1. Inclusion and Exclusion Criteria for the Literature Review

Inclusion Criteria	Exclusion Criteria
1. The main objective of the publication should be exploring the e-government adoption and (re)use behavior from citizen's perspectives. 2. The publication had to have e-government adoption and (re)use related variable(s), such as attitude to use, intention to use, intention to reuse, or use. 3. The publication was written in English. Most of the publications are written in English.	1. Publications that investigated the e-government adoption and (re)use from the perspective of government agency's implementation and utilization. 2. Publications that addressed variables that were not directly linked to e-government adoption and (re)use such as outcomes or outputs of adoption or (re)use. 3. Publications for which only extended abstracts and/or PowerPoint presentations were available. 4. Popular media publications that are descriptive in nature and whose main objective is to inform and encourage citizens to adopt or (re)use e-government services. 5. We excluded studies that were published in other languages such as Arabic, polish, Chinese, and so on.

In Stage 4, we conducted the main search validation to make sure that all the relevant e-government publications were included in our study. We double-checked the references of both the included and excluded publications and added any e-government publications that had been missed. Using the terms "e-government adoption", "e-government use", and "e-government reuse", we performed additional searches in academic databases for publications that appeared after we performed the search in Stage 2. After completing the search validation, we ended up with a final dataset of 109 e-government publications, including 96 journal articles and 13 conference papers and proceedings, as illustrated in Figure 2. *Government Information Quarterly* (13) has been the main outlet for e-government adoption journal publications, and *Americas Conference on Information Systems* (5) and *Hawaii International Conference on Information Systems* (5) have been the main outlets for e-government adoption conference publications. Other peer-reviewed journals and conferences that have published e-government adoption studies include *Transforming Government: People, Process and Policy* (8), *Information Systems Management* (4), *European Conference of Information Systems* (3), *Journal of Strategic Information Systems* (2), *Information Technology & People* (2), *International Journal of Public Administration* (2), *Internet Research* (1), *Information Systems Frontiers* (1), *Journal of Management Information Systems* (1), *Journal of Science and Technology Policy Management* (1), *Journal of Urban Management* (1), *Behavior & Information Technology* (1), and *Sustainability* (1).

Figure A2. Summary of literature review output



As our research model largely focuses on the D&M IS success model, we provide details about the results of the literature review only based on the D&M IS success model and its key constructs including trust, risk, user satisfaction, demographics, culture, and their geographical coverage. Table A2 summarizes the research on citizens' e-government adoption and (re)use that focuses on the D&M IS success model. Table A3 summarizes the key e-government technology-, satisfaction-, service-c, and user-centered factors associated with the D&M IS success model. Finally, Table A4 summarizes the studies that used the D&M IS success model to investigate e-government adoption and (re)use.

Table A2. Summary of Prior Research on Citizens' e-Government Adoption and (Re)use that Focuses on the D&M IS Success Model

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
Ahmed and Campbell (2015) *Australasian Journal of Information Systems*	First study to investigate citizen attitudes to e-government adoption in the Kurdistan Region of Iraq and thus provides insight into the factors affecting the adoption of e-government within an emerging democratic state. It distinguishes between two types of e-government services; informational and transactional. Below are the tested hypotheses and associated results: • Perceived usefulness, facilitating conditions, social influence, trust in government (+) on intention to get information • Perceived risk (-) on intention to get information • Trust in government (-) on perceived risk • Perceived ease-of-use (+) on perceived usefulness • Perceived usefulness, compatibility, social influence, trust in government (+) on intention to conduct transactions • Perceived risk (-) on intention to conduct transactions • Trust in government (-) on perceived risk • Trust in the Internet (-) on perceived risk • Perceived ease-of-use (+) on perceived usefulness • Intention to use informational e-government (+) on transactional e-government	• DeLone & McLean's IS Success Model (D&M) • Diffusion of Innovation (DOI) • Technology Acceptance model (TAM) • Technology Readiness Index Model • Theory of Planned Behavior (TPB) • Unified Theory of Acceptance and Use of Technology (UTAUT)	**DV:** • Intention to conduct transactional e-government **IVs:** • Intention to get informational e-government • Perceived usefulness • Perceived ease-of-use • Facilitating conditions • Social influence • Information quality • Trust in government • Trust in the Internet • Perceived risk • Demographics (gender, age, computer experience, Internet experience, prior website visit)	Survey (548) Iraq (S)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
Akram et al. (2019) *Government Information Quarterly*	This study proposes a conceptual framework that extends expectation-confirmation model of IS continuance and D&M's IS successful model by adding the perceived functional benefit as mediating, perceived risk as moderating, and demographics. It ascertains the antecedents of e-tax filling continuance and explores the role of perceived risk on relationships between perceived functional benefit, satisfaction, and e-tax filing continuance intention. Below are the tested hypotheses and associated results: • Users' satisfaction (+) on continuance intention • Perceived functional benefits (+) on satisfaction and continuance intention • Confirmation of expectation (+) on perceived functional benefits and satisfaction • Information quality (+) on perceived functional benefit and confirmation expectation • Service quality (+) on perceived functional benefit and confirmation expectation • Low perceived risk (+) on relationship between perceived functional benefit and satisfaction • Low perceived risk (+) on relationship between perceived functional benefit and continuance intention • E-tax experience (+) on continuance intention	• DeLone and McLean's IS Success Model (D&M) • Expectation-Confirmation Model of IS Continuance	**DV:** • e-Tax continuance intention **IVs:** • System quality (information, system, service) • Perceived functional benefit ▪ Confirmation of expectation ▪ Perceived risk • Satisfaction • Demographics (gender, age, education, e-tax experience)	Online survey (409) Pakistan (S)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
Al-Zahrani (2020) *International Journal of Electrical and Computer Engineering*	This study adopts D&M and TAM to investigate the status of the IS success and cybersecurity aspects that influence the e-government service efficiency and effectiveness. Findings show that the constructs fundamental of the D&M strongly influence users' satisfaction of the e-government services. Similarly, the fundamental constructs factors of cybersecurity with TAM have a strong effect on perceived risk, in addition, both which affect the e-government services usage and effectiveness.	• DeLone & McLean's IS Success Model (D&M) • Technology Acceptance Model (TAM)	**DVs:** • e-|Government usage • e-|Government effectiveness **IVs:** • User satisfaction • Perceived risk • Perceived usefulness • Perceived ease-of-use • Perceived trust • Perceived privacy • Perceived security • Quality (system quality, service quality, information quality)	Online survey (211) Saudi Arabia (S)
Alzahrani et al. (2018) *Information Systems Management*	This study proposes a conceptual framework that draws on D&M's IS to examine factors influencing adoption of e-government. It includes not only technical factors but also government agency, risk and citizen's aspects, and examines how differences in gender, age and internet experience can moderate trust. Below are the tested hypotheses and associated results: • Risk (-) on trust • Intention (+) on adoption • Satisfaction less influence on adoption • Females greater trust than male groups Higher positive evaluation of online service dimensions than men • Positive influence on technical factors on trust (female more than males)	• DeLone and McLean's IS Success Model (D&M)	**DV:** • Adoption of e-government system **IVs:** • Trust in e-government • Technical factors (system quality, service quality, information quality) • Disposition of trust • Risk factors (performance risk, technical risk) • Intention to continue use • Citizens' satisfaction • Demographics (age, gender, Internet experience)	Online survey (912) Saudi Arabia (S) *All subjects with prior experience using e-government services.*
Colesca and Liliane (2008)	This study proposed an extension of TAM to understand adoption behavior of e-	• DeLone & McLean's IS Success Model (D&M)	**DV:** • Adoption of e-	Survey (507)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering	government. The analysis revealed that the citizen's higher perception of usefulness, ease of use, quality and trust of e-government services directly enhanced the level of adoption of e-government. Satisfaction is associated with perceived ease-of-use, perceived usefulness and perceived quality. Unclear, however, how time spent is assessed, as spending more time on e-government services might mean one can't find information swiftly. Maybe they controlled it using.	• Technology Acceptance Model (TAM)	government system **IVs:** • Perceived ease-of-use • Perceived usefulness • Perceived trust • Perceived quality (information quality, service quality) • User satisfaction (overall satisfaction) • Demographic factors (gender, age, occupation, education, income, years of Internet use, time spent using e-government services)	Romania (S)
Gonzalez et al. (2010) *Americas Conference on Information Systems*	This study investigates the impact of using e- government on local, state, and federal government efficiencies and effectiveness and, in the process, help understand the relationship between e- technologies and e-government success using quantitative data from the United States and Spain. It is found that the Spanish e-government citizens put more emphasis on information quality in terms of relevance, reliability, timeliness, clarity, conciseness, and currency. The system usage construct, e-government citizens on both side of the Atlantic agree that their e- government should provide superior user training, facilitate use of extranets to communicate with governmental agencies, allow automated transmitting and processing of data, and allow real time monitoring of citizen request for information in an e-government integrated with governmental agencies environment.	• DeLone and McLean's IS Success Model (D&M)	**DV:** • e-Government success (adoption) **IVs:** • e-Government system quality • e-Government information quality • e-Government system usage • e-Government satisfaction	Online survey (US: 280; Spain: 176) United States and Spain (M) *All subjects are citizens working in government agencies.*
Gemoets et al. (2011) *International Journal of Electronic Governance*				

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
Kaisara and Pather (2011) *Government Information Quarterly*	This study extends the e-service quality research into e-government domain. It develops the e-GovSqual for evaluation of e-government adoption. It identifies a set of e-government service quality dimensions that have impact on website design, navigation, site aesthetics, information quality, security and communication.	• DeLone & McLean's IS Success Model (D&M)	**DV:** • Adoption of e-government services **IVs:** • Information quality • Service quality ▪ Security/Trust ▪ Communication ▪ Site aesthetics ▪ Design ▪ Access	S1: Focus groups (55) S2: Online survey (106) South Africa (S)
Lin et al. (2011) *Government Information Quarterly*	This study integrated model of TAM, D&M and TRA. However, it been criticized for: incorrect use of sources, number of survey respondents do not add up, flawed questionnaire, biased data collection procedures, poor wording of definitions and hypotheses, respondents do not reflect the target population of the study, and explanations are not provided for the model.	• DeLone & McLean's IS Success Model (D&M) • Technology Acceptance Model (TAM) • Theory of Reasoned Action (TRA)	**DV:** • Behavioral intention to use e-government **IVs:** • Perceived usefulness • Perceived ease-of-use • Information system quality • Information quality • Attitude towards using	Unclear of number of respondents. Indicated survey (167) in Section 4.2. But Table 2 indicates 276 (add up male and female respondents). Gambia (S)
Napitupulu (2017) *International Journal of Advanced Science Engineering Information Technology*	This study develops a model that incorporates antecedents from TAM, UTAUT, D&M, as well as other factors influencing the adoption of e-government such as trust and compatibility based on previous research. The conceptual model proposed could bring better understanding about critical issues especially in e-government adoption process in Indonesia.	• DeLone & McLean's IS Success Model (D&M) • Diffusion of Innovation (DOI) • Technology Acceptance Model (TAM) • Technology Readiness Index (TRI) Model • Unified Theory of Acceptance and Use of Technology (UTAUT)	**DV:** • e-Government adoption **IVs:** • Behavioral intention • Perceived intention • Perceived usefulness • Perceived ease-of-use • Human dimension (optimism, innovativeness, discomfort, insecurity, social influence, citizen trust, compatibility)	Conceptual Indonesia (S)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
			• Technology dimension (information quality, system quality, service quality) • Organization dimension (facilitating conditions)	
Pappas et al. (2018) *Americas Conference on Information Systems*	This study presents a conceptual model by drawing on complexity and configuration theories, which captures the multidimensional and interdependent nature of e-government systems success combing trust and quality factors and identifies multiple configurations explaining different levels of citizens net benefits. None of the factors are necessary or a sufficient condition for high or low/medium net benefits; instead, it is always the combination of factors that explains the desired outcome. High net benefits explain that there is no solution on which any of the quality and trust factors are both at low levels. High net benefits can be explained when two of the quality factors are high, while trust of the government is at low levels (S2a), or both trust of the service and government remain at low levels (S3a). All three quality factors are absent, a percentage of the sample (23%) who trust the government will have also high benefits.	• Complexity Theory • DeLone & McLean's IS Success Model (D&M)	**DV:** • Intention to use e-government **IVs:** • Information quality • System quality • Service quality • Trust of the service • Trust of the government • Net benefits	Survey (502) Greece (S)
Rana et al. (2015) *Information Systems Frontiers*	This study integrates D&M's and Seddon's (1997) IS Success Models alongside with TAM constructs. Information quality, perceived ease of use, and perceived satisfaction strongly determines the perceived usefulness of the system. Ease-of-use and information quality, though significant, is weak relationship – there is a need to consider relevance, timeliness and	• DeLone & McLean's IS Success Model • Seddon's (1997) IS Success Model • Technology Acceptance Model (TAM)	**DVs:** • Behavioral intention to use e-government • Perceived satisfaction from e-government **IVs:** • System quality • Information quality	Survey (419) India (S)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
	accuracy of information generated by e-government system.		• Service quality • Perceived usefulness • Perceived ease-of-use • Perceived risk	
Rehman et al. (2012) *Transforming Government: People, Process and Policy*	This study integrates models of TAM, D&M, DOI and SERVQUAL. It is found that awareness and information quality strongly influence citizens' intention to adopt e-government services to get information from the government web site. Citizens are highly concerned with information quality when they intend to use e-government services to get information. Perceived ease of use, awareness, service quality and transaction security influence citizens' intention to conduct a transaction with the government.	• DeLone & McLean's IS Success Model (D&M) • SERVQUAL • Technology Acceptance Model (TAM)	**DV:** • Intention to adopt e-government **IVs:** • Quality of service (service quality, information quality) • Website design (perceived usefulness, perceived ease-of-use, paralingual web support) • Security (perceived risk, information security, transaction security) • e-Readiness (ICT infrastructure) • Awareness	Online survey (138) Pakistan (S)

Rehman et al. (2016)
 	
Information Systems Management
	This study integrates models of TAM, D&M and DOI. It examined online and offline users' intention to adopt e-government. It includes demographic factors, website design, quality of service, security, trust and e-readiness. Web site design (including the variable of paralingual web support); quality of service (including the variable of information quality); e-readiness (including the variable of awareness); and security (including the variables of information security and transaction security) are added by the researcher. Perceived usefulness and perceived ease-of-use are significant contributors influencing the citizens'	• DeLone & McLean's IS Success Model (D&M)
		• Technology Acceptance Model (TAM)
			DV:
			• Intention to adopt e-government
			
			IVs:
			• Quality of service (service quality, information quality)
			  ▪ Website design (perceived usefulness, perceived ease-of-use, paralingual web support
			  ▪ Security (perceived risk, information
				Stage 1: Expert interviews (6)
				
				Stage 2:
				Online survey (138)
				
				Stage 3:
				Online survey (150)
				Paper-based survey (150)
				
				Pakistan (S)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
	intention to adopt e-government services. Concerns of trustworthiness of the service providers. Citizens feel reluctant to transact with the available e-government services due to security loopholes in the government systems.		security, transaction security) ▪ e-Readiness (ICT infrastructure) ▪ Awareness	
Sharma and Mishra (2017) *Government Information Quarterly*	This study extends existing technology acceptance models by incorporating specific factors that are relevant such as word-of-mouth, service quality, one-stop-shop, accessibility, trusting belief, awareness. The research context of this study is rural India. Social influence, trusting belief, awareness, accessibility and one-stop shop are not significant in predicting behavioral intention. Dimensions of service quality (i.e., assurance, empathy and responsiveness) which captures behavior of intermediary significantly promotes acceptance of e-government outlets promoting e-government services. Furthermore, it proposes one-stop-shop as new factor of adoption, which is found to be insignificant. The research context played a significant role, as well as the frequency of using e-government services.	• DeLone & McLean's IS Success Model (D&M) • Unified Theory of Acceptance and Use of Technology (UTAUT)	**DV:** • Intention to use e-government **IVs:** • Awareness • Trusting belief (benevolence, integrity belief, competency belief) • Usefulness • Ease of obtaining services • Social influence • Behavior of intermediary • Reliability • Physical facility • Service quality (responsiveness, empathy, assurance, physical facilities, reliability) ▪ Accessibility ▪ Word-of-mouth ▪ One-stop-shop	Mixed-method Stage 1: Interviews (14) Stage 2: Survey (328) India (S)
Teo et al. (2008) *Journal of Management Information*	This study examines the role of trust in e-government success using the updated D&M's IS success model as the theoretical framework. Below are the tested hypotheses and associated results:	• DeLone & McLean's IS Success Model (D&M)	**DV:** • Intention to continue using e-government services	Survey (214) Singapore (S)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
Systems	• Trust in government (+) on trust in e-government services • Trust in e-government services (+) on information quality, system quality, and service quality • Information quality (+) on intention to continue using • System quality (+) on user satisfaction • Service quality (+) on user satisfaction • User satisfaction (+) on intention to continue using		IV: • Trust (trust in government, trust in technology, trust in e-government services) • Quality (information quality, system quality, service quality) • User satisfaction	
Wang and Liao (2008) *Government Information Quarterly*	This study provides the first empirical test of an adaptation of D&M's IS success model in the context of G2C e-government. The model consists of six dimensions: information quality, system quality, service quality, use, user satisfaction, and perceived net benefit. Below are the tested hypotheses and associated results: • Information quality (+) on user satisfaction • Information quality (+) on use • System quality (+) on user satisfaction • Use (+) on user satisfaction • Use (+) on perceived net benefit • User satisfaction (+) on perceived net benefit	• DeLone & McLean's IS Success Model (D&M)	**DV:** • Perceived net benefit **IV:** • Quality (information quality, system quality, service quality) • Use • User satisfaction • Demographics (gender, age, education, industry, G2C system used)	Survey (119) Taiwan (S)
Veeramootoo et al. (2018) *Government Information Quarterly*	This study integrates the models of D&M and ECM. Three quality constructs borrowed from the IS Success model are theoretically linked. It is found that system quality and user satisfaction are significant predictors of intention. Furthermore, system quality and service quality were found to influence service quality while information	• DeLone & McLean's IS Success Model (D&M) • Expectation-Confirmation Model (ECM)	**DV:** • Intention to continue using e-government application **IVs:** • Information quality • Service quality	Survey and online survey (645) Mauritius (S) *Does not differentiate between completed hard copy and e-copy*

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
	quality was influenced by system quality.		• System quality ▪ Perceived risks ▪ Confirmation ▪ Habit ▪ User satisfaction	*responses.*
Weerakkody et al. (2016) *Information Systems Management*	This study examines the importance of trust in relation to system quality and information quality of e-government systems and to what level cost (in terms of time and money) influences user's satisfaction to use e-government services. Below are the tested hypotheses and associated results: • System quality (+) on trust and user satisfaction with e-government services • Information quality (+) on trust and user satisfaction with e-government services • Trust and cost (+) on user satisfaction with e-government services	• DeLone and McLean's IS Success Model (D&M)	**DV:** • User satisfaction with e-government services **IVs:** • System quality • Information quality • Cost • Trust • Demographics (gender, age, education, internet usage, e-government service use)	Survey (1518) United Kingdom (S)
Deden Witarsyah et al. (2017) *International Journal on Advanced Science Engineering Information Technology*	This study aims to find critical factor that influences e-government adoption based on comprehensive bibliometric analysis. It develops a conceptual framework for e-government adoption, which included variables such information quality, trust, system quality, and other relevant ones from UTAUT.	• DeLone and McLean's IS success model (D&M) • Unified Theory of Acceptance and Use of Technology (UTAUT)	**DV:** • Use behavior **IVs:** • Behavioral intention • Trust • Social influence • Facilitating conditions • Effort expectancy • Performance expectancy • Information quality • System quality	Conceptual Indonesia (S)
D Witarsyah et al. (2017) *International Journal on Advanced Science,*	This study proposes a conceptual model of e-government using variables from UTAUT, D&M and trust.	• DeLone & McLean's IS Success Model (D&M) • Trust • Unified Theory of Acceptance and Use of Technology (UTAUT)	**DV:** • Intention to use e-government **IVs:** • Performance expectancy	Conceptual N/A (C)

Citation and outlet	Contributions	Theoretical perspective	Dependent and independent variables	Method (sample n) and country
Engineering and Information Technology			• Effort expectancy • Facilitating conditions • Social influence • Trust • System quality • Information quality	

**Note: C = conceptual; M = multiple countries; S = single country; JOR = journal publication; CON = conference paper or proceeding.

Table A3. Summary of the Key e-Government Constructs Related to the D&M IS Success Model

Category	Theory	Construct (Independent Variables)
Technology-centered constructs	e-Government system quality	**Information quality** (Abu-Shanab, 2014; Ahmed & Campbell, 2015; AL Athmay et al., 2016; Al-Zahrani, 2020; Alzahrani et al., 2018; Gemoets et al., 2011; Gonzalez et al., 2010; Kaisara & Pather, 2011; Lin et al., 2011; Napitupulu, 2017; Pappas et al., 2018; Rana et al., 2015; Rehman et al., 2012; Rehman et al., 2016; Teo et al., 2008; Veeramootoo et al., 2018; Venkatesh et al., 2016; Wang & Liao, 2008; Weerakkody et al., 2016; Deden Witarsyah et al., 2017; D Witarsyah et al., 2017)
		System quality (Akram et al., 2019; AL Athmay et al., 2016; Al-Zahrani, 2020; Alharbi et al., 2017; Alzahrani et al., 2018; Gemoets et al., 2011; Gonzalez et al., 2010; Napitupulu, 2017; Pappas et al., 2018; Rana et al., 2015; Sharma & Mishra, 2017; Teo et al., 2008; Veeramootoo et al., 2018; Wang & Liao, 2008; Weerakkody et al., 2016; Deden Witarsyah et al., 2017; D Witarsyah et al., 2017)
		Service quality (Al-Zahrani, 2020; Alawneh et al., 2013; Alzahrani et al., 2018; Hussein et al., 2011; Kumar et al., 2007; Napitupulu, 2017; Pappas et al., 2018; Rana & Dwivedi, 2015; Rehman et al., 2012; Rehman et al., 2016; Teo et al., 2008; Veeramootoo et al., 2018; Wang & Liao, 2008)
	Other e-government system-based constructs	• **e-Government services** (Mirchandani et al., 2008) ▪ Financial transaction services ▪ Requests and records services ▪ Government documentation services
		• **Website/Web design** (Alomari et al., 2012; Rehman et al., 2012; Rehman et al., 2016; Samuel et al., 2020) • **Design** (Kaisara & Pather, 2011) • **Aesthetics** (Gupta et al., 2017; Kaisara & Pather, 2011)
		• **User-friendliness** (Persaud & Persaud, 2013)
		• **Site content** (Persaud & Persaud, 2013)
		• **Participation** (Persaud & Persaud, 2013)
		• **Personalization/Localization** (Persaud & Persaud, 2013) • **Local information services** (Mirchandani et al., 2008)
		• **Multilingual option** (Kumar et al., 2018; Shareef et al., 2011)
		• **Paralingual web support** (Rehman et al., 2012; Rehman et al., 2016) • **e-Filling helpline competency** (Ojha et al., 2009) • **Technical support** (Gupta et al., 2017) • **Training** (Al-Sobhi et al., 2012; Gupta et al., 2017) • **Citizen feedback services** (Mirchandani et al., 2008)
		• **Technical infrastructure** (Gupta et al., 2017; Samuel et al., 2020)
		Perceived quality (Colesca & Liliane, 2008; Mensah et al., 2020; Zhang & Zhu, 2020) ▪ Information quality (did not specify use of IS success models) ▪ Service quality (did not specify use of IS success models)
		• **Perceived website quality** (Alsaghier et al., 2009) ▪ Navigation

Category	Theory	Construct (Independent Variables)
		▪ Presentation
		• **Output quality** (Karavasilis et al., 2016; Sang et al., 2009)
Satisfaction-centered factors	Overall satisfaction	• **Citizen satisfaction** (Al-Hujran et al., 2013; Kriti Priya Gupta et al., 2016; K P Gupta et al., 2016) ▪ Empathy ▪ Overall satisfaction ▪ Reliability ▪ Responsiveness • **Satisfaction** (Akram et al., 2019; Alzahrani et al., 2018; Sarabdeen et al., 2014) ▪ Time spent using e-government services • **User satisfaction** (AL Athmay et al., 2016; Al-Zahrani, 2020; Colesca & Liliane, 2008; Gemoets et al., 2011; Gonzalez et al., 2010; Teo et al., 2008; Veeramootoo et al., 2018; Wang & Liao, 2008)
Service-centered factors	Service itself	• **Perceived effectiveness** (AL Athmay et al., 2016) • **Efficiency** (Sharma, 2015) • **Government efficiency services** (Mirchandani et al., 2008)
		• **Reliability** (Orgeron & Goodman, 2011; Sharma & Mishra, 2017; Sharma, 2015) • **Perceived services response** (Shareef et al., 2011)
		• **Demonstrability** (Hussein et al., 2011)
		• **Accessibility** (Al-Sobhi et al., 2010; Alawneh et al., 2013; Persaud & Persaud, 2013) • **Access to speed** (Gupta et al., 2017)
		• **Responsiveness** (Orgeron & Goodman, 2011; Sharma & Mishra, 2017; Sharma, 2015)
		• **Empathy** (Orgeron & Goodman, 2011; Sharma & Mishra, 2017)
		• **Assurance** (Orgeron & Goodman, 2011; Sharma & Mishra, 2017)
		• **Communication** (Kaisara & Pather, 2011)
		• **Physical facilities** (Sharma & Mishra, 2017)
		• **One-stop shop** (Sharma & Mishra, 2017)
		Channel characteristics (Venkatesh et al., 2016) ▪ Convenience ▪ Personalization **Behavior of intermediary** (Sharma & Mishra, 2017) ▪ Responsiveness ▪ Empathy ▪ Assurance
	Transaction of the service [Trust]	• **Trust in/for/of Internet** (Abu-Shanab & Al-Azzam, 2012; Ahmed & Campbell, 2015; Akkaya et al., 2012; Alomari et al., 2014; Belanger & Carter, 2008; Carter, 2008; Carter & Belanger, 2004; Carter et al., 2016; Emrah Kanat & Özkan, 2009; Hussein et al., 2011; Kumar et al., 2018; Kurfali et al., 2017; Lallmahomed et al., 2017; Li, 2021; Mansoori et al., 2018; Orgeron & Goodman, 2011; Ozkan & Kanat, 2011; Rehman et al., 2012; Schaupp & Carter, 2005; Schaupp & Carter, 2010; Schaupp et al., 2009; Verkijika & De Wet, 2018; Wang & Lo, 2012;

Category	Theory	Construct (Independent Variables)
		Weerakkkody et al., 2013; Zhao & Khan, 2013) • **Trust in/for/of government** (Abu-Shanab, 2014; Abu-Shanab & Al-Azzam, 2012; Ahmed & Campbell, 2015; Akkaya et al., 2012; Belanger & Carter, 2008; Carter & Belanger, 2004; Carter & Weerakkkody, 2008; Carter et al., 2016; Emrah Kanat & Özkan, 2009; Kriti Priya Gupta et al., 2016; K P Gupta et al., 2016; Hussein et al., 2011; Kourouthanassis et al., 2016; Kumar et al., 2018; Kurfali et al., 2017; Lallmahomed et al., 2017; Li, 2021; Mansoori et al., 2018; Mensah & Adams, 2020; Mensah et al., 2020; Orgeron & Goodman, 2011; Ozkan & Kanat, 2011; Pappas et al., 2018; Rehman et al., 2012; Schaupp & Carter, 2005; Srivastava & Teo, 2009; Teo et al., 2008; Verkijika & De Wet, 2018; Wang & Lo, 2012; Zhang & Zhu, 2020; Zhao & Khan, 2013) ▪ Internal political self-efficacy (Hussein et al., 2011) ▪ External political self-efficacy (Hussein et al., 2011) • **Trust in intermediary** (Al-Sobhi et al., 2012; Kumar et al., 2018; Weerakkkody et al., 2013) • **Trust in e-Government services** (Alharbi et al., 2017; Alzahrani et al., 2018; Horst et al., 2007; Karavasilis et al., 2016; Kourouthanassis et al., 2016; Pappas et al., 2018; Teo et al., 2008) • **Trust in e-Government organization** (Horst et al., 2007) • **Trust in channels that provide e-government services** • **Trust (with no further conceptualization)** (Abdel-Fattah, 2015; Al-Hujran et al., 2015; Al-Sobhi et al., 2010; Alawneh et al., 2013; Alryalat et al., 2012; Carter & Weerakkkody, 2008; Emrah Kanat & Özkan, 2009; Husin et al., 2017; Moreno et al., 2013; Rufín et al., 2014; Samuel et al., 2020; Weerakkody et al., 2016; Deden Witarsyah et al., 2017; D Witarsyah et al., 2017) • **Trust in technology/Internet** (Al-Sobhi et al., 2012; Kriti Priya Gupta et al., 2016; K P Gupta et al., 2016; Teo et al., 2008) • **Trust in Internet technology** (Srivastava & Teo, 2009) • **Trust in technology** (Gupta et al., 2017) ▪ Trust in data storage and management ▪ Trust in technical infrastructure • **Trust of the system** (Schaupp & Carter, 2010; Schaupp et al., 2009) • **Trustworthiness** (Al-Hujran et al., 2013; Carter & Belanger, 2004; Chen & Aklikokou, 2020; Wang & Lo, 2012) ▪ Trust in Internet ▪ Trust in Government ▪ **Trust in e-government** (Abu-Shanab, 2017; Abu-Shanab & Al-Azzam, 2012) ▪ Trust in Internet ▪ Trust in Government • **Perceived Trust** (Al-Zahrani, 2020; Colesca & Liliane, 2008; Shareef et al., 2011) • **Trust** (Warkentin et al., 2002) ▪ Institutional structures ▪ Characteristics-based trust ▪ Experience (familiarity) • **Disposition to/of Trust** (Alsaghier et al., 2009; Alzahrani et al., 2018; Belanger & Carter, 2008; Carter et al.,

Category	Theory	Construct (Independent Variables)
		2016; Warkentin et al., 2002) • **Confidentiality and trust** (Rodrigues et al., 2016) • **Trust in e-government** (Alsaghier et al., 2009)/ **Trusting belief** (Sharma & Mishra, 2017) ▪ Benevolence ▪ Integrity belief ▪ Competency belief • **Means of uncertainty reduction** (Sabani, 2020; Venkatesh et al., 2016) ▪ Transparency ▪ Trust • **E-democracy** (Reddick, 2005) ▪ Trust of government ▪ Political beliefs • **Trust** (Lean et al., 2009) ▪ Perception of authentication ▪ Perception of non-repudiation ▪ Perception of confidentiality ▪ Perception of privacy protection ▪ Perception of data integrity • **Institution-based trust** (Alsaghier et al., 2009) ▪ Structure assurance trust ▪ Situation normality • **Trust** (Cabinakova et al., 2013) ▪ Trust in Online Services ▪ Trust in Public Sector • **Citizen trust** (Napitupulu, 2017)
	Transaction of the service [Risk]	• **Risk perception** (Horst et al., 2007) • **Perceived risk/risks** (Abu-Shanab & Al-Azzam, 2012; Ahmed & Campbell, 2015; Akkaya et al., 2012; Akram et al., 2019; Al-Zahrani, 2020; Alryalat et al., 2012; Alsaghier et al., 2009; Belanger & Carter, 2008; Carter et al., 2016; Hussein et al., 2011; Karavasilis et al., 2016; Kumar et al., 2007; Mensah et al., 2020; Rana & Dwivedi, 2015; Rana et al., 2017; Rehman et al., 2012; Schaupp & Carter, 2010; Veeramootoo et al., 2018; Verkijika & De Wet, 2018; Warkentin et al., 2002) • **Risk factors** (Alzahrani et al., 2018) ▪ Performance risk ▪ Technical risk ▪ Time risk
	Transaction of the service [Privacy and security]	• **Privacy and security concerns** (Abu-Shanab, 2014) • **Privacy and security assurance** (Abu-Shanab, 2017) • **Worry** (Horst et al., 2007)

Category	Theory	Construct (Independent Variables)

		• **Security** (Li, 2021; Rehman et al., 2012; Rehman et al., 2016; Sharma, 2015)
		  ▪ Perceived risk
		  ▪ Information security
		  ▪ Transaction security
		• **Internet safety perception** (Phang et al., 2005)
		• **Security/Trust** (Al-Zahrani, 2020; Kaisara & Pather, 2011)
		• **Perceived data security** (Hofmann & Heierhoff, 2012)
		• **Perceived security/Security perception** (Al-Sobhi et al., 2010; Alawneh et al., 2013; Alharbi et al., 2017; Alryalat et al., 2012; Sarabdeen et al., 2014; Shareef et al., 2011; Zhang & Zhu, 2020)
		• **Perceived privacy/Privacy perception** (Al-Sobhi et al., 2010; Al-Zahrani, 2020; Alawneh et al., 2013; Alharbi et al., 2017; Alryalat et al., 2012; Sarabdeen et al., 2014; Shareef et al., 2011)
		• **Perceived uncertainty** (Shareef et al., 2011)
		• **Perceived control** (Kumar et al., 2007)
		• **Tangible security features** (Alharbi et al., 2017)
		• **Information security awareness** (Alharbi et al., 2017)
		• **Cybersecurity law** (Alharbi et al., 2017)
		• **Security culture** (Alharbi et al., 2017)

User-centered factors	Demographics	• **Age** (Ahmed & Campbell, 2015; Akkaya et al., 2012; Akram et al., 2019; AL Athmay et al., 2016; Al-Shafi & Weerakkody, 2009; Al-Zahrani, 2020; Alawneh et al., 2013; Alharbi et al., 2017; Alzahrani et al., 2018; Colesca & Liliane, 2008; Dečman, 2015; Dimitrova & Chen, 2006; Gracia et al., 2012; Kriti Priya Gupta et al., 2016; Gupta et al., 2017; Hofmann & Heierhoff, 2012; Husin et al., 2017; Hussein et al., 2011; Mensah & Mi, 2018; Munyoka & Maharaj, 2017; Ojha et al., 2009; Ozkan & Kanat, 2011; Persaud & Persaud, 2013; Rabaa'i, 2017; Reddick, 2005; Rehman et al., 2012; Rufín et al., 2014; Samuel et al., 2020; Sawalha et al., 2019; Schaupp & Carter, 2005; Sharma, 2015; Verkijika & De Wet, 2018; Wang & Liao, 2008; Weerakkody et al., 2016; Zhao & Khan, 2013; Zhao et al., 2018)
		• **Gender** (Ahmed & Campbell, 2015; Akkaya et al., 2012; Akram et al., 2019; AL Athmay et al., 2016; Al-Awadhi & Morris, 2008; Al-Shafi & Weerakkody, 2009; Al-Zahrani, 2020; Alawneh et al., 2013; Alharbi et al., 2017; Alzahrani et al., 2018; Colesca & Liliane, 2008; Dečman, 2015; Dimitrova & Chen, 2006; Gracia et al., 2012; Gupta et al., 2008; Kriti Priya Gupta et al., 2016; Gupta et al., 2017; Hofmann & Heierhoff, 2012; Husin et al., 2017; Hussein et al., 2011; Kumar et al., 2007; Mensah & Mi, 2018; Moreno et al., 2013; Munyoka & Maharaj, 2017; Ojha et al., 2009; Ozkan & Kanat, 2011; Persaud & Persaud, 2013; Rabaa'i, 2017; Reddick, 2005; Rehman et al., 2012; Rodrigues et al., 2016; Rufín et al., 2014; Sarabdeen et al., 2014; Sawalha et al., 2019; Schaupp & Carter, 2005; Sharma, 2015; Verkijika & De Wet, 2018; Wang & Liao, 2008; Weerakkody et al., 2016; Zhao & Khan, 2013; Zhao et al., 2018)
		• **Education** (Akkaya et al., 2012; Akram et al., 2019; AL Athmay et al., 2016; Al-Shafi & Weerakkody, 2009; Alawneh et al., 2013; Alharbi et al., 2017; Colesca & Liliane, 2008; Dimitrova & Chen, 2006; Gupta et al., 2017; Husin et al., 2017; Hussein et al., 2011; Mensah & Mi, 2018; Munyoka & Maharaj, 2017; Persaud & Persaud, 2013; Reddick, 2005; Rehman et al., 2012; Rodrigues et al., 2016; Samuel et al., 2020; Sarabdeen et al., 2014;

Category	Theory	Construct (Independent Variables)
		Sawalha et al., 2019; Sharma, 2015; Verkijika & De Wet, 2018; Wang & Liao, 2008; Weerakkody et al., 2016; Zhao & Khan, 2013; Zhao et al., 2018) • **Academic stream** (Ojha et al., 2009) • **Academic course** (Al-Awadhi & Morris, 2008)
		• **Occupation** (AL Athmay et al., 2016); Al-Zahrani (2020); (Alawneh et al., 2013; Colesca & Liliane, 2008; Zhao & Khan, 2013; Zhao et al., 2018)
		• **Industry** (Wang & Liao, 2008)
		• **Location** (Munyoka & Maharaj, 2017; Zhao & Khan, 2013)
		• **Income** (AL Athmay et al., 2016; Alawneh et al., 2013; Colesca & Liliane, 2008; Dimitrova & Chen, 2006; Persaud & Persaud, 2013; Rufín et al., 2014; Samuel et al., 2020)
		• **Nationality** (Rodrigues et al., 2016; Sarabdeen et al., 2014) • **Ethnicity** (Husin et al., 2017; Rufín et al., 2014; Schaupp & Carter, 2005)
		• **Vernacular language** (Munyoka & Maharaj, 2017; Samuel et al., 2020)
		• **Race** (Dimitrova & Chen, 2006; Hussein et al., 2011; Reddick, 2005)
		• **Religious views** (Alomari et al., 2014) • **Beliefs** (Alomari et al., 2012)
		• **Political beliefs** ((Reddick, 2005)
		• **Job relevance** (Karavasilis et al., 2016; Sang et al., 2009)
	Use of computers/Internet	• **Years of internet experience** (Ahmed & Campbell, 2015; Al-Shafi & Weerakkody, 2009; Alharbi et al., 2017; Colesca & Liliane, 2008; Hussein et al., 2011; Ojha et al., 2009; Persaud & Persaud, 2013; Reddick, 2005; Samuel et al., 2020; Sarabdeen et al., 2014) • **Years of MS Excel experience** (Ojha et al., 2009)
		• **Familiarity with the Internet** (Abu-Shanab, 2014; Sawalha et al., 2019)
		• **Computer self-efficacy/experience** (Ahmed & Campbell, 2015; Al-Sobhi et al., 2010; Alawneh et al., 2013; Belanger & Carter, 2008; Hussein et al., 2011; Kumar et al., 2018; Lallmahomed et al., 2017; Shareef et al., 2011; Verkijika & De Wet, 2018; Zhao & Khan, 2013)
		• **Technological expertise** (Dimitrova & Chen, 2006) • **Technologies owned** (Persaud & Persaud, 2013)
		• **Internet experience** (Al-Awadhi & Morris, 2008; Alzahrani et al., 2018; Kumar et al., 2007)
		• **Internet and computer skills confidence** (Alomari et al., 2014; Alomari et al., 2012)
		• **Time spent on Internet/computer usage** (Ahmed & Campbell, 2015; AL Athmay et al., 2016; Alawneh et al., 2013; Hussein et al., 2011; Ojha et al., 2009; Ozkan & Kanat, 2011; Rehman et al., 2012; Rodrigues et al., 2016; Rufín et al., 2014; Sarabdeen et al., 2014; Schaupp & Carter, 2005; Weerakkody et al., 2016)
		• **Internet/computer skill** (Belanger & Carter, 2008; Emrah Kanat & Özkan, 2009; Gupta et al., 2017; Hussein et al., 2011; Ozkan & Kanat, 2011)
		• **Perceived awareness** (Al-Sobhi et al., 2010; Alawneh et al., 2013; Karavasilis et al., 2016; Kumar et al., 2018; Lallmahomed et al., 2017; Persaud & Persaud, 2013; Rehman et al., 2012; Rehman et al., 2016; Shareef et al.,

Category	Theory	Construct (Independent Variables)
		2011)
		• **Optimism bias** (Schaupp & Carter, 2010; Schaupp et al., 2009)
		• **Anxiety** (Rana & Dwivedi, 2015; Rana et al., 2017; Rana et al., 2016)
		• **Previous e-government transaction** (Belanger & Carter, 2008; Ojha et al., 2009)
	Individual's prior experiences with use of e-government services	**Personal experience (prior use of e-government services)** (Akram et al., 2019; Alharbi et al., 2017; Dečman, 2015; Gemoets et al., 2011; Gonzalez et al., 2010; Kriti Priya Gupta et al., 2016; Hofmann & Heierhoff, 2012; Horst et al., 2007; Ozkan & Kanat, 2011; Persaud & Persaud, 2013; Rabaa'i, 2017; Sawalha et al., 2019; Wang & Liao, 2008; Weerakkody et al., 2016)
		• **Time spent using e-government services** (Colesca & Liliane, 2008)
		• **Familiarity** (Alsaghier et al., 2009)
		• **Confirmation** (Veeramootoo et al., 2018)
		• **Habit** (Alharbi et al., 2017; Munyoka & Maharaj, 2017; Veeramootoo et al., 2018)
		• **Habitual Patterns** (Cabinakova et al., 2013) ▪ Habit of using government services on site ▪ Inertia
		• **Perceived need** (Dimitrova & Chen, 2006)
	Psychological characteristics	• **Risk tolerance** (Dimitrova & Chen, 2006)
		• **Preference** (Samuel et al., 2020)
		• **Resistance to change/degree of openness** (Alomari et al., 2014; Chen & Aklikokou, 2020; Zhang & Zhu, 2020)
		• **Optimism/Positive emotions** (Kourouthanassis et al., 2016; Napitupulu, 2017) • **Pessimism/Negative emotions** (Kourouthanassis et al., 2016) • **Affect** (Rana & Dwivedi, 2015)
		• **Innovativeness** (Karavasilis et al., 2016; Napitupulu, 2017; Sawalha et al., 2019) • **Perceived innovativeness in IT** (Ojha et al., 2009)
		• **Perceived behavior conflict** (Khan et al., 2012)
		• **Voluntariness** (Kumar et al., 2018)
		• **Susceptibility** (Gracia et al., 2012)
		• **Enjoyment/Hedonic motivation** (Munyoka & Maharaj, 2017)
		• **Discomfort** (Napitupulu, 2017)
		• **Insecurity** (Napitupulu, 2017)
		• **Interpersonal channels** (Dimitrova & Chen, 2006; Gracia et al., 2012)
		• **Mass media channels** (Dimitrova & Chen, 2006; Gracia et al., 2012) • **Service communication** (Abdel-Fattah, 2015; Hofmann & Heierhoff, 2012)
		• **Frequency of Internet use** (Dimitrova & Chen, 2006)
		• **Social contact** (Dimitrova & Chen, 2006)
	Civic-mindedness	• **Media use for public affairs** (Dimitrova & Chen, 2006; Gracia et al., 2012)

Category	Theory	Construct (Independent Variables)
		• **Prior interest in government** (Dimitrova & Chen, 2006)
		• **National culture** (country wide) (Al-Hujran et al., 2015; Aladwani, 2013) • **Wasta (favoritism)** (Alomari et al., 2014) • **Cultural orientation** (Zhao et al., 2018) ▪ Uncertainty avoidance (Cabinakova et al., 2013; Lean et al., 2009; Warkentin et al., 2002; Zhao et al., 2018) ▪ Power distance (Cabinakova et al., 2013; Warkentin et al., 2002; Zhao et al., 2018) ▪ Individualism (Zhao et al., 2018) ▪ Masculinity (Zhao et al., 2018) ▪ Long-term orientation (Zhao et al., 2018) ▪ Performance orientation (Zhao et al., 2018) ▪ Future orientation (Zhao et al., 2018)
		• **Social influence** (Abu-Shanab, 2014; Ahmed & Campbell, 2015; AL Athmay et al., 2016; Al-Shafi & Weerakkody, 2009; Alharbi et al., 2017; Alryalat et al., 2012; Chen & Aklikokou, 2020; Gupta et al., 2008; K P Gupta et al., 2016; Hussein et al., 2011; Kumar et al., 2018; Kurfali et al., 2017; Lallmahomed et al., 2017; Li, 2021; Mansoori et al., 2018; Mensah & Adams, 2020; Mensah et al., 2020; Munyoka & Maharaj, 2017; Napitupulu, 2017; Ovais Ahmad et al., 2013; Rana & Dwivedi, 2015; Rana et al., 2017; Rana et al., 2016; Sabani, 2020; Sawalha et al., 2019; Schaupp et al., 2009; Weerakkkody et al., 2013; Deden Witarsyah et al., 2017) • **Peer Influence** (Al-Awadhi & Morris, 2008; D Witarsyah et al., 2017)
		• **Social network** (Zhao et al., 2018)
		• **Image** (Carter & Belanger, 2004; Husin et al., 2017; Hussein et al., 2011; Kumar et al., 2018; Lean et al., 2009; Ojha et al., 2009; Phang et al., 2005; Rokhman, 2011; Sang et al., 2009; Shareef et al., 2011; Sharma & Mishra, 2017)
	Culture difference	• **Word-of-Mouth (WOM)** (Alomari et al., 2014; Sharma & Mishra, 2017)

Table A4. Summary of the Studies that Used the D&M IS Success Model

No.	Study	TRA	UTAUT	TAM	DOI	TPB	D&M	Other Theories/Models	Conceptual
1	Ahmed and Campbell (2015)		Y	Y	Y	Y	X	Technology readiness index model	
2	Akram et al. (2019)						X	Expectation-confirmation model	
3	Alzahrani et al. (2018)						X		
4	Al-Zahrani (2020)			Y			X		
5	Colesca and Liliane (2008)			Y			X		
6	Gonzalez et al. (2010)						X		
7	Gemoets et al. (2011)						X		
8	Kaisara and Pather (2011)						X		
9	Lin et al. (2011)	Y		Y			X		
10	Napitupulu (2017)		Y	Y	Y		X	Technology readiness index model	
11	Pappas et al. (2018)						X	Complexity theory	
12	Rana et al. (2015)			Y			X	Seddon's (1997) IS success model	
13	Rehman et al. (2012a)			Y	Y		X	SERVQUAL	
14	Rehman et al. (2016)			Y			X		
15	Samuel et al. (2020)			Y					
16	Sharma and Mishra (2017)		Y				X		
17	Teo et al. (2008)						X		
18	Wang and Liao (2008)						X		
19	Veeramootoo et al. (2018)						X	Expectation-confirmation model	
20	Weerakkody et al. (2016)						X		
21	Witarsyah et al. (2017a)		Y				X		
22	Witarsyah et al. (2017b)		Y				X	Trust construct	X
23	Zhang and Zhu (2020)	Y	Y	Y					

**Note: This table includes only publications with theoretical contributions; "X" signifies explicit reference to theory/theories; "Y" signifies implicit reference to theory/theories.

Appendix B. Survey and Measurement Details

Note: English, Arabic, and Polish text were used so that participants could best understand it in their preferred language (the text in red represents the Polish version). For the Kuwaiti participants, the survey text was updated to refer to the Kuwaiti e-government website, which was the following: http://e.gov.kw. For the Polish participants, the survey text was updated to refer to the Polish e-government website, which was the following: https://obywatel.gov.pl/

1. **الجنس ، gender، Płeć**

- ☐ ذكر (Male)، Męski
- ☐ انثى (Female)، Kobieta

2. **فئتي العمرية، Age range، Wiek**

- ☐ أقل من 21 سنة
- ☐ 21-29 سنة
- ☐ 30- 39 سنة
- ☐ 40-49 سنة
- ☐ فوق 50 سنة

3. **الجنسية، Nationality، Narodowość.....**

4. **أنا (Status)، Jesteś**

- ☐ طالب جامعي، Student، Studentem
- ☐ موظف، Employee، Pracownikiem
- ☐ باحث عن عمل، Job seeker، Bezrobotnym
- ☐ متقاعد، Retired، Emerytem/rencistą

5. **المستوى التعليمي، Education Level، Wykształcenie**

- ☐ درجة الثانوية أو أقل (High school & lower)، Podstawowe
- ☐ درجة الدبلوم من التطبيقي (Diploma degree)، Średnie
- ☐ درجة البكالوريوس من الجامعة (Bachelor degree)، Licencjackie
- ☐ درجة الماجستير (Master degree)، Magisterskie
- ☐ درجة الدكتوراه (Ph.D. Degree)، Doktor

6. **استخدم الانترنت للقيام بما يلي (تستطيع ان تختار اكثر من خيار) I use Internet for، Używam Internetu w szczególności do**

- ☐ البريد الإلكتروني، Email، Poczty email
- ☐ التسوق الالكتروني ، Purchasing online، Zakupów
- ☐ الحوارات الفورية المباشرة، Instant messaging، Czat online
- ☐ البحث عن المعلومات على الانترنت، Searching on the web، Wyszukiwania informacji
- ☐ الألعاب الالكترونية عبر الإنترنت، Playing online games، Gier online

☐ الشبكات الاجتماعية ،Social networking، Sieć społecznościowa
☐ خدمات موقع الحكومة الالكترونية ،Online services of e-government، Usługi online e-administracji

7. كم عدد مرات استخدمت لموقع الحكومة الالكترونية ?How many time do you access the e-government، **Ile razy masz dostęp do e-administracji?**

☐ لم يسبق لي أن استخدمته ، Never use it before، Nigdy nie używałem/łam go wcześniej
☐ مرة واحدة في السنة ، One time per year، Raz w roku
☐ مرة في الشهر ، One time per month، Raz w miesiącu
☐ مرة في الاسبوع ،One time per week، Raz w tygodniu
☐ يوميا ،Daily، Codzienny

8. ما هي نوعية الخدمة التي استخدمتها على موقع الحكومة الالكترونية ؟what type of service did you used on the e-government، **z jakiego rodzaju usługi korzystałeś w e-administracji?**

☐ البحث عن المعلومات ، Search information services، Serwis informacyjny
☐ اتمام عمليات الدفع عبر نظام الدفع الحكومي تسديد ، Online payment transactions، Transakcje płatności online

يرجى تحديد انطباعاتك بخصوص موقع البوابة الرسمية للحكومة الالكترونية بالكويت مع كل من العبارات الواردة ادناه باستخدام المقياس التالي : 1 = غير موافق بشدة، 2 = غير موافق، 3 = محايد، 4 = أوافق، 5 = أوافق بشدة

Please specify your perceptions about the official website of the e-government portal with each of the statements below using the following scale:
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

Proszę określić swoje wrażenia na temat oficjalnej strony internetowej portalu e-administracji w Polsce za pomocą każdego z poniższych stwierdzeń przy użyciu następującej skali: 1 = Zdecydowanie się nie zgadzam, 2 = Nie zgadzam się, 3 = Neutralny, 4 = Zgadzam się, 5 = Zdecydowanie zgadzam się

Table B1. Measurement Details

Latent Constructs	Prompts and Items	Measurement source
Information quality (IQ)	IQ1. The e-government website provides the precise information that I need Strony e-administracji dostarczają mi wszystkich informacji, których potrzebuję يوفر موقع الحكومة الالكترونية المعلومات الدقيقة التي احتاجها.	Doll and Torkzadeh (1988) and Rouibah et al. (2015)
	IQ2. The information content of the e-government website meets my needs Zawartość informacyjna stron internetowych e-administracji spełnia moje potrzeby يناسب احتياجاتي محتوى المعلومات الواردة في موقع الحكومة الالكترونية.	
	IQ3. The e-government website provides sufficient information Strony e-administracji dostarczają mi pełnych, wyczerpujących informacji يوفر موقع الحكومة الالكترونية المعلومات الكافية التي احتاجها.	
	IQ4. The e-government website provides accurate information Strony e-administracji dostarczają dokładnych informacji المعلومات الواردة في موقع الحكومة الالكترونية صحيحة.	
	IQ5. The information in the e-government website is clear Informacje na stronach e-administracji są jasne المعلومات الواردة في موقع الحكومة الالكترونية واضحة.	
	IQ6. The e-government website provides up-to-date information Na stronach e-administracji informacje są aktualizowane na bieżąco المعلومات الواردة في موقع الحكومة الالكترونية حديثة.	
	IQ7. The information of the e-government is presented in a good format Informacje zawarte na stronach e-administracji są przedstawione w sposób zrozumiały i przejrzysty المعلومات الواردة في موقع الحكومة الالكترونية معروضة بشكل جيد.	
	IQ8. The information presented in the e-government web site is easily to understand Informacje na stronach e-administracji są łatwe do zrozumienia i napisane przystępnym językiem المعلومات الواردة في موقع الحكومة الالكترونية سهلة الفهم	
System quality (SQ), 2nd order, formative construct made of ease of use, reliability, and security (all reflective) SQ ease of use (SQE): SQ1–SQ2, SQ7, SQ10	SQ1. The e-government website is user friendly Strony internetowe e-administracji są przyjazne użytkownikom يتميز موقع الحكومة الالكترونية بواجهة وتفاعل سهلة الاستخدام.	Doll and Torkzadeh (1988) and Rouibah et al. (2015)
	SQ2. The e-government website is easy to learn and to use Korzystanie ze stron internetowych e-administracji jest łatwe موقع الحكومة الالكترونية سهل التعلم والاستخدام.	
	SQ3. The e-government website is always up and available Strony internetowe są zawsze dostępne dla użytkownika خدمات موقع الحكومة الالكترونية دائما متوفرة و لا تتعرض لأعطال.	Rouibah et al. (2015)

SQ reliability (SQR): SQ3–SQ4, SQ9 SQ security (SQS): SQ5–SQ6, SQ8	SQ4. The e-government website is NOT subject to frequent problems and crashes Na stronach e-administracji NIE występują często awarie i brak dostępności غالبا لا يتعرض موقع الحكومة الالكترونية للمشاكل والانقطاعات الفنية.	Goodhue and Thompson (1995) and Rouibah et al. (2015)
	SQ5. The e-government website ensures transactions security Strony internetowe e-administracji gwarantują bezpieczeństwo transakcji يحافظ موقع الحكومة الالكترونية على أمن وسرية عمليات الدفع	Rouibah et al. (2015)
	SQ6. The e-government website protects consumers' privacy Strony e-administracji zapewniają ochronę prywatności użytkownika يحمي الموقع المعلومات الشخصية الخاصة بالعملاء.	
	SQ7. The e-government web site depicts short response time for on-line enquiry Strony internetowe e-administracji zapewniają krótki czas odpowiedzi na zadane pytania يقوم موقع الحكومة الالكترونية باختصار زمن الاستجابة أثناء طلبات الاستفسار	Added from expert feedback during measurement development
	SQ8. Payments are made through secure payment gateway. Płatności na stronach e-administracji są odpowiednio zabezpieczone يوفر موقع الحكومة الالكترونية طرق آمنة للدفع.	Kuo and Chen (2011) and Rouibah et al. (2015)
	SQ9. The e-government website provides well-built advanced search engine Na stronach e-administracji są dobrze działające wyszukiwarki informacji يوفر موقع الحكومة الالكترونية محرك متطور للبحث عن المعلومات.	
	SQ10. All processes (paying and support) on the e-government website are explained clearly. Wszystkie procesy na stronach e-administracji są wyjaśnione w sposób zrozumiały i przystępny كل الاجراءات (الدفع و الدعم) على موقع الحكومة الالكترونية مشروحة بطريقة واضحة	
Service quality (SVQ)	SVQ1. I believe that e-government website will provide customer service as promised if needed Wierzę, że na stronach internetowych e-administracji w razie potrzeby uzyskam niezbędną pomoc أعتقد أن موقع الحكومة الإلكترونية يوفر خدمات للعملاء كما وعد إذا لزم الأمر	Kettinger and Lee (2005)
	SVQ2. I believe that e-government website is ready to respond customers' requests Wierzę, iż administratorzy stron e-administracji reagują szybko i sprawnie na potrzeby użytkowników أعتقد أن موقع الحكومة الإلكترونية على استعداد للاستجابة لأسئلة العملاء	
	SVQ3. I believe that e-government website has the knowledge to answer customers' questions Wierzę, iż zarządzający stronami e-administracji posiadają odpowiednią wiedzę zgodną z potrzebami klientów أعتقد أن موقع الحكومة الإلكترونية لديه المعرفة للرد على أسئلة واستفسارات العملاء	
	SVQ4. I believe that e-government website understands the needs of customers Wierzę, że administratorzy stron e-administracji rozumieją potrzeby użytkownika أعتقد أن موقع الحكومة الإلكترونية يتفهم احتياجات العملاء	
	SVQ5. I believe that e-government website provides professional services. Wierzę, że strony e-administracji zapewniają profesjonalną obsługę użytkownikowi أعتقد أن موقع الحكومة الإلكترونية يوفر الخدمات عالية الجودة	

	SVQ6. When users have a problem e-government web site shows a sincere interest in solving it Gdy użytkownicy strony e-administracji mają problem, administratorzy wyrażają szczere chęci by go rozwiązać عندما يواجه المستخدم مشكلة ما يظهر موقع الحكومة الإلكترونية اهتماما صادقا في حلها	Wang and Liao (2008)
	SVQ7. When I have a problem, the e-government website provides online support sources (e.g., email, chat room, social networking, FAQ). Kiedy mam problem, na stronie internetowej e-administracji zapewnione są źródła pomocy technicznej online (np e-mail, czat, portal społecznościowy, Tel, FAQ). يوفر موقع الحكومة الالكترونية الدعم المطلوب لحل المشاكل التي يمكن أن تواجهني عن طريق الانترنت وذلك من خلال طرق التواصل المختلفة (مثل البريد الالكتروني غرف المحادثة ، مواقع التواصل الاجتماعي، أسئلة وأجوبة).	Wang and Tang (2003), Mukherjee and Nath (2007), and Rouibah et al. (2015)
	SVQ8. The e-government web site provides high prompt support service Strony internetowe e-administracji zapewniają wysoką jakość usługi wsparcia użytkownika يوفر موقع الحكومة الالكترونية سرعة عالية في خدمات الدعم	Al-Awadhi and Morris (2008) and Rouibah et al. (2015)
	SVQ9. The government web site provides high reliable support service Strony internetowe e-administracji zapewniają wysoką jakość usługi wsparcia technicznego يوفر موقع الحكومة الالكترونية خدمات دعم موثوقة وعالية الجودة	
	SVQ10. The government web site provides high responsive support service Rządowa strona internetowa zapewnia wysoce responsywną usługę wsparcia يستجيب موقع الحكومة الالكترونية بسرعة لطلبات خدمات الدعم	
Perceived value (PV)	PV1. Compared to the time I need to spend, the use of e-government is worthwhile to me W stosunku do poświęconego czasu korzystanie ze stron e- administracji jest dla mnie opłacalne استخدام موقع الحكومة الإلكترونية مفيد بالنسبة لي مقارنة بالوقت الذي أبذله	Sirdeshmukh et al. (2002) and Rouibah et al. (2015)
	PV2. The effort I put on the e-government website is very worthwhile Wysiłek, jaki wkładam w uzyskanie informacji ze strony e-administracji jest niewielki يعتبر استخدام موقع الحكومة الإلكترونية مفيد لي مقارنة بالجهد الذي احتاج لابذله	Sirdeshmukh et al. (2002) and Rouibah et al. (2015)
	PV3. I think that using e-government website can offer me a wider range of online services Myślę, że strony e-administracji mogłyby mi zaoferować szerszy zakres usług أعتقد أن استخدام موقع الحكومة الإلكترونية يمكن أن يقدم لي مجموعة واسعة من الخدمات عبر الإنترنت	Yiu et al. (2007)
	PV4. The e-government website makes my online service and payment easier Strony internetowe e-administracji sprawiają że usługi online są łatwiejsze يجعل موقع الحكومة الإلكترونية الخدمات الالكترونية وعمليات الدفع أكثر سهولة	Wang and Liao (2008)
	PV5. The e-government web system saves me time System stron e-administracji oszczędza mój czas يوفر موقع الحكومة الإلكترونية لي الكثير من الوقت	
	PV6. Overall, the use of the e-government website delivers me good value Ogólnie rzecz biorąc, strony e-administracji dostarczają usługi dobrej jakości عموما يعطيني موقع الحكومة الإلكترونية قيمة جيدة	Sirdeshmukh et al. (2002)
User satisfaction (US)	US1. I feel satisfied with using e.gov.kw Czuję satysfakcję z użytkowania rządowych stron internetowych	Bhattacherjee (2001)

	أنا راضي عن تجربتي مع موقع الحكومة الالكتروني	
	US2. I feel contented with using e.gov.kw Jestem zadowolony (a) z użytkowania rządowych stron internetowych أحس بالاقتناع جراء استخدام موقع الحكومة الالكترونية	
	US3. I feel pleased with using e.gov.kw Jestem usatysfakcjonowany podczas korzystania z rządowych stron internetowych احس بالسرور جراء استخدام موقع الحكومة الالكترونية	
Intention to reuse (IR)	IR1. I intent to reuse the e-government website in the future Mam zamiar korzystania ze stron e-administracji w przyszłości أنوي استخدام موقع الحكومة الإلكترونية مستقبلا.	Rouibah et al. (2015)
	IR2. I will frequently use the e-government website in the future Będę częściej korzystać z serwisów e-administracji w przyszłości سوف استخدم موقع الحكومة الإلكترونية بشكل متكرر في المستقبل.	
	IR3. In the next six months it is likely that I will use the e-government web site to pay my bills and fines Jest prawdopodobne że w ciągu najbliższych 6 miesięcy będę korzystał (a) ze stron e-administracji w celach zapłaty podatków, mandatów itp. خلال الستة شهور القادمة من المحتمل جداً أن استخدم موقع الحكومة الإلكترونية لتسديد فواتير اشتراكاتي ومخالفاتي	
	IR4. I am likely to recommend the e-government web site to my friends Jest prawdopodobne że polecę strony e-administracji przyjaciołom i znajomym من المرجح جدا أن أوصي أصدقائي باستخدام هذا الموقع	Rouibah et al. (2016)
	IR5. I would re-use e-government services provided over the Web site Chciałbym/chciałabym ponownie skorzystać ze stron e-administracji i dostępnych tam usług أنوي استخدام خدمات الحكومة الإلكترونية المقدمة على موقع الويب	Belanger and Carter (2008)
Trust in e-government (TiE)	TiE1. The e-government web site is trustworthy Strony e-administracji są wiarygodne يستحق موقع الحكومة الإلكترونية أن يكون موضع ثقتي	Teo and Liu (2007)
	TiE2. The e-government web site keeps promises and commitments Administratorzy stron e-administracji dotrzymują terminów i obietnic يحافظ موقع الحكومة الإلكترونية على وعوده والتزاماته تجاه المستخدم	
	TiE3. The e-government web site keeps customers' interests in mind Strony internetowe e-administracji działają w interesie klientów يضع موقع الحكومة الإلكترونية مصالح العملاء في الاعتبار.	
	TiE4. The e-government web site provides reliable information Serwis e-administracji dostarcza rzetelnych informacji يوفر موقع الحكومة الإلكترونية للمستخدم معلومات قيمة وموثوقة	

Psychological risks (RPY)	RPY1. The e-government web site will not fit in well with my self-image or self-concept Strony internetowe e-administracji odbiegają od moich wyobrażeń, co do funkcjonowania tego typu stron بالنسبة لي لا يصلح موقع الحكومة الإلكترونية لي بشكل جيد	Featherman and Pavlou (2003)
	RPY2. The usage of the e-government web site would lead to a psychological loss for me because it would not fit in well with my self-image or self-concept. Korzystanie z e-administracji może doprowadzić do utraty przeze mnie komfortu psychicznego يسبب استخدام موقع الحكومة الإلكترونية لي ضرر نفسي لأنه لا يناسبني بشكل جيد	
Privacy risks (RP)	RP1. Using the e-government web site will cause me to lose control over the privacy of my payment information Korzystanie ze stron e-administracji spowoduje utratę mojej prywatności يسبب استخدام موقع الحكومة الإلكترونية امكانية فقداني السيطرة على خصوصية المعلومات التي تخص عمليات الدفع	Lee (2009)
	RP2. Using the e-government web site would lead to a loss of privacy for me because my personal information would be used without my knowledge. Korzystanie ze stron e-administracji spowoduje wykorzystywanie moich danych osobowych przez osoby trzecie قد يؤدي استخدام موقع الحكومة الإلكترونية إلى فقدان خصوصية معلوماتي الشخصية بدون علمي	
	RP 3. Internet hackers might take control of my online payment if I use the e-government web site Jeżeli będę używać stron internetowych e-administracji hakerzy mogą przejąć kontrolę nad moimi płatnościami قد يسيطر الهاكرز على عمليات الدفع عبر الإنترنت إذا استخدمت موقع الحكومة الإلكترونية	
Time risks (RT)	RT1: Using e-government service would lead to a loss of convenience of me because I would have to waste a lot of time fixing payments errors. Korzystanie z usług e-administracji i sytemu płatności powoduje, iż stracę mnóstwo czasu na naprawianie błędów w płatności استخدام موقع الحكومة الإلكترونية غير مريح لي لأنه يمكن أن أضيع الكثير من الوقت لتثبيت أخطاء الدفع الالكتروني	Lee (2009)
	RT2: It would take me lots of time to learn how to use e-government services over the web site. Zajęłoby mi zbyt dużo czasu nauczenie się korzystania z usług stron e-administracji يستغرق تعلم كيفية استخدام موقع الحكومة الإلكترونية الكثير من الوقت	
Overall risks (RO)	RO1. Using the e-government web site for payment would be risky Korzystanie z płatności za pośrednictwem stron e-administracji jest ryzykowne استخدام موقع الحكومة الإلكترونية للدفع محفوف بالمخاطر	Lee (2009)
	RO2. The e-government web site is dangerous to use. Strony e-administracji nie są bezpieczne استخدام موقع الحكومة الإلكترونية أمر فيه مخاطر	
	RO3. Using the e-government web site would add great uncertainty to my online payment Korzystanie z płatności za pośrednictwem stron e-administracji może spowodować niepewność co do moich płatności online سيضيف استخدام موقع الحكومة الإلكترونية قدر كبير من الشك على عمليات الدفع التي أقوم بها	

	RO 4. Using the e-government web site exposes me to an overall risk Korzystanie z witryn e-administracji naraża mnie na ryzyko يعرضني استخدام موقع الحكومة الإلكترونية الى مخاطر كثيرة	
Individualism-collectivism (IC)	IC1. Group welfare is more important than individual rewards. Dobro grupy jest ważniejsze niż nagrody indywidualne في رأيي رفاهية المجموعة أكثر أهمية من المكافآت الفردية.	Dorfman and Howell (1988)
	IC2. Group success is more important than individual success. Sukces grupy jest ważniejszy niż sukces jednostki في رأيي نجاح المجموعة أكثر أهمية من النجاح الفردي.	
Uncertainty avoidance (UA)	UA1. It is important to have requirements and instructions spelled out in detail so that you always know what you are expected to do. Ważne jest, aby mieć wymagania opisane szczegółowo aby wiedzieć czego się oczekuje من المهم تحديد التعليمات بالتفصيل حتى يتسنى لي دائما معرفة ما يُتَوَقعُ منى أن أفعله.	Dorfman and Howell (1988)
	UA2. Rules and regulations are important because they inform you what is expected of you. Przepisy i prawa są dobre ponieważ konkretyzują oczekiwania wobec mnie القواعد والأنظمة مهمة لأنها تحيطني علما بما هو متوقع مني أن أفعله.	
	UA3. Standard procedures and policies are helpful to people. Standardowe procedury i zasady są pomocne dla ludzi إجراءات وقواعد العمل مفيدة للناس والأفراد.	
Masculinity-femininity (MF)	MF1. Men usually solve problems with logical analysis; women usually solve problems with intuition Mężczyźni rozwiązują problemy logicznie, kobiety intuicyjnie عادة ما يقوم الرجال باستخدام التحليل المبني على المنطق في حل المشاكل بينما تستخدم النساء الحدس.	Dorfman and Howell (1988)
	MF2. Solving problems usually requires direct approach, which is typical of men Rozwiązywanie problemów zwykle wymaga bezpośredniego podejścia, co jest typowe dla mężczyzn عادة ما يتطلب حل المشاكل أسلوب المواجهة المباشر وهو أمر يليق بالرجال.	
	MF3. it is better to have a man in a high-level position rather than a woman. Lepiej jeśli mężczyzna zajmuje wyższą pozycję niż kobieta أعتقد أنه من الأفضل أن يكون رجلا في مستوى إداري عالي بدلا من امرأة.	

Appendix C: Methodology and Analysis Support

Formative or Reflective Constructs?

A key step in preparing to assessing factorial validity is to determine which constructs are formative and which are reflective (Diamantopoulos & Winklhofer, 2001).[i] We used (Cenfetelli & Bassellier, 2009; Diamantopoulos & Winklhofer, 2001; Petter et al., 2007) as the basis for determining which constructs were formative and which were reflective. In this assessment, the most important consideration is to see how the constructs were theoretically formed and validated in other literature, to make sure no contradictions exist in their current use, and to model the constructs consistently. All of our first-order measures were considered reflective. Finally, system quality was a formative second-order construct made up of three first-order reflective subconstructs.

Factorial Validity for the Reflective Constructs

Factorial validity of reflective constructs is established by establishing both convergent validity and discriminant validity, two highly interrelated concepts that must coexist. Importantly, factorial validity is established in different ways for reflective and formative constructs; thus, we discuss these analyses separately.

To establish the factorial validity of our reflective constructs, we followed procedures shown by Straub Gefen and Straub (2005) and Lowry and Gaskin (2014). For an especially conservative analysis, we used two established techniques to establish convergent validity and two established techniques to establish discriminant validity. First, we examined the outer model loadings, summarized in Table C1. Following Gefen and Straub (2005), convergent validity can be established when the *t*-values of the outer model loadings are significant. All items in the model passed these checks. Moreover, all loadings were above the conservative 0.500 threshold.

As a second check, we correlated the latent variable scores against the indicators as a form of factor loadings and then examined the indicator loadings and cross-loadings to establish convergent validity (see Table C2). Although this approach is typically used to establish discriminant validity (Gefen & Straub, 2005), convergent validity and discriminant validity are interdependent and help establish each other (Straub et al., 2004). Thus, convergent validity is also established when each loading for a latent variable is substantially higher than those for other latent variables.

We also used two approaches to establish discriminant validity, as described in Gefen and Straub (2005) and Lowry and Gaskin (2014). First, as with convergent validity, we examined the factor loadings, but this time to ensure significant overlap did not exist between the constructs. Second, we used the approach of examining the square roots of the AVEs described in Fornell and Larcker (1981); Staples et al. (1999)[ii] Strong discriminant validity was shown for all subconstructs, using both approaches. All of the AVE thresholds were exceeded for all latent constructs, as summarized in Table C3, which also displays the measurement model statistics for all first-order reflective constructs.

Mono-Method Bias (aka Common Method Bias)

Several steps were taken a priori to decrease the likelihood of common-method bias from occurring in our data collection, as discussed in the main text. However, all data was collected using a similar-looking online survey; thus, we tested for common-method bias to establish that it was not a likely negative factor in the data remaining for our analysis.

In addition, we had created a marker variable, based on our two attention-trap questions from our survey, which we could use to further establish that common-method bias exists. A marker variable is one that is unrelated to the theoretical model being tested. The idea here is that if common-method bias existed, then all (or most) constructs would be highly correlated, including the marker variable. The simplest way to test this was to run the marker variable in the correlation matrix of all variables. We did so against all the major constructs of our model and found trivial to low correlations (see Table C3). This provides further evidence common-method bias is likely not a legitimate threat to this study.

Moreover, method research involving PLS indicate that high multicollinearity is a key symptom of mono-method bias (Kock, 2015). Because our data manifests low multicollinearity, this is another indication that mono-method bias is an unlikely factor in our data that would negatively influence our analyses.

Checking for Multicollinearity

Another key threat to check for with any form of path modeling (including SEM and regression) is the potential threat of multicollinearity, and thus we followed the latest standards in checking for multicollinearity with all construct items. All of the first-order reflective constructs had Variance inflation factors (VIFs) well below the conservative

threshold of 5.0, for both inner VIFs (Table 2 in main paper) and outer VIFs (Table C4). VIFs less than 10 are traditionally viewed as justification for a model's lack of multicollinearity, with 5.0 being ideal. However our results are in line with the latest most stringent standards (reflective constructs should be below 5.0 and formative should be below 3.3) (Cenfetelli & Bassellier, 2009). Hence, we conclude that our model does not suffer from multicollinearity.

Table C1. Outer Model Weights to Establish Convergent Validity

Latent construct	**Items**	**Outer loadings**	**Retain?**
Trust in e-government (TiE)	TiE 1	0.791	yes
	TiE 2	0.825	yes
	TiE 3	0.821	yes
	TiE 4	0.790	yes
Individualism-collectivism	IC1	0.925	yes
	IC2	0.860	yes
Intention to reuse	IR1	0.827	yes
	IR2	0.828	yes
	IR3	0.766	yes
	IR4	0.761	yes
	IR5	0.806	yes
Information quality	IQ1	0.674	yes
	IQ2	0.664	yes
	IQ3	0.793	yes
	IQ4	**0.584**	**no**
	IQ5	0.794	yes
	IQ6	0.749	yes
	IQ7	0.693	yes
	IQ8	0.679	yes
Masculinity-femininity	MF1	0.883	yes
	MF2	0.817	yes
	MF3	**0.589**	**no**
Overall risks	OVERI1	0.862	yes
	OVERI2	0.880	yes
	OVERI3	0.742	yes
	OVERI4	0.735	yes
Privacy risks	PRIVRI1	0.900	yes
	PRIVRI2	0.940	yes
	PRIVRI3	0.899	yes
Psychological risks	PSYCORI1	0.941	yes
	PSYCORI2	0.948	yes
Perceived value	PV1	0.816	yes
	PV2	0.845	yes
	PV3	0.782	yes
	PV4	0.750	yes
	PV5	0.840	yes
	PV6	0.786	yes
SQ: ease-of-use	SQ1	0.813	yes
	SQ2	**0.590**	**no**
	SQ7	0.756	yes
	SQ10	0.667	yes
SQ: reliability	SQ3	0.645	yes
	SQ4	0.723	yes
	SQ9	0.842	yes
SQ: security	SQ5	0.843	yes
	SQ6	0.876	yes
	SQ8	0.834	yes

Latent construct	Items	Outer loadings	Retain?
Service quality	SVQ1	0.759	yes
	SVQ2	0.815	yes
	SVQ3	0.808	yes
	SVQ4	0.809	yes
	SVQ5	0.805	yes
	SVQ6	0.768	yes
	SVQ7	0.720	yes
	SVQ8	0.820	yes
	SVQ9	0.808	yes
	SVQ10	0.710	yes
Time risks	TIMERI1	0.865	yes
	TIMERI2	0.902	yes
Uncertainty avoidance	UA1	0.832	yes
	UA2	0.805	yes
	UA3	0.821	yes
User satisfaction	US1	0.882	yes
	US2	0.796	yes
	US3	0.822	yes

*Note: all loadings were significant at a minimum of 0.001 or lower, but we removed loadings less than .600 to be conservative.

Table C2. Correlations of Latent Variable Scores against the Indicators to Establish Convergent and Discriminant Validity)

Items	CT	IC	IR	IQ	MF	OR	RP	RPY	PV	SQE	SQR	SQS	SVQ	RT	UA	US
CT1	**.791**	.196	.559	.410	.138	-.249	-.341	-.339	.514	.510	.245	.588	.619	-.321	.156	.598
CT2	**.825**	.342	.473	.434	-.014	-.161	-.370	-.349	.522	.579	.515	.432	.556	-.157	.062	.608
CT3	**.821**	.188	.465	.366	-.023	-.272	-.424	-.407	.532	.452	.420	.411	.399	-.134	.112	.487
CT4	**.790**	.031	.507	.358	.095	-.391	-.465	-.451	.539	.428	.323	.433	.346	-.332	.253	.452
IC1	.217	**.925**	.207	.280	.050	.120	-.016	-.113	.255	.388	.072	.289	.359	.052	-.073	.323
IC2	.196	**.860**	.155	.263	-.036	.082	-.043	-.110	.210	.383	.126	.081	.226	.028	-.015	.282
IR1	.536	.082	**.827**	.311	.168	-.402	-.428	-.496	.607	.349	.283	.468	.249	-.271	.299	.447
IR2	.504	.012	**.828**	.343	.203	-.351	-.356	-.416	.589	.351	.288	.423	.211	-.259	.264	.453
IR3	.470	.150	**.765**	.353	.166	-.188	-.193	-.271	.542	.385	.150	.493	.346	-.204	.166	.461
IR4	.462	.355	**.761**	.505	.079	-.069	-.087	-.183	.559	.557	.285	.423	.554	-.233	.117	.624
IR5	.518	.232	**.806**	.446	.157	-.199	-.227	-.299	.575	.504	.366	.361	.428	-.292	.187	.571
IQ1	.388	.118	.333	**.697**	.051	-.155	-.225	-.249	.458	.471	.380	.318	.246	-.089	.009	.439
IQ2	.316	.115	.388	**.643**	.211	-.194	-.206	-.235	.431	.417	.394	.316	.208	-.043	.181	.353
IQ3	.318	.287	.331	**.783**	.081	-.009	-.072	-.119	.417	.558	.473	.249	.422	-.059	.021	.502
IQ5	.308	.367	.333	**.785**	-.014	.035	-.049	-.079	.456	.554	.351	.389	.448	-.040	-.037	.512
IQ6	.372	.241	.331	**.757**	.061	-.015	-.066	-.048	.383	.575	.469	.342	.528	-.120	.025	.482
IQ7	.356	.204	.330	**.717**	.065	-.027	-.083	-.077	.382	.545	.320	.441	.542	-.148	-.032	.475
IQ8	.429	.169	.472	**.692**	.222	-.280	-.358	-.385	.516	.545	.342	.511	.372	-.286	.059	.454
MF1	.055	.045	.178	.185	**.883**	-.021	.080	.034	.077	.167	.051	.173	.073	-.042	.086	.083
MF2	.061	-.024	.157	.020	**.846**	-.091	.024	.006	.099	.005	-.011	.172	.021	-.051	.247	-.009
OVERI1	-.446	.031	-.288	-.125	.016	**.862**	.820	.710	-.316	-.188	-.169	-.268	-.091	.515	-.020	-.202
OVERI2	-.303	.118	-.290	-.045	-.103	**.880**	.633	.557	-.232	-.073	.029	-.281	-.073	.486	-.155	-.104
OVERI3	-.087	.081	-.221	-.178	-.034	**.742**	.492	.456	-.201	-.086	-.048	-.168	.102	.384	.005	-.071
OVERI4	-.120	.203	-.152	-.007	-.123	**.735**	.387	.354	-.113	.026	.142	-.143	.090	.392	-.099	.015
PRIVRI1	-.423	.026	-.328	-.164	.007	.731	**.900**	.747	-.341	-.198	-.085	-.383	-.133	.600	-.091	-.221
PRIVRI2	-.470	-.045	-.313	-.201	.048	.707	**.940**	.755	-.365	-.247	-.243	-.301	-.104	.479	-.060	-.274
PRIVRI3	-.464	-.071	-.251	-.180	.122	.646	**.899**	.696	-.310	-.230	-.262	-.278	-.103	.378	-.003	-.229
PSYCORI1	-.477	-.149	-.403	-.225	.038	.619	.764	**.941**	-.461	-.303	-.148	-.363	-.115	.469	-.008	-.303
PSYCORI2	-.429	-.088	-.392	-.200	.007	.655	.755	**.948**	-.447	-.262	-.137	-.341	-.094	.511	-.120	-.291
PV1	.543	.119	.592	.451	.160	-.267	-.269	-.361	**.815**	.465	.277	.485	.397	-.258	.229	.537
PV2	.540	.122	.630	.470	.156	-.298	-.284	-.362	**.845**	.481	.313	.513	.413	-.274	.228	.560
PV3	.531	.223	.541	.472	.051	-.175	-.301	-.386	**.783**	.452	.307	.554	.448	-.205	.102	.539
PV4	.493	.479	.534	.495	-.039	-.151	-.255	-.374	**.750**	.561	.302	.425	.434	-.166	.036	.601
PV5	.511	.220	.587	.482	.043	-.208	-.310	-.411	**.839**	.445	.351	.464	.269	-.152	.157	.571
PV6	.529	.128	.586	.501	.104	-.269	-.372	-.423	**.786**	.493	.444	.426	.335	-.245	.136	.588
SQ1	.424	.397	.363	.684	.033	-.040	-.152	-.204	.452	**.788**	.455	.350	.477	-.126	-.073	.568
SQ7	.478	.399	.431	.525	.063	-.090	-.187	-.238	.465	**.810**	.438	.415	.577	-.168	-.036	.553

Items	CT	IC	IR	IQ	MF	OR	RP	RPY	PV	SQE	SQR	SQS	SVQ	RT	UA	US
SQ10	.504	.199	.443	.466	.145	-.146	-.226	-.247	.467	**.710**	.341	.574	.510	-.137	.143	.475
SQ3	.231	-.167	.134	.284	.100	-.101	-.152	-.064	.169	.171	**.644**	.091	.085	.090	.160	.118
SQ4	.311	-.007	.199	.339	.138	-.126	-.238	-.160	.219	.323	**.722**	.156	.192	-.053	.075	.249
SQ9	.421	.225	.353	.499	-.073	.040	-.129	-.114	.428	.551	**.843**	.297	.528	-.057	.037	.545
SQ5	.507	.101	.499	.424	.219	-.280	-.355	-.344	.525	.471	.340	**.843**	.351	-.214	.195	.412
SQ6	.483	.256	.436	.437	.208	-.257	-.301	-.331	.474	.490	.171	**.876**	.417	-.176	.037	.410
SQ8	.499	.218	.445	.424	.084	-.175	-.245	-.276	.516	.523	.200	**.834**	.447	-.171	.100	.455
SVQ1	.455	.339	.405	.484	.037	.018	-.064	-.096	.430	.574	.313	.420	**.759**	-.175	.035	.567
SVQ2	.462	.213	.363	.400	.033	-.029	-.090	-.067	.332	.516	.298	.366	**.815**	-.197	.072	.492
SVQ3	.394	.221	.326	.417	.076	-.006	-.027	-.014	.314	.482	.292	.372	**.808**	-.176	.073	.481
SVQ4	.456	.244	.372	.473	.076	-.024	-.061	-.057	.378	.561	.319	.404	**.809**	-.208	.048	.571
SVQ5	.432	.237	.335	.451	.017	-.014	-.063	-.042	.358	.544	.296	.395	**.805**	-.233	-.004	.535
SVQ6	.436	.166	.267	.300	-.070	.071	-.062	.015	.264	.422	.347	.257	**.768**	-.099	.051	.446
SVQ7	.445	.338	.252	.448	-.128	.095	-.087	-.087	.386	.515	.434	.295	**.720**	-.010	-.098	.502
SVQ8	.503	.272	.327	.386	-.033	.006	-.115	-.082	.335	.519	.352	.348	**.820**	-.145	.015	.478
SVQ9	.510	.317	.401	.483	.156	-.038	-.122	-.128	.439	.575	.419	.411	**.808**	-.164	.034	.529
SVQ10	.560	.221	.384	.424	.208	-.173	-.248	-.237	.406	.533	.408	.393	**.710**	-.183	-.008	.468
TIMERI1	-.213	.036	-.253	-.181	-.056	.455	.419	.393	-.207	-.158	-.066	-.166	-.186	**.865**	-.064	-.199
TIMERI2	-.311	.046	-.304	-.098	-.040	.529	.523	.518	-.268	-.172	.003	-.220	-.177	**.902**	-.213	-.204
UA1	.112	-.020	.173	.046	.125	.012	.037	.029	.104	.030	.078	.041	.057	-.150	**.832**	.067
UA2	.185	-.060	.175	.038	.037	-.059	-.122	-.099	.166	.016	.149	.078	-.041	-.144	**.805**	.073
UA3	.154	-.049	.266	.012	.247	-.119	-.054	-.085	.176	.001	.029	.174	.038	-.116	**.821**	.039
US1	.560	.433	.566	.601	.086	-.135	-.228	-.306	.624	.687	.412	.434	.585	-.189	.030	**.881**
US2	.594	.143	.541	.495	.084	-.204	-.272	-.291	.571	.517	.274	.517	.532	-.263	.084	**.801**
US3	.516	.257	.490	.490	-.067	.012	-.158	-.182	.562	.513	.549	.297	.516	-.116	.063	**.819**

Table C3. Measurement Model Statistics

Construct	Average	SD	CT	IC	IR	IQ	MF	OR	PV	RP	RPY	RT	SQE	SQR	SQS	SVQ	UA	US
CT	3.603	0.688	**.807**															
IC	3.253	1.061	.232	**.893**														
IR	3.714	0.694	.625	.206	**.798**													
IQ	3.385	0.626	.487	.304	.490	**.727**												
MF	3.332	0.030	.067	.015	.194	.124	**.865**											
OR	2.717	0.827	-.335	.116	-.306	-.115	-.062	**.807**										
PV	3.634	0.671	.653	.263	.721	.595	.101	-.286	**.804**									
RP	2.717	0.827	-.495	-.031	-.327	-.199	.062	.762	-.371	**.913**								
RPY	2.509	1.011	-.479	-.124	-.421	-.225	.024	.675	-.480	.804	**.944**							
RT	2.568	0.812	-.300	.046	-.317	-.154	-.053	.559	-.271	.536	.520	**.884**						
SQE	3.423	0.677	.610	.430	.537	.725	.105	-.120	.600	-.246	-.299	-.187	**.771**					
SQR	3.156	0.730	.458	.106	.347	.535	.025	-.044	.414	-.211	-.151	-.033	.534	**.741**				
SQS	3.592	0.671	.584	.223	.542	.503	.199	-.279	.595	-.353	-.373	-.220	.582	.282	**.851**			
SVQ	3.308	0.705	.600	.337	.446	.555	.056	-.017	.476	-.125	-.110	-.205	.678	.450	.475	**.783**		
UA	4.041	0.704	.184	-.053	.261	.035	.186	-.079	.187	-.058	-.069	-.163	.016	.094	.133	.025	**.820**	
US	3.477	0.721	.667	.340	.640	.637	.046	-.134	.703	-.264	-.314	-.228	.692	.490	.501	.654	.069	**.834**
marker	n/a	n/a	.115	-.007	.024	.051	.039	.118	.004	.101	.155	.215	.088	.132	.071	.160	-.159	.103

*Note: the marker variable was composed of our two attention-trap questions (the average correlation of the marker value against all other latent constructs was an insignificant, 0.076); bolded numbers down the diagonal represent the square root of the AVEs. CT = consumer trust; IC = individualism-collectivism; IR = intention to reuse; IQ = information quality; MF = masculinity-femininity; OR = overall risks; PV = perceived value; RP = privacy risks; RPY = psychological risks; RT = time risks; SQE = SQ ease-of-use; SQR = SQ reliability; SQS = SQ security; SVQ = service quality; UA = uncertainty avoidance; US = user satisfaction.

Table C4. Outer VIFs

Items	VIF	Items	VIF	Items	VIF	Items	VIF
CT1	1.590	MF1	1.327	SQ1	1.430	TIMERI1	1.467
CT2	2.099	MF2	1.327	SQ10	1.151	TIMERI2	1.467
CT3	2.142	OVERI1	2.048	SQ3	1.725	TRAPQ1	1.530
CT4	1.673	OVERI2	2.829	SQ4	1.796	TRAPQ2	1.530
IC1	1.566	OVERI3	1.561	SQ5	1.738	UA1	2.208
IC2	1.566	OVERI4	2.048	SQ6	2.112	UA2	2.090
INT2	2.711	PRIVRI1	2.514	SQ7	1.469	UA3	1.273
IR1	2.723	PRIVRI2	3.857	SQ8	1.680	US1	1.891
IR3	1.841	PRIVRI3	2.907	SQ9	1.095	US2	1.484
IR4	2.081	PSYCORI1	2.606	SVQ1	2.122	US3	1.675
IR5	2.131	PSYCORI2	2.606	SVQ10	1.871		
IQ1	1.571	PV1	3.011	SVQ2	3.023		
IQ2	1.690	PV2	3.330	SVQ3	2.862		
IQ3	2.277	PV3	1.920	SVQ4	2.596		
IQ5	2.016	PV4	1.799	SVQ5	2.500		
IQ6	1.859	PV5	2.586	SVQ6	2.276		
IQ7	1.872	PV6	1.991	SVQ7	1.898		
IQ8	1.610			SVQ8	2.836		
				SVQ9	2.448		

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[i] The difference is that items within *formative constructs* are theoretically distinct and thus are not replaceable with other items in the same construct; items in *reflective constructs* are theoretically the same and thus are replaceable with each other Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research*, *38*(2), 269-277. . This distinction has recently become a serious issue in systems-related research where it has been discovered that many previous studies have been mis-specified because they did not distinguish between reflective and formative constructs Petter, S., Straub, D. W., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly*, *31*(4), 623-656. . Such mis-specification can lead to problems in empirical results and theoretical interpretations, including the potential increase in both Type I and Type II errors ibid..

[ii] The basic standard followed here is that the square root of the AVE for any given construct (latent variable) should be higher than any of the correlations involving the construct Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50. , Staples, D. S., Hulland, J. S., & Higgins, C. A. (1999). A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Organization Science*, *10*(6), 758-776. . The numbers are shown in the diagonal for constructs (bolded and underlined).