


# Impact of Risk Perceptions and User Trust on Intention to Re-Use E-Government: A Mixed Method Research

Kamel Rouibah, Kuwait University, Kuwait\*

 <https://orcid.org/0000-0003-3652-5610>

Hasan Qurban, College of Business Administration, Kuwait University, Kuwait

Nabeel Al-Qirim, College of Technological Innovation, Zayed University, UAE

## ABSTRACT

Despite the plethora of studies investigating different impacting factors on intention to re-use (IR) e-government services, they suffer from two limitations. First, initial studies provide mixed results on the effect of risk perception (PR) on IR. Second, although e-commerce studies have considered PR as a complex construct that encompasses several dimensions to date, none have considered exploring the effect of this complex construct on IR e-government websites. Thus, this study attempts to extend surrogates to such gaps by integrating PR and user trust (UT) in IR e-government using mixed-methods. It involved both a qualitative study (n = 81) to identify perceive risk antecedents and quantitative study (369 users) to build and test the proposed model. Results show that of eight PR factors, only privacy, time, psychological, and overall emerged as negative influencers and as such indirectly affect the IR government through the mediating role of perceived value and user's trust. System quality also has an indirect effect on IR through perceived value mediation.

## KEYWORDS

E-Government, Intention to Re-Use, Perceived Value, Privacy Risk, Psychological and Overall Risk, Risk Perceptions, System Quality, Time, Trust

## 1. INTRODUCTION

E-government is the usage of information technologies by public institutions to alter relations with businesses, citizens, and other government institutions (The World Bank Group, 2002). It allows to improve administrative efficiency, improve public services, improve trust and confidence in government, open government capabilities, improve social value and well-being, and improve ethical behavior and professionalism (Twizeyimana & Andersson, 2019). There are different e-government models (G2C, G2B, G2G, etc.), however, this research focuses on government to citizens (G2C) adoption only. The importance of this focus stems from the following important perspectives.

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\*Corresponding Author

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Even though e-government portals have been around for more than two decades, their usage by individuals is still a hot research topic. For example, Palvia et al. (2017) analyzed key topics published in three top journals (I&M, EJIS and MISQ) and found e-government research to be ranked fifth in the EJIS, nineteenth in I&M, and twentieth in MISQ. In addition, there is an abundance of published research in this area that portrays a gloomy picture about the low-level usage and satisfaction with e-government initiatives (Harfouche, 2010). Furthermore, the use of e-government websites among individuals is still a serious issue as most are heavily involved in online social networks, e-commerce, and e-banking transactions, yet they hesitate using e-government services (Harfouche & Robbin, 2012), which has led to an increased risk of failure of these projects (Heeks, 2003; Dada, 2006) and their expected returns on investment (United Nations, 2010; Maharaj & Munyoka, 2019). Accordingly, most government efforts go towards boosting acceptance and continuous use of e-government websites by the different stakeholders.

Prior studies have investigated a diverse range of factors that affect intention to reuse (IR). However, while several studies included both user trust (UT) and perceived risks (PR) (Horst et al., 2007; Lean et al., 2009; Bélanger & Carter, 2008; Colesca, 2009; Liu & Zhou, 2010; Horsburgh et al., 2011; Rehman et al., 2012b; Ejdys et al., 2019; Maharaj & Munyoka, 2019) to date, research has left significant gaps in our comprehension of IR e-government from the perspective of PR, UT and their relationship to IR.

First, most prior e-government studies were dominated by TAM (Alzahrani et al., 2017; Rana et al., 2015a) and few studies used the Information System Success (ISS) model (Delone & McLean, 2003). While system quality is an important component of ISS, compared to information quality (IQ) and service quality (SVQ), SQ received limited attention, and its effect on both user satisfaction (US) and perceived value (PV) produced confusing and mixed results (Akram, Malik, Shareef, & Goraya, 2019; Rana, Dwivedi, Williams, & Weerakkody, 2015b; Stefanovic, Marjanovic, Delić, Culibrk, & Lalic, 2016; 2008; Veeramootoo, Nunkoo, & Dwivedi, 2018; Wang & Liao, 2008).

Second, most prior e-government studies have considered PR as a simple construct without justification, (Maharaj & Munyoka, 2019; Ejdys et al., 2019) and appendix, despite many e-commerce studies have conceptualized it as complex phenomenon (Yang et al., 2015b; Martins et al., 2014; Featherman & Pavlou, 2003). Such limitation encouraged Al-Fakhri et al. (2008) to conduct further studies on the impact of other major PR elements.

Third, prior studies provided mixed results on the effect of UT on e-government adoption. On the one hand, different researchers reported its positive effect on adoption (Carter & Bélanger, 2005; Bélanger & Carter, 2008; Teo et al., 2008; Navarrete, 2010; Schaupp & Carter, 2005; Fakhoury & Aubert, 2015; Alharbi et al., 2017; Ejdys et al., 2019; Maharaj & Munyoka, 2019). On the other, other researchers failed to find significant effect UT on adoption (e.g. Horst et al., 2007; Horsburgh et al., 2011) or even found that UT has the least effect on IR e-government as compared to other factors (Carter & Bélanger, 2005). And the relationship between UT and PR provide also mixed results (Rana & Dwivedi, 2015c) between those that found significant effect (Horst et al., 2007; Liu & Zhou, 2010; Horsburgh et al., 2011; Maharaj & Munyoka, 2019) and those who failed (Ejdys et al., 2019).

Fourth, there is a dearth of studies that used mixed methods to justify the studied factors, including Arab studies that looked into this important area (e.g. Alharbi et al., 2017; Al-Hujran et al., 2015; Abu-Shanab, 2017) and a more recent one (Twizeyimana & Andersson, 2019) did not include any Arab study. Most prior studies have either used an existing theory or enhanced it with additional factors, without using mixed method research. The literature review of Rana & Dwivedi (2015c) cited very few studies that were published in good quality journals carried out in the Arab world including Saudi Arabia (Dwivedi & Weerakkody, 2007; Al-Sobhi et al., 2011) and Qatar (Al-Shafi & Weerakkody, 2009).

To fill these four gaps, this study seeks for the first time to include PR perceptions and their antecedents and UT to the components of ISS model using a mixed method to enlighten the IR behavior and its contextualization in an Arab country. Therefore, the following two research questions

are posited, Q1: “What important factors (including PR) affect IR e-government”? And Q2: “How are the identified factors related to IR e-government?”

The research objectives are to highlight the effect of new PR elements that were ignored in previous literature and their relationship to UT and to extend important surrogates to existing literature in this area. We adopted a mixed method research<sup>1</sup> based on sequential exploratory strategy that serves development and expansion, according to Venkatesh et al. (2013, p.6) classification, to answer the two research questions. It combines a qualitative and quantitative data collection. We used a deductive qualitative study to answer Q1 and quantitative research to answer Q2. Findings of the qualitative study were used to enlighten the quantitative study with more insights. We used the qualitative method to identify drivers and obstacles, including PR and their measures, toward the use of the e-government website of Kuwait, and the quantitative study builds and tests the proposed research model between identified factors and their influence on IR e-government.

## **2. RESEARCH BACKGROUND AND LITERATURE REVIEW**

E-government research is split amongst conceptual developmental studies (Warkentin et al., 2002; Bannister & Connolly, 2011; Gupta & Jana, 2003; Chan et al., 2008; Al-Fakhri et al., 2008; Alzahrani et al., 2017), systematic literature review (Bannister & Connolly, 2011; Rana & Dwivedi, 2015c; Alzahrani et al., 2017; Jonathan & Rusu, 2019; Twizeyimana & Andersson, 2019), and empirical studies, either qualitative and/or quantitative. In the following, we focused on factors that were studied quantitatively, qualitatively or using mixed in order to motivate our research.

### **2.1. Most Prior Studies Addressed Adoption From the Perspective of TAM Which Has Its Limits**

Prior studies have explored behavioral impacts on IR e-government adoption using popular behavioral theories such as TAM (Carter & Bélanger, 2005; Horst et al., 2007; Colesca, 2009; Ahmad & Campbell, 2015), TPB (Horst et al., 2007; Hung et al., 2006), Diffusion of Innovations theory-DOI (Carter & Bélanger, 2005; Schaupp & Carter, 2005), Consumer Behavior Model (Alalwan, 2013), UTAUT (Alharbi et al., 2017; Al Mansoori et al., 2018), Social Cognitive Theory (Rana & Dwivedi, 2015c), Expectation Confirmation Theory (Veeramootoo et al., 2018; Akram et al., 2019), SERVQUAL (Rehman et al., 2012a), Trust Theory (Veeramootoo et al., 2018; Akram et al., 2019; Bélanger & Carter, 2008), ISS model (Wang & Liao, 2008; Teo et al., 2008; Rana et al., 2015b; Veeramootoo et al., 2018; Akram et al., 2019; Stefanovic et al., 2016), Cultural Model of Hofstede (Al-Hujran et al., 2015) as well as a combination of these theories/models (Veeramootoo et al., 2018; Akram et al., 2019; Al-Hujran et al., 2015). Among these theories, the literature review of Alzahrani et al. (2017) found that TAM and its variations dominate (eight studies used TAM), three used DOI, and one study used TPB, while only few (two) studies used the ISS Model (DeLone & McLean, 2003) although it has been extensively investigated in many contexts. The intense focus on TAM has diverted researchers' attention away from other important research issues (Benbasat & Barki, 2007), here we will focus on the role of SQ, PR, and UT which are examined next

### **2.2. There is Low Level of E-Government Usage Despite High Investment**

Prior studies have investigated different factors that influenced IR e-government using different theories. Also despite huge investments (Rouibah et al., 2018) they have reported low levels of e-government usage, for several reasons, despite the fact that citizens and residents are aware of its existence (Alenezi et al., 2017). Only 15.6% of e-Government services in Indonesia are fully accessible and work properly (Prahono, 2015). E-Government in Saudi Arabia was found to be ineffective due to the strong presence of cultural factor of Wasta (Almukhlifi et al., 2019), and low uptake of e-Government in Malaysia due to users' low satisfaction (Shuib et al., 2019), and citizens in Pakistan were reluctant to e-government IR due to risk concerns (Shahzad et al., 2019). Many

factors were investigated and found to negatively impact user's IR/use. These include low level of UT (Teo et al., 2008), PR (Horst et al., 2007; Bélanger & Carter, 2008; Alharbi et al., 2017; Abu-Shanab, 2014; Ahmad & Campbell, 2015; Abu-Shanab, 2017; Maharaj & Munyoka, 2019; Ejdy et al., 2019), perceived risk (PR) (Bélanger & Carter, 2008; Alharbi et al., 2017; Akram et al., 2019; Abu-Shanab, 2017; Hung et al., 2006; Maharaj & Munyoka, 2019; Ejdy et al., 2019), low perceived value (Veeramootoo et al., 2018; Twizeyimana & Andersson, 2019), low level of perceived ease of use (Al-Hujra et al., 2011; Hung et al., 2006; Abu-Shanab, 2017) and SQ problems (Rouibah et al., 2018; Alenezi et al., 2017), information quality (IQ) and service quality (SVQ) problems too (Teo et al., 2008; Liao et al., 2009; Stefanovic et al., 2016; Veeramootoo et al., 2018).

### **2.3. The Role of System Quality on IR E-Government**

Compared to IQ and SVQ, SQ received limited attention. Empirical evidence showed the important role played by SQ. For example, Dada (2006) found that problems behind e-government failure are due to the existing gap between the design and the reality of the e-government system. And Choudrie et al. (2005) found that obstacles for use were the lack of accessibility and usability. Despite the importance of SQ, its effect on US, PV and IR produced confusing and mixed. The literature review of Rana & Dwivedi (2015c) showed significant association of 3 studies between SQ and US (vs. 2 studies failed), and 21 studies found significant association between perceived benefits (i.e. PV) and IR (vs. 3 failed). Both Wang & Liao (2008) and Stefanovic et al. (2016) found that SQ directly affected US and indirectly perceived net benefit (i.e. PV) via the mediation of US. Teo et al. (2008) found that SQ directly affected US and indirectly affected IR via US. Rana et al. (2015b) found that SQ directly affected US, while it indirectly affected IR via the mediation of perceived ease of use (PEOU) and not perceived usefulness (Almukhlifi et al.). Veeramootoo et al. (2018) found that SQ directly affected IR and indirectly affected it via the mediation of US. Akram et al. (2019) found that SQ affected perceived functional benefit (a component of PV), which in turn affected US that affected IR. It is also worth noting that some studies did not include PV (Veeramootoo et al., 2018; Teo et al., 2008; Stefanovic et al., 2016) despite it being an important construct. And while these studies proposed models that included a chain of associated factors (SQ, US, IR and PV/ benefits), these models did not comply with TAM which provide more parsimonious models that organize factors into the beliefs –attitude- behavior chain (Rouibah et al., 2015; Wang, 2008; Rouibah. K. et al., 2020). And the proposed models also lacked consistency with the marketing and customer behavior literature that had proposed external factors-value-satisfaction-loyalty chain that influences end-users to transact. Our proposed model will alleviate these inconsistencies.

### **2.4. The Need to Re-Examine the Role of User Trust and Perceived Risks on IR E-Government**

According to the theory of trust (Gefen et al., 2003), UT and PR are two major factors that affect user's adoption of new technologies. Furthermore and according to risk theory (Featherman & Pavlou, 2003), the use of online based systems is not without risk. Risk is either related to the used technology, the service provider, the user himself or any information presented for use (Featherman & Pavlou, 2003).

Many empirical studies have ascertained that PR (Veeramootoo et al., 2018; Rana et al., 2015b; Akram et al., 2019; Abu-Shanab, 2017) and lack of UT (Teo et al., 2008; Horst et al., 2007; Mellouli et al., 2016) or both (Bélanger & Carter, 2008; Schaupp et al., 2010; Ahmad & Campbell, 2015; Alharbi et al., 2017; Ejdy et al., 2019; Maharaj & Munyoka, 2019) are two important factors (see more in appendix) that affect e-government adoption. UT and PR are present because the system creates physical separation between users and the parties with whom they transact.

Prior studies have found that PR decreases UT; they however considered PR as a single construct (Ejdy et al., 2019; Maharaj & Munyoka, 2019; Rana et al., 2015b; Veeramootoo et al., 2018; Akram et al., 2019) and Arab studies found that PR related to privacy violation is important in e-government

adoption (Alharbi et al., 2017; Ahmad & Campbell, 2015; Abu-Shanab, 2014; Abu-Shanab, 2017), and none investigated the causal effect of multi-faceted PR on e-government adoption. In addition, the association between UT-PR, and UT-IR, and PR-IR provided mixed results. Indeed, the literature review of Rana & Dwivedi (2015c) showed 19 out of 63 studies (among 103) found a positive association between UT and IR (vs. 3 failed significant path). On the other hand, results showed that: 4 studies found a negative association between PR and IR (vs. 3 failed studies) and 4 studies between UT and PR (vs. 2 failed studies). Additionally, while the ISS model included UT (Teo et al., 2008) but none expanded it on both UT and PR perceptions, despite the increase of their importance in e-government studies (Alharbi et al., 2017; Ejdy et al., 2019; Maharaj & Munyoka, 2019).

Thus, investigating the role of PR, UT, SQ factors on IR e-government is important from an Arab culture where the preference is toward face-to-face transactions (Rouibah & Hamdy, 2009).

## **2.5. Very Few E-Government Studies Used Mixed Method Research**

Finally, to the best of our knowledge, only one study was found to use a mixed-method approach to investigate factors that drive IR e-government (Alharbi et al., 2017). Instead of choosing a predefined existing theory or modified it with extra factors without justification from the end-users perspective as done by prior studies, this study uses a qualitative method to uncover the driving factors/new items to measure these factors, risk factors (among the eight ones identified in the literature) are more important to participants, and theory lens as suggest by following contextualization guidelines from Hong et al. (2014) to: i) identify a general theory that emerged from the qualitative study, ii) add or remove core constructs to fit a specific context, (iii) integrate contextual factors as core constructs or determinant variables. As such this study highlights the theory that represents these factors from the real world.

## **3. PHASE ONE: THE QUALITATIVE STUDY**

### **3.1. Factors That Influence Perceived Risk (PR) in E-Government**

Although some prior studies considered PR perceptions as a complex construct (Featherman & Pavlou, 2003; Martins et al., 2014), many e-government studies have ignored this aspect (Veeramootoo et al., 2018; Horst et al., 2007) including existing Arab studies (Abu-Shanab, 2017; Alharbi et al., 2017; Ahmad & Campbell, 2015; Alawneh et al., 2013), see appendix that shows a subset of Arab and non-Arab studies on e-government.

Featherman & Pavlou (2003) examined the factors that influence IR e-services. They combined TAM with PR composed of seven types (privacy, time, psychological, overall, performance, financial, and social) and found that with the exception of social risk, all have an indirect effect on IR via PR. Yang et al. (2015a) studied the impact of UT and seven types of risks (economic, performance, security, time, service, privacy, and psychology) on IR e-payment and found only the effect of economic, performance and privacy risk through the mediation of overall risk. Martins et al. (2014) replicated the study of Featherman & Pavlou (2003) but used UTAUT instead of TAM with the same risk types in the context of e-banking services. They succeeded to show that all risks have an indirect and negative effect on IR via the overall/total PR.

As e-government and e-commerce have different environment characteristics (Harfouche & Robbin, 2012) and there is a scarcity of studies into factors that influence PR as a complex construct in an e-government context, we start by exploring this issue from users' perspectives.

### **3.2. Research Methodology**

In order to highlight risk perceptions factors and driving factors that influence IR e-government, we employed a qualitative deductive study as a first step.

### **3.2.1 Kuwait E-Government**

Kuwait started e-government initiatives in 2000 in order to accomplish the crucial goal of e-Kuwait. The e-government portal, web site ([www.e.gov.kw](http://www.e.gov.kw)), and mobile application (EGOVKW), were developed by a public agency in 2006, the Central Agency for Information Technology-CAIT ([www.cait.gov.kw](http://www.cait.gov.kw)). This online portal connects 88 public institutions in a secured network base CINET ([www.cinet.com.kw](http://www.cinet.com.kw)) and provides 1993 services. Among them 998 are information services and 995 electronic transactions important to different beneficiaries. It also integrates an online payment system (also known as Tasdeed) that enables online payments for the intended beneficiaries.

The [e.gov.kw](http://e.gov.kw) portal includes several categories to make it easy for visitors to find relevant information. The first includes the latest projects in Kuwait and the latest important news. The second category includes a section that enables users to navigate through the public ministries. The third one shows all the available e-services. In the fourth category, a box enables users to write visitors' opinions. It also includes a section related to "IT awareness" which aims to increase awareness among the society regarding security threats and includes links to many YouTube videos.

### **3.2.2 Data Collection**

We used a deductive qualitative study because we used the codes created from concepts drawn from the past literature. Following similar prior studies (Tsohou et al., 2020), we collected analyzed data from a sample of a large sample (81 users) using purposeful sampling snowball technique<sup>2</sup> (Teddlie & Yu, 2007) in order to identify most important driving factors based on frequencies. Twenty qualified data collectors/interviewers were hired, trained, and monitored the interview process. They instructed to interview a sample composed of 4 to five people belonging to their family members, colleagues, and networks of friends in the workplace, malls, homes, and so on. The sample included university students (35 undergraduates and 15 postgraduate students), 23 employees, 2 unemployed people, 2 jobseekers, and 4 retirees from both genders. The study identified the factors that influenced their IR/use the e-government website of Kuwait using interviews. We followed a rigorous process to collect and analyze data. We first developed a short research instrument that consisted of open-ended questions where participants were asked to state: whether they were aware of and use the e-government portal (website and mobile app). If they neither knew nor used them, they were presented to the portal, available e-services and e-transactions, functions relevant for use, and how to browse these services. Also, participants were asked to state as much as they can in a free format: (i) What factors affect their intention to use or not to use or continue to use the e-government system? What are the potential problems they may face when using the e-government system? The use of open-ended questions allowed researchers to gather information from the respondents in an unbiased and non-leading way. The minimum time of interviews was 5 minutes, the maximum 15 minimum and an average time of 8 minutes.

### **3.2.3 Data Analysis and Procedures**

Two knowledgeable researchers in the information system adoption field performed the coding/classification process independently. We followed the steps of Miles & Huberman (1994) and established a list of factors and their definitions derived from past studies and the elicitation method of Limayem & Hirt (2003). We employed these as guideline for the two coders to record answers of participants. The two coders used content analysis (Stemler, 2001) to read participants' answers and categorized them into driving factors and frequencies according to the identified list. Although the primary focus of phase 1 was identifying intention to use (IR) factors, the relationship between these factors and IR was not addressed until phase 2.

### 3.2.4 Internal and External Validity

To ensure issues of external validity, that is, to determine the accuracy, generalizability, and possibilities of replicating of data analysis, we followed four steps from Yin (2004) during data collection and data analysis: *First*, the researchers were not involved in the data collection phase; hence, they had no input or control over what interviewees said. *Second*, the primary research findings were based on the triangulation of interviews and the list of constructs and their definitions derived from past studies. *Third*, interviewees have written their answers in free format and coders just categorized their answers according a pre-list of factors derived from past studies. *Fourth*, whenever the two coders disagreed about classification factors, they discussed their reasons until consensus was established.

## 3.3 Results

After the categorization we counted frequencies for identified retention factors, which reflect the importance of the identified factor (Venkatesh & Brown, 2001). Results of the qualitative analysis identified several positive and negative factors of e-government adoption.

### 3.3.1 Negative Risk Factors Perceptions

The participants specified that numerous risks perceptions affected their IR/use e-government website:

- **Privacy risk (n=25):** This refers to the potential loss of control over personal information, such as the use of an individual's information without his knowledge (Featherman and Pavlou 2003). Privacy risks have grown in complexity and occurrence as shown by participants expressing their concern about their privacy violation when transmitting their personal information to the portal: "I do trust the e-government website and complete my transaction online (e.g. paying for traffic violations)", nonetheless, my personal data may be accessed by others. And therefore someone could know much information about me by just entering my civil ID, and misuse it"; "Having to exchange my personal information for a service or some level of access online of the e-government website may expose me to risk perpetrators", and "I am concerned about providing personal information to CAIT because others may access/misuse it without my knowledge".
- **Time risk (n=15):** This refers to the loss of time with researching and making the online payment, and learning how to use the e-government (Featherman and Pavlou 2003). Among the perceived risks, participants indicated that loss of time is a potential risk. This includes the following three items: "I would need time to learn how to use the e-government portal", and "it would take much time to familiarize myself with the online services, (information and transactions) of the e-government" and "most information exist on Google; and "using the e-government results in the loss of my precious time."
- **Psychological risks (n=15):** This refers to the potential loss of self-esteem and the frustration of not achieving the expected goals (Featherman & Pavlou 2003). It also refers to whether the service is consistent with the prospect's sense of self-identity. Several quotations of participants confirm this risk, comprised of thoughts, psychological, emotions, and negative attitudes that likely make them develop fears of using an e-government portal. For example, "I am afraid that the e-government will not perform as expected", "There are electronic forms related to different ministries available online that I required to download, complete, and then visit them physically to complete my transactions. This does not fit well with my view of e-government", and "I accessed the site of Ministry of Finance, however, I found that some links were not active, which upset me".
- **Overall risk (n=30):** It refers to the negative user's perception that the online provider will not fulfill his security requirements (Rouibah et al, 2016) and a general measure of perceived risk when all criteria are evaluated together (Featherman & Pavlou, 2003). This is a general measure that includes all previous criteria together. Several quotations show that this factor deters people

from using the e-government websites, such as “There may be some risks associated with the use of e-government since Internet is not secured at 100%”, “it took too long time loading, and nothing appears then, then I shut down”, “I tried to use the mobile app. But I found it did not perform and I was obliged to use another mobile with another operating system”.

Unlike previous studies that included seven risk factors in e-banking (Martins et al., 2014; Featherman & Pavlou, 2003) and online payment (Yang et al., 2015a), only four risk factors were identified.

In addition, we identified new items from the content analysis to enrich the contextualized measurement for time risk, psychological risk and privacy risk. For time risk we built on existing items from Featherman & Pavlou (2003) by adding more item specific to the e-government context “It would take much time to familiarize myself with the online services of the e-government”. In terms of the psychological risk, and in addition to two items of Featherman & Pavlou (2003) we added a third item specific to e-government “I am afraid that the e-government web site will not perform as expected”. Likewise, for privacy risk construct, we leveraged the three items identified by Featherman & Pavlou (2003), by adding a new item “I am concerned about providing personal information because others may access and misuse it without my knowledge”.

Results of the qualitative study clearly showed that the information system success (ISS) model (Delone & McLean, 2003) could be used to study the e-government behavior through the identification of its core construct (quality, perceived value/ perceived benefit, satisfaction, and IR). However, ISS alone is not sufficient to capture the essence of IR e-government as prior studies have. We alleviated this by adding other factors that emerged from the qualitative study and developed a new model which is described next. The improvement of ISS includes risk perception (privacy risk, time risk, psychological risks, and overall risk) and user’s trust. These proposed improvement are in line with researchers who have called for improvements of e-government adoption studies (Veeramootoo et al., 2018; Stefanovic et al., 2016).

### 3.3.2. *Positive Perceived Factors*

In addition to the previous negative reactions, five factors related to favorable reactions were recorded as follows:

- **Perceived Value-PV (n=53):** Egovernment was perceived as useful in term of making transactions easier, saves users time and allows them to find a range of relevant information: “It is easy to search for the public institution that is responsible for a specific service, find the ministry of interior to pay my traffic violations”, “It saves my time and effort and provides me with valuable information”, “It allows me to find a different range of information faster instead of browsing all the sites of ministries”.
- **System Quality-SQ (n=57):** The e-government website was found to be “easy to use”, “user-friendly” and “reliable” to “pay water and electricity bills, and traffic violations” and searching “for specific information related to different public ministries” but others show where bottlenecks are in order to propose improvement related to the mobile App “it tends to be a very long and agonizing process when using the mobile app”.
- **User’ trust-UT (n=27):** Participants have expressed positive trust perceptions toward e-government: “I trust e.gov.kw and feel comfortable while using it”, “I trust any website related to the government that tries to keep its promises”, “From my point of view, the e.gov.kw system is safe because many people use it and don’t complain”.
- **User satisfaction-US (n=64) and Intention to Reuse -IT (n=33):** All agreed about their positive experience in using the online payment: “I am very satisfied with the online payment Tasdeed service which allows me to pay my bills anywhere and anytime”, “I am fully satisfied and plan to use the e-government web site to pay my bills and get a dentist appointment”.



As noted in this section, several positive factors related to the information success model (PV, SQ, US, and IR) and negative factors (four perceived risk factors) were considered for adoption. The following section will draft a model that combines these factors.

#### 4. PHASE TWO: THE QUANTITATIVE STUDY

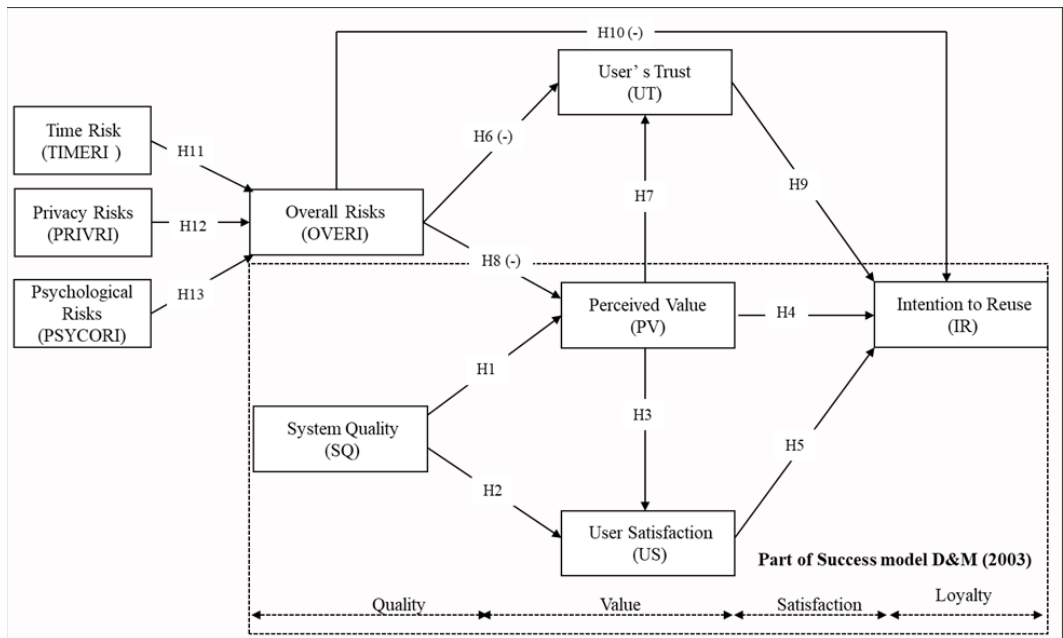
##### 4.1. Research Model and Theoretical Background

The study developed a research model figure 1 that combines the success model (Delone & McLean, 2003), trust theory (Gefen et al., 2003) and risk theory (Featherman & Pavlou, 2003). Our model consists of three groups of factors: beliefs (SQ and PV), attitudes (US), and behaviors (IR). Thus, it complies with TAM and marketing studies that connects quality, value, satisfaction and loyalty (Rouibah et al., 2015; Wang, 2008). This figure shows four independent factors and four mediating factors that have a direct or indirect impact on IR. Therefore, the proposed model (Figure 2) is in line with the marketing and customer behavior literature that proposes a value-satisfaction-loyalty chain that influences customer's behavior (Rouibah et al., 2015).

##### 4.1.1 Delone and Mclean, the Base of This Theory and Its Improvements

DeLone & McLean (1992) proposed the information system success model that stipulates six factors to affect the use: SQ and quality of information affect both the “degree of system use” and “US”. In addition, both US and degree of use affect the “individual impact” and the “impact on the organization” factors. After 10 years of developing the theory Delone & McLean (2003) reviewed their 1992 model and modified it adding service quality, and use was renamed current usage / IR”. The “individual impact” and “impact on the organization” factors were merged into a new construct, “net benefit”. Later, Wang (2008) reviewed and improved the theory and applied it in the field of e-commerce. Improvements focused on its adequacy with the TAM and marketing studies in terms of reordering the link between quality attributes, US, and loyalty. He renamed “net benefits” to “IR”,

Figure 1. Research model



which refers to “loyalty”. He also replaced “use” with “PV”, which refers to a broader concept than does perceived benefits. Later, Rouibah et al. (2015), improved the Wang (2008) model in terms of defining new measures of the components of the success model and successfully tested the new model in the context of B2C websites success in Kuwait.

Our study focuses on four constructs - SQ, PV, US, and IR - of the improved model and measures developed by Rouibah et al. (2015). These four constructs are defined as follow (Delone & McLean, 2003): SQ refers to the performance of the system in terms of usability, availability, reliability, adaptability, and response time. PV refers to the difference between the positive and the negative impacts of the system on users. US refers to the degree to which the user is satisfied with a system. IR refers to the likelihood the user will reuse the services of the e-government website. Previous studies demonstrated that the SQ is positively related to PV (Akram et al., 2019) and USs (Wang & Liao, 2008; Teo et al., 2008; Rana et al., 2015b; Veeramootoo et al., 2018; Akram et al., 2019), whereas PV is positively related to US (Wang & Liao, 2008)<sup>3</sup> and IR (Akram et al., 2019). Additionally, US is also positively related to IR (Teo et al., 2008; Veeramootoo et al., 2018; Akram et al., 2019). Thus, we posit the following five hypotheses (H1 to H5):

- H1:** Higher perceived SQ is associated with higher PV.
- H2:** Higher perceived SQ is associated with higher US.
- H3:** Higher perceived PV is associated with higher US.
- H4:** Higher perceived PV is associated with higher IR.
- H5:** Higher perceived US is associated with higher IR.

#### *4.1.2 Role of UT in E-Government Services: Causes and Consequence*

Prior studies have also shown that UT reduces risk perceptions and increases their likelihood to the re-use of an e-government portal (Veeramootoo et al., 2018; Gefen et al., 2005). The importance of UT lies in the fact that the used system creates a physical barrier between users and public institutions connected to the e-government portal. Therefore, exploration of factors that affect the users' IR e-government remains a promising area of research, especially in the Arab world where the face-to-face UT is more preferable than online UT. Rouibah et al. (2016) called for more studies to understand and increase its effect in the Arab world. Following McKnight et al. (2000), we consider UT as the user's belief that system transactions will be processed in accordance with their expectations. However, there is a debate among researchers as to whether or not UT affects perceived risk (Pavlou & Gefen, 2004; Kim et al., 2008) or whether perceived risk affects UT (Rouibah et al., 2016; Kim et al., 2010; Kim et al., 2008; Yang et al., 2015a).

Regarding these two steams, our study seeks to investigate the later in that the overall risk (OR) reduces the level of UT. Previous e-government studies (Horst et al., 2007; Liu & Zhou, 2010; Horsburgh et al., 2011; Maharaj & Munyoka, 2019) revealed overall risk is negatively related to UT. Thus, we infer for the first time:

- H6:** Higher OR is negatively associated with higher UT

Unlike previous studies that tested the path from UT to PV and found a significant path (Al-Hujran et al., 2015; Kurfali et al., 2017), we follow Horst et al. (2007) we assume that more users perceived the benefits of using the e-government web site the more they have tendency to trust, it which translates it in more IR the portal, and infer:

- H7:** Higher perceived PV is associated with higher UT.

### 4.1.3 Consequences of Overall Risk

Unlike prior non-e-government studies that succeeded in showing a negative link between OR and UT (Yang et al., 2015a), our study posits for the first time that the more a user perceives the overall risks, the least likely s/he will perceive the value of the e-government website. Thus we posit that:

**H8:** Higher perceived OR is negatively associated with higher PV.

Following prior studies that showed that UT increases IR in non-Arab (Carter & Bélanger, 2005; Schaupp & Carter, 2005; Bélanger & Carter, 2008; Wang & Lo, 2013; Kurfalı et al., 2017; Ejdyś et al., 2019; Maharaj & Munyoka, 2019) and Arab contexts (Fakhoury & Aubert, 2015; Ahmad & Khalid, 2017; Ahmad & Campbell, 2015; Alharbi et al., 2017), we infer that

**H9:** Higher perceived UT is associated with higher IR.

Overall risk (OR) is commonly thought of as representative of the uncertainty regarding possible negative consequences of using a service. If users perceive the degree of loss and uncertainties is high when they conduct services their IR to the website will be reduced. Since no prior e-government study has tested the link between OR and IR, and following non-e-government studies about the negative association between OR and IR (Martins et al., 2014), we posit for the first time:

**H10:** Higher perceived OR is associated with higher IR.

### 4.1.4 Antecedent of Overall Risk (OR)

Contrasting with prior e-government studies (Schaupp et al., 2010; Alharbi et al., 2017; Ahmad & Campbell, 2015; Veeramootoo et al., 2018; Akram et al., 2019), this study considers risk perception as a complex construct that includes four dimensions - time, psychology, privacy, and overall risk. Following prior studies (Martins et al., 2014; Featherman & Pavlou, 2003), we hypothesize that the three types of risk (time, psychology, and privacy) are antecedents to overall risks, which directly and negatively impact UT and IR.

Following the results of the qualitative phase and prior studies (Featherman & Pavlou, 2003; Martins et al., 2014) that found a positive association between time risk and overall risk, psychological risk and overall risk, and privacy risk and overall risk, we replicate the three hypotheses in the e-government context:

**H11:** Higher perceived time risk is associated with higher overall risk.

**H12:** Higher perceived privacy risk is associated with higher overall risk.

**H13:** Higher perceived psychological risk is associated with higher overall risk.

## 4.2. Research Methodology

### 4.2.1 Measurement

The study used established and standard measures from valid studies to increase validity and reliability as well as new items from the qualitative study (see Appendix B in this document). We followed well-established procedures (cf., Lowry et al., 2011) to translate and back translate items originally published in English to Arabic. And the respondents were asked to express their opinion on all items using the five-point Likert scale.

#### 4.2.2 Participants and Procedure of Data Collection

This study developed a questionnaire split into three sections: 3 questions measured demographics (gender and age), 3 questions measured internet and e-government activities (web use activities, frequency of e-government use, and type of e-service use), and 32 questions measured 9 constructs of the research model (see appendix B in this document).

The population consisted of university students in Kuwait who are users or potential users of the e-government website. And we used two modes to collect data: a paper mode and online mode using Qualtrics software. The paper mode was distributed to students involved in an introductory course of information systems. The online questionnaire was sent randomly to students using the database of a public university that included more than 4 thousands students, whom were asked to distribute it to their network. A total of 400 responses were received who chose the extra credit assignment of which 31 did not meet the requirements because of trap questions asking respondents to choose a predefined answer which participants did not fulfill. This led to 369 valid and completed questionnaires used to test the research (200 from the online mode and 169 from the paper). As tested by ANOVA, there was no significant difference in IR e-government service for the two groups. Accordingly, we used the combined sample in the data analysis.

Among the survey participants, more than half were female (n=244; 66.1%), representing nearly twice the males (n=125; 33.9%). The majority of respondents were 20-25 year olds (n= 206, 55.82%).

### 4.3 Analysis and Findings

#### 4.3.1 Respondents' Activities Related to E-Government

When asked about their web service activities (Table 1), the majority (66.7%) reported that they search for information, 66.2% use e-mail, 59.9% use social networks, 43.1% use e-government, and 39% use online shopping. Furthermore, a large percentage of participants, one-third (30.08%), use the e-government website once per year, followed by 29.53% who use it once per month. It is also interesting to note that a small percentage use it on a regular basis, either weekly (9.75%) or daily (5.14%). Moreover, results showed that 62.6% of participants use the e-government

Table 1. Description of e-government activities

Activities	Items	Frequencies	%
<b>Frequencies of e-government use</b>	One time per year	111	30.08
	One time per month	109	29.53
	One time per week	36	9.75
	Daily	19	5.14
	Not used	94	25.47
<b>Type of services used</b>	Search Web	246	66.7
	Email	226	61.2
	Social networking	221	59.9
	E-government website	159	43.1
	Online shopping	144	39.0
	Social network activities	131	35.5
	Online game	88	23.8
<b>Type of e-service usage</b>	Search information services	231	62.6
	Online payment transactions	138	37.4

website to search for online information, while one-out-of-four users (37.4%) use it to conduct online payments transaction.

#### 4.3.3 Principal Components Analysis and Normality Test

Regression analysis assumes that all variables have normal distribution. Normality can be achieved through descriptive statistics (such as skewness and kurtosis). Before using the multiple regression analysis, we used factor analysis to identify potential cross-loading among items of the research model and tested normal distribution. We found that all items loaded with their constructs with the following exceptions, one item for SQ, one for time risk, one for psychological risk, and 2 for overall risk which were eliminated from the remaining study. The model accounted for 73% of the variance explained, all items having cross-loadings above 0.4, and Eigen values above 1.0 (Hair et al., 1998).

The skewness and kurtosis values of all observed variables were checked to assess the univariate normality. Kline (2015) recommended that values of skewness should be below |3| and those of kurtosis should be below |8|. Table 4 in appendix shows that the skewness values range from -1.097 to 0.093, and kurtosis values range from -0.577 to 2.024, which satisfy the recommended threshold.

#### 4.3.4. Reliability, Construct Validity, and Common Bias Method

Discriminant validity and reliability are measured by Cronbach's alpha. This revealed that all the constructs range from 0.738 to 0.914, see Table 2, and above the cutoff point of 0.60 required in behavioral studies (Hair et al., 1998). In addition, a description of the items measuring the research model variables is shown with their means and standard deviations (see Table 2).

We tested convergent validity via factor loadings. Results show they vary from 0.566 to 0.817 (see Table 2) which satisfy the guidelines (Hair et al., 1998).

We tested common method bias<sup>4</sup> using the Harman's single factor score (Sharma & Sharma, 1996). This method estimates if items that measure a latent variable are loaded into one common factor. Common method bias is absent if the total variance extracted (VE in Table 2) for a single factor is less than 50%. Table 2 shows this criteria is fulfilled.

The presence of the multi-Collinearity was tested by the Variable Inflation Factor (VIF) for each independent variable after running a multivariate regression (O'Brien, 2007): if  $VIF < 3$  multi-Collinearity is absent. Otherwise there is evidence of a multi-Collinearity problem.

These results reveal the research instrument is valid, reliable, reflects unidimensionality of the factors, and ensures convergent validity and discriminant reliability. And since the correlation matrix (Table 3) shows association between the components of the research model, then we used the multiple regression tests to explore the paths and to validate the proposed hypotheses.

Figure 2 provides results of the validated research model, and show direct and indirect effect (through mediation) of independent variables on IR the e-government portal.

#### 4.3.5 Hypotheses Test

After verifying the assumptions of multiple regressions, the hypotheses tests were conducted.

## 5. DISCUSSION

This study aimed to uncover the association of overall risk perceptions, its determinants, UT, PV, SQ, and US on IR the e-government portal (website and its mobile app services). This study validates the proposed model using a sample that includes mainly highly educated people in Kuwait.

### 5.1. Summary of Results

Out of 13 hypotheses, ten were supported by the results (see Table 4):

Table 2. Construct, number of deleted items, mean (m), standard deviation (sd), factor loading, and cronbach'α

Construct	Items	Number of Items	Number of Deleted Items	M	SD	Factor Loading	Cronbach' α	Variance explained
Intention to reuse [IR]	IR1	3	0	3.97	.793	.776	0.896	13.34
	IR2			3.87	.866	.741		
	IR3			3.81	.856	.753		
US [US]	US1	3	0	3.43	.967	.753	0.89	10.59
	US2			3.48	.934	.741		
	US3			3.51	.954	.756		
PV [PV]	PV1	4	0	3.71	.944	.802	0.911	10.45
	PV2			3.72	.929	.814		
	PV3			3.84	.963	.691		
	PV4			3.82	.937	.766		
User' trust [UT]	UT1	4	0	3.64	.902	.735	0.866	10.43
	UT2			3.50	.882	.752		
	UT3			3.45	.872	.660		
	UT4			3.67	.880	.657		
SQ [SQ]	SQ1	4	1	.929	3.47	.715	0.819	8.86
	SQ2			.914	3.55	.738		
	SQ4			.906	3.25	.814		
Time risk [TIMER1]	TIMER1 2	3	1	2.71	.970	.689	0.738	7.47
	TIMER1 3			2.57	.991	.700		
Psychological risks [PSYCORI]	PSYCORI 2	3	1	2.55	.958	.748	0.891	6.45
	PSYCORI 3			2.38	.893	.655		
Privacy risks [PRIVRI]	PRIVRI1	4	1	2.80	.922	.663	0.826	5.72
	PRIVRI2			2.97	1.004	.752		
	PRIVRI4			3.15	.945	.786		
Overall risks [OVERI]	OVERI 1	4	2	2.84	.940	.733	0.914	3.20
	OVERI 4			2.76	.963	.817		

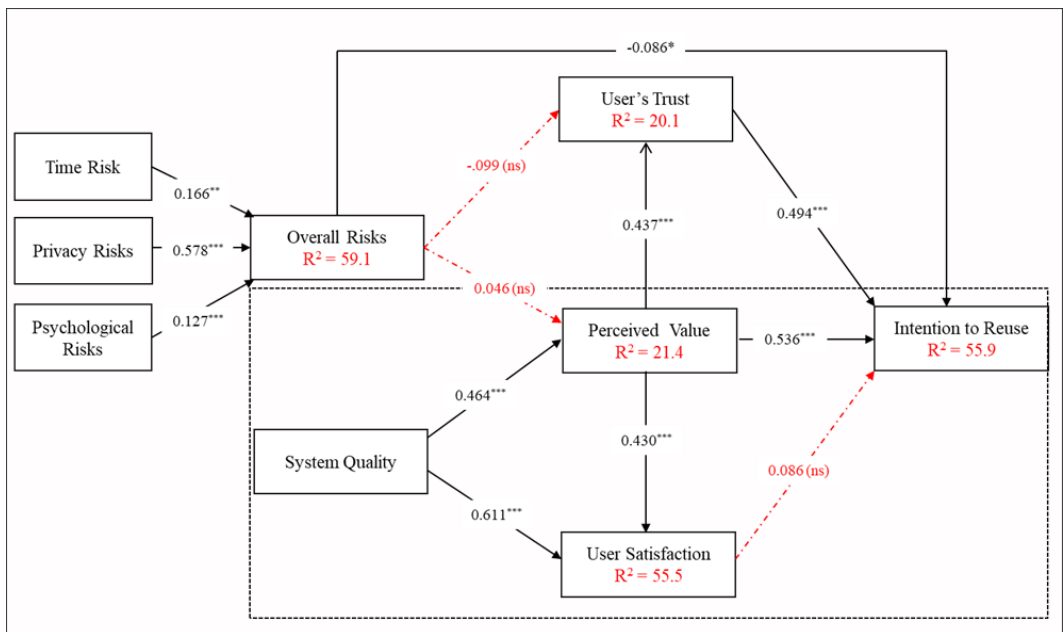
- **Predicting of IR:** Results show that three-out-of-four factors have a direct impact on IR e-government: PV ( $\beta = 0.536$ ), UT ( $\beta = 0.494$ ) and overall risk ( $\beta = -0.086$ ) leading to support H4, H9 and H10 and reject H5. Results also show the important role of PV on the IR as it has the largest effect and almost twice that of PV.
- **Prediction of use satisfaction:** Results show that SQ ( $\beta = 0.611$ ) and PV ( $\beta = 0.430$ ) have a direct effect on US, leading to support H2 and H3. The effect of SQ is greater than the PV.
- **Predicting of PV:** Results show that only SQ exerts positive effect ( $\beta = 0.464$ ) on PV, while the overall risk perceptions have no effect, leading to support H1 and failed to find support for H8.
- **Prediction of UT:** Results show that PV increases UT ( $\beta = 0.437$ ), while overall risk has no effect, leading to support H7 and failed to find support for H6.

Table 3. Correlation matrix between constructs

	1	2	3	4	5	6	7	8	9
IR	<b>0.775<sup>a</sup></b>								
US	.607 <sup>**b</sup>	<b>0.845</b>							
PV	.661 <sup>**</sup>	.637 <sup>**</sup>	<b>0.711</b>						
EUT	.701 <sup>**</sup>	.695 <sup>**</sup>	.636 <sup>**</sup>	<b>0.729</b>					
SQ	.421 <sup>**</sup>	.611 <sup>**</sup>	.457 <sup>**</sup>	.575 <sup>**</sup>	<b>0.822</b>				
TIMERI	-.431 <sup>**</sup>	-.463 <sup>**</sup>	-.460 <sup>**</sup>	-.468 <sup>**</sup>	-.484 <sup>**</sup>	<b>0.802</b>			
PSYCORI	-.497 <sup>**</sup>	-.403 <sup>**</sup>	-.417 <sup>**</sup>	-.458 <sup>**</sup>	-.356 <sup>**</sup>	.710 <sup>**</sup>	<b>0.744</b>		
PRIVRI	-.391 <sup>**</sup>	-.335 <sup>**</sup>	-.318 <sup>**</sup>	-.435 <sup>**</sup>	-.350 <sup>**</sup>	.546 <sup>**</sup>	.537 <sup>**</sup>	<b>0.823</b>	
OVERI	-.410 <sup>**</sup>	-.368 <sup>**</sup>	-.325 <sup>**</sup>	-.449 <sup>**</sup>	-.425 <sup>**</sup>	.571 <sup>**</sup>	.555 <sup>**</sup>	.737 <sup>**</sup>	<b>0.744</b>

<sup>a</sup>Average Variance Extracted (AVE); <sup>b</sup> Correlation

Figure 2. Validated research model



- Prediction of overall risk perceptions:** Results show that the three factors of privacy risk ( $\beta = 0.578$ ), time risk ( $\beta = 0.166$ ), and psychological risk ( $\beta = 0.127$ ) have a positive effect on overall risks, leading to support H11, H12, and H13. In addition, results show the important role of privacy risk on the overall risk perception, having the largest effect at almost 3.5 times that of psychological risk and 4.55 times that of time risk.

Our results also reveal that the three types of risks have an indirect influence on IR e-government website over the overall risk.

Table 4. Hypotheses testing and impact between constructs of the research model

Number	Hypotheses	Hypotheses/ Paths	Significance [Yes/No]	$\beta$ Value	T and P value New
H1	Higher perceived SQ is associated with higher PV	SQ → PV	Yes	.464	7.819*** (.000***)
H2	Higher perceived SQ is associated with higher US	SQ → US	Yes	0.611	13.961*** (.000***)
H3	Higher perceived PV is associated with higher US	PV → US	Yes	.430	9.817*** (.000***)
H4	Higher perceived PV is associated with higher IR	PV → IR	Yes	0.536	12.298*** (0.000***)
H5	Higher perceived US is associated with higher IR	US → IR	No	0.086	1.904 (0.058)
H6	Higher perceived overall risk is negatively associated with higher UT	OVERI → UT	No	-.099	-1.687 (.093)
H7	Higher perceived PV is associated with higher UT	PV → UT	Yes	.437	7.406*** (.000***)
H8	Higher perceived overall risk is negatively associated with higher PV	OVERI → PV	No	.046	.776 (.438)
H9	Higher perceived UT is associated with higher IR	UT → IR	Yes	0.494	10.899*** (0.000***)
H10	Higher perceived overall risk is associated with higher IR	OVERRI → IR	Yes	-0.086	-1.983* (0.049)
H11	Higher perceived time risk is associated with higher overall risk	TIMERI → OVERI	Yes	.166	2.698** (.007**)
H12	Higher privacy risk is associated with higher overall risk	PRIVRI → OVERI	Yes	0.578	11.228*** (000***)
H13	Higher psychological risk is associated with higher overall risk	PSYCORI → OVERI	Yes	.127	2.067* (.040*)

\*\*\* Significant at 0.001; \*\* significant at 0.01; \* significant at 0.05



## 5.2. Research Contributions

The study achieved five key contributions.

First, this is the first study that justified and integrated perceived risk as a complex construct composed of four types (TR, PR, PS and OR) besides UT and has found they have negative impact on the IR e-government. This contrast with the majority of prior e-government Arab studies (Alharbi et al., 2017; Ahmad & Campbell, 2015; Alawneh et al., 2013; Abu-Shanab, 2014; Abu-Shanab, 2017) and non-Arab studies (Horst et al., 2007; Bélanger & Carter, 2008; Liu & Zhou, 2010; Akram et al., 2019; Teo et al., 2008; Schaupp et al., 2010; Hung et al., 2006) that investigated risk as a single construct. In addition, our study is the first that used a mixed method sequential approach composed of a qualitative approach to justify the studied factors followed by a quantitative one and revealed that overall risk is a multi-construct composed of privacy, time, and psychological risks. However, the number of identified risks (04) to impact IR e-government is less than those identified by prior e-commerce studies that found the importance of seven risk types (privacy, time, psychological, overall, performance, financial, and social) (Martins et al., 2014; Featherman & Pavlou, 2003) that impact IR e-commerce. One potential explanation for non-importance of financial and social risk is that e-commerce and e-government are different. There are many websites for e-commerce available for consumers which present potential risks, while there is only one e-government portal that represents the official gate for online services provided by government. Also, in Arab countries, people still do not trust the government and may have not use it for financial transactions, and we did not include trust of government as an additional factor in the proposed model. Furthermore, our findings support findings of previous Arab studies (Abu-Shanab, 2014; Abu-Shanab, 2017; Alharbi et al., 2017) and non-Arab studies (Colesca, 2009; Beldad et al., 2012; Lean et al., 2009) that highlight the importance of privacy protection since privacy risk was found to negatively influence IR e-government. Moreover, our findings go further and highlight additional risk factors. Our findings contradict Al-Busaidy & Weerakkody (2009) who found that 70% of participants were happy about their privacy protection on the e-government portal. The importance of privacy risk from users perspective is fueled by their increased awareness related to recent Facebook case where the company was penalized \$5 billion for violating user's privacy (Snider & Baig, 2019). *Last*, our results failed to find support for two paths: between overall risks and user' trust, and overall risks and perceived value. We can advocate two potential explanations. Either, the effect doesn't exist in our sample or the effect exists but our test didn't detect it because we used multiple regression analysis instead of simultaneous equation modeling (SEM) technique, which call for additional studies.

Second, this is the first study to expand the information system success model for e-government after the first attempt by Wang & Liao (2008) to apply the Delone & McLean (2003) model and the second attempt by Teo et al. (2008), who added UT and its determinants, and Veeramootoo et al. (2018) who added only risk as a simple construct, while our study contributed the inclusion of overall risk and its three determinants to the improved model of Rouibah et al. (2015) and Wang (2008). This is an important result as a previous literature review on the effect of trust on e-government (Alzahrani et al., 2017) showed that only two studies used the information systems success of Delone & McLean (2003) in e-government context. Also our study goes beyond Arab studies that merely used TAM and UTAUT (Al Mansoori et al., 2018; Alharbi et al., 2017; Ahmad & Khalid, 2017; Al-Hujran et al., 2015; Ahmad & Campbell, 2015). Although prior studies that applied ISS model and succeeded to find significant impact of satisfaction on IR (Teo et al., 2008; Veeramootoo et al., 2018; Akram et al., 2019; Stefanovic et al., 2016), our results failed to demonstrate existence of such path for the potential possibility effect of cultural effect. Although participants felt satisfied about the e-government website, this does not translate in immediate intention to reuse, because of *Wasta*, which is not included in this study. In fact an Arab study has found that Arab people do not intent to use e-government because of the usage of cultural *Wasta* factor (Almukhlifi et al., 2019). *Wasta* is derived from the Arabic word (قطيس أو) and was defined by Rouibah & Al-Hassan (2019, p. 143) "as using one's personal connections to gain something, and/or influence to get things done quickly,

including transactions such as the quick renewal of a passport, waiving of traffic fines". This is similar to Chinese Guanxi and Arab people usually use Wasta to accelerate executing transactions in public institution, and therefore have no intent to use e-government website.

Third, this study provides additional insight to e-government adoption in an Arab country compare to previous ones. It validates a model that includes four risk factors, technical factors (system quality), user's beliefs (UT, PV, and US), and loyalty (IR), and shows the relative importance of these factors on IR.

Fourth, the lack of the effect of OR on UT and OR on PV two key but controversial results of our study. Indeed prior studies provided mixed results on the role of OR on UT (Rana & Dwivedi, 2015c) between those that found significant effect (Colesca, 2009; Beldad et al., 2012; Horst et al., 2007; Liu & Zhou, 2010; Horsburgh et al., 2011; Maharaj & Munyoka, 2019) and those who failed (Ejdys et al., 2019). Our results support those of the later. Also our study is the first to examine the link between PR on PV in e-government and failed to find significant effect although a prior e-commerce study contrast with our finding (Yang et al., 2015a). Two potential explanations can be advocated for the lack of the two paths (OR→UT and OR→PV). The first is related to nature of the used construct. Unlike our overall risk construct composed of three antecedents (privacy, time and psychological), prior studies have considered PR as a simple construct measured merely in term of exposure of participants to risks and risk of losing data. The second is related to social trust. Arab culture is characterized by the social relationship between people (Rouibah & Hamdy, 2009) who developed a kind of social trusted network. As such if people of network believes the website is trusty/useful, then even someone feels threatened by potential risk, his trust/perceived value is not affected.

With regard to the relative importance of UT → IR and OR → IR our results found the former has the second strongest effect, after PV, and OR exerts the least effect on IR. These results confirm the important role of trust on IR in the Arab culture, and suggest that positive feeling (represented by trust) has more influence than negative feeling (represented by risk perceptions) and are consistent with finding of prior studies (Bélanger & Carter, 2008; Fakhoury & Aubert, 2015) but contrasts with others (Carter & Bélanger, 2005; Ahmad & Campbell, 2015).

### 5.3. Research Limitations

Results of this study should be examined in light of the following four limitations: First, this study is restricted to the Kuwaiti context and used a homogenous random sample of respondents composed of highly educated university students that are a mix of current user (74.3%) and potential users (25.7%), and therefore cannot be generalized to all population in Kuwait. Second, we obtained data from participants about continuous IR at a single point in time that may introduce respondent bias and limit the generalizability of the results. Third, the research model did not account for two factors (information quality and service quality) in the ISS model. Fourth, we used multiple regression analysis based SPSS, a first generation multivariate method instead of the second generation multivariate method based "Structural Equation Modeling" Thus, these limitations restrict the generalizability of the results to other categories.

### 5.4 Managerial Implications

This study recommends marketing strategies to increasing the use of the Kuwait e-government website and its mobile App.

This study recommends that CAIT, the public organization in charge of the e-government portal (both the website and its mobile app), to raise citizens and resident's awareness of the e-government in term PV, UT, and available security that protect available informational and electronic services. This is necessary to lessen fears and risk perceptions related to privacy, psychology, and time, and to strengthen that the e-government portal maintains and safeguards the privacy of users.

## 5.5 Research Perspectives

This study suggest futures studies be carried out in several areas.

First, prior studies suggested that age, education, and income play a role in adoption, and that certain groups of individuals (young, high educated and high income) are more driven toward IR e-government (Carter & Bélanger, 2005; Dimitrova & Chen, 2006; Warkentin et al., 2002; Welch et al., 2004). Therefore, we suggest to test and expand the proposed model to other groups, not only students in higher educations, but to include older people, who have less exposure to internet culture, and the majority of expatriates as well as to conduct a study at a broader level to include the focus on specific electronic services provided by a specific public agency (e.g., Ministry of Interior vs. Ministry of Finance), and then to identify the similarities and differences between the factors of pull and push toward usage between different government agencies in Kuwait.

Second, our model did not include information quality and service quality or other trust constructs (trust in government public / agencies, disposition of trust, and trust of Internet technology), social trust and Wasta. We measured SQ with only four items (that measure ease of use and system reliability). Thus, we suggest continuing to study additional positive and negative factors that affect IR e-government portal by including quality of services, information quality, other items to measure SQ, UT and its determinants, trust of (government and internet) (Teo et al., 2008). In addition, the SQ was measured by four items (2 items measured ease of ease, reliability and presence of advanced search engine responsiveness), but other measure could be added in future studies to improve the model and account for important and additional features, such as availability of clear procedures for the use of e-government portal, and assurance of the website security, etc. E-government is still relatively new and an emerging trend in Kuwait's context. We therefore recommend including the effects of awareness of the e-services provided by the portal and its PV and focusing on comparing the effect of two different medias: TV and social network use (Twitter, Facebook, Instagram, and WhatsApp) (Al-Aufi et al., 2017; Alawneh et al., 2013; Dimitrova & Chen, 2006) and test how behavior changes over time.

Third, there is a need to expand the validity of the tested model to include other respondents from other Arab countries. For example the Gulf Cooperation Council (GCC) Arab countries share common characteristics in terms of customs and traditions, living standards, high penetration rate of mobile phones, high quality infrastructure, and thus constitutes a good context to conduct a cross Arab culture in order to ascertain the homogenous of the Arab culture. Furthermore, as past studies have proven that culture affects technology adoption, this study encourages future studies to expand and test the research model to other European cultures (e.g., Poland) using the SEM, in order to assess the validity of the proposed model since very few studies have shown that differences in e-government adoption exist across cultures (Al-Maliki, 2014). Therefore, we suggest to continue investigating factors that influence IR e-government by comparing the behavior of users from other countries in order to increase our understanding of the similarities and differences in e-government behavior.

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## ENDNOTES

- <sup>1</sup> Mixed methods research, according to Venkatesh et al. (2013, p.3) involves a research design that uses multiple methods (i.e., quantitative or qualitative research approaches). It uses qualitative and quantitative research methods, either concurrently (i.e., independent of each other) or sequentially (e.g., findings from one approach inform the other), to understand a phenomenon of interest (Venkatesh et al., 2013, p.3). Following Venkatesh et al. (2013, p.4) we conducted a sequential mixed methods study (a quantitative study first followed by a qualitative study) to understand the deeper role of perceived risk perceptions on intention to reuse e-government. In addition, among the six objectives of the seven mixed methods research categorized by Venkatesh et al. (2013, p.6), complementarity, completeness, developmental, expansion, corroboration/confirmation, compensation, and diversity we followed one that aims for development and expansion upon the understanding obtained in a prior e-government. This study involves both qualitative and quantitative data collection.
- <sup>2</sup> It is the process of identifying a population of interest and developing a systematic way of selecting cases that is not based on advanced knowledge of how the outcomes would appear
- <sup>3</sup> Wang and Liang (2008) found that US affect perceived net benefits, i.e., a form of PV.
- <sup>4</sup> Common method bias took place when variations in participant's responses are caused by the research instrument (i.e., questionnaire) rather than the actual dispositions of the respondents that the instrument attempts to uncover (Podsakoff et al., 2012). Thus, the instrument introduces a bias, which needs to be analyzed and removed if it exists. If not removed data results are affected by the biased instruments. Since this study used SPSS, then we tested common method bias using the Harman's single/one factor score before executing exploratory factor analysis (Malhotra et al. 2006; Sharma et al. 2009). This method allows estimating if all items (measuring latent variable) are loaded into a single common factor. The rule of thumb for Harman's single-factor test is that the first major component's eigenvalue (percentage of variance) should be less than 50% to demonstrate the absence of the common method bias (Podsakoff et al., 2012). As can be seen from Table 2 our analysis revealed that all the items can be categorized into nine (09) factors and when the first major component was extracted, only 13.34% of the variance was explained. This demonstrates that the remaining variance which was not extracted, explains a significant amount of the factors. Therefore, the findings show that common method bias was not an issue for this study.

## APPENDIX A: RESEARCH INSTRUMENT

1. Gender:
  - Male
  - Female
2. Age range:
  - less than 20
  - 21 to less than 30
  - 31 and less than 40
  - $\geq 40$
3. Nationality:
  - Kuwaiti
  - Non-Kuwaiti
4. Use Internet for:
  - Email
  - Purchasing online
  - Instant messaging
  - Searching on the web
  - Playing online games
  - Social networking
  - (Online services of www.e.gov.kw)
5. How many times do you access the www.e.gov.kw?
  - Never use it before
  - One time per year
  - One time per month
  - One time per week
  - Daily
6. What type of service did you use on the e.gov.kw?
  - Search information services
  - Online Payment transactions

### System Quality [SYSQ]

**SYSQ1:** The e-government website is user friendly [Ease of use]; (Wang & Liao, 2008).

**SYSQ2:** The e-government website is easy to learn and to use [Ease of use]; (Wang & Liao, 2008).

**SYSQ3:** The e-government website is always up and available [Reliability]; *[deleted]* (Rouibah et al., 2015).

**SYSQ4:** The e-government website provides well-built advanced search engine [Reliability]; (Rouibah et al., 2015).

### Perceived Value [PV] From (Wang & Liao, 2008)

**PV1:** Compared to the time I need to spend, the use of e-government is worthwhile to me.

**PV2:** The effort I put on the e-government website is very worthwhile.

**PV3:** I think that using e-government website can offer me a wider range of online services.

**PV4:** The e-government web system saves me time.

### User Satisfaction [US] From (Bhattacharjee, 2001)

**US1:** I feel satisfied with using e.gov.kw.

**US2:** I feel contented with using e.gov.kw.

**US3:** I feel pleased with using e.gov.kw.

### **Intention to Reuse [IR] From (Rouibah et al., 2015)**

**IR1:** I intent to reuse the e-government website in the future.

**IR2:** I am likely to recommend the e-government web site to my friends.

**IR3:** I would re-use e-government services provided over the Web site.

### **User's Trust [EUT] From (Rouibah et al., 2016)**

**UT1:** The e-government web site is trustworthy.

**UT2:** The e-government web site keeps promises and commitments.

**UT3:** The e-government web site keeps customers' interests in mind.

**UT4:** The e-government web site provides reliable information.

### **Time Risk [TIMER1]**

**TIMER1 1:** 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. *[deleted]* (Featherman & Pavlou, 2003).

**TIMER1 2:** It would take me lots of time to learn how to use e-government services over the web site. (Featherman & Pavlou, 2003).

**TIMER1 3:** It would take much time to familiarize myself with the online services of the e-government *[from the qualitative study]*.

### **Psychological Risks [PSYCOR1]**

**PSYCOR1 1:** The e-government web site will not fit in well with my self-image or self-concept *[deleted]* (Featherman & Pavlou, 2003).

**PSYCOR1 2:** 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. (Featherman & Pavlou, 2003).

**PSYCOR1 3:** I am afraid that the e-government web site will not perform as expected *[from the qualitative study]*.

### **Privacy Risks [PRIVR1]**

**PRIVR1 1:** Using the e-government web site will cause me to lose control over the privacy of my payment information (Featherman & Pavlou, 2003).

**PRIVR1 2:** 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 (Featherman & Pavlou, 2003).

**PRIVR1 3:** Internet hackers might take control of my online payment if I use the e-government web site *[deleted]* (Featherman & Pavlou, 2003).

**PRIVR1 4:** I am concerned about providing personal information because others may access and misuse it without my knowledge *[from the qualitative study]*.

### **Overall Risks [OVER1] From (Featherman & Pavlou, 2003)**

**OVER1 1:** Using the e-government web site for payment would be risky.

**OVER1 2:** The e-government web site is dangerous to use *[deleted]*.

**OVER1 3:** Using the e-government web site would add great uncertainty to my online payment [OVER13] *[deleted]*.

**OVER14:** Using the e-government web site exposes me to an overall risk.

## APPENDIX B: MULTIPLE REGRESSION ANALYSIS

Table 5. Results of multiple regression analysis of “Overall risk”

	Unstandardized Coefficients (β)	Standardized Coefficients (β)	t	P-Value	Collinearity (VIF)
Constant	.197		1.772	.078	
Time risk	.208	.166	2.698**	.007**	2.181
Psychological risk	.128	.127	2.067*	.040*	2.151
Privacy risk	.642	.578	11.228***	.000***	1.519
<b>DF</b>	<b>Fischer (F)</b>	<b>R<sup>2</sup></b>	<b>R<sup>2</sup>-adjusted</b>	<b>DW</b>	<b>P-Value</b>
3	112.898	59.1%	58.6%	1.872	0.000

Table 6. Results of multiple regression analysis of perceived value

	Unstandardized Coefficients (β)	Standardized Coefficients (β)	t	P-Value	Collinearity (VIF)
Constant	1.627		9.623	.000	
Overall risk	.030	.046	.776	.438	1.024
System Quality	.555	.464	7.819***	.000***	1.024
<b>DF</b>	<b>Fischer (F)</b>	<b>R<sup>2</sup></b>	<b>R<sup>2</sup>-adjusted</b>	<b>DW</b>	<b>P-Value</b>
2	30.664	21.1%	20.4%	2.24	0.000

Table 7. Results of multiple regression analysis of end-user trust

	Unstandardized Coefficients (β)	Standardized Coefficients (β)	t	P-Value	Collinearity (VIF)
Constant	3.341		81.203	.000	
Overall risk	-.070	-.099	-1.687	.093	1.000
Perceived value	.307	.437	7.406***	.000***	1.000
<b>DF</b>	<b>Fischer (F)</b>	<b>R<sup>2</sup></b>	<b>R<sup>2</sup>-adjusted</b>	<b>DW</b>	<b>P-Value</b>
2	28.847	20.1	19.4	2.013	0.000

Table 8. Results of multiple regression analysis of satisfaction

	Unstandardized Coefficients (β)	Standardized Coefficients (β)	t	P-Value	Collinearity (VIF)
Constant	1.014		8.435	.000	
System Quality	.704	.611	13.961***	.000***	1.000
Perceived value	.267	.430	9.817***	.000***	1.000
<b>DF</b>	<b>Fischer (F)</b>	<b>R<sup>2</sup></b>	<b>R<sup>2</sup>-adjusted</b>	<b>DW</b>	<b>P-Value</b>
2	145.634	55.9	55.5	2.032	0.000

Table 9. Results of multiple regression analysis of intention to re-use

	Unstandardized Coefficients (β)	Standardized Coefficients (β)	t	P-Value	Collinearity (VIF)
Constant	3.098		116.064	0.000	
End-user trust	0.304	0.494	10.899***	0.000***	1.077
Perceived value	0.33	0.536	12.298***	0.000***	1.000
Satisfaction	0.053	0.086	1.904	0.058	1.079
Overall risks	-0.053	-0.086	-1.983*	0.049	1.002
<b>DF</b>	<b>Fischer (F)</b>	<b>R<sup>2</sup></b>	<b>R<sup>2</sup>-adjusted</b>	<b>DW</b>	<b>P-Value</b>
4	97.031	56.7	55.9	2.091	.000

Kamel Rouibah is an Associate Professor of information systems, College of Business Administration (CBA), Kuwait University. He holds a PhD in Information Systems from Ecole Polytechnique of Grenoble, France. Before joining CBA, he worked at the Faculty of Technology Management at Eindhoven (Netherlands) and Institut National de la Recherche Scientifique (France). His research interests include Design of Information Systems, Management Information Systems, Engineering Data Management, Workflow Management, Information System and Information Technology Acceptance, diffusion, and satisfaction. He has authored/coauthored over 50 research publications in peer-reviewed reputed journals and conference proceedings. He was involved in several European projects. His publications appeared in several leading journals: *Journal of Strategic Information System*, *IT & People*, *Journal of Global Information Management*, *Computers in Human Behavior*, *Computers in Industry*; *Information Management & Computer Security*, *International Journal of Computer Integrated Manufacturing*; *Robotics & Computer Integrated Manufacturing Journal*; *Journal of Decision System*; *Journal of Engineering Design*, *International Journal of Handheld Computing Research*, *Telematics and Informatics*, and *International Journal for E-Adoption*. He has received the excellence younger researcher award from Kuwait University for the academic year 2001/2002. Dr Rouibah has directed many funded research projects, and has served as the program committee member of various international conferences (*Australasian Conference of Information Systems-ACIS*, *Information System Development-ISD*; *ACM Symposium on Applied Computing on e-Business Applications*; *IADIS*, etc.) and reviewer for various international journals (*IT & People*, *Journal of Global Information Management*, *Industrial Management & Data System*, *Journal of Electronic Commerce in Organization*, *International Journal of e-Adoption*, *International Journal of Computer Integrated Manufacturing*, *International Journal of Production Research*, *The Australasian Journal of Information System*, *Arab Journal of Administrative Sciences*, *Journal of Global Information Technology Management*, *Asian Academy of management Journal*, *Information Management & Computer Security*, *Communication of the IIMA*). Dr Rouibah sits on the Editorial Board of several IS journals: *Journal of Global Information Management*; *Journal of Electronic Commerce in Organizations (JECO)*; *International Journal of e-Adoption*; *The Australasian Journal of Information System*, *International Journal of Handheld Computing Research*, *International Journal of Advanced Pervasive and Ubiquitous Computing (IJAPUC)*. He is the co-editor of "Emerging markets and e-commerce in developing economies" book. He has taught many information systems courses in France, Netherlands, and Kuwait.