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E-government service use intentions in Afghanistan: technology adoption and the digital divide in a war-torn country

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Abstract

In this article, we developed and tested an integrated model to predict intention to use e-government services by combining the concepts of technology adoption, the digital divide, and conflict literature through surveys of 360 citizens of Afghanistan. Using a partial least squares approach, we found that components of the access divide and the social divide have significant effects on intentions to use e-government services, and that the *perceived intensity of civil conflict* and *perceived behavioral conflict* moderate certain predictors of intention to use e-government services. Implications for e-government service adoption and delivery in digitally divided conflict zones in the contexts of research, policy and practice are also discussed.

Keywords

e-government, digital divide, e-government adoption, civil conflict, behavioral conflict, Afghanistan

Civil conflicts and violence can have psychological consequences for the likelihood of citizens to use e-services.

Introduction

Various forms of civil conflicts and violence have increased significantly around the world (Pedersen 2002) with the likelihood of expansion in the coming years (National Intelligence Council 2008). Civil conflicts and violence have numerous consequences for a society, spanning psychological, environmental and economic effects (Kaplowitz 1976; Landrigan et al. 2004; Pedersen 2002; United Nations Environment Programme 1991). However, despite the growing number of civil conflicts and violence throughout the world, information systems research, particularly e-government research, is silent regarding the psychological consequences of civil conflicts and violence on

the likelihood of citizens to use e-services. Information system research has mainly dealt with organizational, process, task and relationship conflicts (Barki and Hartwick 2001; D. Robey et al. 1989; Smith and McKeen 1992; Trimmer et al. 2000). In contrast, the potential influence of civil conflicts and violence on online service use has not been adequately explored. How does civil conflict and violence affect technology adoption?

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To answer this question was the first major objective of this study.

Secondly, from an adoption and use perspective, researchers have identified several contextual and non-contextual factors affecting technology adoption in culturally homogeneous (Wu et al. 2008) and in cross-cultural settings (Kiiski and Pohjola 2002; Oyelaran-Oyeyinka and Catherine 2004), including individual (Isgin et al. 2008), organizational (Wu et al. 2008) and country-level factors (Kijsanayotin et al. 2009). Among these factors, the intention to use electronic service or e-services is the most important (Al-Adawi et al. 2005; Teo et al. 2008) and has been studied from different perspectives in diverse settings (Carter and Weerakkody 2008; Gilbert and Balestrini 2004; Ren 1999). Similarly, the digital divide research stream has been broadly explored in parallel with technology adoption (Dewan and Riggins 2005). However, studies of the digital divide and e-government have historically been treated as separate research streams, even though researchers have stressed the need for an integrated approach that considers digital divide issues as integral parts of e-government adoption models (Carter and Weerakkody 2008; Helbig 2008). Thus, the second objective of this study was to develop and test an integrated model of e-government adoption by incorporating digital divide issues and insights from the technology adoption literature.

Thus, by drawing upon the concepts of the digital divide and technology adoption, as well as the civil and behavioral conflict literature, we developed an integrated model for predicting citizen perceptions of e-government services in a digitally divided conflict zone. Despite the presence of a digital divide, civil conflicts, and political instability, the government of Afghanistan has implemented and intends to implement crucial e-government services (Afghanistan National Development Strategy 2008). The aim of this research is to identify the components of the digital divide that shape intentions to use e-government services in less-developed countries undergoing civil conflict and political instability, and where there are low levels of information and communication technology (ICT) awareness. The findings of this study will assist policymakers and practitioners in designing policies that address citizen concerns.

The rest of this paper is organized as follows: Section 2 provides an overview of the literature related to technology adoption, the digital divide and civil conflict. In Section 3, we discuss our research model and hypotheses. Section 4 describes the methodology used and provides an analysis of the results. Finally, we conclude with a discussion and summary of our main findings in Sections 5 and 6.

Literature review

Technology adoption and e-government

Researchers have identified several factors that affect e-government service adoption behaviors from an adoption and usage perspective. Among these factors, intention to use e-services has been studied widely (Al-Adawi et al. 2005; Teo et al. 2008) from different perspectives in diverse settings (Carter and Weerakkody 2008; Gilbert and Balestrini 2004; Ren 1999). For example, Warkentin et al. (2002) studied the impact of citizen trust and risk perceptions toward e-government service use and found that trust positively affects intentions to use an e-government service, and that perceived risk is negatively related to service use. Furthermore, the authors hypothesized that the perception that an individual has control over how personal information will be used, and over how and when information will be acquired, could encourage adoption. Gilbert and Balestrini (2004) utilized an approach focusing on technology adoption and service quality to investigate the factors that users take into account when deciding to use government services that are provided online. The authors found that trust, financial security, information quality, time and money influence government e-service usage. In other words, citizens will use government services that are provided online if the government can ensure the security of their financial details, develop relationships of trust with citizens, provide relevant and updated information, and ensure savings of time and money (Gilbert and Balestrini 2004).

Carter and France (2005) found that citizens' intentions to use e-government services are positively influenced by compatibility, ease of use and perceived trustworthiness of the service. Furthermore, they argue that e-government information presented on websites should meet the needs of citizens and be well-organized, and that online government services should be designed to be compatible with citizen lifestyles, because people who trust the Internet and government agencies are more likely to use e-government services (Carter and Bélanger 2005; Carter and Weerakkody 2008). By combining insights from the technology acceptance model, trust models, and the risk literature, Al-Adawi et al. (2005) presented a conceptual model of citizen adoptions of

e-government. The author stressed that intentions to obtain information and conduct transactions using e-government websites are different and must be treated differently (Al-Adawi et al. 2005). Recently, Teo et al. (2008) investigated the continued usage intention of e-government websites by integrating the DeLone and McLean model and the online trust literature, and found that online trust of e-government websites is a strong predictor of continuing intention to use e-government services. Furthermore, they showed that perceptions of website quality attributes such as information quality, system quality and service quality, as well as and offline trust in the government, are affected by online trust. In a study similar to that of Teo et al. (2008), Wang and Liao (2008) applied an updated DeLone and McLean model (DeLone and McLean 1992) to assess e-government service success in the government-to-citizen (G2C) context. While validating their multidimensional e-government system success model, they found that information quality, system quality, service quality, use, user satisfaction and perceived net benefit predict the success of e-government systems (Wang and Liao 2008).

The digital divide and e-government

Parallel to technology adoption is the digital divide research stream. The digital divide can be classified as the access digital divide or the social digital divide (Harper 2003; Norris 2001). The access digital divide lies between those who have access to digital infrastructure and information, and those who have no or limited access: according to Mehra et al. (2004), the access digital divide is "the troubling gap between those who use computers and the Internet and those who do not" (p. 782). The social digital divide exists due to perceptions, culture and interpersonal relationships (Harper 2003). Dewan and Riggins (2005) classified digital divides at three different levels: individual, organizational and national, with first order and second order effects. The first order effects are disparities in access to ICT, and the second order effects are disparities in the ability to use ICT among those who already have access (Dewan and Riggins 2005). According to Kathleen and Gallagher (2004), the primary factors contributing to the digital divide are income, employment, education, geography, gender, physical disability and ethnicity (Kathleen and Gallagher 2004).

The impact of the digital divide on e-government adoption is huge, particularly in developing countries.

Few studies have explored factors that inhibit or contribute to e-government service adoption in developing countries. For example, according to Thomas and Streib (2003), ethnicity and education are the most important predictors of government website usage, with the highest rates of Internet usage among individuals with high levels of education. Mossberger et al. (2003) suggested four different types of divides related to ICT: an information divide, a skill divide related to computer-specific capabilities, an economic opportunity divide and a democratic divide related to the inability to participate in e-government (Mossberger et al. 2003). Belanger and Carter (2006) studied potential impacts of the digital divide on e-government service usage and found that income, education, age and frequency of Internet use impact e-government service use. Carter and Bishath (2008) carried out a cross-cultural e-government adoption study rooted in digital divide, trust and technology adoption models. They found that digital divide factors such as skill and access vary across cultures, whereas relative advantage and trust equally influence citizens' intentions to use e-government services across different cultures (Carter and Weerakkody 2008).

Civil conflict

Conflict is a natural and integral part of social life (Simmel 1950) and can occur within an individual as well as between individuals, ethnic groups, organizations and countries. Conflicts can be defined in several ways reflecting the various levels at which conflicts exist in a society (Deutsch 1990; Wall and Callister 1995). For example, they can be defined as behavioral conflict (Argyris 1957) and civil conflict (Wall and Callister 1995). Behavioral conflict is internal to individuals, and it arises due to actual or perceived oppositions of needs, values and interests (Argyris 1957). Civil conflict occurs due to the expressed struggle for political dominance between groups who have divergent goals (Dmitriy and Grossman 2000).

The frequency of civil conflicts and violence has increased significantly around the world (Pedersen 2002), and it is likely that they will continue to expand in coming years (National Intelligence Council 2008). Examples of civil conflicts and violence across the globe include conflicts in Afghanistan, Burma, Colombia, Congo, Georgia, India, Iran, Iraq, Mexico, Nigeria, Pakistan, the Philippines, Russia, Somalia and Sri Lanka (Heidelberg Institute for
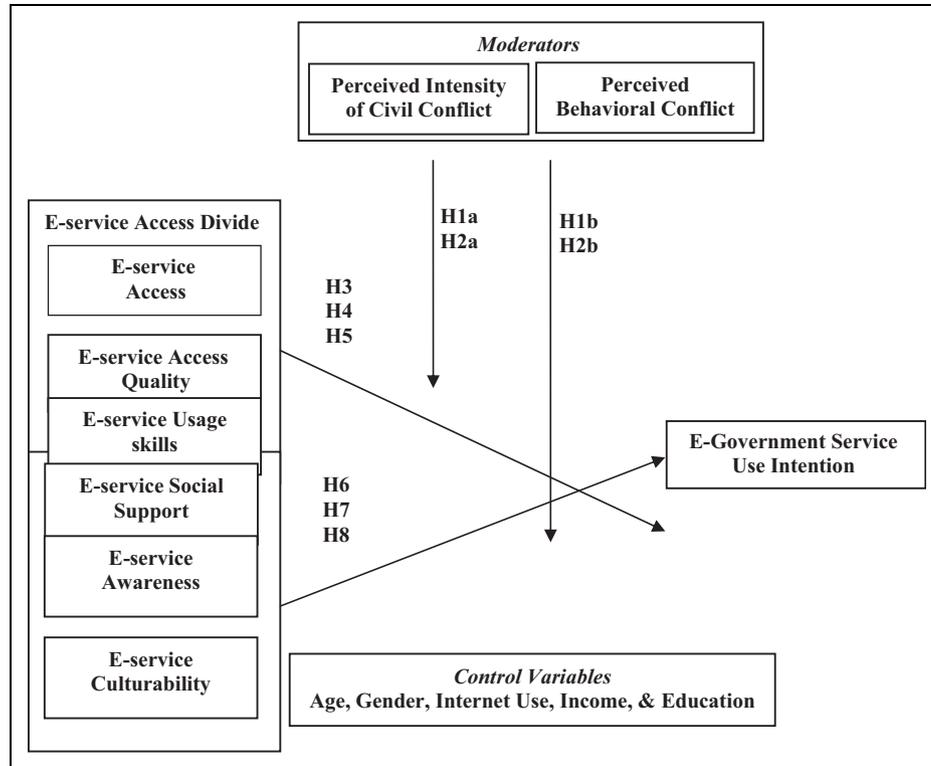
Figure 1. Proposed research model

International Conflict Research 2008). According to a survey conducted by Heidelberg Institute for International Conflict Research (HIIK) (2008), at a global level, a total of 345 conflicts–both intrastate and interstate–were reported, where intrastate conflicts accounted for the most violence. Among the 345 conflicts reported, 111 conflicts were located in Asia and Oceania, 79 in Africa, 65 in Europe, 47 in the Middle East and the Maghreb, and 43 in the Americas. However, the potential influence of civil conflicts and violence on online service use has not been adequately explored.

Research model and hypotheses

Our research model is shown in Figure 1. We considered the digital divide in e-government from two aspects: 1) the e-service access divide and 2) the e-service social divide (Harper 2003; Norris 2001), that may affect citizen intentions to use e-government services. In the literature, the access divide is mainly viewed as the product of differences between groups regarding computer and Internet use (Mehra et al. 2004). However, in the context of e-government service access, we extend the concept of access to three dimensions: e-service access,

e-service access quality and e-service access skills. Similarly, the social divide is also considered from three dimensions with respect to e-government service: social support, e-service awareness and e-service culturability. Taking into account the context of the study, we also incorporated two moderator variables: perceived intensity of civil conflict (PICC) and perceived behavioral conflict (PBC), as shown in Figure 1. We discuss these variables later in detail while constructing our hypotheses. In the next section, we discuss our hypothesis in the light of digital divide, technology adoption and civil and behavioral conflict models.

E-service access divide

E-service access

Conventionally, in the digital divide literature, access refers to the availability of digital resources related to Internet use (Mehra et al. 2004). In this study, e-service access is defined as resource availability and convenience of access to these resources. Resources include infrastructure such as personal computers, Internet kiosks, cyber cafés, and Internet connections. Convenience of access is associated with the ease of finding and using

e-government access points including computers, kiosks, and cyber cafés. According to a survey conducted by Graafland-Essers and Ettedgui (2003), convenience of time and location are the main factors determining e-government service use (Graafland-Essers and Ettedgui 2003). Slack and Rowley (2004) studied the role of public kiosks in delivering e-government services and identified several issues that make their use problematic (Slack and Rowley 2004). Governments must also take into account effort expectancy and ease of use while providing access points (Wang and Shih 2009). Moreover, Carter and Bishath (2008) also hypothesized that access may influence e-government service use intention. This leads us to the following hypothesis:

> H1: An individual's level of access will be positively associated with e-government service use intention.

E-service access quality

In developing countries, e-government is often accessed via privately owned computers in local tele-centers, cyber cafés or similar facilities, thus making these intermediaries vital to e-government service access (Heeks 2006). Furthermore, the quality and type of Internet access mode impact usage patterns (Davidson and Cotten 2003). For instance, dial-up and broadband users have different usage patterns (Carter and Weerakkody 2008). Therefore, we measure e-service access quality in three dimensions: timeliness (speed) of the connection, trust in the Internet connection, and stability of the connection. E-service access quality is defined as the quality of e-government services expressed in terms of response time, stability and reliability.

Davidson and Cotten (2003) found that broadband users spend more time on the Internet than users with dial-up connections, and that the availability of high-speed connections impacts what users do online. Horrigan and Rainey (2002) reported that broadband users search for information more widely, engage in a broader range of activities and more often produce their own web content than do users without high-speed connections (Horrigan and Rainey 2002). Moreover, Carter and Belanger (2005) found that trust in the Internet is also a significant predictor of e-government service use intention. Carter and Bishath (2008) stressed the need for considering types of access when executing cross-cultural studies. Furthermore, trust has profound effects

on continued intention to use e-government websites (Teo et al. 2008).

> H2: Higher levels of e-service access quality will be positively related to e-service use intention.

E-service use skills

Skill inequality is one of the primary contributors to the digital divide (Dewan and Riggins 2005; Mossberger et al. 2003). Skilled human resources are necessary for e-government success (Chen et al. 2006; Khan et al. 2010). Khan et al. (2010) defined e-skills as "the set of skills, knowledge, and concepts that are needed for effective consumption–access, locate, operate, manage, understand, and evaluate–of e-services provided in different stages of e-government" (p. 8). They classified e-skills needed for e-government service utilization into two broad categories: technical and applied e-skills. In this study, we define e-service usage skills as the basic skills and knowledge citizens need to use e-government services. Furthermore, according to Carter and Bishath (2008), Internet skills are positively correlated with e-government service use intention. Therefore, we construct the following hypothesis:

> H3: An individual's level of e-skills will be positively associated to e-service use intention.

E-service social divide
E-service social support

Social support takes two forms in the digital divide literature: technical assistance and emotional reinforcement from friends and family (DiMaggio et al. 2004). DiMaggio et al. (2004) categorized a variety of usage inequalities including inequality in the availability of social support, the inequality of technical tools, inequality in autonomy of use, inequality of skill levels, and wide variation in usage. Kim and Jung (2002) found that social support from family and friends is strongly correlated with online activity (Kim and Jung 2002). In this study, e-service social support is defined as reinforcement from peers (friends and family) in the form of social and technical support to encourage e-service use. The technology adoption literature postulates that emotional reinforcement from peers is a strong predictor of technology use intention (Al-Gahtani et al. 2007; Maldonado et al. 2010; Venkatesh et al. 2003).

H4: Social support provided to an individual will be positively related to e-service use intention.

E-service awareness

In this study, e-service awareness is defined as the degree to which citizens are aware of the availability of e-government services provided online. Such awareness is crucial (Jaeger and Thompson 2003). Several studies have found that government must promote awareness among citizens to access and use ICT by utilizing a variety of channels, including communicating directly with citizens to explain the benefits of using ICT and to offer training and technical support (Graafland-Essers and Ettedgui 2003; Khan et al. 2010; Kvasny and Keil 2002; Van der Meer 2003). Government efforts to encourage and facilitate ICT use convey the message that the government is committed to public interests and has taken the needs and requirements of citizens into consideration (Kvasny and Keil 2002).

Graafland-Essers and Ettedgui (2003) conducted a study of citizen acceptance and use of e-government services in different countries. They found that e-government service familiarity was highly correlated with attitudes toward e-government service use, and that most citizens were not aware of the types of government services available online. A survey conducted by the Bahrain E-Government Authority reported high positive correlations between e-government service awareness and usage rates (Bahrain E-Government Authority 2007). According to the survey, by making e-government website addresses easier to learn and remember, citizen awareness rose from 25 percent to 80 percent. According to Carter and Bishath (2008), government must promote awareness by implementing national e-government service awareness strategies, which may increase participation.

H5: An individual's level of e-service awareness will be positively associated with e-service use intention.

E-service culturability

"Culturability" is the merging of culture and usability in website design based on color, spatial organization, fonts, shapes, icons, metaphors, geography, language, flags, sounds and motion that affect user interactions with the site (Badre 2000). In this study, e-service culturability is defined as the availability of e-government services in terms of the cultural characteristics and values of citizens (e.g. local language or national colors and pictures). Cyr and Smith (2004) identified significant design preferences across different cultures in municipal websites, and they stressed the importance of addressing specific cultural preferences in website design: culturally insensitive websites may exclude certain user populations.

Sun (2001) conducted a study of website design and found that cultural considerations–language, pictures, graphics, colors and page layout–increase the usability of a website (Sun 2001). Singh et al. (2009) presented a framework for analyzing website localization based on content localization, cultural customization, local gateways and translation quality, and found that culturally customized websites affect user intentions and foster positive attitudes toward products or services that are provided online (N. Singh et al. 2009). In the present study, perceptions of culturability on the part of e-government website users are measured by assessing the use of national colors, pictures (e.g. flags, historical places and famous people), and the availability of a website in a local language.

H6: An e-government website's level of culturability will be positively associated with e-service use intention.

Moderators

Need for moderators

The present study was conducted in Afghanistan, a country that has been plagued by civil war and political instability for the past three decades. Civil conflicts and violence have a variety of effects on societies including, but not limited to, psychological, environmental and economic effects (Kaplowitz 1976; Landrigan et al. 2004; Pedersen 2002; United Nations Environment Programme 1991). Contextual (e.g. civil conflict) and psychological (e.g. behavioral conflict) factors cannot be ignored while assessing technology adoption behavior in war-torn societies, particularly if researchers intend to obtain realistic pictures of the situation on the ground. Furthermore, it is vital to explore the link between civil conflicts (and violence) and citizen attitudes toward government-led initiatives (e.g. e-government); governments are often held responsible for such conflicts because they are perceived as not being capable of handling them, or as being directly involved in them. Exploring such

links may provide insights into the perceptions of citizens related to government-led initiatives in the context of conflict. Thus, we include *perceived intensity of civil conflict* (PICC) and *perceived behavioral conflict* (PBC) as moderators in our model explained below.

Perceived Intensity of Civil Conflict (PICC)

The natures of modern wars and conflicts are different than they were in the past; most are domestic, or occur within countries. These types of conflicts are known as "low intensity wars" (Walhelstein 1985). Civil conflicts are defined as clashes of interests and expressed struggles for political dominance among groups that have mismatched goals and interests (Gershenson and Grossman 2000; Heidelberg Institute for International Conflict Research 2008). Civil conflicts can take two major forms: ending conflicts and never-ending conflicts (Gershenson and Grossman 2000). Ending conflicts are resolved over time once one party achieves political dominance over another. Never-ending conflicts, such as the Palestine and Kashmir conflicts, may continue forever. Civil conflict can also be classified based on perceived intensity: latent conflict, manifest conflict, crises, severe crises and war (Heidelberg Institute for International Conflict Research 2008).

According to the Heidelberg Institute for International Conflict Research (2008), latent conflict can be defined as "positional difference over definable values of national meaning where demands are articulated by one of the parties and perceived by the other as such." (p.1). Manifest conflict describes the use of measures prior to the use of violent force, for example, verbal pressure, threats of violence, or economic sanctions. The Heidelberg Institute for International Conflict Research (2008) defines crises as tense situations in which violent force is used by at least one of the actors involved in sporadic incidents; in severe crises, the use of violent force occurs repeatedly in an organized fashion. Finally, war is defined as "a violent conflict in which violent force is used with certain continuity in an organized and systematic way" (Heidelberg Institute for International Conflict Research 2008, p. 1). It must be noted that latent and manifest conflicts are non-violent in nature; crises, severe crises and war are violent (Heidelberg Institute for International Conflict Research 2008).

A literature review found that in management information systems (MIS), the potential impact of conflict has been studied primarily from organizational (Smith and McKeen 1992) and interpersonal aspects (Barki and Hartwick 2001), focusing on relationship conflict (Kankanhalli et al. 2007), task conflict (Trimmer et al. 2000) and process conflict (D. Robey et al. 1989; D. L. Robey et al. 1993). However, the relationships among behavioral conflict (Argyris 1957), civil conflict (Wall and Callister 1995) and MIS, particularly regarding e-government service use intention, have not been tested. The issue is briefly addressed in e-government studies that discuss political instability (Basu 2004) as being one of the prominent challenges faced by e-government, which greatly affect e-government initiatives in developing countries. Elsewhere, the effects of civil conflicts on natural resource management and technology adoption have been studied, leading to a positive association between technology adoption and civil conflicts (Sanginga et al. 2007). However, Partridge (2007) pointed out that the level of civil conflict in a country may explain new technology adoption behavior in that country; countries engaged in civil conflicts are less likely to adopt new technology because their resources and efforts are devoted to winning the war instead of adopting new civilian technologies (Partridge 2007).

Thus, by taking into account the context of the study (and the gap that exists in the MIS literature), we developed and included a PICC construct as a moderator in our model based on the classification provided by the Heidelberg Institute for International Conflict Research (2008). PICC measures the perceived intensity of civil conflict and violence around citizens in a region. We propose the following hypotheses:

H7a: PICC will moderate the relationship between the e-service access divide and e-service use intention.
H7b: PICC will moderate the relationship between the e-service social divide and e-service use intention.

Perceived Behavioral Conflict (PBC)

Perceived Behavioral Conflict (PBC) is considered as a moderator in this study and defined as follows: perceived psychological (or inner) conflict toward an e-government service based on cultural values, personal needs and interest of citizens. Studies have suggested that people vary in psychological dimensions both on a between-country basis and on a within-country basis (Arenas-Gaitán et al. 2011;

Brockner 2005; Straub et al. 1997). Thus, it is important that psychological factors, such as cultural values, needs and interests, be considered in this study. PBC is the "inner voice" or psychological in nature that develops over time. According to Argyris (1957), behavioral (or inner) conflict is defined as "actual or perceived opposition of needs, values, and interests which is internal (within oneself) to individuals" (Argyris 1957) (pp. 47–54), in the context of which one must choose whether or not to take a particular course of action (Thomas 1992). Inner psychological voices (e.g. needs, values and interests) play a vital role in forming intent to use a technology. For example, an e-government website or service may easily be adopted if it does not conflict with the cultural values and interests of citizens. According to Venkatesh and Brown (2001), individuals with individualistic values assess the usefulness of the technology with respect to their own needs without taking into consideration the needs of others (Venkatesh and Brown 2001). Srite and Karahanna (2006) studied the influence of values on technology adoption and found that technology use varies as a function of cultural values (Srite and Karahanna 2006). Selwyn et al. (2005) showed that use of Internet services is mediated primarily by interest and relevance (Selwyn et al. 2005). Similarly, Anderson and Tracey (2001) observed that "applications and services delivered via the Internet are not changing the way people live their lives in a simple, straightforward manner, but are supporting and enhancing their existing lifestyles, whatever those lifestyles may be" (p. 458) (Anderson and Tracey 2001). Furthermore, Koh et al. (2008) found that cultural values play a moderating role in household technology adoption intention (Koh et al. 2008). Therefore, we construct the following hypothesis:

H8a: PBC toward an e-service will moderate the relationships between e-services access divide components–e-service access, access quality and access skills–and e-service use intention.

H8b: PBC toward an e-service will moderate the relationship between e-service social divide components–e-service social support, e-service awareness–e-service culturability, and e-service use intention.

Research methods

Assessing e-government status in Afghanistan

Afghanistan citizens had limited or no access to ICTs, particularly the Internet, prior to the 2000 era (i.e.

during and before the Taliban regime) with less than 0.05 percent telephone penetration in the country (Ministry of Communications and Information Technology 2011). Large-scale telecommunication infrastructure development was initiated after the Bonn agreement in 2002 where several nations (notably the USA) pledged to support the newly Afghan government under the leadership of President Hamid Karzai. International support and foreign investment has led to the rapid development of the telecommunication sector in the country, for example, currently, there are five major telecommunications service providers in Afghanistan–Afghan Wireless, Etisalat, Roshan, Areeba, and Afghan Telecom–providing network coverage to about 80 percent of population (Ministry of Communications and Information Technology 2011). In 2003, as a part of Internet development strategy, the Ministry of Communications and Information Technology (MCIT), developed and published Internet policies with a vision to enable Afghanistan to become part of the global information society. Since then, the Internet has gradually developed in Afghanistan. As of 2009, there were 3.4 Internet users per 100 people; 3.3 computers per 100 people; 50 percent of the total Internet users were fixed broadband subscribers; and international Internet bandwidth per citizen was 550 bits/second (for more details see World Bank permanent URL for Afghanistan's statistics: http://go.worldbank.org/6872 0Z9GR0). According to the Ministry of Communications and Information Technology (MCIT), currently there are approximately 2 million Internet users and 32 Internet service providers against the population of 28 millions (Ministry of Communications and Information Technology 2011); with the majority of the Internet users in big cities, such as Kabul and Jalal Abad (i.e. Nangarhar province) (Altai 2007). In order to equip Afghan citizens with proper ICT skills, MCIT has establishing several ICT training centers, Cisco academies, and multi-purpose community telecenters across the country. According to the ICT directorate of the MCIT, currently, there are 6 Cisco centers and 31 ICT training centers across the country[1].

Furthermore, in quest for transparent and corruption free government, e-government initiative has also been strongly pursued by the Afghan government, particularly by the MCIT with support from international donors. For example, the government of Afghanistan has implemented several e-government-related projects with the goal of establishing a fully functional government (Afghanistan National Development Strategy 2008). For example, among the projects

implemented and/or ongoing are a government communication network (GCN), district communication network (DCN), national data centre, national fiber optic backbone connecting 20 provinces and Pakistan, Iran, Tajikistan, and Uzbekistan, electronic national identification card system, electronic document management system, and the establishment of access kiosks and websites for central and local government bodies (for details, see http://www.mcit.gov.af).

For the purpose of this study, we assessed the status of e-government services in Afghanistan by surveying the websites of 14 government bodies in Afghanistan and examined the online services provided to Afghan citizens. Based on the staged approach (Chatfield 2007; Layne 2001), e-government in Afghanistan can be characterized as being at an initial stage of development.

Instrument development

We developed a survey instrument consisting of 33 items that were adopted from previous studies and reworded to fit in the context of the current study[2]. The original English version of the instrument was back-translated (Brislin 1970, 1986) into Pashtu and Dari with the help of two experts who had command of all three languages (i.e. English, Dari and Pashtu). A marker variable was included in the questionnaire to control for potential common method biases (Podsakoff et al. 2003). The research instrument is available at Appendix A. To remove ambiguity and to prevent misinterpretations, a pilot and a pretest were also carried out. The final paper-and-pencil version of the questionnaire was distributed for full study in April 2010, with a 100 percent response rate.

Subjects

The subjects of the study were 360 citizens from two major provinces of Afghanistan, namely, Kabul and Nangrahar. According to a survey conducted by (Altai 2007), there were approximately 120 Internet cafés in major cities of Afghanistan in 2007. Most of the cafés were located in Kabul (70 cafés) and Nangrahar (12 cafés). Data from male (62 percent) respondents were collected from Internet cafés, while data from female (38 percent) respondents were collected at major universities in the two provinces, as women in Afghanistan rarely visit Internet cafés. We also incorporated five sets of control variables–age, gender, education, income, and Internet use–in our study. Sample characteristics are shown in Table 1.

Table 1. Sample characteristics

	Frequency	**Percentage**
Gender		
Male	222	62
Female	138	38
Age		
Below 17	44	12
18 to 24	166	46
25 to 34	79	22
Above 35	29	8
Missing	42	12
Internet use		
Less than 1 hour	144	32
1 to 2 hours	109	30
3 to 4 hours	71	20
5 to 6 hours	21	6
More than 7 hours	40	11
Missing	5	1
Education		
Elementary school	68	19
High School	100	28
Bachelors degree	154	43
Masters	11	3
PhD	16	4
Missing	11	3
Total	360	

Results

Due to the multilevel nature of our hypotheses and the large number of interaction terms, hierarchal multiple regression (HMR) analysis was employed for data analysis (Partridge 2007). Specifically, due to the latent nature of the constructs used, a Smart PLS software package (Ringle et al. 2005) was used for data analysis. PLS is a structured equation modeling technique that can analyze structural equation models (SEMs) involving multiple-item constructs. PLS analysis was performed in two steps: (1) a test of the measurement model, an estimation of internal consistency (composite reliability), and determination of the convergent and discriminant validity of the instrument items; and (2) assessment of the structural model using HMR.

Test of measurement model (reliability and validity test)

Composite reliability measures were robust and well above the recommended level of 0.70 (Nunnally 1978). The average variance extracted (AVE) values were also well above the accepted level of 0.50

Table 2. HLM model predicting e-government service use intention

	Model 1	Model 2	Model 3	Model 4
R^2	0.13	0.18	0.32	0.36
ΔR^2		0.05	0.05	0.09 (from model 2)
	Y	Y	Y	Y
Block 1: access divide				
E-service access (H1)	−0.163*** (0.066)	−0.137** (0.051)	0.0164 (0.123)	−0.205*** (0.048)
E-service access quality (H2)	0.224*** (0.051)	0.136** (0.054)	0.377** (0.135)	0.150*** (0.040)
E-service usage skills (H3)	0.216*** (0.056)	0.152** (0.074)	−0.344* (0.144)	−0.026 (0.052)
Block 2: social divide				
E-service awareness (H4)		0.249*** (0.051)	0.246* (0.104)	0.238*** (0.037)
E-service social support (H5)		0.094* (0.049)	−0.045 (0.095)	0.065 (0.036)
E-service culturability (H6)		0.025 (0.060)	−0.300* (0.143)	0.061 (0.042)
Block 3: PICC moderator				
Hypothesis 7a:				
PICC x EA			−0.418** (0.150)	
PICC x EAQ			−0.417* (0.192)	
PICC x EUS			0.491* (0.194)	
Hypothesis 7b:				
PICC x ESA			−0.027 (0.154)	
PICC x ESS			0.237 (0.181)	
CC x ESC			0.526** (0.171)	
Block 4: PBC moderator				
Hypothesis 8a:				
PBC x EA				0.009 (0.038)
PBC x EAQ				−0.075 (0.070)
PBC x EUS				−0.181* (0.052)
Hypothesis 8b:				
PBC x ESA				0.211* (0.111)
PBC x ESS				−0.027 (0.060)
PBC x ESC				0.023 (0.037)
Direct effect				
PICC			−0.332* (0.171)	
PBC				−0.002 ns

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; standard error in parentheses ().

(Fornell 1981). AVE indicates the reliability of the construct and allows the evaluation of discriminant validity. To indicate satisfactory discriminant validity, the square roots of the AVEs were greater than the off-diagonal elements in their corresponding row and column in all cases, supporting the discriminant validity of our scales. Furthermore, the data were not contaminated by common method bias, as indicated by low correlations between marker variables and the rest of the constructs (Podsakoff et al. 2003). Convergent validity is demonstrated when items load highly (loading> 0.50) on their associated factors. Five items–PICC1, PICC5, EA3, EAQ1 and ESC1–did not load adequately on their respective constructs, so we eliminated them from our analyses. After eliminating

the problematic items, all measures had significant loadings and were higher than the suggested threshold. Furthermore, the factor loading of each item on its respective construct was highly significant, as the values of t-statistics were between 2.5 and 55.6.

Assessment of the structural model using HMR

The results of a structural model carried out through HMR are shown in Table 2. In HMR, the constructs are entered blockwise into the regression equation (Frazier et al. 2004). First there is an access divide block: e-service accessibility (EA), e-service access quality (EAQ), and e-service usage skills (EUS) were entered first in the equation. This was followed by a

second block related to the social divide: e-service awareness (ESA), e-service social support (ESS) and e-service culturability (ESC). Moderator variables PICC and PBC were entered into the third and fourth blocks, respectively. Step-by-step guidelines recommended by (Frazier et al. 2004) were followed to test for moderator effects. First, main effects were entered in the model followed by interaction terms (Frazier et al. 2004). The interaction terms were created by multiplying indicators of predictor and moderator variables as recommended in a previous study (Chin et al. 2003).

As shown in Table 2, contrary to our prediction in Hypothesis 1, EA had a significant negative effect on e-government service use intention ($\beta = -0.163$, $p < 0.001$). EAQ and EUS access divide components had positive and significant effects on government service use intentions ($\beta = 0.224$, $p < 0.001$; $\beta = 0.216$, $p < 0.001$) respectively, supporting Hypotheses 2 and 3. Overall, the e-service access divide accounted for 13 percent of variance in e-service use intention (see Model 1 in Table 2).

Entering social divide components ESA, ESS, and ESC into the model explained an additional 5 percent of the variance in e-government service use intention as shown in Model 2, Table 2. Consistent with Hypotheses 4 and 5, ESA and ESS had significant positive influences on e-government service use intention ($\beta = 0.249$, $p < 0.001$; $\beta = 0.094$, $p < 0.05$, respectively; see Model 2). However, the effect of ESC on e-government service use intention was not significant ($\beta = -0.025$, $p = $ ns), thus rejecting Hypothesis 6.

Hypothesis 7a predicted that PICC moderates the relationships between access divide components EA, EUS, EAQ and e-government service use intention. After entering PICC interaction terms into the model, the model explained an additional 5 percent of the variance in e-service use intention, as shown in Model 4. PICC negatively moderated the relationship between EA, EAQ and e-government use intention ($\beta = -0.418$, $p < 0.01$; $\beta = -0.417$, $p < 0.05$), respectively, as shown in Model 4. PICC positively moderated the relationship between EUS and e-government service use intention ($\beta = 0.491$, $p < 0.01$), as shown in Model 4. Keeping in mind the sample size used in this study and the MIS literature, a 5 percent effect size is sufficient for a moderator effect to occur if the beta coefficients are significant (Chin et al. 2003). Thus, Hypothesis 7a is accepted. The same criteria apply to the rest of hypotheses in this study.

Similarly, Hypothesis 7b states that PICC moderates the relationship between social divide (SD) components ESA, ESS, and ESC and e-government service use intention. Thus, Hypothesis 7b is partially supported; PICC positively moderated the relationship between ESC and e-service use intention ($\beta = 0.526$, $p < 0.01$), whereas PICC did not play a moderating role between the relationship of ESA, ESS and e-service use intention ($\beta = -0.027$, $p = $ ns; $\beta = -0.237$, $p = $ ns), respectively. See Model 4.

Hypothesis 8a predicts that PBC moderates the relationship between access divide components EA, EAQ, and EUS and e-government service use intention. After introducing PBC interaction terms in the model, it explains an additional 9 percent of the variance in the e-service use intention as shown in Model 5 and negatively moderated only the relationship between EUS and e-service use intention ($\beta = -0.181$, $p < 0.051$). By contrast, the moderating role of PBC between two other components of the access divide–EA and EAQ–was not significant ($\beta = 0.009$, $p = $ ns; $\beta = -0.075$ $p = $ ns, respectively), as shown in Model 5 in Table 2. Therefore, Hypothesis 8a is only partially supported.

Similarly, Hypothesis 8b states that BC moderates the relationship between social divide (SD) components ESA, ESS, and ESC and e-government service use intention. Therefore, Hypothesis 8b is partially supported; PBC positively moderated the relationship ESA and e-government service use intention ($\beta = 0.211$, $p < 0.05$; see Model 5). PBC did not play a moderating role between ESS, ESC and e-service use intention ($\beta = -0.027$, $p = $ ns; $\beta = 0.023$, $p = $ ns, respectively), as shown in Model 5.

Discussion

The purpose of this study was to explore the consequences of the digital divide and conflict (i.e. civil and behavioral) on e-government use intention in Afghanistan. Our results suggest that two access divide components–e-service quality and e-service use skills–positively influence e-government service use intention, and are consistent with the results of previous studies (Carter and Weerakkody 2008; Graafland-Essers and Ettedgui 2003). As the quality of government services that are provided online increases, intentions to use the service increase proportionally. Furthermore, contrary to conventional wisdom, e-service access (the second component of the access divide) negatively influenced use intention.

This may be due to the positive relationships between use intention, access quality and usage skills. For example, if an e-government service provided online is of low quality and citizens do not possess the skills necessary to take advantage of it, greater accessibility may negatively affect use intention. This finding can be further explained by the presence of conflict in the region under investigation. In a country embroiled in conflict, access to technology may not guarantee its use. Furthermore, from a social divide point of view, social support and awareness influence intentions to use services that are provided online. These findings are consistent with the results of prior digital divide literature (Kim and Jung 2002; Nitish Singh et al. 2009).

Our findings also provide evidence that PICC and PBC play partial moderating roles between the access divide, the social divide, and e-government service use intention. We found that PICC negatively moderates the relationship between e-service access and e-government service use intention. Simply put, as the PICC in a region increases, the effects of greater access to e-services lead to decreased intention to use e-government; the more citizens access online services in high conflict regions, the less they intend to use government services that are provided online. Similarly, PICC negatively influences the relationship between access quality and e-service use intention; as the PICC in a region increases, the effect of increased quality of e-service on e-government use intention decreases. Interesting, PICC positively moderated the relationship between e-service culturability and e-government service use intention; as the PICC in a region increases, the effect of greater culturability on e-government use intention also increases. Our results suggest that PICC strengthens the relationship between usage e-skills and use intention. This implies that as PICC increases, the effect of greater skills on e-government service use intention increases. The positive influence of civil conflict on technology use has been noted previously (Sanginga et al. 2007). PICC does not moderate the relationships between e-service awareness, e-service social support and e-government use intention either positively or negatively.

We found that PBC had a positive moderating effect between e-service awareness and e-service use intention. In other words, as PBC decreases (PBC was reversely coded; a 5 on Likert scale means a low level of PBC), the effect of higher e-service awareness on e-government use intention increases. These findings highlight the importance of reflecting user desires, feelings and interest when delivering government

services online; doing so will strengthen the relationships between e-service awareness and e-government use intention.

Implications for research

Several research implications can be drawn from our findings. First, our study contributes to the body of e-government research by developing and validating an integrated model using the concepts of the digital divide and technology adoption to determine e-service use intentions in a conflict zone. Second, PICC and PBC were introduced for the first time as moderators of the relationship between the digital divide and e-government service use intention. Third, we explored the consequences of civil conflict and violence on e-government service use intention; MIS research has previously dealt primarily with organizational and interpersonal conflict (Barki and Hartwick 2001; D. Robey et al. 1989; Smith and McKeen 1992; Trimmer et al. 2000). We have contributed to the digital divide literature, as we constructed and validated reliable measures of the digital divide by classifying it as the access and social divides (Harper 2003; Norris 2001). Furthermore, the findings of this study will help set the agenda for researchers working in the fields of civil and behavioral conflicts and their effects on technology adoption. Fourth, this study will broaden our understanding of user perceptions toward online services under the influence of civil conflict and violence, particularly e-government research. Finally, our findings will also contribute to integrated approaches toward e-government and digital divide issues (Helbig 2008). We developed and tested a localized questionnaire in two regional languages–Pashtu and Dari–that can be utilized (with minor adjustments) in future MIS research in other Central Asian countries such as Iran, Pakistan and Afghanistan. The constructs developed (in English) can be used in other regions facing conflicts to test technology adoption behavior.

Implications for practice

The research also has implications for policymakers and practitioners working in the fields of e-government or online service delivery. Government agencies in countries facing digital divide problems, conflicts and instability may find these findings useful while delivering online services. For example, our findings suggest that citizens who are more skillful (e.g. basic computer and internet skills) are more

likely to use online government services, which is consistent with the results of previous studies (Carter and Weerakkody 2008). We also found that citizens who are more aware of e-government initiatives and services provided online are more likely to use them. For this reason, government agencies must make every effort to promote awareness among citizens regarding online service availability (Carter and Weerakkody 2008). Quality of e-government services (in terms of response time, stability and reliability) was found to be positively associated with e-government service use intention, which is consistent with the results of prior MIS literature (Teo et al. 2008).

Government agencies must be aware that if the quality of service provided online is low, or citizens do not possess e-skills to utilize that service, use intentions may be reduced. In addition, our results indicate that government agencies do not need to invest heavily in the culturability of e-government websites, because it is not a strong predictor of use intention. Citizens may use online services even though websites do not portray national colors or pictures. However, our findings suggest that in conflict regions, government websites must include cultural elements to motivate citizens to use those websites. We found that social support provided to citizens in the form of emotional reinforcement or motivation through peers (friends and family) will increase intentions to use online services (Maldonado et al. 2010). Therefore, special policies must be designed to achieve this objective. For example, in countries where citizens do not possess sufficient skills, the government must provide on-site support to increase intentions to use government e-services and similar initiatives to motivate citizens through peer interactions.

Similarly, the negative effect of e-service access on use intention indicates that providing higher levels of access does not guarantee use, particularly in countries with digital divide problems and political instability. In addition to increasing access (e.g. by providing computers and Internet access), factors such as skills, awareness, service quality and cultural factors must be taken into account.

Our results indicate that due to civil conflict and political instability, higher levels of access will reduce e-government use intentions. This implies that in countries facing civil conflict and violence, government agencies should initiate special policies for giving citizens a feeling of security or reducing the effects of conflict while providing online services. Simply making online services available in a conflict region will decrease use intention. For example, governments in conflict zones may provide access points where citizens can feel comfortable and shielded from the effects of conflict and violence. Similarly, special consideration must be given to the findings that PICC negatively influences the relationship between e-service quality and use intention. In a conflict region, the authorities might be optimistic and provide high quality services to offset the psychological effects of conflict and increase use intention. However, our results suggest that under the influence of conflict, providing high quality e-services will not increase use intention but rather will reduce it. Therefore, extra efforts and policies directed toward eliminating the effects of conflicts on citizens are crucial in regions experiencing conflicts and political instability. Interestingly, PICC positively moderates the relationship between e-service usage skills and use intention. This implies that governments in countries facing conflicts must make every effort to equip citizens with necessary e-skills (Chen et al. 2006; Khan et al. 2010) because people with high e-skills surrounded by conflicts are more likely to use government services provided online.

We found that in conflict regions, citizens attach greater importance to the culturability of websites. Therefore, special considerations must be given when designing government websites, for example, by featuring national colors and pictures. Except for the influence of the PICC website, culturability has no effect on use intention. The positive moderating effect of PBC between e-service awareness and use intention shows that alongside digital divide issues (e.g. skills, resources and service quality), government agencies in developing countries must customize the service to represent the needs, feelings and desires of citizens.

Limitations and future work

This study has several limitations. First, our analysis included only one country facing digital divide and political instability issues. However, different countries may have different levels and forms of digital divides and social conflicts that may influence user intentions regarding an e-service differently. Second, we assessed only the e-government services provided during the first stage of e-government development because e-government in the target country was at an early stage. Third, we only investigated the G2C (government-to-citizens) side of e-government service. Therefore, the

influence of digital divide and conflicts on G2E (government-to-employees), G2B (government-to-business) and G2G (government-to-government) services will be the subjects of future studies. Fourth, we tested moderating effects of only two types of conflicts (i.e. civil and behavioral conflict). Future research may focus on the consequences of different forms of digital divides (e.g. organization level divides) and civil conflicts on user intentions regarding online services. Another area opened for future research is the cross-cultural effects of civil and behavioral conflict on e-government service use intention and actual use. Fifth, we looked into basic e-government services provided in the first stage of development; future studies may investigate the issues discussed in this article at more advanced stages of e-government development in developed countries facing digital divide and political conflict issues. Finally, we used a cross-sectional data collection method, and more research is needed to test the consequences of the digital divide and conflicts on online services in longitudinal settings.

Conclusion

Utilizing the concepts of technology adoption and the digital divide, we took a first step toward understanding the consequences of the digital divide and civil and behavioral conflict on online service use intention in a conflict zone by proposing and empirically validating an integrated research model. This study is the first to combine digital divide, technology adoption and civil conflict issues in the context of e-government and will serve to set the agenda for MIS researchers exploring the effects of conflict and violence on the use of e-government and other online services.

Our results suggest that access and social divide issues significantly affect e-government service use intention and that PICC and PBC play partially moderating roles between some of the access and social divide components and e-service use intention. Extreme caution must be exercised, and specially designed policies must be implemented, while delivering e-government services in areas characterized by digital divides, civil conflict and violence. Simply increasing access to online services may not bear results without taking into consideration the digital skills of citizens, e-service quality, social support, the awareness of citizens, and the ways that civil conflict and violence affect those citizens.

Appendix A

Research items (scale)

All items of the questionnaire were measured on a 5-point Likert scale, in which 1 was "very strongly disagree" and 5 was "very strongly agree".

Perceived behavioral conflict (PCB). Desires: The service provided through the internet is attractive to me.
   Feelings: The service provided through the internet would not bring negative emotions.
Interest: The service provided through the internet would deal with topics of interest.

Perceived intensity of civil conflict (PICC). Latent conflict: Individuals/groups around me articulate positional differences about national values. (R)

   Manifest Conflict: Verbal threats and abuse can be heard around me.
   Crises: Violent force can be seen periodically around me.
   Severe Crises: Violent force is used repeatedly and in a systematic way around me.
   War: Organized massive violent force is continuously used around me. (R)

E-service access. I have access to the Internet.
   I can easily access the Internet at anytime.
Access points (e.g. Kiosk, internet café, PC) are user friendly. (R)

E-service access quality. Response time: My internet connection responds quickly to my requests. (R)
   Reliability: My internet connection is reliable enough for me to safely use online services.
   Stability: My internet connection speed remains stable regardless of the number of requests.

E-service usage skills. I am skillful enough to use the e-services provided through the internet.
   I have basic knowledge about using the e-services through the Internet.

E-service social support. My friends would want me to use e-services provided through the internet.
   My family would want me to use e-services provided through the internet.
Someone would provide me technical support to use services provided through the Internet.

E-service culturability. The governmental websites that I know are available in our local languages (e.g. Pashtu or Dari). (R)

The governmental websites known to me portray our national colors.

The governmental websites that I know show pictures related to our culture (e.g. flags, historical places, and famous people).

E-service awareness. Nowadays, government services are available on the internet.

I know the addresses (links) of government websites. The government promotes awareness about government services provided through the internet.

Use intention. Assuming that I have access to government services provided through the internet, I intend to use it.

Assuming that I have access to government services provided through the internet, I may use it.
Note: Items with (R) were eliminated from the study due to lower loadings

Acknowledgment

Notes

1. This information was obtained by contacting the ICT Directorate of the MCIT.
2. Most of the details in the method and results sections are omitted due to length considerations for publication. Any readers interested in more depth may contact the corresponding author.

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