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# EFFECTS OF A PUBLIC EMERGENCY ON CITIZENS' USAGE INTENTION TOWARD E-GOVERNMENT: A STUDY IN THE CONTEXT OF WAR IN IRAQ

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## Abstract

*The study examines the effects of a public emergency on citizens' intention to use e-government services. Since the national disaster on September 11, 2001, the United States government has invested considerable efforts to increase homeland security and public safety. However, virtually no academic research has focused on the impact of public emergencies on e-government services. The study examines relationships between citizens' intentions to use e-government services and factors that can influence those intentions in the context of a public emergency. The first survey was conducted in April 2003, when the second Iraq war was ongoing and the Homeland Security Advisory System's terrorist threat level was high. The analysis of the survey results and implications of the study are presented.*

**Keywords:** E-government; intention to use; public emergency; homeland security; usefulness; risk, trust

## Introduction

Since the national disaster on September 11, 2001, the United States government has invested considerable effort in homeland security and e-government in order to ensure the citizens and the nation against possible terrorist attacks and related risks. However, recently conducted opinion polls revealed that half of Americans polled are worried about possible terrorist attacks, including cyber-attacks, and are not satisfied with the current terrorism alert system (Rainie 2003). These are rather striking findings if we consider that the majority of citizens have identified increased government accountability as the most important benefit of e-government (CEG 2001). In spite of this apparent discrepancy, there has been no academic effort to advance our understanding of citizens' use of e-government in a public emergency.<sup>1</sup>

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<sup>1</sup>In this study, public emergency refers to the occurrence or existence of an unexpected event that poses significant potential danger to the general public such as terrorism, natural disaster, war, or disruption of the critical social infrastructure.

The second Iraq war in 2003 where the U.S. government played a central role presented a new set of concerns to U.S. e-government initiatives. How do citizens' trust in government and perceptions of public emergency change and influence their use of e-government services? Does the public believe that e-government is more vulnerable to intrusion and attack during the war? Does e-government provide useful services for concerned citizens? These are some of the questions that must be answered to assure citizens' use of e-government services and the stable functioning of e-government as an instrument of services even in a public emergency situation. This study examines the effects of a public emergency on citizens' intentions to use e-government services. Specifically, the study investigates citizens' perceptions regarding the usefulness of e-government services, risks of the Internet, and trustworthiness of e-government service agents<sup>2</sup> in relation to the event of war and the perception of a public emergency.

The second Iraq war in 2003 provided a unique opportunity to study citizens' e-government service use in a public emergency. Because the U.S. government played a central role in the war, there was an increased concern that an adversarial entity such as the Iraqi government or a terrorist organization might attempt to launch an attack against U.S. citizens. Accordingly, the Department of Homeland Security made the decision to raise the national threat level to high (level orange). Although, in reality, this risk did not present a direct threat to the citizens in the U.S., it had an immediate impact on citizens' perception of public emergency. This concern is evident in the result of a recent poll which revealed that about half of the Americans polled feared that terrorists might cripple social infrastructure such as electric, transportation, and water systems (Rainie 2003). Further, being engaged in the war was a major political decision of the U.S. government, which may have caused a shift of citizens' perceptions of the government in terms of political trust. While the perceived public emergency and trust in the U.S. government are expected to influence citizens' perceptions of the Internet and e-government, the war itself could also affect citizens' perceptions regarding the usefulness of e-government services as a source of information. Therefore, the Iraqi war was a public emergency that could affect citizens' use of e-government services in many ways, and thus the situation offered a unique chance to study the citizens' e-government usage behavior in such a context.

## Theoretical Background

In the following sections, we first overview mainstream theories that explain human behavior in the context of information technology, and then discuss the constructs and their relationships included in our model.

### *Information Technology Use*

The search for the determinants of users' new technology acceptance has long been a central issue in the field of management information systems. One of the most widely accepted theories adopted to explain users' technology acceptance behavior is Fishbein and Ajzen's (1975) theory of reasoned action (TRA), which has its roots in personal and social psychology theories of human behavior. TRA asserts that human behavior is a direct function of behavioral intention and that personal beliefs determine the attitude toward the behavior and subjective norm, which in turn influence behavioral intention. (Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). The technology acceptance model (TAM) (Davis 1989; Davis et al. 1989) stems from TRA to explain an individual's technology acceptance behavior. TAM maintains that attitude and subjective norm are the major determinants of behavioral intention, while usefulness is a major predictor of the intention (Venkatesh and Davis 2000). This behavioral mechanism of an individual's technology use forms a solid theoretical foundation for our model of citizens' e-government service use in a public emergency (Figure 1). The concepts and hypotheses in the model are discussed in detail in the following sections.<sup>3</sup>

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<sup>2</sup>The e-government service agent refers to an entity or collection of entities that provide or manage any component of e-government services under a government authority. For example, government employees and contract Web service providers ([www.wildlifelicence.com/](http://www.wildlifelicence.com/)) together provide online fishing/hunting licensing services for the Colorado Department of Natural Resources.

<sup>3</sup>The links labeled as TBA are relationships to be analyzed after the second survey. This study is research in progress and includes only the results from the first survey. The analysis of TBA links requires a comparison of mean values during and after the war, and the results will be available from the authors in 2004.

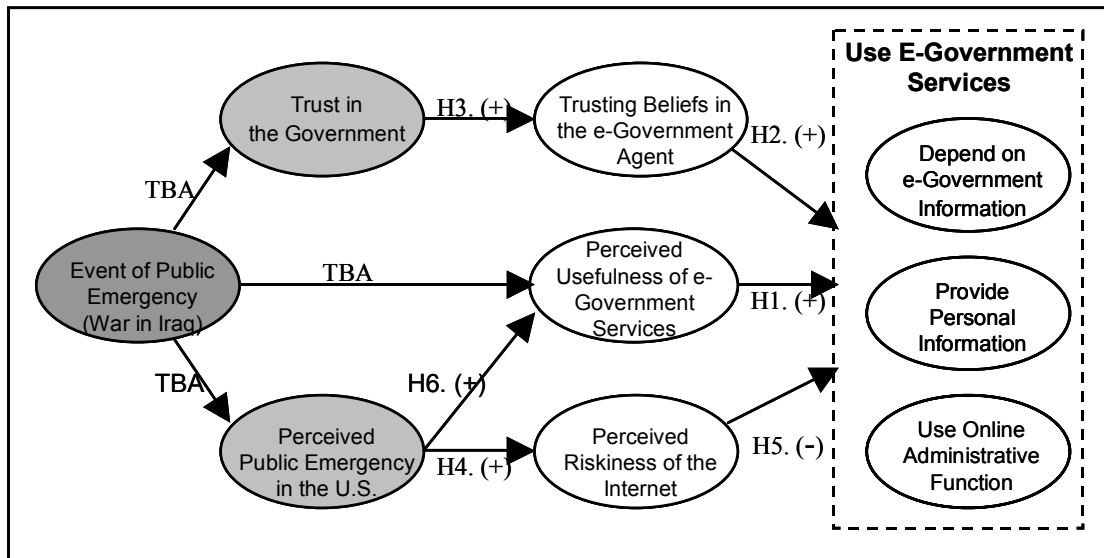


Figure 1. A Model of Citizen's E-Government Service Use in a Public Emergency

### Intention to Use E-Government Services

TAM assumes that behavioral intention is the best predictor of human behavior (Davis 1989). Such an indicator is a useful proxy measure when actual behavior cannot be measured (Gupta et al. forthcoming). This holds true in our study context. One difficulty in measuring actual usage behavior in our study is that there are a number of e-government services, many of which are still in a primitive form and not well known to citizens. The evolving nature and unfamiliarity of numerous e-government services make behavioral intention the only available, yet important, measure in any e-government study. Therefore, instead of the actual behavior of citizens, we use three behavioral intentions to use e-government services: (1) intention to depend on information in the e-government service Website, (2) intention to provide personal information to the e-government service Website, and (3) intention to use online administrative functions on the e-government Website. These intention measures represent the information flow from the government to citizens, from citizens to the government, and execution of an administrative process, respectively. This grouping also coincides with the level of online service sophistication called for improvement in e-government services (Palmer 2003).

### Perceived Usefulness

Perceived usefulness has been identified as one of the strongest determinants of new technology usage intention. According to TAM based empirical research, perceived usefulness has a direct effect, as well as an indirect effect through attitude, on the intention to use (Davis 1989; Venkatesh and Davis 2000). In the context of e-government, the traditional benefits recognized in TAM (i.e., job performance, productivity, and effectiveness) may not be the major concerns of citizens, since an individual citizen does not use e-government services to compete with other citizens for limited resources or for better recognition in an organization. However, other types of benefits have been identified which make the usefulness argument still valid. The most important benefits of e-government identified by U.S. citizens were more accountable government, greater public access to government information, more efficient and cost-effective government, and more convenient government services (CEG 2001). With the traditionally demonstrated strong effect of usefulness and the newly identified benefits, we hypothesize *perceived usefulness of e-government services has a positive effect on citizens' intention to use the e-government services*.

As noted, TAM was originally intended to explain technology use within an organization where potential users usually do not need to trust another party in order to use the technology. However, e-government services can involve many other parties such as government agents, contracted online service providers, other Internet users, and entities who are responsible for creating public emergencies (e.g., terrorists), over which neither the government nor individual citizens have much control. Therefore, we need to bring in the concept of trust and risk in order to understand this characteristic of a citizen–e-government relationship and to fill the gap between the intra-organizational and Internet environments.

### **Trust, Trusting Beliefs, and Trusting Intention**

With the explosive diffusion of e-commerce and renewed interest in trust, it has been suggested that trust is one of the most important factors for successful e-commerce (Gefen 2000; Kim et al. forthcoming; McKnight et al. 2002). Mayer et al. (1995) clarified the concept of trust, trustworthiness, and risk taking relationship behavior. According to their definition, trust refers to “a willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (p. 712).

Mayer et al. argued that trustworthiness of a trustee in an interpersonal relationship leads to risk-taking behavior by the trustor. McKnight et al. (1998) further developed the concepts and advanced a model of initial trust formation. In the model, trusting beliefs, a concept analogous to Mayer et al.'s trustworthiness, is the major determinant of trusting intentions, which in turn positively affects trust-related behavior, or risk-taking behavior. McKnight et al. (2002) also presented three common trusting beliefs: competence, benevolence, and integrity.<sup>4</sup> Citizens will not depend on an e-government service agent if they believe the agent is incapable of providing the service offered, not interested in the public well-being, or not willing to guarantee the minimum level of service standard imposed by the government. An individual citizen may have different levels of trusting beliefs in different e-government service agents (Lee and Rao 2003), which will result in different levels of intentions to use certain e-government services. Koehler and Gershoff (2003) found that, when it comes to a product that is supposed to protect them, people would rather choose an inferior product than a better product with a slight possibility of betrayal. Because this study deals with situations wherein innocent individuals could be killed and services that have the potential to save lives, the perceived trustworthiness of e-government service agents has profound implications. Therefore, we hypothesize that *a citizen's trusting beliefs regarding an e-government service agent positively affect intentions to use e-government services provided by the agent.*

Further, if, and only if, a citizen has a high level of trusting beliefs in the U.S. government will the citizen assume a high trustworthiness for an online entity that identifies itself as an agent of the government. While privacy in e-government is already a critical concern of U.S. citizens (CEG 2001), the government's plan to implement a shared government database has made this concern even more difficult to address (Nicolaisen 2003). This kind of act will undermine citizens' trust in the government and result in reduced trusting beliefs in e-government agents who are under the strong influence of the government body. Therefore, we expect that *citizens' trust in the U.S. government would have a direct effect on their trusting beliefs in an e-government service agent.*

### **Perceived Riskiness of the Internet**

Although some risks exist within a relationship (Mayer, et al. 1995; Sitkin and Pablo 1992) and have been implicitly considered in the effects of trusting, there is another type of risk external to the relationship. Mayer et al.'s definition of perceived risk, “the trustor's belief about likelihood of gains or losses outside of considerations that involve the relationship with the particular trustee” (p. 726), depicts the risks external to a certain relationship. This type of risk should be separately measured in addition to the trust relationship (Mayer, et al. 1995). For example, an individual could fail to prepare for a potential danger if an e-mail security alert system or the network was disrupted in an emergency situation such as a cyber terrorist attack. The perceived riskiness of the Internet in our model measures the extent to which an individual believes the Internet is not a secure and robust enough medium. Because these kinds of risks are situational factors not related to the uncertain behavior of the e-government service agents, the perceived riskiness of the Internet is assessed separately from trusting beliefs.

We argue that *in an ongoing public emergency situation, citizens perceive a higher level of risk in the Internet.* For example, in case of a public emergency that disrupts power supply or communication network, any services on the Internet become unstable. Whether the disruption is caused by a natural disaster or by a terrorist attack, Internet services, including e-government services, will not be as dependable as physical services. This *riskiness of the Internet posed by a public emergency will form a negative effect on citizens' intention to use e-government services.*

However, an opposite effect of public emergency is also possible. Citizens may rely on the Internet as a primary source of emergency information when other infrastructures are also affected by the emergency. A previous survey shows that, on the day

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<sup>4</sup>Competence refers to a trustee's capability required to fulfill the trustor's need. Benevolence means a trustee's caring and motivation to act in the trustor's interests. Integrity refers to the honesty and promise-keeping characteristics of the trustee. For details, refer to McKnight et al. 2002 and to Bhattacharjee 2002.

of the 911 terrorist attack, 4 to 5 million people turned to the Internet to make contact with others because the phones were not working properly (Rainie 2001). This is not because the emergency reduced the risk of using the Internet, but because the Internet was the only option the citizens could choose. Therefore, it is important to distinguish the difference between the usefulness of e-government services as opposed to the riskiness of the Internet. Even though a public emergency may increase the riskiness of the Internet, it will also increase the riskiness of other types of service media. Therefore, as a robust and flexible medium, the *Internet will be perceived as a useful channel of e-government services in a public emergency.*

## Research Design and Methodology

This research adopts a structured questionnaire survey methodology. The first survey was administered to 240 U.S. undergraduate level students in a large northeastern university in April 2003 when the second Iraq war was ongoing and the homeland security advisory system's terrorism alert was high. The analysis of the first survey adopted a structural equation modeling technique, using PLS-Graph. The summary of this analysis is presented in the following sections.<sup>5</sup> The second survey is scheduled in April 2004 when the terrorism alert is expected to be low (green) or guarded (blue) level, and the effect of the war would be removed. The second survey will be administered to multiple groups including a cohort group of the first sample to calibrate and generalize the findings from the first survey. The two results will also be analyzed using MANOVA to test the effects of the war.

## Data Analysis

The first survey yielded 177 responses with a 73.8 percent response rate. The average age of the respondents is 21.5 years old, and 92 percent of the respondents have more than 3 years of Internet experience. We believe, therefore, the group represents the population that utilizes the Internet the most. Logical consistency and low variance check dropped 19 unsatisfactory cases, resulting in 158 usable cases for the rest of the analysis.

Many of the measurement items were adopted from previous studies and modified to reflect the e-government service context. Measures for usage intentions and trusting beliefs on e-government agent are from McKnight et al. (2002). Perceived usefulness measures are from TAM research. Trust in the government measures were adapted from the political cynicism measure in political science literature. The measures for the perceived public emergency and the riskiness of the Internet were newly created for this study. The event of war in Iraq in our analytical model (Figure 1) was not to be measured by the questionnaire items but was given as a treatment by the time selection.

Most of the individual item reliabilities in terms of standardized loading are higher than the ideal level of 0.707. Only 5 out of 30 items were lower, yet were also over the acceptable level of 0.6 for scales applied across contexts (Barclay et al. 1995; Chin 1998). All the composite reliabilities for internal consistency are well over the acceptance value of 0.7 (Hair et al. 1995). Discriminant validity was tested by average variance extracted (AVE) as well as by cross-loadings. Every construct had AVE scores higher than the correlations between the construct and the other constructs. The correlations between construct scores and standardized item scores also showed that items were not cross-loaded.

## Results and Discussion

Figure 2 shows the result of the analysis, which supports most of our hypotheses. As expected, citizens' trusting beliefs in an e-government agent, perceived riskiness of the Internet, and perceived usefulness of e-government services are strong determinants of their intentions to use e-government services, explaining roughly 30 to 40 percent of the variances of the intentions. Specifically, citizens' trusting beliefs in an e-government agent have the strongest positive effect on their intention to depend on information provided by the agent. Perceived riskiness of the Internet negatively affects the intentions, especially the intention to provide personal information. Perceived usefulness has strong positive effects across the three types of intentions.

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<sup>5</sup>The details of the results are omitted due to the limited space. The full version of data analysis and results are available from the authors.

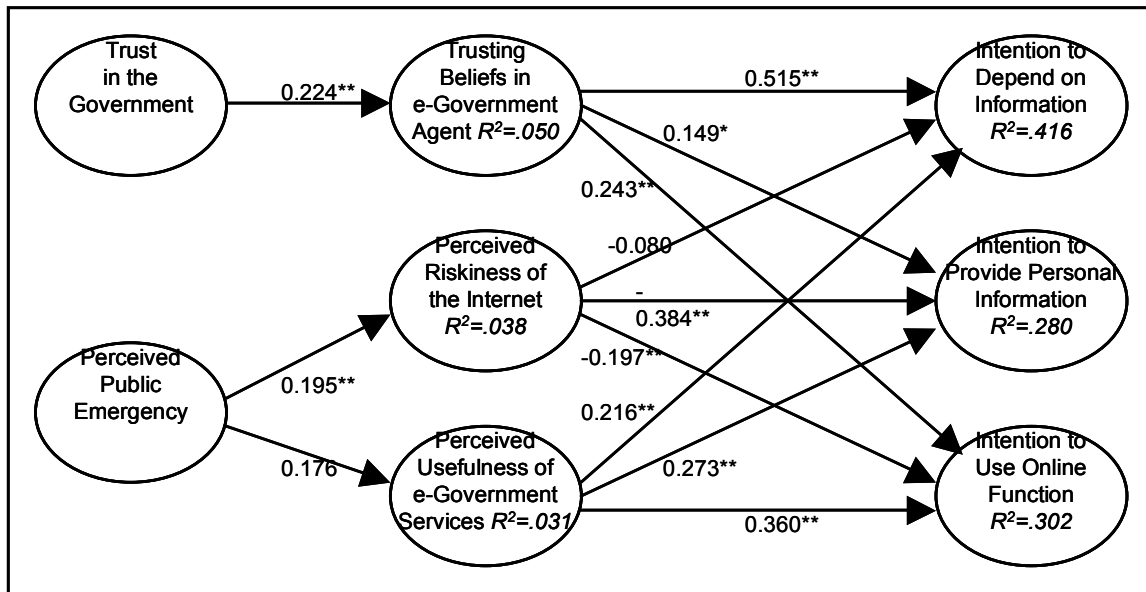


Figure 2. Effects of Public Emergency on Citizen's Intention to Use E-Government

The result shows marginal effects of citizens' trust in the government and perceived public emergency. However, we should recall that we hypothesized the war would alter citizens' trust in the government, perception of public emergency, and usefulness of e-government services. Therefore, changes of the mean values under two different situations (i.e., high and low terrorism risk situations) caused by the war in Iraq, rather than the variance explained by trust in the government or perceived public emergency, should be our concern. This effect will be analyzed by a follow-up survey. The current study has identified inhibiting factors that put a restraint on the citizens' options to use e-government services to maximum advantage as well as possible improvements in an effort to create symbiosis between citizens and the government in a public emergency.

The increased risk of terrorism that the U.S. government and citizens face today poses a potential threat to the e-government service initiatives and warrants urgent research efforts to assure efficient, effective, and reliable e-government services during public emergency situations. We believe this study is a first step to enhance our understanding of the determinants of citizens' e-government service use in a public emergency, the impacts of a public emergency on the role of e-government, and the dynamics of trust in e-government service environments.

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