Effects of innovation-supportive culture and organizational citizenship behavior on e-government information system security stemming from mimetic isomorphism

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ABSTRACT

Using institutional theory as a theoretical framework, this study illuminates organizational changes stemming from institutional pressures to investigate innovation in e-government information system security (ISS). From the perspective of mimetic isomorphism, the study examines ISS innovation by the South Korean government to elucidate organizational factors affecting organizational changes. This study attempted to investigate the inter-relation of institutional influences and internal organizational factors in the course of ISS innovation. A research model was developed to elucidate the effects of mimetic isomorphism on innovation-supportive culture, legitimacy, and organizational citizenship behavior (OCB); furthermore, the relationships among innovation-support-ive culture, legitimacy, and OCB, as well as how they influence organizational ISS effectiveness, were examined. A survey was administered to 489 civil servants working for the South Korean national government; valid data were analyzed using the partial least squares method. The results showed that mimetic isomorphism positively affected both innovation-supportive culture and legitimacy in ISS innovation. However, mimetic isomorphism influenced only individual OCB, not organizational OCB. Consistent with our hypotheses, innovation-supportive culture, legitimacy, and OCB positively influenced ISS effectiveness, whereas organizational cynicism negatively influenced ISS effectiveness. These findings provide interesting insights into how ISS innovation for e-govern-ment can be viewed within institutional theory and organizational behavior. As this study's results show the ap-propriateness of ISS innovation-supportive culture for ISS effectiveness in the government, the government should diagnose cultural manifestations or cultural artifacts to help ISS practitioners formulate, implement, and manage ISS strategies.

1. Introduction

Many governments have developed e-government systems. It has been shown that e-government initiatives can provide benefits in terms of efficiency, productivity (Zhao & Zhao, 2010), cost savings (Andersen, 2009), and service quality (Luna-Reyes & Gil-Garcia, 2011). Since the mid-1990s, isomorphic pressures have promoted the rapid diffusion of e-government and successful e-government systems have been benchmarked (Eom, 2012). Because of mimetic isomor-phism, there is often pressure for governments to adopt innovative pro-grams and strategies. However, such programs and strategies are sometimes implemented in unsatisfactory ways (Damanpour & Schneider, 2006; Jun & Weare, 2010; Tolbert, Mossberger, & McNeal, 2008). e-Government involves a wide range of factors, including tech-nology and information use, organizational elements, institutional ar-rangements, and socioeconomic contexts (Snead & Wright, 2014).

However, an inadequate understanding of the relationships among these factors has been a frequent cause of failures in e-government (Anderson & Henriksen, 2005; Rubin & Feeley, 2002; Luna-Reyes & Gil-Garcia, 2011). Because e-government emerged in the mid-1990s, re-search on the subject is relatively nascent (Coursey & Norris, 2008).

Despite the benefits of e-government and the fact that e-govern-ment is increasingly being adopted worldwide, e-government services are threatened by cyberattacks. Most governments have developed se-curity initiatives; for example, the US federal government developed an initiative for cyber defense (Zhao & Zhao, 2010). According to Coursey and Norris (2008), information security issues are serious bar-riers to e-government and most governments must continually inno-vate in regard to information system security (ISS). ISS has received substantial attention since the late 1990s and the number of issues sur-rounding ISS has increased (Boss, Kirsch, Angermeier, Shingler, & Boss, 2009; Scott & Meyer, 1994). Organizations seeking to protect informa-tion must also consider controls on internal stakeholders (Alge, Ballinger, Tangirala, & Oakley, 2006): a substantial number of informa-tion security breaches are caused by poor ISS compliance among users

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(Nograšek & Vintar, 2014; Stanton, Stam, Mastrangelo, & Jolton, 2005). In other words, internal stakeholders can also threaten information security (Ifinedo, 2014). The importance of ISS in protecting organizational information has been increasingly recognized (Hsu, Shih, Hung, & Lowry, 2015; Posey, Roberts, Lowry, Bennett, & Courtney, 2013). As a continual process, ISS can be defined as "encompassing systems and procedures designed to protect an organization's information assets from disclosure to any person or entity not authorized to have access to that information" (Hill & Pemberton, 1995, p. 15).

ISS violation harms private organizations by causing financial losses (Feng, Wang, & Li, 2014) and reputation damage (Willison & Warkentin, 2013). In the public sector, ISS violation can result in even more serious reputation damage; complex financial, political, and economic losses; and most importantly, the loss of public trust in e-government and government organizations that utilize e-government. In Sweden, the lack of an organization assigned to managing e-government issues, as well as the fact that future governments might differ with regard to e-government policies and decision-making, has created uncertainty about e-government sustainability (Larsson & Grönlund, 2016). In this sense, a perceived risk of ISS problems could lead governments to reduce e-government systems and services. Accordingly, advanced ISS systems and continuous ISS innovation might enhance pubic trust in e-government and thus improve the legitimacy and sustainability of e-government. Therefore, to defend against both external and internal cybercrime techniques, which are constantly evolving, it is natural for governments to seek advanced security management processes and continuous ISS innovation. To ensure successful e-government, ISS innovation should entail more than technical changes. This study regards ISS innovation and management as not simply a matter of technological innovation and management but also one of holistic organizational and administrative innovation. ISS innovation encompasses not only technological innovation focused on developments in information security technologies but also a philosophy of administrative innovation that is inclusive of the development of security management programs (Hsu, Lee, & Straub, 2012), cultural changes, and, among stakeholders, behavioral changes. ISS innovation also encompasses the establishment of various, new routine ISS practices, as "innovations can potentially include many routines that can be combined in different ways." (Westphal, Gualti, & Shortell, 1997).

This study examines what affects ISS innovation and management as comprised of holistic organizational and administrative innovation. As ISS innovation entails technological uncertainties and organizational changes, mimetic isomorphism provides a useful solution (Kondra & Hurst, 2009), and successful ISS innovation and management systems have been benchmarked. Mimetic isomorphism in institutional processes incorporates three levels; a source of mimesis (uncertainty in the case of ISS), inter-organization processes (mimicry of organizational form and process), and imitation of individual behavior as intra-organization processes (Kondra & Hurst, 2009). Hence, the analysis of the government's mimetic processes regarding ISS innovation must be conducted at those three levels. The multi-level analysis of the government's ISS innovation, which has not been sufficiently analyzed previously, sheds new light on the government's ISS research in the context of e-government, and provides useful theoretical and practical insights.

The research questions in this study are threefold. First, this study attempts to elucidate how external influences, in particular mimetic isomorphism, affect ISS innovation for e-government. Second, it investigates the role of an innovation-supportive culture, influenced by the mimetic isomorphism, as a central inter-organizational process in achieving ISS effectiveness. Finally, it examines the role of legitimacy and OCB-O (OCB-organization), as inter-organizational processes, and OCB-I (OCB-Individual) as intra-organizational processes in achieving ISS effectiveness. To address these questions, we take institutional theory as a conceptual approach, which helps to explain how an innovation is maintained, reproduced and institutionalized (Kim, Kim, & Lee, 2009),

and our proposed model and hypotheses test data collected from a field survey study of South Korean government employees. The current study employed an institutional theory framework to illuminate organizational changes made by the South Korean government to facilitate ISS innovation.

2. Literature review and hypotheses

2.1. Literature review and theoretical background

e-Government has been defined as using "the Internet and the World-Wide-Web for delivering government information and services to citizens" (UN & ASPA, 2002, p. 1). It seeks to improve transparency, citizen satisfaction, information quality, decision-making, and productivity; it also aims to facilitate efficient communication between governments, citizens, and other stakeholders for integrated services (Franke, Kroenung, Born, & Eckhardt, 2015; Gil-Garcia, Chun, & Janssen, 2009; Irani, Love, & Montazemi, 2007; Joseph, 2013a, 2013b).

The establishment of new public governance systems (Zheng, Chen, Huang, & Zhang, 2013) under the auspices of e-government has been transformational (Luna-Reyes & Gil-Garcia, 2011). Jun and Weare (2010) indicated that e-government's complicated characteristics (e.g., its position amid technological uncertainties and its challenging of management, resources, and power and social structures) can facilitate innovation diffusion. As e-government began in the middle of the 1990s, e-government is a nascent research field, though attention to e-government has been on the rise in both academia and practice (Heeks & Bailur, 2007).

Previous studies on e-government have investigated e-service adoption (Carter & Weerakkody, 2008; Susanto & Goodwin, 2011) and e-government user adoption models (Dwivedi, Williams, & Alryalat, 2012), e-government innovation (Baldersheim & Øgård, 2008; Ben & Schuppan, 2014; Gil-Garcia, Helbig, & Ojo, 2014; Luna-Reyes, Zhang, Gil-García, & Cresswell, 2005) and institutional influences (Boyer-Wright & Kottemann, 2015; Criado, 2009; Gil-Garcia & Martinez-Moyano, 2005; Luna-Reyes & Gil-Garcia, 2011, 2014). Additionally, e-government success factors (Franke et al., 2015; Gil-Garcia, 2006; Gil-García & Pardo, 2005; Luna-Reyes, Mellouli, & Bertot, 2013) as well as barriers (Bertot, Jaeger, & Grimes, 2010; Daou, Karuranga, Thiam, Mellouli, & Poulin, 2013; Gil-Garcia et al., 2009; Gil-Garcia, Schneider, Pardo, & Cresswell, 2005) have been important research themes to understand e-government processes and success; and Yıldız (2012) emphasized the importance of the evaluation of e-government projects' success and failure.

Our literature review on e-government indicates that the interplay between technological functionality, and human and social aspects (including organizational, socio-economic and institutional factors) influences innovation/diffusion of e-government as well as success and failure of e-government; though various themes have been studied with various perspectives. However, Yildiz (2007) indicated that the e-government literature was still limited by, for example, too much focus on output- and outcome-oriented research, a lack of process-oriented e-government research, and a lack of understanding of the complex political and institutional environments in which the processes of e-government decision-making and development take place. To address the oversimplification of the literature on e-government, certain studies have focused on the processes involved in e-government initiatives (Tsai, Choi, & Perry, 2009), how national cultural values and practices affect e-government readiness (Khalil, 2011), and how system dynamics can be explored to understand complex e-government phenomena (Luna-Reyes & Gil-Garcia, 2011). In the e-government literature, studies using primary data are lacking and there are opportunities for investigating diverse topics in order to expand the e-government literature (Joseph, 2013a, 2013b). Larsson and Grönlund (2016) analyzed the sustainability of e-governance, a term that has been used interchangeably with e-government, in Sweden; they found