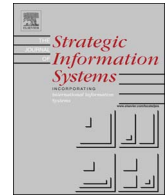




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The doctrine of the mean: Reference groups and public information systems development

Kui Du^{a,*}, Ye Dai^b

^a College of Management, University of Massachusetts Boston, 100 Morrissey Blvd., Boston, MA 02125, USA

^b College of Business, Southern Illinois University Carbondale, 1025 Lincoln Drive, Carbondale, IL 62901, USA

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ABSTRACT

This paper studies the influence of reference groups on developing public information systems. It hypothesizes that municipal governments dynamically adjust the development of their public information systems towards the average levels of their reference groups, a behavior embodying the classic “*doctrine of the mean*” in Confucianism. Specifically, both trait-based and institution-based reference groups can influence the e-Government development of municipal governments, and superordinate provincial governments enhance the influence of institution-based reference groups but dampen the influence of trait-based ones. Analyses based on the development of municipal government web portals in China between 2009 and 2013 provide support for these hypotheses.

“Going too far is as bad as not going far enough.”¹

The Analects of Confucius (Book XI 11.16)

1. Introduction

Researchers of information systems have been long interested in understanding organizations’ decisions regarding information systems development (e.g., Dewan et al., 1998; Kobelsky et al., 2008; Mithas et al., 2013; Salge et al., 2015). Many scholars pursuing this line of inquiry found that such decisions were not merely of the free will of the decision-making organizations, but also influenced by their institutional environments (e.g., Gosain, 2004; Newman and Sabherwal, 1996; Teo et al., 2003; Wang, 2010). Despite these findings, the field has not adequately explored topics about the interaction between information systems development and institutional environments (Mignerat and Rivard, 2009; Orlikowski and Barley, 2001). One such topic is the development of information systems in the public sector (Pang et al., 2014a). Although researchers found that organizations in the public sector often succumbed to institutional influences when developing public information systems (Jun and Weare, 2011; Zheng et al., 2013), these researchers have not examined adequately the dynamics in which organizations adjust their information system development in response to institutional environments.

To address this research gap, our study examines how reference groups influence governments’ development of their electronic government systems (“e-Government” hereafter). A reference group is a group of selected peer organizations with which a focal organization associates itself, or to which a focal organization compares itself, so that the perspectives, decisions, behaviors, or outcomes of these peers influence those of the focal government (Shibutani, 1955). Previous studies have examined the influence of

* Corresponding author.

E-mail addresses: kui.du@umb.edu (K. Du), ye.dai@business.siu.edu (Y. Dai).

¹ Quoted from *The Analects of Confucius: Translations from the Asian Classics* (Watson, 2007, pp. 74).

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reference groups in strategic decision making (e.g., [Fiegenbaum and Thomas, 1995](#); [Massini et al., 2005](#)). This research builds on these studies and strives to make the following three contributions.

First, this study clarifies the directionality of peer influence in the public sector. Institutional theorists recognize the existence of mutual directionality of peer influence. However, they focus almost all on a unilateral peer influence that superior performers influence inferior ones, or the leading adopters of innovations influence laggards ([DiMaggio and Powell, 1983](#); [Haveman, 1993](#)). The neglect of influence in the opposite direction may have blinded researchers from exploring the countervailing forces in peer influence. Our study finds that, in developing their e-Government systems, government organizations appear to move towards a moderate level of development. That is, while government organizations lagging in their e-Government development try to catch up, leading ones tend to slow down their e-Government development to avoid overly deviating from the average of their reference groups. The countervailing forces that arise from the reference groups to slow down the e-Government development of the leading organizations appear to be consistent with a classic Confucian doctrine, *the doctrine of the mean*, which suggests that pursuing only a moderate level of achievement helps an individual maintain balance and harmony, and thus direct his or her mind to a state of constant equilibrium ([Watson, 2007](#)). By revealing the intricate dynamics of peer influence, this study contributes to the studies of institutional environments and information systems development.

Second, this study explores how government organizations utilize reference groups in making decisions. Peer influence occurs only if peers are identified in the first place. Therefore, identifying who constitute reference groups is crucial to understanding the influence of peers on information system development. Our study finds that, in deciding their effort for e-Government development, government organizations appear to rely on at least two different reference groups, the selection of which is based on prospect theoretic thinking ([Kahneman and Tversky, 1979](#)) and institutional conformity ([DiMaggio and Powell, 1983](#)) respectively. These findings deepen our understanding about the functioning of organizational reference groups.

The last issue that this study addresses is the dearth of research on public information systems. It remains largely unknown whether existing theories and findings, including those from extant institutional-IT studies (e.g., [Newman and Sabherwal, 1996](#); [Teo et al., 2003](#); [Wang, 2010](#)), are applicable to government organizations that face unique challenges in developing and using information systems ([Caudle et al., 1991](#); [Cordella and Iannacci, 2010](#); [Rocheleau and Wu, 2002](#)). The practical importance of public information systems to modern society has urged greater research attention to the under-explored topic of public information systems development ([Huang, 2007](#); [Irani et al., 2007](#); [Pang et al., 2014a](#)). In responding to this call, this study joins forces with a few previous studies (e.g., [Jun and Weare, 2011](#); [Zheng et al., 2013](#)) to extend the inquiry of institutional-IT problems to the public sector.

2. Literature background

2.1. Information systems development in the public sector

Despite their commonalities, the development of information systems in the public and private sectors differs from each other in important ways. Organizations in the public sector face unique problems, such as the pressure of public scrutiny, bureaucratic and political hurdles, and shorter budgeting cycles. Therefore, the development of public information systems tends to be incremental, gradual, and short-term oriented. It also requires more extensive testing and higher levels of accountability, openness, and representativeness ([Bozeman and Bretschneider, 1986](#); [Caudle et al., 1991](#)). The objectives of information systems development in the public sector are broader, which include, besides efficiency and effectiveness, democracy, compliance, accountability, and responsiveness ([Ahn and Bretschneider, 2011](#); [Huang, 2007](#); [Justice et al., 2006](#); [Li et al., 2017](#)). Moreover, political leaders are not involved in the strategic planning of information systems as much as business executives are ([Dufner et al., 2002](#)), and even this limited involvement is often interfered by political agendas and party affiliations ([Ahn and Bretschneider, 2011](#); [McNeal et al., 2003](#); [Pang, 2017](#)). Consequently, organizations in the public sector tend to have a higher degree of risk aversion and prefer incrementalism when developing public information systems.²

As a specific type of public information system, e-Government is defined broadly as any IT-based systems that facilitate governments' delivery of their services to, and interaction with, the citizens and businesses that they serve ([Heeks and Bailur, 2007](#); [Irani et al., 2007](#); [Yildiz, 2007](#)). The past decades witnessed tremendous progress in e-Government services, as its specific forms evolved from static, informational webpages to integrated, transactional web-based service platforms ([Yildiz, 2007](#)).

However, researchers have described the development of e-Government as a constant battle between rapid technological advancement and conservative legislative and administrative processes ([Strejcek and Theil, 2003](#)). More specifically, on the one hand, emerging information technologies provide opportunities to improve the efficiency, transparency, and accessibility of governmental services. On the other hand, the risks of information system failures instill a sense of pessimism to e-Government initiatives. Public officials have been depicted as "*recalcitrant, suspicious, and skeptical adopters of IT*" ([Goldfinch, 2007, pp. 917](#)),

Various risks contribute to the reluctance to develop e-Government. Financially, advanced e-Government systems, such as those involving online transactions for public services, require significant upfront investment and subsequent expenditures on maintenance. However, returns on these investments often cannot be easily quantified and measured, especially in the short term, which challenges the planning and budgeting processes. In addition, governments face shorter budget cycles and more rigid budget controls

² However, this behavioral conservatism of public-sector organizations by no means indicates that information systems are less important to public-sector organizations. Both [Ward \(2006\)](#) and [Rocheleau and Wu \(2002\)](#) reported that public- and private-sector organizations did not differ in recognizing the importance of IT. Like in private sectors, IT plays crucial roles in creating value in public-sector organizations ([Pang et al., 2014a,b](#)).

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