Chapter 89

Investigating the Determinants of Decision-Making on Adoption of Public Cloud Computing in E-Government

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ABSTRACT

This article analyzed decision-making in terms of the adoption of public cloud computing and its determinants in the context of e-government. The authors proposed a theoretical model and related hypotheses after reviewing the literature and combining technology adoption theory with IT decision-making authority theory. Then, they collected samples from 227 public sectors and tested hypotheses using structural equation modeling. The results show that the determinants of the three modes (IaaS, SaaS, and PaaS) of decision-making on adoption are different. The significant determinants of IaaS adoption include technical factors and business factors, those of PaaS adoption include technical factors and management factors, whereas those of SaaS include technical factors, business factors and management factors. The authors also find managerial/controlling power, which characterizes the special nature of Chinese culture, only have a significant influence on the decision-making on adoption of PaaS mode and SaaS mode.

INTRODUCTION

E-government, which adopts new information and communication technologies, is being increasingly recognized as an important means for transforming all facets of government operations and services (Tan et al., 2013). In China, the public continuously introduces new demands for e-government, such as providing open resource sharing services while casting off time and space limits, which has brought whole-new technological and managerial challenges to its development (Ding & Wu, 2012). However, a relatively small number of all e-government initiatives in China have been successful in attaining their major goals of information sharing and reducing the cost of infrastructure (Wang & Ding, 2015). To promote in-depth sharing of information resources, and improve the intensive level of e-government, the Chinese government is actively considering adopting public cloud computing in a way that can facilitate the management of information resources, and the innovation and creativity of operation modes (Qu et al., 2015). Cloud computing is not a new technical product, but rather a new mode of distributed shared pooling of IT infrastructure linked together to provide centralized IT services on demand. The cloud-based solutions providing various services can be divided into three types: public, private, and hybrid clouds (Harris, 2011). Public clouds, which are open network infrastructure, are designed to provide software access through web-based portals, whereas private clouds, which are proprietary infrastructure with encryption and security measures, are wholly operated for an organization, restricting access to shared resources only for authorized customers, and offer secure computing services either on the organization's premises or operated by a third party vendor offsite (Harris, 2011). The hybrid cloud is a combination of public and private delivery of IT services. The application of public cloud service can realize resource aggregation and virtualization, application service sharing and on-demand supply, and provide a lot of public sectors with computing and data services that are efficient and cost-effective and power-effective (Armbrust et al., 2010). In particular, compared with private and hybrid cloud computing, public cloud computing is more open and highly shared, rendering great risks of adoption (Paquette et al. 2010). Therefore, a proper decision-making on public cloud adoption is a challenge being faced by most public sectors and has been indispensable during the process of shifting e-government applications towards the cloud mode. Predicated by this challenge, in this study, we focus on the factors influencing decision-making on the adoption of public cloud computing in e-government rather than that of private and hybrid clouds.

Public clouds in e-government are a technical innovation (Armbrust et al., 2010). This implies that the technical characteristics of a public cloud may affect decision-maker adoption. The synthesis of this literature review suggests that cloud computing's technical ability to provide distributed systems consisting of virtualized resources that are used for dynamic provisioning on demand is arguably the main factor to influence its adoption (Mustafee, 2010). Other studies seek to provide empirical evidence from the perspective of financial features enabled by cloud computing, i.e., the financial ability for the firm to eliminate the fixed cost of IT infrastructure and only incur usage-based pricing for IT services from the external cloud vendor (Dorsch & Häckel, 2014).

In addition, public clouds are much more than information technology (IT) products, but rather the new managerial modes of government services and operations (Armbrust et al., 2010). Specifically, the power distance is greater in China (Liao et al., 2010); decision-making on public cloud adoption is very difficult because managerial/controlling power of information resources and applications in e-government will be very unclear when the e-government system is transferred to a public cloud platform and the ownership and storage location of information resources and applications are out of the control of the

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