



## External auditors' perceptions of cloud computing adoption in Australia



Ogan M. Yigitbasioglu

School of Accountancy, Queensland University of Technology, 2 George Street, Brisbane 4000, Queensland, Australia

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### ABSTRACT

Adopting a multi-theoretical approach, I examine external auditors' perceptions of the reasons why organizations do or do not adopt cloud computing. I interview forensic accountants and IT experts about the adoption, acceptance, institutional motives, and risks of cloud computing. Although the medium to large accounting firms where the external auditors worked almost exclusively used private clouds, both private and public cloud services were gaining a foothold among many of their clients. Despite the advantages of cloud computing, data confidentiality and the involvement of foreign jurisdictions remain a concern, particularly if the data are moved outside Australia. Additionally, some organizations seem to understand neither the technology itself nor their own requirements, which may lead to poorly negotiated contracts and service agreements. To minimize the risks associated with cloud computing, many organizations turn to hybrid solutions or private clouds that include national or dedicated data centers. To the best of my knowledge, this is the first empirical study that reports on cloud computing adoption from the perspectives of external auditors.

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### 1. Introduction

There is substantial evidence that 30–40% of information system (IS) projects experience cost overruns and that 80–90% of IS investments fail to meet their performance objectives (Clegg et al., 1997; Young, 2006). Additionally, according to a report by Standish Group International, 24% of IS projects are either canceled prior to completion or delivered but never used (SGI, 2009). Cloud computing is an alternative to the in-house IT deployment model where computing resources are purchased over the Internet on pay-per-use basis (Marston et al., 2011). Many organizations are attracted to the perceived cost benefits of cloud computing and the innovative service capabilities it provides (Marston et al., 2011; Sultan, 2011).

Although cloud computing adoption is predicted to grow at a rapid pace (Gartner, 2013; IBM, 2011), not all of the news about cloud computing is encouraging. For example, a report by the Australian Communications and Media Authority revealed that 66% of small and medium-sized enterprises (SME) did not utilize cloud computing services, and those that did used it mainly for webmail (Francis, 2014). Furthermore, Harris Corporation, a US\$6 billion US communications company, closed down its cloud computing facility outside Washington DC because customers preferred hosting mission-critical information on their own premises rather than on the cloud (Garling, 2012).

Cloud computing is associated with a number of risks for its adopters (Grobauer et al., 2011). These risks primarily arise because organizational data are stored outside the physical and legal boundaries of the organization's IT systems. Cloud computing raises critical legal and accountability issues for both the organization opting to store data on the cloud and for the cloud vendor

E-mail address: ogan.yigitbasioglu@qut.edu.au.

providing the services. The risks are particularly concerning in relation to accounting and customer-related data stored in the cloud and the ability to detect and prevent acts of fraudulent activity or misconduct (Ryan and Loeffler, 2010).

Research on cloud computing is still nascent and can be classified into two broad groups: The first group's primary focus is on the workings of cloud computing, i.e., the protocols, layers, infrastructure, etc. (e.g. Foster et al., 2008; Pearson et al., 2009; Youseff et al., 2008). The second stream of research adopts a business approach and discusses the implications of cloud computing from an economic (e.g. Leimeister et al., 2010; Marston et al., 2011; Yigitbasioglu et al., 2013), strategic (Ross and Blumenstein, 2013), or legal point of view (Hooper et al., 2013; Pollitt et al., 2008; Ryan and Loeffler, 2010). A number of recent studies have contributed to the latter group by providing empirical evidence in relation to the factors that influence the intention to adopt cloud computing services in various regions such as Germany (Benlian and Hess, 2011), Taiwan (Hsu et al., 2014; Lian et al., 2014; Lin and Chen, 2012; Low et al., 2011), England (Alshamaila et al., 2013), South Korea (Lee et al., 2013), India (Gupta et al., 2013), and Australia (Yigitbasioglu, 2014). Most of these studies have used the survey method to focus on either SMEs (Alshamaila et al., 2013; Gupta et al., 2013) or particular industries such as the high-tech (Low et al., 2011), retail and manufacturing (Wu et al., 2013), or health sectors (Lian et al., 2014).

Despite a growing body of empirical evidence in this field, most studies adopt a quantitative approach and therefore miss out on the opportunity to provide a more in-depth account of the issues involved in the adoption and use of cloud computing. For example, why are certain types of cloud configurations preferred over others, and what factors influence organizations' adoption decisions?

The aim of this study is to provide qualitative evidence on cloud computing adoption from a new perspective: those of external auditors in Australian accounting firms with forensic accounting practices. External auditors in accounting firms were chosen in this study because many of the medium to large accounting firms provide IT services to their clients, so they are expected to be advanced users of IT. Interviews with both IT experts (ITE) and forensic accountants (FA) were carried out to gain insight into the multifaceted issues involved in cloud computing adoption, which are of technical, economic, and legal in nature. Additionally, these participants were chosen because of their experience with cloud computing, both within but also across client firms as users, implementers, and forensic investigators of such services. The participants in this study were not the IT decision-makers and therefore did not represent the official position of their respective firms. The study specifically addresses the following research question (RQ):

RQ: How do external auditors, employed by medium to large public accounting firms in Australia, perceive the reasons why organizations do or do not adopt cloud computing services?

The paper takes a multi-theoretical approach and draws from theories such as institutional theory and transaction costs economics to explore cloud computing adoption. The study sheds light on various cloud issues such as institutional motives, cost management, security, and transaction risks. This qualitative study contributes to the growing literature on cloud computing by presenting new evidence from a new perspective in a much-speculated-upon area. This paper also addresses calls for more empirical research on cloud computing by previous studies (Kshetri, 2013; Marston et al., 2011).

The remainder of the paper is structured as follows. In Section 2, I briefly define cloud computing and review the most frequent theories used to study IT outsourcing and cloud computing adoption. This section also introduces the institutional theory, which has received little attention in the cloud computing literature. Section 3 presents the data and research method, which is followed with the findings in Section 4. Finally, Section 5 concludes the paper and suggests future avenues for research.

## 2. Cloud computing

Cloud computing enables information technology outsourcing (ITO) whereby computing resources are purchased over the Internet using a pay-per-use model (Marston et al., 2011; Ross and Blumenstein, 2013; Yigitbasioglu et al., 2013). The cloud computing delivery model is built upon old and new computing technology paradigms such as grid computing, service-oriented architecture and virtualization (Youseff et al., 2008). The cloud computing delivery model provides three optional layers: the software layer, the platform layer, and the infrastructure layer. Organizations can elect to outsource one or several of these layers, where platform as a service and infrastructure as a service enable organizations to remotely access, develop, and deploy a variety of applications and hardware (Youseff et al., 2008). In contrast to the *public* cloud, the *private* cloud may refer to two settings: (i) it may correspond to the traditional IT model where computing resources are retained within the corporate firewall, or (ii) it may be managed by a different party on a remote or local site using dedicated infrastructure (Marston et al., 2011).

Cloud computing differs from traditional ITO in several ways. First, IT resources are exclusively delivered over the Internet, which also allows their near-instant scalability, as IT resources are managed through software (Marston et al., 2011). Cloud computing also introduces a number of new actors such as service providers and brokers, which leads to more complex relationships that were more restricted in the past (Leimeister et al., 2010). Finally, cloud computing contracts tend to be shorter and therefore offer more flexibility and less commitment on the part of the customer (Yigitbasioglu et al., 2013).

Cloud computing is of interest to accountants and accounting firms because they operate within a knowledge-intensive business environment that relies heavily on the use of IT. For example, many auditors and forensic accountants use computer-assisted audit technologies and audit support systems (Braun and Davis, 2003; Dowling and Leech, 2014; Van Akkeren et al., 2013). Additionally, extensive software exists for the accountant, ranging from small, off-the-shelf packages to sophisticated enterprise systems that assist them with their daily tasks (Gelinis et al., 2011; Hall, 2012). Therefore, in the accounting sector, it is expected

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