# Factors That Influence Adoption of Cloud Computing: An Empirical Study of Australian SMEs

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## Abstract

Cloud computing is a recent computing paradigm enabling organizations to have access to sophisticated computing services via the Internet on a fee-for-service basis. It provides Small and Medium-sized Enterprises (SMEs) with opportunities to become as technologically advanced as their larger counterparts, without significant financial outlays. This paper examined the important factors that influence SMEs' adoption of cloud computing technology. Drawing upon aspects of the Technology, Organization and Environment framework and Diffusion of Innovation Theory, we developed a research model of SMEs' adoption of cloud computing and tested it through an online survey of 149 Australian SMEs. Data was analyzed using multiple regression methods, with results showing that SMEs were influenced by factors related to advantaging their organizational capability (i.e., relative advantage, quality of service and awareness) rather than risk-related factors (i.e., security, privacy and flexibility). The findings offer insights to SMEs owners, Cloud service providers and government in establishing Cloud computing adoption strategies for SMEs.

**Keywords**: Cloud computing, Adoption, Small and Medium-sized Enterprises (SMEs)

## 1 Introduction

By delivering resources and services through a user-pay system via the Internet, cloud computing offers a new business solution that enables customers to rent information technology (IT) infrastructure, platforms and software through positioning their business applications and data storage in the cloud. In defining its scope and role, The National Institute of Standards and Technology's definition is widely accepted – "*a model for enabling convenient, on demand network access to a shared pool of configurable computing resources (e.g., network, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction*" (Mell & Grance, 2011, 3). Well-known cloud examples include Amazon, Google and Microsoft (Department of Finance and Deregulation [DFD], 2013). Unsurprisingly opportunities and savings have attracted strong market growth in such services. "The Cloud market ... [is] valued [at] $148 billion in 2016" (Waterford Technologies, 2017), with businesses expected to spend US$191 billion on cloud services by

2020, compared to US$72 billion in 2014 (International Trade Administration, 2015). The Australian market shows similar growth, with recent figures from the Australian Bureau of Statistics [ABS] showing that for 2015-2016, 31% of Australian businesses have adopted cloud computing, up from 20% in 2013-2014 (Coyne, 2017). Significantly, ABS' figures show that the adoption rate varies by organizational size, with adoption of paid-for-cloud products in 2015-2016 at "25 percent for businesses with 0-4 employees, and 60 percent for companies with a 200+ headcount" (Coyne, 2017). This is reasonably consistent with results from a Microsoft survey, which show "40% of Australian businesses are already using hybrid cloud technology which they predict to increase to 49% in the next 12-18 months. Of these, 43% are only using a private cloud with 17% using purely public cloud solutions" (Microsoft, 2016). Yet studies into the factors that influence the adoption of cloud computing are limited (Yang & Tate, 2012) and have focused on larger organizations (Venters & Whitley, 2012; Office of the Chief Economist, 2016).

Further relevance is evident from SMEs' importance to national economies. Globally SMEs comprise more than 95% of businesses, accounting for approximately 60% of private sector employment (Ayyagari et al., 2011). In Australia they comprise 95% of active businesses; employ 70% of the nation's workforce, and contribute over 57% of GDP (Australian Bureau of Statistics [ABS], 2015). Yet Australian SMEs' adoption of cloud computing (44%) lags that of large organizations (86%) (Australian Communications and Media Authority [ACMA], 2014). In fact, "firms with four or fewer employees were the lowest users of cloud computing, compared to those with 200 or more employees" (Office of the Chief Economist 2016, 94). This slower uptake of cloud computing warrants investigation, as cloud's special characteristics are particularly advantageous for SMEs (Alshamaila et al., 2013). Firstly, cloud computing allows them to technologically compete with larger businesses without significant infrastructure investment (Mudge, 2010). It eliminates up-front investment in hardware and software, replacing it with pay-by-use resources. Consequently options, such as costly Enterprise Resource Planning systems that permit business capabilities and accessibility from multiple locations, become affordable. Secondly, businesses tend to estimate resource needs based upon peak demand (Armbrust et al., 2010), whereas need for computing services varies over time. Cloud computing offers advantages as businesses are charged for the actual use of such resources (Marston et al., 2011) i.e., elasticity. Thirdly, off-site data storage helps disaster protection (DFD, 2013).

Reports are unclear concerning the causes of SMEs' slower uptake. One Australian Government survey (ACMA, 2014) shows that cloud computing's principal benefits include convenient access to services (36%), including from multiple locations (15%), and disaster protection (11%). These SMEs attribute lagged uptake (ACMA, 2014) to its unsuitability for their business (48%), and their lack of knowledge/awareness (22%). Alternatively research has identified issues such as security, legal and privacy concerns (Mahmood, 2011; IMO, 2013; Tehrani & Shirazi, 2014).

Acknowledging cloud computing's global growth, its recognized benefits to SMEs, and its slow adoption rate in countries such as Australia, this research investigates factors that influence SMEs' decision-making concerning adoption. A theoretical model was derived by integrating the Technology, Organization and Environment (TOE) framework with the Diffusion of Innovation (DOI) theory, and extending it to include specific factors that represent cloud computing's unique characteristics. This research studied the applicability of this model

to the adoption of cloud computing among micro, small and medium-sized organizations separately, which has received less attention in previous research. This provided the basis for design of a survey instrument to elicit insights from Australian SMEs.

Findings from this study contributes new knowledge about the factors that affect cloud computing adoption. Firstly, our research model (validated by a survey) addresses calls for empirical investigation of this topic (Hsu et al., 2014) and development of a model that is relevant to SMEs (Carcary et al., 2014), which can be referenced in future research.

Further, our findings show that Australian SMEs regard relative advantage, quality of service and awareness of cloud computing as being influential in their adoption processes. Prior studies identified relative advantage (i.e., Oliviera et al., 2014; Gangwar et al., 2015) and top management support (i.e., Abubakar et al., 2014; Rowe et al., 2012; Gangwar et al., 2015), which may well be linked to cloud awareness/knowledge, as significant influences. When taken together our three identified factors, which explain 83.3% of the variance in our model, suggests SMEs were influenced by cloud computing's value to build organizational and IT capability. This contrasts with Hsu et al. (2014) who found that perceived benefits and IT capability were not significant. In contrast to prior research (i.e., Gupta et al., 2013) and industry reports (IDC, 2012; ACMA, 2014), our findings also show that risk-related factors such as security, privacy and flexibility were of lesser significance, although respondents did indicate some concerns about these issues and about lack of resources.

Additionally, we show that organizational size was statistically significant even within the SME construct (i.e., micro/small vs medium enterprises). This refines prior research that has consistently identified differences between large and smaller organizations' adoption of cloud computing (i.e., Brender & Markov, 2013; Low et al., 2011; Guiterrez et al., 2015). Alternatively, in contrast to prior research (i.e., Alshamaila et al., 2013; Oliviera et al., 2014), industry type was not found to be influential.

The remainder of the paper is organized as follows. Section 2 presents the theoretical foundation including an overview of prior research and application of the TOE framework and DOI theory to the study. The research model and hypotheses are presented in Section 3, followed by a description of the methodology (Section 4). Results and findings are discussed in Section 5. Finally, Section 6 outlines implication for research and practice, followed by conclusion and limitations of the research in Section 7.

# 2 Theoretical foundation

## 2.1 Organizational size and cloud adoption

It is important to acknowledge that research related to large organizations does not necessarily translate to SMEs (Carcary et al., 2014). In comparison to larger organizations, SMEs face resource constraints that limit their competitiveness and capabilities in areas such as innovation (Rosenbusch et al., 2011), knowledge management (Durst & Edvardsson, 2012), and IT/IS competency (Cragg et al., 2011). Two resource constraints may be particularly important. Firstly, a lack of personnel with specialist IT knowledge may cause reduced absorptive capacity (Zahra & George, 2002), as there is less internal capacity to acquire and apply relevant knowledge (Madrid-Guijarro et al., 2009). Secondly, reduced financial and managerial resources (Georgiadis & Pitelis, 2012) may limit SMEs in articulating the value of cloud computing. As such, one study related to cloud computing showed that larger

businesses were better prepared for cloud adoption than smaller ones (Brender & Markov, 2013).

Despite such differences and the considerable benefits to SMEs, little research has directly investigated factors influencing SMEs' adoption of cloud computing. In fact, Yang and Tate (2012), in their review of 221 relevant journal articles up to 2011, found only six articles related to cloud computing adoption and only one, a single case study, to smaller enterprises. Similarly, Gupta et al. (2013, 861) noted that "many studies were (and currently are being) conducted on the use of cloud computing by large scale enterprises primarily on their perceptions".

Therefore, to position this research, we scanned peer-reviewed journal articles published after 2012 concerned with adoption of cloud computing. After eliminating literature reviews and opinionative pieces, twelve studies were identified (see Table 1). These showed a range of influential factors, with the most consistent being top management support, organizational readiness, complexity of the innovation when linked with relative advantage, and compatibility with existing IT, risk and security. Of these, four studies involved both larger and smaller organizations with insufficient data to extrapolate SMEs' differences. Of the remaining eight, one indicated findings were limited as SMEs' cloud computing adoption was embryonic (Hsu et al., 2014); one studied IT professionals (Werfs et al., 2013); and another investigated use and adoption at the same time (Ross & Blumenstein, 2015). Consequently, the need identified by Carcary et al. (2014, 325) is yet to be addressed, namely "*an SME-specific model and associated guidance to support cloud adoption would be of considerable benefit to the SME market in managing the adoption process and deriving resultant benefits*." We address this need through our review (see Table 1), our related theoretical model and our related survey that investigates what influences SMEs' adoption of cloud computing.

| Primary focus | Authors | Context for adoption of cloud computing | Theory | Method | Findings |
|---|---|---|---|---|---|
| SMEs | Gupta et al. (2013) | SMEs' perceptions | Literature review | Survey | ***Factors:*** ease of use; privacy; convenience; reduced cost; improved security. ***Lesser:*** reliability; sharing; collaboration. |
| | Oliviera et al. (2014) | Portuguese businesses [micro & small (36%), medium (46%), large (18%) enterprises] | TOE + DOI | Survey | ***Factors:*** relative advantage; top management support; complexity; technology readiness; organizational size. |
| | Carcary et al. (2014) | Irish SMEs | Literature review | Survey based | Informal management styles. ***Factors:*** cost reduction, resource utilization, collaboration, complexity. |
| | Abubakar et al. (2014) | Sub-Saharan African SMEs | Grounded theory | 10 case studies | ***Factors:*** top management |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | support; computing resources; solving power supplies. ***Lesser****:* security; privacy. |
| | Trigueros-Preciado et al. (2013) | Barriers to SMEs' | Empirical | Group meetings with managers + survey | ***Main barrier****:* culture. |
| | Ross & Blumenstein (2015) | SME entrepreneurship | Schumpeterian creative destruction scenario | Interviews | ***Factors****:* better access to global markets; reducing opportunity costs; facilitating collaboration and innovation. |
| | Rowe et al. (2012) | Vietnamese SMEs – e-commence | TOE | Survey | ***Factors****:* employees' knowledge of e-commerce; enterprise size + innovation compatibility; managers' attitude; competition; trading partners, industry/government support. ***Inhibitors****:* complexity; risk. |
| IT professionals | Werfs et al. (2013) | SME software vendors | Adaptive STS perspective | Longitudinal study using interviews | ***Factors****:* strategy; complexity; culture. |
| Large & small organizations studied | Hsu et al. (2014) | Taiwanese firms | TOE + DOI | Tested on 200 smaller and larger firms – 65% < 200 employees, but 60% with > 3 employees in the IT dept. i.e., atypical of SMEs | ***Factors****:* benefits; choosing private cloud providers; greater IT capability. ***Lesser****:* external pressure. |
| | Garrison et al. (2015) | Mainly larger organizations | Resource-based theory | On-site interviews, online participation, and telephone interviews | ***Factors****:* relational, managerial and technical IT capabilities. |
| | Gangwar et al. (2015) | small and larger organizations' | TAM[1] + TOE | Survey | ***Factors****:* relative advantage; compatibility; complexity; |

[1] Technology Acceptance Model

| | | | | |
|---|---|---|---|---|
| | | | | organizational readiness; top management support. |
| Gutierrez et al. (2015) | Managers (smaller and large organizations) | TOE | Survey | ***Factors**:* competitive pressure; complexity; technology readiness; trading partners' pressure. |
| This study | Australian SMEs | TOE + DOI | Survey | ***Factors**:* cloud relative advantage; service quality; awareness of cloud computing. ***Lesser**:* security; privacy; and flexibility. |

*Table 1: Summary of the literature post 2012.*

In summary, despite cloud computing being "a fundamental change in the way IT services are invented, developed, deployed, scaled, updated, maintained and paid for" (Marston et al., 2011, 176), there are limited investigations into what influences SMEs' decision-making regarding adoption of this technology. We aim to address this research gap through deriving a model and testing it by surveying Australian SMEs.

## 2.2 The Technology, Environment and Organization Framework and Diffusion of Innovation Theory

Both TOE and DOI are relevant to this study, and their use in prior research motivates comparative appraisal of their relevance (see Table 1). DOI theorizes two influential factors (innovation and organizational characteristics) as an innovation progresses from instantiation to use. An innovation's attributes are influential on an individual's decision-making (Rogers, 2003) (i.e., relative advantage, compatibility, complexity, trialability and observability). Other relevant variables include: the decision type (collective, authority etc.); communication strategies; organizational social systems (norms, interconnectedness); and effectiveness of change agents (Rogers, 2003). When applied at an organizational level, where innovation decisions are usually less individualistic, DOI construes organizational innovativeness as depending upon the leadership characteristics, as well as organizations' internal structure and external characteristics (Rogers, 1995). Despite DOIs' wide acceptance, concerns have been raised about its ability to take into account the particularities of complex IS. Issues relate to the interactions that occur, their social construction and related intensive learning (Lyytinen & Damsgaard, 2001); as well as accommodating environmental contexts (Hsu et al., 2014).

TOE usefully extends DOI. Unlike DOI's focus on the individual, TOE focuses on organizations' adoption decisions. TOE's two categories (technology and organization) have obvious synergies with DOI's innovation and organization. TOE's technological context concerns perceived benefits, barriers and importance of compliance, interoperability; and interconnectivity (i.e., Oliveira et al., 2014). Organizational factors include: size; complexity; perceptions of existing IT; cost; and management impacts (i.e., Gutierrez et al., 2015). Environmental factors include: market uncertainty; competitors; and regulatory pressure (i.e.,

Low et al., 2011). Thus, the two theories meaningfully complement each other (Oliveira et al., 2014).

We draw upon both DOI and TOE to derive our model and survey instrument (see Appendix A) for studying SMEs' decision-making regarding adoption of cloud computing. Through linking this theoretical positioning to our literature review (i.e., Table 1, Section 3 and Appendix A), we identify key attributes of cloud computing adoption in terms of technological, organizational and environmental factors. As discussed Section 3, we construe the key attributes of our theorized model and instrument as:

- Technological: DOI (relative advantage), TOE (security, privacy and flexibility);
- Organizational: DOI and TOE (leadership awareness, flexibility, slack and interconnectedness). Note: size is controlled (i.e., SMEs);
- Environmental: TOE (competitors, market, regulations and service).

# 3 Research model and hypotheses

## 3.1 Cloud Relative Advantage

Relative advantage refers to the degree to which potential adopters perceive that innovations provide benefits and superiority to any predecessors (Rogers, 2003). It has been widely investigated in previous studies concerned with technology adoption (Salleh et al., 2012; Gibbs & Kraemer, 2004; Ramdani & Kawalek, 2007), with findings showing it as an important attribute (Gangwar et al., 2015; Oliviera et al., 2014). In this study Cloud Relative Advantage (CRA) is defined in terms of wider market coverage (including better communication with customers and suppliers) and lower business costs from related flexible cost structures and scalability (Sultan, 2011; Bharadwaj & Lal, 2012). CRA relates to SMEs reducing operating costs by avoiding capital expenditure in hardware, software and IT support (George & Shyam, 2010, Marston et al., 2011) by outsourcing infrastructure, platforms and services (DFD, 2013). Through reducing duplication and costs, buying bandwidth and paying according to their usage, organizations leverage economies of scale and increase savings through virtualization (Sharif, 2010; DFD, 2013). Hence, we propose:

*H1: The relative advantages of cloud computing positively influence SMEs' decision to adopt cloud computing.*

## 3.2 Cloud Flexibility

IT flexibility is defined as the fast deployment of technology components, facilitated through business/IT infrastructure (Garrison et al., 2015). It is particularly relevant to adoption of new IT (Zhao et al., 2014). Flexibility involves the ability of an organization to rapidly and easily adapt to up-to-date services to support business processes (Mell & Grance, 2011; McCabe & Hancock, 2009). For SMEs without IT resources, such as dedicated staff, cloud-based hardware and software provides available, affordable and reliable alternatives to installing and maintaining on-site infrastructure (Fairchild, 2014). As such, Cloud-based Flexibility (CF) has been found to foster more responsive, adaptive and competitive businesses (McCabe & Hancock, 2009; Mudge, 2010). Indeed, strategic flexibility gained through cloud computing is shown to effect major operational improvements (Armbrust et al., 2010; Whitten et al., 2010). Therefore, the following hypothesis is proposed:

*H2: The flexibility of cloud computing positively influences SMEs' decision to adopt cloud computing.*

### 3.3 Quality of Service

Quality of Service (QoS) is defined as the capability to meet specific requirements using specific metrics to analyze the level of quality i.e., response time and throughput (Carroll et al., 2014). As an inherent feature of many clouds, QoS is often delivered via service level agreements (SLAs) between the SME and the cloud service provider (DFD, 2013). For example, Amazon has sought to provide assured QoS through basic SLAs such as 99.9% infrastructure uptime (Luis et al., 2009). High levels of QoS are typically provided at competitive costs by dynamic resource scaling of IT management and administration with commitment to service efficiency (Busch et al., 2014). In providing QoS, availability and reliability may be bundled with ongoing service updates (Information Industry Innovation Council [ITIIC], 2011; Lippert & Govindarajulu, 2006), which contributes to growing demand for cloud computing, including access to cloud services from various client devices (ITIIC, 2011). However, SMEs need to balance the trade-offs between costs and QoS. Therefore, the following hypothesis is proposed:

*H3: Quality of service of cloud computing positively influences SMEs' decision to adopt cloud computing.*

### 3.4 Cloud Security

Current research has identified Cloud Security (CS) as an important issue, with specific reference to SMEs (i.e., Abubakar et al., 2014; Gupta et al., 2013). Specifically, cloud computing's architecture may generate new security issues such as data leakage, virtualization, vulnerability and hypervisor vulnerability (Gonzalez et al., 2012). CS is complicated by the multi-tenancy of the virtualized resources (DFD, 2013), with data owners not necessarily knowing the location or reliability of the data hosts (Sarwar & Khan, 2013). Other major issues relate to: transmission, and availability (Mahmood, 2011); malicious insiders, outside attacks, and service disruptions (Behl, 2011); data protection, disaster recovery, and business continuity (DFD, 2013). SMEs commonly cite CS concerns about use of cloud computing (Sultan, 2011). Therefore, the following hypothesis is proposed:

*H4: Security in the cloud computing environment positively influences SMEs' decision to adopt cloud computing.*

### 3.5 Cloud Privacy

Given cloud's technologically-driven interactions, Cloud Privacy (CP) and related risks are long-standing issues (Gangwar et al., 2015; Gupta et al., 2013). With information stored in the cloud, users may be concerned about it being accessed by others anywhere in the world (Vanessa, 2014). Moreover, cloud's distributed physical location creates legal issues due to difficulties in determining jurisdiction. The Australian Government's concern regarding the location of outsourced personal data storage is reflected in the preference for cloud services to be located within Australia's borders (Hutley, 2012), meaning that data is protected by Australian privacy laws. Recommendations to manage cloud-related privacy issues include: minimizing the personal information stored, as well as specifying and limiting the purposes for its data usage (Pearson, 2009). For SMEs, issues include: poor user control; trustworthiness; and lack of transparency. Even with appropriate policies, risks remain apparent (Ko et al., 2011). Thus, CP remains a relevant issue. Therefore, the following hypothesis is proposed:

*H5: Privacy in the cloud computing environment positively influences SMEs' decision to adopt cloud computing.*

## 3.6 Awareness of Cloud

Knowledge and awareness of the cloud (AWC) have been identified as significant constraints upon adoption for initial cloud adoption (Vanessa, 2014) and its sustainable use (Prasad et al., 2014). Knowledge about cloud computing has been shown as a primary influence in SMEs' decision to adopt cloud computing (Tehrani & Shirazi, 2014). Equally lack of awareness about the benefits of options such as SaaS[2] has demonstrably limited adoption (Carcary et al., 2014). Given limited awareness is reportedly an issue in the cloud market, especially within Australian SMEs (Hutley, 2012), the following hypothesis is proposed:

*H6: Awareness of cloud computing positively influences SMEs' decision to adopt cloud computing.*

Two control variables were identified. Firstly, the industry sector within which organizations operate has been shown to influence IT adoption (Alshamaila et al., 2013; Oliviera et al., 2014; Forman, 2005). Different business needs in different industry sectors may affect innovation uptakes (Levenburg et al., 2006; Prasad et al., 2014; Ifinedo, 2011). Secondly, larger businesses arguably possess more resources, skills, experience and hence ability to adopt new innovation than smaller businesses. Equally small organizations can be more innovative as their simpler organizational structures arguably permit greater business agility (Jambekar & Pelc, 2002). Therefore industry sector and organization size (micro, small and medium) are considered control variables.

Based on this analysis we hypothesized a theoretical model (see Figure 1) with six latent variables (CRA, CF, QoS, CS, CP and AWC) as influences upon SMEs' adoption of cloud computing. Cloud adoption is the dependent variable.

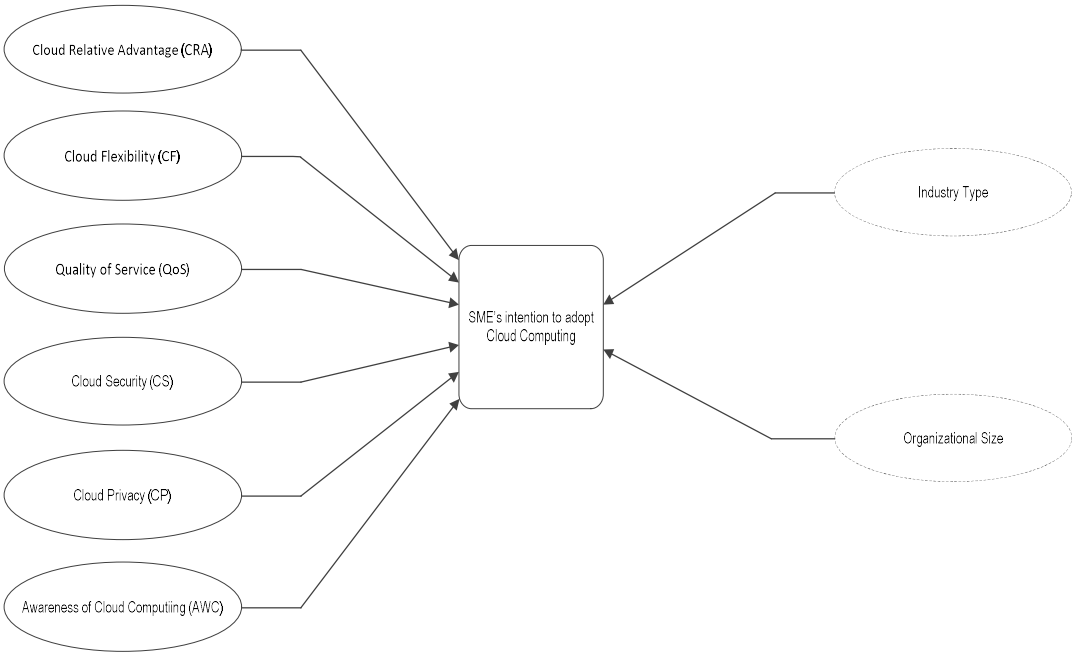


*Figure 1. Conceptual model of the factors that affect SMEs' adoption of cloud computing.*

[2] Software as a Service (**SaaS**) is a cloud model in which vendors host applications that customers access over a network i.e. the internet.

# 4 Methodology

## 4.1 Context: Small and Medium-Sized Enterprises (SMEs)

Given no universal definition of SMEs, as this study was conducted in Australia, we adopted the ABS' definition i.e., SMEs employ less than 200 people (specifically micro <4 people, small 5-19, and medium 20-199 people). Despite their importance in national economies, their lagged uptake of Internet innovation has been established (see Section 1). For example, despite the Australian market for cloud computing growing, and 94% of Australian SMEs having Internet access, only 44% use cloud computing compared to 86% of large organizations'.

## 4.2 Survey development

Based on the identified factors (see Section 3), a survey was developed with items adapted from previous research and/or industry reports (see Appendix A). The instrument comprised three parts covering: (1) company profile; (2) actual use of cloud computing; and (3) 28 items related to the 6 factors and adoption (CRA – 6 items; CF – 4 items; QoS – 4 items; CS – 3 items; CP – 3 items; AWC – 4 items; and Adopt – 4 items). A 7-point Likert scale (1 "strongly disagree" to 7 "strongly agree") was used to capture perceptual data. Pre-testing honed survey understandability, wherein items were reviewed and revised several times by the research team, then pre-tested on 10 SMEs from different industries. Refinements at each stage were based on the feedback received. The survey instrument (see Appendix B) was designed to capture respondents' use of cloud computing. For example they were asked: (1) whether they understood the differentiation between SaaS, PaaS and IaaS; (2) about their familiarity with private, public and hybrid cloud; and (3) to indicate what applications were used in their organization (i.e., Dropbox, Google docs, iCloud, Google Drive, Sky Drive, Office365, Jolidrive, Other).

## 4.3 Survey application and testing

An Australian marketing research company was used to identify/invite a stratified random sample of 1,179 respondents (SMEs) to complete the online survey. It is not recognized that there is no method to evaluate the expert authority of the marketing research company. Responses were collected in Qualtrics and downloaded into IBM SPSS V22 for analysis. Several analytical methods were used. For multivariate analysis, data were screened to check for missing data, outliers and normality (Pallant, 2011). Then descriptive summary analysis was performed using Cronbach's alpha to assess the reliability of the items ($\alpha$ >0.70 was used as the cut-off point). To verify each factor's validity, confirmatory factor analysis, using principal axis factoring extraction, was used on all 28 survey items. To test Hypotheses 1-6, results of the factor analysis were used as input values for the multiple regression analysis (MLR). The direct relationship between the six independent variables (CRA, CF, QoS, CP, CS and AWC) and the dependent variable (Adopt) was examined using Pearson's correlation and standard multiple regression. Since all six variables were considered equally important, a simultaneous enter method was chosen when performing MLR (Pallant, 2011). To test the effect of control variables (organizational size and type) on the dependent measure, an ANOVA was conducted. After organizations were categorized into two groups (micro and small/medium SMEs), a One-Way ANOVA was used.

# 5 Results and discussion

In total 191 responses were received. Due to incompleteness, 39 were excluded, leaving 149 usable responses i.e., an effective response rate of 13%, which is regarded as acceptable for statistical purposes (i.e., Harrigan et al., 2008), especially as there is consistency with rates achieved by prior research[3] (Denscombe, 2014). Descriptive analysis (see Table 2 below) showed that unsurprisingly states with larger populations provided higher response rates. The sampled SMEs comprised mainly micro enterprises (61.8%), with the remainder classified as small (20.8%) and medium (17.4%). 27.5% of the respondents indicated that they used some form of cloud computing.

| Category | No. of Responses | % |
|---|---|---|
| No. of employees | | |
| 0 to 4 (micro) | 92 | 61.8% |
| 5 to 19 (small) | 31 | 20.8% |
| 20 to 199 (medium) | 26 | 17.4% |
| State/Territory | | |
| Victoria | 29 | 19.5% |
| New South Wales | 30 | 20.1% |
| Queensland | 41 | 27.5% |
| Western Australia | 19 | 12.8% |
| South Australia | 17 | 11.4% |
| Tasmania | 10 | 6.7% |
| Northern Territory | 3 | 2.0% |
| Use of cloud computing | | |
| Yes | 41 | 27.5% |
| No | 108 | 72.5% |

*Table 2: Demographic characteristics of the responding organizations (n=149).*

Cronbach's alpha and factor analysis were used to determine whether there was adequate reliability and validity of the measures. The Cronbach's alpha score for each reflective indicator was >0.7, permitting confidence in accepting internal consistency (Hair et al., 2005). All extracted factors had an eigenvalue of 1 (Table 3) and each reflective indicator loaded strongly on its associated factor (loadings >0.50). As no reflective indicators cross-loaded (see Table 4), discriminant validity was established. This implied that the instrument provided a reasonable measure of the theorized model's predefined factors (see Figure 1). Orthogonal varimax rotation was used to produce factor structures that were uncorrelated. The rotated solution revealed unexpected reflective indicator groupings. Therefore factor analysis was run several times and indicators that did not load were removed i.e., <0.50 (Thompson, 2004) with the exception of CFA4. Three items (2 CRA items and 1 QoS item) were removed due to assumptions associated with Cook's distance (Pallant, 2011) (see Appendix A). The final model provides a clear solution with 6 extracted factors accounting for 62% of variability in the original data.

[3] The response rate is comparable with research reported by Garrison et al. (2015), Trigueros-Preciado et al. (2013) and Carcary et al. (2014).

| Factor | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings |
|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| AWC | 5.814 | 27.688 | 27.688 | 5.435 | 25.882 | 25.882 | 3.231 |
| CF | 3.089 | 14.711 | 42.399 | 2.838 | 13.514 | 39.396 | 2.435 |
| CRA | 2.080 | 9.906 | 52.305 | 1.707 | 8.128 | 47.524 | 2.137 |
| QoS | 1.799 | 8.568 | 60.873 | 1.329 | 6.330 | 53.854 | 1.850 |
| CP | 1.353 | 6.445 | 67.318 | 0.951 | 4.529 | 58.383 | 1.685 |
| CS | 0.987 | 4.698 | 72.016 | 0.583 | 2.777 | 61.160 | 1.506 |

*Table 3: Total variance explained.*
*Note: Extraction Method is Principal Axis Factoring.*

The pattern matrix (see Table 4) reveals all reflective indicators (items) load significantly on their respective factors (CRA, CF, QoS, CS, CP and AWC) with the exception of item CF4, although its loading (0.464) is above the 0.4 threshold (Hair et al., 2005). Further, the reflective indicators were not cross-loaded, supporting discriminant validity. Thus, there is reason to accept that the instrument provides a reasonable measure of the theorized factors.

| Items | Factor | | | | | |
|---|---|---|---|---|---|---|
| | CRA | CF | QoS | CS | CP | AWC |
| CRA3 | **.704** | .266 | .119 | .140 | -.018 | .062 |
| CRA1 | **.678** | .189 | .167 | .160 | -.017 | .064 |
| CRA2 | **.617** | .183 | .100 | -.117 | -.062 | .173 |
| CRA4 | **.588** | .255 | .153 | .045 | -.118 | .044 |
| CF1 | .330 | **.733** | .203 | .075 | -.081 | .135 |
| CF2 | .313 | **.693** | .139 | .096 | -.034 | .135 |
| CF3 | .244 | **.564** | .252 | .081 | -.133 | -.123 |
| CF4 | .255 | **.464** | .249 | .064 | -.004 | .014 |
| QoS1 | .264 | .158 | **.728** | .137 | .083 | .163 |
| QoS2 | .142 | .136 | **.740** | .044 | .053 | .148 |
| QoS3 | .105 | .321 | **.627** | .077 | -.006 | .133 |
| CS3 | .050 | .078 | .130 | **.722** | -.013 | .109 |
| CS1 | -.104 | .112 | -.001 | **.685** | -.166 | -.005 |
| CS2 | .266 | .000 | .072 | **.622** | .032 | -.064 |
| CP2 | .092 | -.132 | -.070 | .001 | **.879** | .057 |
| CP3 | -.019 | .095 | .175 | -.085 | **.724** | .023 |
| CP1 | -.215 | -.159 | -.008 | -.060 | **.551** | -.056 |
| AWC4 | .112 | -.011 | .131 | -.014 | -.018 | **.966** |
| AWC2 | .106 | -.039 | .127 | .002 | .013 | **.914** |
| AWC1 | .121 | .062 | .160 | .007 | -.018 | **.846** |
| AWC3 | -.012 | .131 | .028 | .056 | .040 | **.752** |

*Table 4: Pattern matrix of factor analysis for the independent variables.*
*Note: Extraction Method (Principal Axis Factoring); Rotation Method (Varimax with Kaiser Normalization); Rotation converged in 7 iterations.*

For the dependent variable, factor analysis yielded one factor (Adopt) with an eigenvalue >1 explaining 97.4% of the variance, with four reflective items loading strongly onto this extracted factor. No rotated pattern matrix was imposed as only one factor was extracted. All item loadings were significant i.e., >0.95 and all factor loading scores were saved as variables.

Next, multiple regression analysis (MRA) using the simultaneous enter method, was used to determine if the extracted factors could significantly explain SMEs' perceptions related to adopting cloud computing. Underlying assumptions of the regression analysis were assessed and met (ANOVA p-value <0.001). Parametric testing of our data, which was derived on a Likert Scale, is justified as testing by Norman (2010) showed that (1) "parametric tests not only can be used with ordinal data, such as data from Likert scales, but also that parametric tests are generally more robust than nonparametric tests " and (2) "parametric tests are sufficiently robust to yield largely unbiased answers that are acceptably close to "the truth" when analyzing Likert scale responses" (Sullivan & Artino, 2013, 541).

Significant factors contributing to these results were CRA, AWC and QoS. Most SMEs emphasized that their organization's needs could be met by cloud computing and agreed/strongly agreed (Mean 5.53 out of 7, SD 1.6458) with the statement that their organization would take steps to adopt cloud computing in the near future. Hypotheses 1-6 could now be considered with MLR used to identify the relative contribution of each independent variable (extracted factor). This technique has been widely used in previous IT adoption studies (e.g., Alam et al., 2011; Tan et al., 2010). The results are presented in Table 5 below. As a result, hypotheses 1, 3 and 6 were accepted (see Table 5 and Figure 2).

| Model | B | *Beta* | *t* | Sig. | Tolerance | VIF |
|---|---|---|---|---|---|---|
| (Constant) | 0.038 | | 1.157 | 0.249 | | |
| CRA | 0.187 | 0.190 | 5.635 | **0.000** | 0.994 | 1.006 |
| CF | -0.002 | -0.002 | -0.047 | 0.962 | 0.991 | 1.009 |
| QoS | 0.193 | 0.186 | 5.497 | **0.000** | 0.987 | 1.013 |
| CS | -0.018 | -0.019 | -0.564 | 0.574 | 0.999 | 1.001 |
| CP | 0.006 | 0.006 | 0.188 | 0.851 | 0.998 | 1.002 |
| AWC | 0.853 | 0.873 | 25.969 | **0.000** | 0.998 | 1.002 |

*Table 5: Coefficients of MLR*
*Note: $R^2$ = 0.840; Adj.$R^2$ = 0.833; F (6, 142) = 19.834; P <0.001*

In summary results indicate a significant and strong positive relationship between AWC and cloud computing adoption (Beta weight 0.873, p<0.001), with both QoS and CRA also indicating a significant positive influence (p <0.001). CS, CP and CF did not significantly contribute to modelled outcomes (p >0.05). ANOVA was conducted to test whether the influence of the independent variables on the dependent variable (Adopt) varied based on organizational size or industry type.

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 6.239 | 2 | 3.120 | 3.363 | .037 |
| Within Groups | 135.432 | 146 | .928 | | |
| Total | 141.671 | 148 | | | |

*Table 6: ANOVA (organization size and cloud adoption)*

As can be seen in Table 6, results indicate that adoption of cloud computing as a function of organizational size was statistically significantly different ($p < 0.05$), with small & medium enterprises more likely to adopt cloud computing than micro organizations. One possible explanation for this significant relationship is that small to medium organizations have greater resources to allocate to such initiatives than micro ones (see Section 2.1). Contrastingly, variances related to SMEs' industry types were not different and statistically not significant ($p > 0.05$). Given contrary findings from prior research (Ininedo, 2011; Levenburg et al., 2006), this result is unexpected. However, whilst not statistically significant, results suggest that the following industries are more likely to adopt cloud computing: professional, scientific and technical services; information, media and telecommunication; education and training; health care and social assistance; administrative and support services; manufacturing; electricity, gas and water and waste services; and retail trade.

As a result, the research model was revised to reflect the findings (see Figure 2 below). The model explains 83.3% of the variance and is consistent with the TOE/DOI structure that framed the study. Analysis shows reason to accept that the research model has statistical significance.

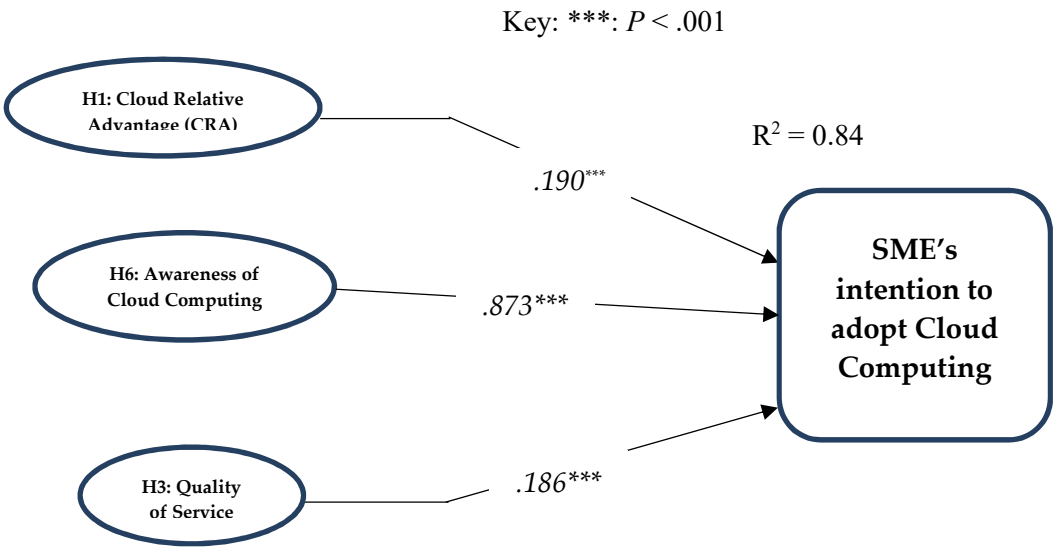


*Figure 2. Revised model showing the factors affecting SMEs' adoption of cloud computing.*

## 6 Contributions and implications for research and practice

Cloud computing offers flexible and affordable access to IT infrastructure, platforms and software. It has generated strong uptake by large organizations (ITA, 2015), but less in SMEs (Office of the Chief Economist, 2016). Yet its special characteristics, including pay-by-use access to previously unaffordable resources, accessibility from multiple locations, and protection against disaster risks, are equally significant for SMEs (Marston, 2011; DFD, 2013). As such, lagged uptake by SMEs (IDC, 2012), including those in Australia (ACMA, 2014), is

unexpected and a significant issue given their strategic contribution to national economies (Ayyagari et al., 2011). Rather than focusing on perceived barriers to SMEs' adoption of cloud computing (i.e., unsuitability for their business [IDC, 2012] or their lack knowledge [ACMA, 2014]), this research sought to probe to determine the factors influence SMEs' adoption.

The contributions from the research are fourfold. Firstly, it extends knowledge about adoption of cloud computing to SMEs where there is identified need for such a study (i.e., Table 1; Carcary et al., 2014; Yang & Tate, 2012). Whilst prior research provides important knowledge about cloud computing, "empirical studies that rigorously examine the proposed factors that might affect the adoption of cloud computing [are] needed" (Hsu et al., 2014, 475). Rather than using the Technology Acceptance Model and Unified Theory of Technology Acceptance, which focus on individuals and technology use, we drew upon the established use of TOE and DOI in our organizational context of cloud computing adoption (see Table 1), linking them with the factors identified in prior research and practitioner sources (see Appendix A). This aligns with Hsu et al. (2014, 476) that whilst "the three TOE dimensions influence adoption ... these dimensions must be uniquely operationalized in each specific innovation context". Our proposed research model comprised six factors (and their related indicators) with one dependent variable (Adopt) and two control variables. By testing the models' significance through a survey, our revised model (see Figure 2) addresses calls to develop a model for SMEs' adoption of cloud computing (Carcary et al., 2014) that may be referenced in future research.

Secondly, as the first study to investigate Australian SMEs' decision-making regarding adoption of cloud computing, findings show that organizational size (micro/small vs medium) is significant even within the SME construct (see Table 6), with small & medium enterprises more likely to adopt cloud computing than micro organizations. These findings refine research on this topic, as to date research has been limited to revealing differences between larger and smaller organizations' adoption of cloud computing (i.e., Brender & Markov, 2013; Low et al., 2011; Guiterrez et al., 2015). In contrast to other research (i.e., Alshamaila et al., 2013; Oliviera et al., 2014), industry type was not found to be influential.

Thirdly, in the context of cloud computing, our findings reveal that the primary influence upon SMEs' decision-making relates to the benefit in building organizational capability. This is reflected in the three primary influences being: relative advantage (increasing profits, reducing costs, creating business opportunities); quality of service (creating a flexible business environment with dynamic scaling and accessibility); and awareness of cloud (related to understanding the opportunities of various options). Relative advantage has previously been identified as a significant influence (Oliviera et al., 2014; Gangwar et al., 2015), as has top management support (Abubakar et al., 2014; Rowe et al., 2012; Gangwar et al., 2015), which may be linked to awareness/knowledge about cloud computing. Our finding that the three significant influences are relative advantage, quality of service and awareness of cloud computing, suggests that SMEs are influenced by cloud computing's value to build IT and organizational capability. This contrasts with Hsu et al. (2014) who found that perceived benefits and IT capability were non-significant.

Fourthly, findings show that risk-related factors such as security (sensitive information); privacy (trust and issues with location of hosting); and flexibility (reliability, responsiveness and availability) were of lesser significance. This contrasts with prior research (i.e., Gupta et

al., 2013; IDC, 2012; ACMA, 2014). One interesting concern raised by SMEs was lack of resources, a reflection of SMEs' capabilities.

Finally, there are implications for practice. Our findings provide guidelines for decision makers by revealing the factors SMEs consider important as they evaluate cloud adoption. For example, the importance attributed to relative advantage should encourage decision makers to evaluate potential benefits regarding organizational capability. The weighting afforded to awareness and service quality may encourage a focus on strategically evaluating potential benefits related to resource utilization, increased productivity, and cost/benefit analysis. The findings also help software vendors to devise a strategy to cater for this category, offering components of a system as a module instead of offering a system as a whole (e.g., the components of an ERP system). Similarly, the Australian Federal Government can reflect upon the cloud computing framework when developing policies for SMEs to facilitate them to reduce the cost of their IT operations and reach globalization.

# 7 Conclusion and limitations

This study examined the factors that influence cloud computing adoption by Australian SMEs. Our results reveal a significant and strong positive relationship between awareness of cloud computing and cloud computing adoption, with both quality of service and cloud relative advantage also having significant positive influences. Cloud security, privacy and flexibility did not significantly contribute to modelled outcomes. Findings also indicate that organizational size was significant even within the SME construct (i.e., micro/small vs medium enterprises).

There are a number of limitations to the study. For example, the survey was restricted to Australian SMEs, limiting generalizability. Moreover the quantitative methodology suggests value in additional qualitative techniques to consolidate our derived understanding. Inclusion of factors such as culture, different legal systems and cloud providers' management styles would also be useful extensions.

Given the value that larger organizations perceive in cloud computing, as evidenced by their substantial investments, together with the contribution of SMEs to national economies and SMEs' lagged uptake of this technology, it is important to understand why SMEs' intentions are being so slowly translated into what is recognized by their larger counterparts, namely the business value that can be generated from adopting cloud computing.

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# Appendix A: Sources of items for the survey instrument.

| Factor | Academic | Government | Practitioner | Key points for 28 items |
|---|---|---|---|---|
| **Cloud Relative Advantage (CRA)** | Oliveira et al. (2014); Tehrani & Shirazi (2014); Vanessa (2014); Gangwar et al. (2015) | DBCDE (2013); DOC (2014) | Hutley (2012); Ben (2014) | 1. Increase profits<br>2. Reduce operating costs<br>3. Allow organization to start new businesses<br>4. Better communication with customers & suppliers<br>*5. No upfront capital investment**<br>6. *Capability to extend/reduce access at any time** |
| **Cloud Flexibility (CF)** | Oliveira et al. (2014); Tehrani & Shirazi (2014); Li et al. (2015); | ITIIC (2011); Jansen & Grance (2011); DBCDE (2013); DOC (2014) | Frost & Sullivan (2011); Hutley (2012); ACCA (2014); Ben (2014); Minifie (2014) | 1. Cloud Computing (CC) is a reliable service<br>2. CC is highly available<br>3. CC is an up-to-date service<br>4. CC responds quickly to customers' requests |
| **Quality of Service (QoS)** | Kauffman et al. (2014); Mero & Mwangoka (2014); | ITIIC (2011); Jansen & Grance (2011); DBCDE (2013); DOC (2014) | Jansen & Grance (2011); Telstra (2011); Herhalt & Cochrane (2012); Ren et al. (2012) | 1. CC creates a flexible environment<br>2. CC permits dynamic resource scaling<br>3. CC means access to cloud from various client devices<br>*4. CC enables agility re changing business environment** |
| **Cloud Security (CS)** | Oliveira et al. (2014); Tarmidi et al. (2014); Tehrani & Shirazi (2014); Gangwar et al. (2015); Li et al. (2015); Safari et al. (2015); Tang and Liu (2015) | DFD (2011a); ITIIC (2011); Jansen & Grance (2011); Anthony (2012); DBCDE (2013); IMO (2013); DOC (2014) | Telstra (2011); Herhalt & Cochrane (2012); Pearson (2012); Ren et al. (2012); Ben (2014); Minifie (2014) | 1. Security is a major concern with CC<br>2. CC is more secure than traditional computing |

| | | | | |
|---|---|---|---|---|
| | | | | 3. We are willing to host sensitive information on CC |
| **Cloud Privacy (CP)** | Tehrani & Shirazi (2014); Vanessa (2014); Gangwar et al. (2015); Safari et al. (2015); Tang & Liu (2015) | Anthony (2012); DFD (2011a; 2011b); IMO (2013) | Telstra (2011); Herhalt & Cochrane (2012); Pearson (2012); Ren et al. (2012); Ben (2014); Minifie (2014) | 1. Prefer Australian storage<br>2. Feels less privacy with storage in different country<br>3. Feels CC cannot be trusted |
| **Awareness of Cloud (AWC)** | Tarmidi et al. (2014); Tehrani & Shirazi (2014); Shetty & Kumar (2015) | ITIIC (2011); Jansen & Grance, (2011); Anthony (2012) | Ko et al. (2011); Pearson (2012); Ning (2013); ACCA (2014); Minifie (2014) | 1. Our organization aware of CC<br>2. Difference between SaaS, PaaS and IaaS understood<br>3. Aware CC linked with other applications<br>4. Familiar with public, private and hybrid cloud services |
| **Adopt** | Oliveira et al. (2014); Tehrani & Shirazi (2014); Vanessa (2014); | DFD (2011c) | CSA (2009); Pearson (2012); Dave (2012) | 1. Our organization intends to adopt cloud computing<br>2. Our organization feels that the organization's needs can be met by cloud computing<br>3. Our organization will take steps to adopt cloud computing in the future<br>4. Our organization will adopt cloud computing in the next twelve months |

**Items deleted during factor analysis i.e., CRA 5, CRA 6, and QoS 4*

# Appendix B: The survey instrument

qualtrics.com

What is your position?

- Owner
- CEO
- IT Manager
- IT Executive
- Other

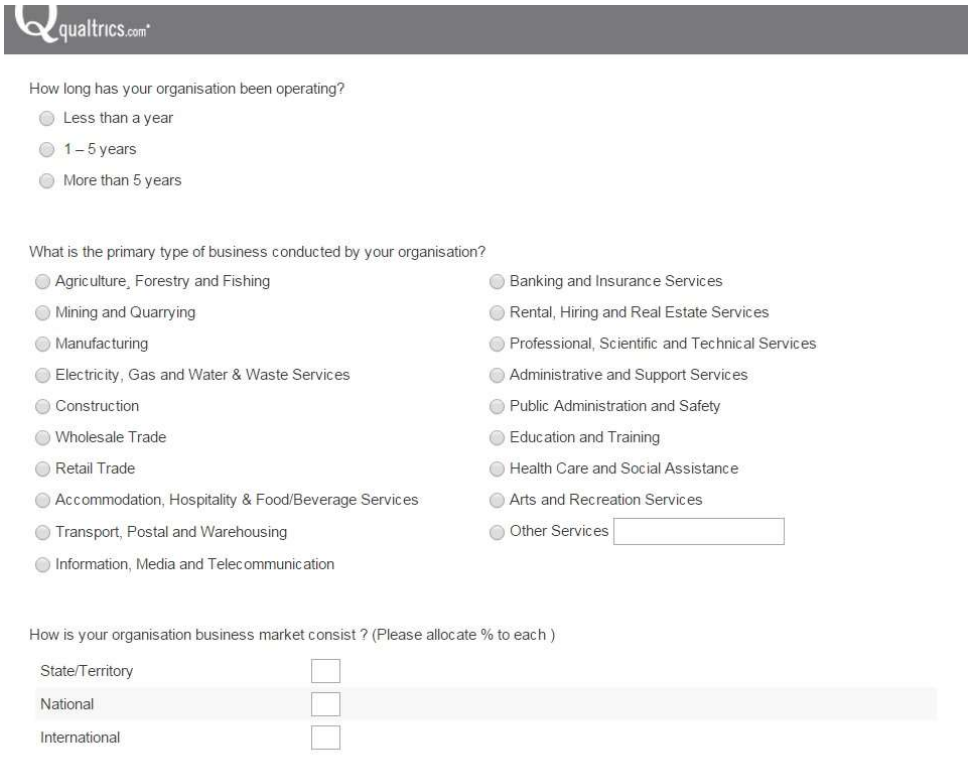
***Part I - Company Information***

Approximately how many employees does your organisation employ?

- 0-4 Employees (Micro)
- 5-19 Employees (Small)
- 20-199 Employees (Medium)
- 200+ Employees

Next

Survey Completion
0% 100%



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How long has your organisation been operating?

- Less than a year
- 1 – 5 years
- More than 5 years

What is the primary type of business conducted by your organisation?

- Agriculture, Forestry and Fishing
- Mining and Quarrying
- Manufacturing
- Electricity, Gas and Water & Waste Services
- Construction
- Wholesale Trade
- Retail Trade
- Accommodation, Hospitality & Food/Beverage Services
- Transport, Postal and Warehousing
- Information, Media and Telecommunication
- Banking and Insurance Services
- Rental, Hiring and Real Estate Services
- Professional, Scientific and Technical Services
- Administrative and Support Services
- Public Administration and Safety
- Education and Training
- Health Care and Social Assistance
- Arts and Recreation Services
- Other Services

How is your organisation business market consist ? (Please allocate % to each )

| | |
|---|---|
| State/Territory | |
| National | |
| International | |

Where is the location of your organisation?

- Regional
- Metro
- Multinational

Which state / territory you are in?

- VIC
- NSW
- QLD
- WA
- SA
- TAS
- NT
- Other

Post Code:

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Do you understand the differentiation between: Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS)?

- Yes
- No

Are you familiar with Private Cloud, Public Cloud and Hybrid Cloud?

- Yes
- No

Which of the following applications does your organisation use? (Select all applicable)

- Dropbox
- Google Docs
- iCloud
- Google Drive
- SkyDrive
- Office365
- Jolidrive
- Other

Does your organisation use Cloud Computing?

- Yes.
- No.

Next

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What types of cloud computing are currently being used in your organisation?

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If Cloud computing is being used, Directed to:

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Please indicate how much you disagree or agree with each of the following statements based on a scale ranging from: Strongly Disagree to Strongly Agree

| | Strongly Disagree | Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| Adopting Cloud Computing... increased the profitability of our organisation | | | | | | | |
| allowed for reduced operational costs | | | | | | | |
| allowed us to enter into new businesses or markets | | | | | | | |
| allowed better communication with our suppliers and customers | | | | | | | |
| required no up-front capital investment | | | | | | | |
| provided to extend or reduce resources any time | | | | | | | |
| created a flexible service-oriented environment | | | | | | | |
| provided dynamic resource scaling | | | | | | | |
| provided access to Cloud services from various client devices | | | | | | | |
| increased the ability of a business to adapt rapidly and cost efficiently in response to changes in the business environment | | | | | | | |
| Our organisation... considers Cloud Computing as a reliable service | | | | | | | |
| considers that service availability of the Cloud Computing is high | | | | | | | |
| believes that Cloud Computing provides an up to date service | | | | | | | |
| knows that Cloud Computing response quickly to customer requests | | | | | | | |
| concerns about the security of the Cloud Computing | | | | | | | |
| considers that Cloud Computing is more secure than traditional computing | | | | | | | |
| uses Cloud Computing to host sensitive information Ex: financial information, personal information etc. | | | | | | | |
| prefers to store data in the Cloud data centre located in the Australia | | | | | | | |
| feels a loss of privacy as Cloud services run from a different country (different privacy legislation applies) | | | | | | | |
| feels Cloud Computing can't be trusted | | | | | | | |

If Cloud computing is being used without aware, Directed to:

Please indicate how much you disagree or agree with each of the following statements based on a scale ranging from: Strongly Disagree to Strongly Agree

| | Strongly Disagree | Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| Adopting cloud computing... increased the profits of our organisation | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| allowed for reduced day to day activities costs | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| allowed us to start new businesses | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| enabled better communication with our suppliers and customers | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| required no initial capital investment to use IT | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| allowed to access Cloud Computing any time easily | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| created a flexible environment to operate | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| allowed to extend or reduce resources any time | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| provided access to Cloud services from various client devices (eg:- laptop, tablet, smart phone etc...) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| increased the ability of a business to change to an external environment more rapidly and cost efficiently | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud Computing provides a reliable service | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud Computing service is highly available | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud Computing provides an up to date service | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud Computing response quickly for customer request | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| security is a major concern when adopting Cloud Computing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud Computing is more secure than traditional computing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| uses Cloud Computing to keep sensitive information Ex: financial information, personal information etc. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| prefers to store data in the Cloud located within the Australia | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| data has less privacy in the Cloud as it is run from a different country (different privacy legislation applies) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Cloud Computing can't be trusted | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

If Cloud computing is not being used, Directed to:

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Please indicate how much you disagree or agree with each of the following statements based on a scale ranging from: Strongly Disagree to Strongly Agree.

| | Strongly Disagree | Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| Adopting cloud computing... may increase the profits of our organisation | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may allow for reduced day to day activities costs | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may allow us to start new businesses | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may enable better communication with our suppliers and customers | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may require no initial capital investment to use IT | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may provide to access any time | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may create flexible environment to operate | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may allow to extend or reduce resources any time | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may provide access to Cloud services from various client devices (eg:- laptop, tablet, smart phone etc...) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may increased the ability of a business to adapt rapidly and cost efficiently in response to changes in the business environment | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Our organisation... is aware of Cloud Computing services | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| understands the difference between Saas, Paas, and Iaas | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| is aware that Cloud Computing is linked with other applications | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| realises the difference between Public, Private, and Hybrid Cloud services | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| realises Cloud Computing provide a reliable service | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| realises that Cloud Computing service is highly available | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| believes that Cloud Computing provides up to date service | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| thinks that Cloud Computing may response quickly to customer requests | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| is concerned about the security of the technology used in Cloud Computing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| feels that Cloud Computing may be more secure than traditional computing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| may be willing to use Cloud Computing to host sensitive information Ex: financial information, personal information etc | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| is willing to store data in the Cloud data centre located in the Australia | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| feels a loss of privacy as Cloud services run from a different country (different privacy legislation applies) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| feels Cloud Computing can't be trusted | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| intends to adopt cloud computing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| feels that organisation's needs can be met by Cloud Computing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| will take steps to adopt cloud computing in the future | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| will adopt cloud computing within the next 12 months | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

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What are the top drivers of cloud computing initiatives at your organisation?

Can you explain about the main issues that you are most worry about your company adopting cloud computing?

Please explain if there any influence of available IT resources (Eg:- servers, PCs, network etc...) of your company to the process of Cloud adoption? If not why?

Would you like to receive more information about this study (including the results) in the future.

- Yes
- No

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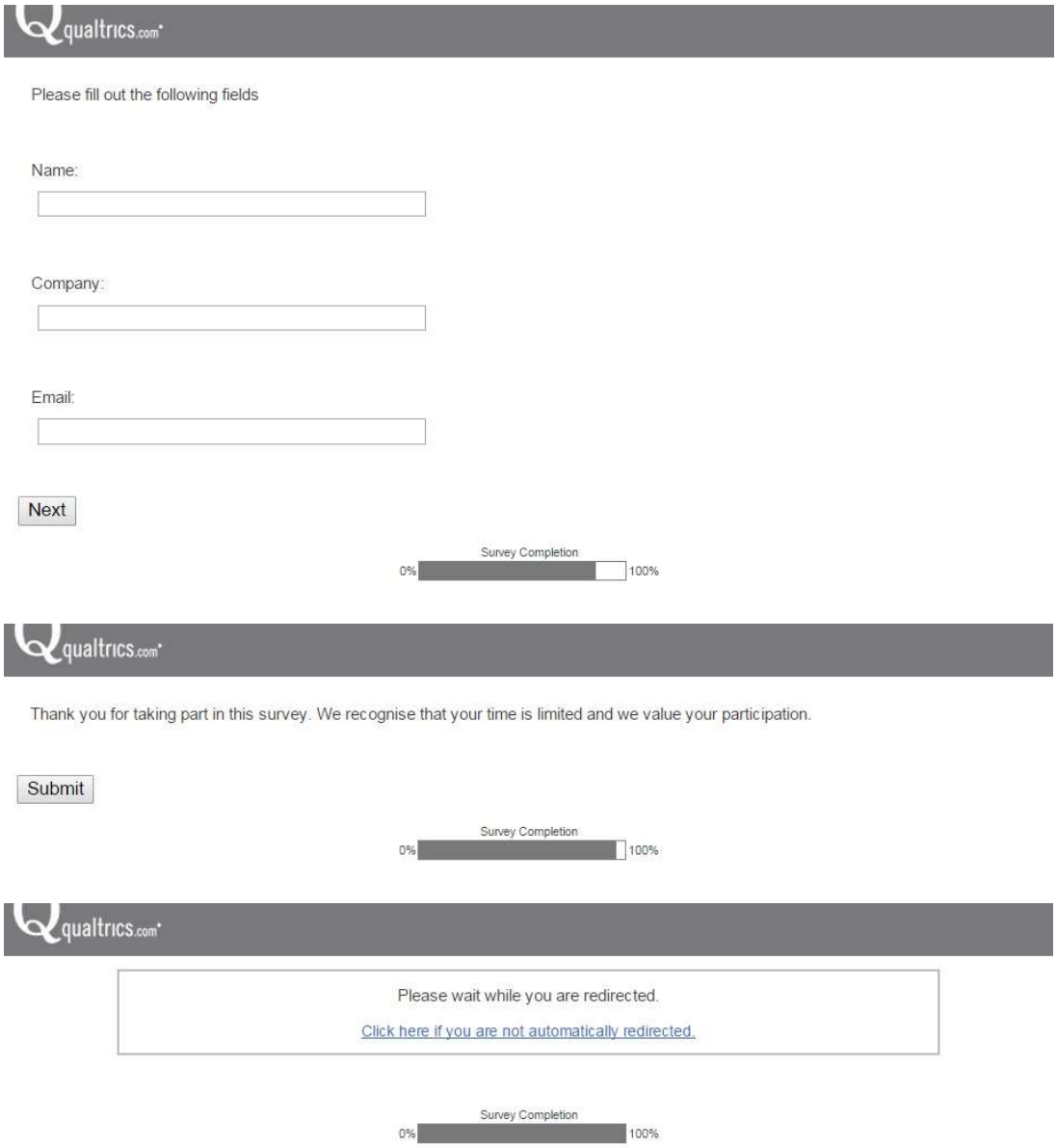


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