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Governance in the Cloud: Role of Certification for SME Trust and Adoption

Alea Fairchild
Hogeschool-Universiteit Brussel, alea.fairchild@hubrussel.be

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Hogeschool-Universiteit Brussel
alea.fairchild@hubrussel.be

Abstract

Growth of cloud computing as a concept continues to pose challenges on how to deliver agile, yet secure, IT services to enterprises. While the hype surrounding cloud computing may have peaked, the concept of "cloudwashing" (adding the term "cloud" to an existing service for marketing reasons) continues to cause confusion and inflated expectations with enterprise buyers. This fear, uncertainty and doubt (FUD) just slows down the growth of a potentially larger market. This is especially true for small and medium sized businesses (SMEs) who turn to IT providers to handle the underlying systems for their businesses.

To assist cloud service buyers, a recent communication from the European Commission advocated voluntary certification for cloud service providers. This has sparked a debate as to the relevance and authority of certification bodies in verifying the ability and capability of cloud service providers (CSP).

In this research in progress paper, we present the current status of our research on examining what role third party certifiers can play in adoption of cloud by SMEs, with a case study of one certifier in Europe already involved in market adoption to test our framework.

Keywords

Cloud, Governance, Information Economics, Adoption, Regulatory, Trust.

1. Introduction

Buyya *et al.* (2008) defines cloud as: "*…a type of parallel and distributed system consisting of a collection of interconnected and virtualised computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers."*

This definition shows a computing resource as a service being provided; there is an agreement for said service; and the fact that this service is negotiated between parties. The forms of service that cloud computing provides today may be broken down into managed services, software as a service (SaaS), web services, utility computing, and platform as a service (PaaS). The ideas

behind these forms of service are not new, but the fact that the users can tap into these services from web browsers via the Internet makes them "cloud" services (Kim, 2009).

Cloud-based software is often easier to use, quicker to install and implement, and provides far greater flexibility than on-premise solutions that need to be installed and maintained, especially for SMEs without resources for a dedicated IT staff. Cloud-based software can also help small businesses lower costs, often by a significant amount. A recent survey by market research firm IDC found that almost every SME that uses cloud services saves money, with many lowering costs between 10% and 20%. Despite these benefits, the path to the cloud has been bumpy, particularly in Europe, and due to a convoluted web of privacy laws and other governmental regulations, as well as concerns about data security, analysts estimate that business cloud adoption in Europe lags behind the US by about two years (Guardian Professional, n.d.). Cloud provides a big opportunity for Europe, and openness is the key attributed to provide opportunity for SMEs, with a concern that lock-in and barriers to entry could block that opportunity.

As part of their Europe 2020 strategy on cloud computing, the European Commission's recently released strategy to boost adoption of cloud computing services throughout Europe had a statement was that ‘cloud certification should be voluntary and industry driven, building on current and emerging international standards to foster global compatibility of cloud computing offerings’ (European Commission, 2012).

But is certification good for making and growing a marketplace? What is the role of certifiers in making a market, and how are they regulated? Auriol and Schilizzi (2003) show us that there is a problem signaling the quality of goods and services when quality is never observable to consumers. Certification acts to transform unobservable credence attributes into observable search attributes. They then studied the cost of certification systems on market structure and performance in agricultural seed production. Given we are discussing an intangible deliverable, since this is a service, that is not available in bulk, we will take a slightly different approach.

The central research question is: **“What are the benefits of cloud service certification for building trust and establishing market growth for SME customers?”**

Our research objectives are the following:

- Define the role of the certifier in creating trust and establishing credibility
- Examine the impact of certification on market development
- Explore how best to regulate the certification process to protect user benefits, if needed

For our methodology, we will explore the role of the certifier by examining complementary markets where certification is active to see how trust has been created as well as the impact over time on market growth; and by examining the activities of one particular early market entrant in certification to see how stakeholder dynamics work between them, their customers, and the government bodies in the countries where they are present. Using a case study in this research is motivated by seeing examples in the field to test and extend theory.

2. Role of third party certifiers

Fundamental concepts from information economics can provide a framework for examining the role of third-party certifiers, who are "external institutions that assess, evaluate, and certify quality claims" (Deaton, 2003). Five important concepts we can use for this framework from an information economics perspective are:

1) uncertainty;
2) information asymmetries;
3) opportunistic behavior;
4) divergences between private and social returns; and
5) signaling institutions.

For the framework of our evaluation of the role of certifiers, we started with Spence's (1973) article on Job Market Signaling, which provides an approach for thinking about countervailing institutions (institutions that emerge to address problems that arise from uncertainty and asymmetric information). Given uncertainty in the market some individuals or institutions may attempt to signal differences to prospective buyers or employers. Differentiation is critical to position a firm amongst its competitors.

We then looked at Tanner's (2000) argument that third-party certifiers' key asset is their perceived independence. If third-party certifiers are truly independent, than the costs of obtaining third-party certification (for a quality attribute) will be inversely related to the quality of a firm and/or its product. If this were not the case, third-party certification would not allow for discrimination on the basis of quality. Masters and Sanoga (2002) raise an additional point in that they argue that the emergence of third-party certifiers depends, in part, on the presence of a national standards authority. In a sense they provide a basis for certifying the certifiers.

We also have included other industry-specific certifications and quality seals in our evaluation of the role of certification and their role in trust with SMEs. The first example is ISO/IEC 27001, initially published in 2005, designed for information security management and assists firms in developing an independently assessed and certified information security management system. This standard allows SMEs to protect their reputation, as well as compete with bigger brands. We also explored SAS70 II certification, which is developed by the American Institute of Certified Public Accountants (AICPA) and used for audit control for activities and processes in services in ICT in the dedicated server and co-location hosting market. We also included in our analysis Eurocloud's Datacentre Star Audit (DCSA), which is a more niche seal of approval for data centers throughout Europe.

In examining existing related theory, we utilise Habib *et al.* (2010) on trust and reputation in cloud environments. In online service environments, trust and reputation models have been proven useful in decision making (Jøsang et al, 2007). We have also included research from Prezas (2008) on trust and ISO/IEC 27001 certification.

Using a framework developed on these information economics concepts and information from other certification and quality seal market efforts, we will therefore be examining the dynamics of market adoption based on:

- Signaling quality in cloud service provisioning
- Independence of certification bodies in impacting market adoption
- Regulatory backing for trust of certification bodies

After structuring this framework, we will then examine the Cloud Industry Forum as an example of a certifying organization and how their offerings match with the framework as to impact of market growth and adoption.

3. Case study: Cloud Industry Forum

The Cloud Industry Forum (CIF) is a non-profit organization based in the UK and was developed to assist in advocating cloud adoption. The CIF has been establishing research in cloud adoption, in order to create commonality in language and standards. They claim that they are trying to enable innovation in the marketplace, not restrict it (CIF, 2012).

The CIF has developed a Code of Practice that aims to provide transparency amongst Cloud Service Providers (CSPs), to assist Cloud Service Users (CSUs) in determining the core information necessary for decisions on adoption of Cloud services, and to incorporate current standards and frameworks (e.g. ISO 9001, ISO 14001 and ITIL®) requiring provision of organizational, commercial and operational information which are independently reviewed. The CIF proposes an annual self certification process for CSP's, which would be an online submission based on offline review (CIF, 2012).

The three pillars that provide the scope and framework for their certification are:

1. **Transparency:** Of the organisation, its structure, location, key people and services. This has to be reflected on your website.
2. **Capability:** The processes and procedures in operation to support the delivery of services and customer experience.
3. **Accountability:** Commitment of senior executive to the Code of Practice and behaviour with customers.

If successful, this would lead to an approval to use certification mark and listed on the CIF site as a self certified vendor.

4. Current state of this research

As of February 2013, we are gathering data on other certification efforts in the ICT market and how these have impacted these markets over time. We are making arrangements with the CIF to interview a few of their certified members as to the impact of the certification on their business. And we have a planned survey of SME businesses in progress as to the relevance of certification on their adoption plans.

References

Auriol, E., & S.G. Schilizzi (2003) Quality signaling through certification: theory and an application to agricultural seed market. IDEI Working Paper, 165.

Buyya, R., C.S. Yeo, & S. Venugopal (2008) "Market-oriented cloud computing: Vision, hype, and reality for delivering it services as computing utilities", In High Performance Computing and Communications, 2008. HPCC'08. 10th IEEE International Conference on (pp. 5-13). IEEE.

Cloud Industry Forum (CIF) (2012) 'Certification' within Cloud Computing. Hero or Villain? Presentation of Andy Burton at OFA Round Table 23rd November 2012, Brussels, Belgium.

Deaton, B.J. (2004) "A theoretical framework for examining the role of third-party certifiers", Food Control. December, 615–619.

European Commission (2012) Steering Board of the European Cloud Partnership, Retrieved December 8, 2012, from http://ec.europa.eu/digital-agenda/en/news/steering-board-public-statement

Guardian Professional. (n.d.) "Security, performance, fear or confusion: what's holding back cloud adoption?". Retrieved December 8, 2012, from http://www.guardian.co.uk/media-network/media-network-blog/2012/apr/11/cloud-computing-adoption?INTCMP=SRCH

Habib, S. M., S. Ries and M. Muhlhauser, M. (2010) Cloud computing landscape and research challenges regarding trust and reputation. In Proceedings of the 2010 Symposia and Workshops on Ubiquitous, Autonomic and Trusted Computing (pp. 410-415). IEEE Computer Society.

Jøsang, A., R. Ismail and C. Boyd (2007) A survey of trust and reputation systems for online service provision. Decision Support Systems, 43(2), 618-644.

Kim, W. (2009) Cloud computing: Today and Tomorrow. Journal of Object Technology, 8(1), 65-72.

Kim, W., S.D. Kim, E. Lee & S. Lee. (2009) "Adoption issues for cloud computing", In Proceedings of the 11th International Conference on Information Integration and Web-based Applications & Services (pp. 3-6). ACM.

Masters, W. A., & D. Sanogo (2002) "Welfare gains from quality certification", American Journal of Agricultural Economics, 84(4), 974–989.

Prezas, N. (2008) Advent of ISO/IEC 27001 Certification and its Role in Initial Inter-organizational Trust. From the Convener, 37.

Spence, A. M. (1973) "Job market signaling", Quarterly Journal of Economics, 87(3), 355–374.

Tanner, B. (2000) "Independent assessment by third-party certification bodies". Food Control, 11, 415–417.