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CLOUD Structure Adoption - Theoretical and Practical Analysis of the Adoption Rate of Cloud Computing : Technological, Organisational and Environmental Aspects
雲計算採納的理論與實踐分析：技術、組織與環境的因素

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Abstract

According to Business Analyst firms like Gartner Cloud Computing is strongly evolving and is already making a sustainable change to the ICT landscape worldwide. The Information Systems Audit and Control Association (ISACA) summarized in a Whitepaper on Cloud Computing in 2009 that economic pressure with a Global Financial Crisis but also the strong moves into a globalized world force enterprises to find new ways to improve the efficiency of IT systems, their availability and scalability and decrease costs (CAPEX and OPEX). They state: *"Many parties claim that "cloud computing" can help enterprises meet the increased requirements of lower total cost of ownership, higher return on investment, increased efficiency, dynamic provisioning and utility-like pay-as-you-go services. However, many IT professionals are citing the increased risks associated with trusting information assets to the cloud as something that must be clearly understood and managed by relevant stakeholders."*

This study is providing a deep research into the motivation of corporations to adopt Cloud structures. One main distinction is the theoretical AND the practical approach to the subject.

A focal point which motivated this piece of work was the contradiction in statements between frightened Business / IT Managers on the one hand-side, who said that they won't use Cloud Technology because of security concerns and those researchers / analysts of Gartner and alike on the other side which stated that security is much better in the cloud.

It turned out that in order to get a real good understanding of the issue one has to enlarge the picture as a lot more aspects have a substantial impact on the adoption of Cloud Structures.

Thus the research questions which are answered in this study are firstly looking into the organisation of an Information Technology department and its management and their changes which arise from the successful introduction of Cloud Structures.

Of course the next question is secondly around the topic of security. How can a safe security level be ensured in a cloud within a transformed IT department, and which issues are required to be solved in a technically sound manner – which must be addressed by the organisation (governance and regulations) – and which issues can be addressed through contracts?

Thirdly, what new security challenges arise during a transition into cloud computing that had not occurred before moving into the cloud?

And finally, which expectations and goals attached to the introduction of cloud computing become an actual reality after the transition, and which goals are unmet?

Based on the theoretical framework of Tornatzky et al of the technological, organizational and environmental framework (Tornatzky et al., 1990) as a core theory this research work uses a mixed method approach.

However the unusual approach in this piece of work is that a quantitative analysis is done first. This part used a survey and reached out to more than 1,200 IT decision makers worldwide. It finally resulted in around 180 responses. Those quantitative findings then triggered phase two of this study. A qualitative part (interviews) tried to address further, deeper questions and aspects which didn't match practical and decades of experiences of the author. The qualitative part, the interviews, followed the path of the quantitative research and the theoretical approach which was used in the first place. But it added to the dimension of technology, organisation and environment and second dimension or a second perspective. The client or user view of decision makers of different industries and out of different geographies (USA, Asia and Europe) was compared and enriched with the angle of view of vendors on the one hand-side and the government view on the other side. This by itself provided an entirely new and very precious perspective on very important aspects such as efficient governmental support and initiatives as well as contractual aspects in terms of SLA design and legal frameworks.

This study makes a significant contribution to the understanding of the decision making process on why to adopt Cloud Structures. It then supports the management on the aspects which need to be considered in the planning of Cloud Structure adoptions.

Technology-wise, security, which is one of the findings, is an end-to-end process. It starts in the Cloud and eventually ends on the endpoint, which used to be a desktop computer but is nowadays a tablet or mobile phone. Increasing security doesn't need to be an expensive exercise but a focus on security as a process can help increasing the actual protection against cyber threats. From an organizational point of view the melting between information technology and business units is a key novelty. In order to keep up with the speed of the information age it is absolutely vital to merge

information and business skills not only in systems but also in people. Finally considering environmental aspects governments can have significant impact on the rate to which national organisations adopt cloud structures. Of course the legal framework such as privacy regulations are one key duty of governments but maybe even more important is the role in infrastructure policies. Internet bandwidth is key to satisfying utilisation of Cloud Structures. Countries with a lower urban concentration of industries will need to have a high coverage of high bandwidth and thus fibre-optic access even in very rural areas.