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Key Issues for the Successful Adoption of Cloud Computing

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Abstract

Cloud Computing constitutes an alternative for organizations who do not intend to invest in in-house IT resources. It offers a service model on the premise that the consumer has at its disposal the means for manipulating information, over the internet, according to its current needs. However, outsourcing IT poses various challenges, such as the effective control of IT, attention to an increasing number of threats posed by the Internet ecosystem and concerns regarding the efficient use of resources. Hence, the uncertainties about the migration to Cloud Computing can have a negative impact on the adoption of this technology. In order to better inform the decision process launched by organizations considering the alternative of Cloud Computing, this study presents a list of key issues compiled from literature that could assist IT managers steering the organization towards the path of adopting Cloud Computing solutions efficiently and securely. In addition, to better understand those issues and rank them in terms of importance, interviews were conducted with IT directors of enterprises that use and provide Cloud services, endowing the list of issues with the views of practitioners that successfully experienced the migration to the Cloud environment.

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1. Introduction

Cloud Computing (CC) has been a major technological trend in recent years, drawing the attention of both IT professionals and researchers. Although many publications concentrate on the technical aspects of CC, the focus on organizational aspects is increasingly frequent given the interest of organizations in adopting this technology. The literature includes works on the process and life cycle that enable the creation of a favorable setting in organizations to implement CC solutions. The review of those works led us to compile a list of key issues that may prove useful to IT managers when they consider the organizational requirements needed to adopt CC in a secure and efficient manner.

In this paper we argue that the usefulness of the list of issues may be improved by instilling it with the view of practitioners, namely of those that have conducted the migration to CC in their organizations. Besides having experience with this kind of technology, those practitioners may also have learnt lessons in the implementation process of CC that are relevant to other organizations considering the path to CC. To this end, this research targeted IT providers of CC solutions in the region of Castilla y Leon in Spain, where Cloud solutions received financial resources of more than one million euros in 2015 to assist enterprises of IT sector for the migration or development of software solutions in the cloud (AETICAL 2015). The analysis of the collected data provided insights on how to improve the decision-making process that guides the adoption of CC.

2. Cloud Computing

CC are deposits of virtualized IT resources readily usable and accessible, in which the vendor warranties the use and quality of use of those resources to customers and the customers are charged for what they really use (Mell and Grance, 2011). The vendors of CC services provide users with access to IT resources at a lower cost if we consider that customers do not need to acquire and maintain an IT infrastructure. In addition, CC implements a model for enabling ubiquitous, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction (Mell and Grance, 2011). Table 1 lists five essential characteristics of CC.

Table 1 - Five essentials characteristics of cloud computing. Adapted from Mell and Grance (2011).

Characteristic	Description
On-demand self-service	Consumers can unilaterally provision computing capabilities (e.g., server time and network storage), as needed automatically without the need of human interaction with provider
Broad network access	Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous client platforms
Resource pooling	The provider's computing resources are pooled to serve multiple consumers, with different physical and virtual resources dynamically assigned according to consumer demand
Rapid elasticity	Capabilities can be elastically provisioned and released to scale rapidly with demand
Measured service	Cloud systems automatically control and optimize the use of resources by leveraging a metering capability at some level of abstraction appropriate to the type of service

There are various advantages in the adoption of CC. Gutierrez and Lumsden (2014) highlight the following three main benefits of CC. The most frequent benefit relates to cost reduction, such as the removal of IT infrastructure in the organization along with its direct and indirect costs. Resource rationalization is another advantage since the service is dynamically scalable because users only consume the computing resources they actually use. Portability is another advantage as the feature can be accessed not only from any computer connected to the internet, but also from any type of device, such as mobile phones, tablets, laptops, or desktop computers, and from any geographical location.

The focus of this study is on Public Clouds, the most common type of CC available to individual customers and run by third parties. The option for Public Clouds results from the belief that in this model of deployment, the exploration of IT resources can achieve higher levels of optimization at lower costs.

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