A Decision Table for the Cloud Computing Decision in Small Business

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ABSTRACT

An issue facing the manager of a small business is the use of cloud computing to meet the information technology (IT) needs of the firm. These businesses typically have limited in-house IT capabilities and often outsource much of their IT. This paper discusses this rapidly evolving technology and provides a framework for businesses to decide on harnessing the power of cloud computing. It recommends the appropriate decision based on the way in which IT is currently used in the enterprise and future needs to meet competitive challenges. The potential cost savings, technology insurance from cloud computing, and security risks are discussed and factored into the decision.

Keywords: *Cloud Computing, Decision Table, Information Technology (IT), IT Infrastructure, Small Business*

INTRODUCTION

Small businesses face challenges in owning and managing their IT infrastructure. The advent of e-business models that require 24 by 7 operations has made it even more difficult for these businesses to acquire and maintain the skill-set necessary to host and operate reliable data centers and systems to support the business. Cloud computing, a framework in which the business 'leases' the necessary resource offers these companies the opportunity to obtain a high quality information system without the expense of building a top notch IT team and facility. In this paper, we will look at the cloud computing model and develop a decision table that can be used by managers in determining the best cloud computing strategy for the organization.

In the cloud computing model computing services are located at a well managed data center and delivered to the organization over the Internet. Carr (2008) described a utility computing model where computing would be purchased in a manner similar to electricity or

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natural gas and business would no longer own and operate a data center or software than they would own and operate their own utility. For small and medium sized businesses, this is an obvious choice since they lack the economies of scale to be able to operate a computing center effectively and efficiently (Cheng, 2010). Counter arguments to this line of reasoning have focused on the fact that electricity is a simple product which is fungible and there is not much difference between the services available or much choice in the matter, whereas computing services have many variables and are not easily comparable. We will work through each argument in this paper and consider its impact on the manager's decision. It must be noted that rapid change in IT has resulted in challenges for managers, and the widespread use of coping mechanisms to handle this complexity (Benamati & Lederer, 2010). Our decision table will provide a framework to support the decision making process.

Most published research on cloud computing has focused on the technology during the past three years, and while the term first appears in 1960, the earliest peer reviewed publications are in 2007. However, the Application Service Provider (ASP) model has been around for much longer. Smith and Kumar present a model for ASP and develop a theory of ASP use (Smith & Kumar, 2004). They review the literature in the field, and highlight service delivery over the internet as a key difference between other outsourcing models and the ASP model. In their theory, there are three sub-contexts for the ASP decision; environmental, organizational, and IS management. The environmental context deals with cost pressures of IT and IT problems. The organizational context deals with the attitude towards risk and ASPs. The IT management context deals with the client's ability to deal with the other two contexts. Smith and Kumar point to the change in software at that time from a local, workstation based interface to a web interface with an "access from anywhere" capability. A taxonomy is developed for ASPs based on the type of service offered (Maleki & Anand, 2008). Another survey of small and medium sized business analyzes the ratings on six factors related to ASPs and the intention to adopt the model (Altaf & Schuff, 2010). Based on an analysis of the survey responses they recommend that ASPs offer flexibility in their offerings since many owner believe that ASP offerings are inflexible while in-house systems are more flexible. In addition they recommend that ASPs be financially stable, and provide clearly Service Level Agreements (SLA). The interesting aspect of this survey of 113 business owners is the degree of knowledge about software offerings through the ASP model.

Cloud computing is relatively new technology, and depends on a robust net infrastructure An ontology for cloud computing proposes five layers, with the top three being Software as a Service (SaaS) offering an application over the internet, the second being the software development environment or platform delivered over the internet (PaaS), and the third being the Infrastructure delivered over the internet (IaaS) (Youseff, Butrico, & DaSilva, 2008). The Infrastructure provided can be computational resources, storage, and communication. In addition they add two lower level layers for the software kernel and the hardware/firmware. The NIST defines cloud computing as "a model for enabling convenient, 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 & Grance, 2009). A study of cloud computing growth presents a chart of the growth of actual business use of cloud computing (Rosen, 2010). This chart shows rapid growth in the adoption of cloud infrastructure among public web sites in 2009. Many other publications have discussed the business value of cloud computing, identifying applications for public and private clouds (Nolle, 2009; Hand, 2007).

Cloud Computing Models

Software as a service (Saas) delivers the application to the business online, rather than providing the software to be installed and oper-