Chapter 87
Managing the Cloud for Information Systems Agility

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ABSTRACT

Change is endemic in modern business competition. In an age of globalization, with the rapid development of Internet technologies, changes occur at a much faster pace, and are also more unpredictable. Being agile in a turbulent environment has been ranked highly by executives in surveys of business issues conducted in past five years. Today nearly all organizations rely on information systems (IS) to operate. Agility in IS is critical in achieving overall agility in business. However, despite the interest from the practitioner community, IS agility (sometimes termed IT agility) in academia has received limited recognition and represents an under-researched area. The recent adoption of cloud computing services has presented a major change in the way IS are delivered, in the hope of creating more agile and responsive IS. However, whether or not cloud computing, as promised by the providers, increases IS agility, is still unclear. This research aims at providing a conceptualization of IS agility based on research to date, and examining how cloud computing might facilitate such agility. Based on a literature review, cloud computing services (IaaS, PaaS, and SaaS) are analyzed against multiple aspects of IS agility. Only IaaS is found to have the potential providing consistent agility, whereas agility at PaaS and SaaS levels is more determined by human/organization factors. Lastly, suggestions for businesses and directions to future research are proposed.

INTRODUCTION

In the competitive business world, change has become the rule of the game. Firms have to adapt to changing business conditions (Chonko & Jones, 2005). Indeed, the whole concept of entrepreneurship has long been described as the search for change, response to change, and exploitation of change as opportunity (Drucker, 1968). Furthermore, the rate of change has been

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dramatically increasing due to unprecedented phenomena such as globalisation and revolutionary Internet technologies.

Not only are the changes occurring faster, they are becoming increasingly unpredictable (Sharifi & Zhang, 2001); including unpredictability about when a certain change will take place; what a particular change will look like; or a combination of both (Pankaj, Hyde, Ramaprasad, & Tadisina, 2009). Such changes in the business environment can threaten businesses with rigid established infrastructures and processes (SEO & Paz, 2008). However, organizations with flexible, easily reconfigured infrastructures – i.e., agile businesses - are able to leverage the threats into opportunities and greater profits (Sull, 2010).

Agility is defined as the ability of an organization to handle changes, in particular unpredictable ones, with ease and appropriate speed, so as to thrive in a dynamic market (Dove, 2001). Surveys of executives have found that agility is rated as one of the most critical features organizations should possess. In a global survey, 89 percent of over 1500 respondents indicated that agility is "very" or "extremely" important for business performance, while 91 percent perceived that the importance of agility has increased in the five years preceding the survey (McKinsey, 2006). More recently, a survey conducted by the Society for Information Management (SIM) ranked agility third among the top ten IT management concerns (Luftman & Ben-Zvi, 2010).

Agility in information systems (IS) is often seen as a critical component of business agility (Bhatt, Emdad, Roberts, & Grover, 2010; Caswell & Nigam, 2005; Goodhue, Chen, Boudreau, Davis, & Cochran, 2009). In today's digital economy, IS pervades all aspects of business. In particular, information systems often play a critical role in areas where organizational agility is most required (Oosterhout, Waarts, & Hillegersberg, 2006). IS deployments once measured in years now must be completed in much shorter time spans - months or weeks, or sometimes just days. Furthermore, the accelerating pace of business demands that IS respond to changes in business conditions quickly and effectively. Therefore, to have an agile business, a firm requires agility in its IS function (Hugoson, Magoulas, & Pessi, 2009; Weill, Subramani, & Broadbent, 2002); non-agile, difficult-to-adapt IT systems hinder the overall agility of the business (SEO & Paz, 2008).

To achieve agility in IS, IT practitioners have devoted considerable effort to bring about innovations in technical architectures and frameworks. In particular, the service-oriented paradigm has become increasingly popular in recent years (Chang, He, & Castro-Leon, 2006). This paradigm proposes that IT systems should be built based on loosely coupled and reusable modular services which can be quickly constructed and deconstructed to support changing requirements in IS and business requirements (Setia, Sambamurthy, & Closs, 2008). Out of the notion of service orientation has emerged a new approach for converting conventional IT resources into public online services – an approach commonly called cloud computing.

Cloud computing,[1] which delivers IT resources in a service-oriented model, is intended to provide agile and responsive computing power to organizations. The necessary underlying computing power is provided by large data centers, each typically operating tens of thousands of servers (Katz, 2009), which brings about economies of scale. Hence cloud computing providers can rent out their computing resources and services to clients at a low price. These resources and services are delivered via the Internet, often in a self-service model (Mell & Grance, 2010). Therefore cloud computing adopters no longer need to maintain and manage local IT infrastructures and systems to support their business applications. Instead they can focus more on their core businesses, and leave many IT-related activities such as server operation and maintenance to be handled by remote providers who are more experienced and efficient in managing such technologies.