Strategic Outsourcing to Cloud Computing: A Comprehensive Framework Based on Analytic Hierarchy Process

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ABSTRACT

A common misperception about cloud computing remains that it represents the ideal solution for outsourcing non-core competencies and a simple maneuver that drives costs down. However, the reality may be the complete opposite. The cloud paradigm changes several processes, patterns, practices, and philosophies; so, while the cloud adoption must be considered as a legitimate business strategy, its decision must also be made with a great deal of care. The purpose of this work is to provide organizations with a practical framework for decision-making about the cloud paradigm adoption, as a strategic outsourcing solution. This framework defines the guidelines to map the outsourcing to cloud computing to a comprehensive multi-criteria-decision-making (MCDM) problem, and relies on the analytic hierarchy process methodology providing both simplicity and mathematical rigor to resolve it. The framework is policy-centric and takes account of the organization’s contexts, as it is also built on cloud standards and best practices.

KEYWORDS

Analytic Hierarchy Process, Cloud Computing, Multi-Criteria-Decision-Making (MCDM), Strategic Outsourcing

INTRODUCTION

Outsourcing is an important concept for both organizational structures and business transformation. It allows companies to split their services into those deemed core and non-core; the activity that distracts someone from their core business is the core competency of an outsourcing provider. Hence, this concept allows the business functions to be subcontracted and performed in the most efficient and cost-effective way (Acadia, 2012).

The cloud paradigm by definition is a very suitable outsourcing solution, already providing a multiplicity of mature services for non-core competencies delegation to external cloud services providers (CSP) over the internet (Kavis, 2014). Businesses adopting cloud computing could rely on cloud applications in business-critical departments and functions such as Salesforce.com applications, document management, purchasing, logistics, writing HR, payroll, enterprise resource planning (ERP), accounting, etc., so they do not have any more to support the applications’ infrastructure, provide maintenance, and hire staff to manage it all. Instead, they just pay a subscription fee and simply use the service over the internet as a browser-based service, assuming of course that it meets its needs and is affordable (Kavis, 2014; Mather et al., 2009).

Companies that successfully implement cloud initiatives can reduce IT costs and complexity, improve speed to the market and become more responsive to internal and external systems users (Hill
et al., 2013; Kavis, 2014; Mather et al., 2009). They would be also provided with technologies for better flexibility and scalability, disaster recovery, business continuity and more efficient development lifecycle (Mahmood and Hill, 2011; Varia, 2011).

However, as with any new approach or technology, there are also limits by which the benefits could be realized, and any new way of working may introduce additional risks. Historically, many companies fail when it comes to implementing new and transformational paradigms. Sometimes because they do not fully master these paradigms, or because they disregard the necessary architecture and design steps from several other reasons (Kavis, 2014). Cloud computing is not an exception in this respect, and depending on the perspective and context of the organization, outsourcing systems to cloud computing may represent both, an opportunity and a crisis. Contrarily to start-ups who have the luxury of building from scratch for the new paradigm, well-established firms are more exposed to the risks of resistance and failure as they have both legacy solutions and legacy IT shops (Mather et al., 2009).

The purpose of this paper is to provide organizations willing to outsource their systems, with a comprehensive framework for weighing up the cloud driving forces (needs for cloud computing and expected revenues) and resisting forces (degree of possibility and potential risks), in order to improve their decision-making around the cloud model adoption. This framework is built on the Analytic Hierarchy Process fitting both simplicity and mathematical background, takes account of the actual businesses’ contexts and policies, and strives to provide standard guidelines that can be consistently applied throughout organizations regardless of their size and business nature.

The rest of this paper is organized as follows. Section 2 presents a brief of the concepts involved in this work. Section 3 presents a literature review. Section 4 describes the main motivations for this work and for the employed methodology. Section 5 introduces the proposed framework, and Section 6 illustrates a case of application on a non-core competency. Section 6 discusses this work from different perspectives, and finally, Section 7 drives its main conclusions and prospects.

BACKGROUND

Cloud Computing

The term cloud computing was inspired by the cloud symbol that is often used to represent the Internet in flow charts and diagrams. This term refers to a model for enabling convenient, on-demand network access to a shared pool of configurable and reliable computing resources (e.g., networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal consumer management effort or service provider interaction (Mell and Grance, 2011). This model is composed of five essential characteristics, three service models (the SPI framework), and four deployment models.

Essential characteristics: The cloud main attributes could be described as follows (Mather et al., 2009):

- **Multitenancy**: Cloud computing is based on a business model in which resources are shared (i.e., multiple users use the same resource) at the network level, host level, and application level.
- **Massive Scalability**: Cloud computing provides the ability to scale to a very large number of systems, as well as the ability to massively scale bandwidth and storage space.
- **Elasticity**: Users can rapidly increase and decrease their computing resources as needed, as well as releasing them for other users when they are no longer required.
- **Pay as You Go**: Users pay only for the resources they actually use and only for the time they require them.
- **Self-Provisioning of Resource**: Users self-provision resources, such as additional systems (processing capability, software, storage) and network resources.
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