Service-Level Agreement Negotiation in Cloud Computing Buying Organizations

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ABSTRACT

The cloud archetype is fundamentally dynamic for both service customer and service provider. From the provider’s perspective, resources are removed and/or added irregularly and urgently together with updating of service level agreements (SLAs). However, this dynamical behavior makes contracting sophisticated. Yet, there is a lack of knowledge on how to handle these dynamics contractually. To address this knowledge gap, the authors have investigated “how to improve SLA management with dynamic SLA iterations.” For this reason, a model for cloud computing SLA negotiation is proposed to facilitate the buying organization in determining uncertainty by analyzing attributes of asset specificity and risks associated with them. Survey research has been used for testing the model. The respondents rationalized the SLA negotiation with a better cognitive understanding in all phases within the model. The study’s findings could support cloud service buying organizations to minimize the risks with ever-changing requirements.

KEYWORDS

Cloud Computing, IT Outsourcing, Management Transaction Cost Theory, Risk Assessment, Service Level Agreement, Uncertainty Reduction Theory

INTRODUCTION

Cloud computing (CC) is characterized by on-demand readiness of computing re-sources, like storage, processing power, and networking speed, without the direct interaction of the user (Schneider & Sunyaev, 2016). However, the technology service is often summarized and agreed upon by the Service Level Agreement (SLA) that are not fully capturing the nature of the relationship and responsibilities between the vendor and the buyer, causing complex and ambiguous agreements that are leading to trust issues and misunderstanding of the technology itself. Consequently, additional internal transactional costs are necessary to fully enable the service, leading to cheaper outsourcing strategies in order to prioritize external transactional costs. The SLA is “an agreement between the support service and the user, quantifying the minimum acceptable service to the user” (Hiles, 2000, p.11). A cloud SLA, is an agreement between a Cloud Service Provider (CSP) and a Cloud Service Customer (CSC). In this study, when mentioning SLA, it is always in the context of CC. In the majority of the cases, SLA is established between a seller and a buyer organization. However, SLAs may be agreed between two or more companies (Ibrahim, Kliazovich, & Bouvry, 2016). The increasing growth of agreements with CSPs and other third-party vendors is driving more pressures towards IT to mature comprehensive
SLA to facilitate the governing of the IT services signed for and to guarantee that maximum value is conveyed to the CSC (Al-Gharibi, Warren, & Yeoh, 2020). This makes it imperative for both the CSP and CSC to priorities a correct SLA management, enforcing and encouraging cloud SLA standards (Girs, Sentilles, Asadollah, & Mubeen, 2020) that not only promise consistent SLA negotiation but also ensuring flowing communications among all engaged parties in the service delivery process and delivery stay open and dynamic. Both CSP and CSC require a way to associate SLA performance to the business values they are supposedly committing to. This research objective is to highlight this void with the Transaction Cost Theory (TCT) (Williamson, 1985). The TCT underlines that within exchange relationships, there is a fundamental deficiency of trust, followed by significant issues like uncertainties and opportunisms that surround transactions (Sutcliffe & Zaheer, 1998; Zhong & Myers, 2016; Ayaburi, Maasberg, & Lee, 2020). These notions, throughout the analysis of the Cloud SLA as a pivotal research element, may be of significance in analyzing organizations’ willingness to accept and implement CC services. An understandable cloud SLA is necessary to solve the issues involved in the dependability, reliability, and security of the cloud for each party (Undheim, Chilwan, & Heegaard, 2011). The cloud SLA should be organized with satisfactory clauses and details to reach the user expectations, but also that SLA should be effortlessly evaluated to create accountability in case of legal breaches (Dillon, Wu, & Chang, 2010). Furthermore, SLA is an essential aspect of the CC service, and companies have been advocating for more complete SLAs (Kuma & Pradhan, 2013; Cochran & Witman, 2011). The above findings are problematic in the signing of the SLA and, consequently, for the adoption of CC. In this study, with “Dynamic SLA Iteration,” we mean the change of CSC needs in requirements and deliverables and how the changes have to be adjusted in the CC SLA. Therefore, the research problem addresses the fact that a considerable proportion of service level agreements in CC is inefficient and/or misinterpreted. To address this research problem, the authors have raised the following research question: “How to improve SLA management with dynamic SLA iteration?”.

RESEARCH BACKGROUND

Cloud Computing and Service Level Agreement Challenges

Regardless of the number of benefits presented by CSPs, acceptance and implementation of CC technology are obstructed by security problems like privacy, availability, and performance attributes (Harris & Alter, 2010; Bayramustaa & Nasir, 2016; Singh & Raghuvanshi, 2020). Additionally, the conditions for an optimal cloud SLA have always been major players, and sometimes game-changers for CSCs (Begum & Prashanth, 2013). On the other hand, SLA have developed into more challenging and harder to understand for regular CPCs (Begum & Prashanth, 2013; Garg & Misra, 2019). It has also been observed that SLA are charged with issues that turn them into worthless and unproductive agreements (Durkee, 2010).

Outsourcing Risk Management

Risk is a natural constituent of the IT Outsourcing (ITO) business. If left uncontrolled, the uncertainty factor can extend to the rest of the organization (Buyya, Garg, & Calheiros, 2011; Satta & Mostefai, 2020). The explanation of risk is defined as the responses to three queries according to Kaplan & Garrick (1981): 1. What can go wrong? Defining the failure scenarios; 2. How likely is it to go wrong? Defining the probability of the scenarios; 3. If it does go wrong, what are the consequences? Defining the result of the scenarios. Risk management and risk assessment are fundamentally decision issues. Their construction involves the classification of the three essentials described so well by Howard (Howard, 2007): 1. Set of alternatives; 2. Information structure connecting alternatives to the outcome of interest; 3. Preferences. However, decision preferences are complicated when uncertainty exists that produces a phenomenon named “decision making under risk.” In these settings, the preferences of the decision-maker are less finite than decisions performed under certainty (Starmer, 2000). Based on
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