



Original Contribution

Making the Cloud Adoption Decisions: Gaining Advantages from Taking an Integrated Approach

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This article helps IT decision-makers break down strategic factors to plan cloud and managed services transformations. It has elements of strategic, financial, architecture, security, process, and people. Cloud adoption topics emerge from the review. Cloud adoption has mainly been studied from the innovative technology standpoint utilizing the Technology-Organization-Environment framework. Other popular approaches include the transaction cost theory-driven economic/cost perspective and multicriteria decision framework. The report begins with a concentrated cloud adoption literature review. The literature is then carefully categorized by view (commercial versus technical), dominant theory, and adoption factors. Two existing frameworks are also evaluated for merits and weaknesses. Finally, a brief checklist is created from the cumulative findings. The study organizes reviewed publications' recurring themes into four key sections. The research also includes frequently asked questions in each category to assist firms in assessing their cloud readiness. Thus, the essay blends multiple views and provides enterprises with a straightforward, holistic checklist to consider cloud business implications.

INTRODUCTION

The concept of computing in the cloud has attracted much attention, and researchers are currently utilizing a variety of theories to investigate cloud adoption from both a business and a technological standpoint. Computer science and engineering fields have been responsible for driving significant research into the technical aspects of cloud computing, such as security and virtualization. However, businesses considering moving their operations to the cloud have some choices. Understanding how the organization's IT strategy and goals fit in with cloud computing is the first step in deciding whether to implement it. Consequently, researchers in Information Systems

(IS) need to take a comprehensive approach to understand the challenges posed by cloud computing (Desamsetti, 2016). The procedure as a whole is complicated and has significant repercussions for the organization's development. In order to assist enterprises in successfully adopting cloud computing, researchers in the field of information systems have been looking at these difficulties utilizing a variety of theoretical frameworks and models.

In light of the numerous studies conducted in the field of cloud adoption, a holistic point of view is required to comprehend the steps involved in the process of cloud adoption decision-making. The article initiates this procedure by first reviewing the

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literature on cloud adoption (Porter, 1991). In the next section, we will go into depth about the approach used to review the previous research on different cloud adoption viewpoints thoroughly.

Cloud computing comes with its own unique set of benefits and drawbacks. The operational flexibility of cloud computing, in addition to the financial advantages of shared resources, is one of the many benefits of cloud computing. According to Alshamaila et al. (2013), cloud computing features usage-based pricing, which frees businesses from having to spend much money on upfront technology costs and allows them to scale up or down depending on their need. According to Banerjee et al. (2013), it also offers businesses the chance to investigate new fields, such as analytics and cooperation.

However, widespread cloud computing raises serious challenges that must be addressed. Concerns of cloud computing include ensuring the safety of sensitive and essential data. Organizations that store their data in the cloud run the risk of losing control over crucial data, experiencing outages, having restricted bandwidth for applications that require a large amount of data, and having security breaches that result in the loss of sensitive data (Carcary et al., 2014; Porter, 1991). According to Iyer & Henderson (2010), cloud computing is still in its developmental stages and comes with unique inherent hazards. As a consequence, embracing cloud computing calls for thorough thought and coherence in terms of the organizational strategy and cloud services offered.

CLOUD DECISION COVERING ELEMENT

This article aims to assist IT decision-makers in discerning and tackling strategic components to formulate a comprehensive plan for implementing cloud and managed services transitions. The content is organized into distinct sections that address various aspects: process, people, strategy, architecture, security, and finance (Lewis, 2015).

The Process Element

Examine the internal IT processes utilized to deliver services now and the expected changes from a move during the cloud choice process. Typical processes include change management, service management (including incident and

problem management and service metrics), service monitoring and alerting, capacity planning, and budget planning/tracking. An early understanding of the provider's standard and emergency maintenance processes is crucial. Do they match service commitments or need to be adjusted? What transparency does the supplier offer in change management, problem management, post-incident review, and root cause analysis? If stakeholders are used to high operational transparency, examine if the cloud environment supports it. If not, early communication with service stakeholders will lessen the surprise when anything goes wrong.

The People Element

Naturally, those touched by any change are important. Some technical personnel may see the cloud as a chance to keep current, while others see it as a career danger. Cloud change management must consider people: the executive sponsor must carry the message and provide the context for "why" and "why now," identify advocates and nay-sayers, manage them, and engage people in decision-making. A cloud effort, especially a big one, will require all the organization's leadership skills. However, some individuals' traits may be distinctive. Selecting and managing a cloud provider may test the team's vendor management. Additionally, deployment automation tooling, new data persistence methods, alternative scale-out methods like content delivery networks or app off-loading, and cloud-based caching may need to be learned. Staffing levels for several skill sets may be challenging, and essential resource retention, retraining, and staff reductions must be considered early on.

The Strategic Element

The company should have a clear technology strategy that converts business goals into technological principles. Technology stack goals, service level goals, build positions, security and privacy risk positions, open source positions, and default positions on time-to-delivery versus cost versus quality trade-offs are common. A non-profit organization may use open source to the fullest, build integrations and solutions internally with limited staff, and minimize costs using a uniform tech environment, even if it slows down new capability rollouts. Organizations with significant capital finance, emerging expansion prospects, and competitive threats may spend to overcome scale and growth challenges. Time-to-market is

critical to the organization's growth ambitions. Thus, they may still need to remove scalability obstacles. Using the organization's strategic positions to express a clear set of guiding principles at the start of a decision-making process will assist in keeping all involved on track. The buzzword "Business and IT Alignment" is vital in management today; combining the strategic aspects above may help complete that alignment and tick the buzzword compliance box. Note that not all organizations have a formal or semi-formal technology strategy. A cloud decision process can improve strategic positioning in those instances. This allows stakeholders to discuss financial and service-level themes and potentially start a set of IT decision-making guidelines. Other recent technological decisions and stakeholder dialogues can help identify strategy beginning points.

The Architecture Element

Architecture handles non-functional system needs. The non-functional criteria of reliability, availability, and scalability (RAS) are crucial. It is crucial to understand the service(s)' RAS requirements, how they are met now, and how the cloud architecture supports them. Cloud services have minimal Service Level Agreement terms, yet their architecture and operations meet availability. Provider track record can indicate the ability to meet availability requirements; however, some firms will still need committed SLAs from their cloud provider. RAS must consider mission-critical application disaster recovery. Even with typical "stand by" approaches, the cloud can cut DR investment. If the program can use a cloud platform with native cloud capabilities, data replication, name resolution, and routing can be simplified. Regular testing is essential to any DR plan. Hybrid cloud solutions that combine fixed, dedicated (physical or virtual), and dynamically deployable resources are akin to highly integrated environments. To be effective, automated provisioning/de-provisioning and understanding the indicators that trigger scaling up/down are needed due to increasing deployment and management complexity. Hybrid systems may work for highly changing workloads or fast-expanding needs with fixed capacity, but technical and management complexity is considerable.

The Security Element

Security is complicated in any context and usually depends on risk tolerance. As in any hosting environment, physical security of the provider's

facilities, network and compute infrastructure, data security, application security, and security operations and processes must be considered. There are examples of deploying applications to public clouds with strict physical, network, and data security requirements. However, it can be challenging to determine if the cloud provider's implementations meet secure computing risk tolerances. While SAS 70 Type II audits are good, they only check the provider's claimed IT controls. One must research claimed controls to evaluate if they meet an organization's demands. The apps and data under consideration for cloud migration must also be examined. The organization's IT security strategy, including data classifications and security criteria, is ideal to facilitate cloud migration. Applications with only publicly available data may be more amenable to early cloud migration than those with sensitive and restricted data. App characteristics should be recognized.

The Financial Element

Cloud discussions are often driven by financial concerns or "the CFO/CBO is making me." TCO and ROI can be used to analyze service and security issues, but quantifying them monetarily takes much work. However, solution economics remains crucial. Build a cost model to understand and compare costs to current or alternative solutions. Cloud financial modeling can account for demand variations that cause highly variable computing infrastructure needs. Cloud solutions that scale resources based on demand can save money in education, where demand fluctuates wildly. However, a three-year capital acquisition made more sense for large deployments with even, predictable loads because the supporting infrastructure (data center and related infrastructure, systems administration staff) already existed and was sufficient. Disaster recovery (DR)/business continuity plan (BCP) requirements can significantly affect mission-critical application expenses. DR/BCP systems can be constructed from many cloud solutions. Due to dynamic capacity's financial benefits, DR systems with few to no instances created until needed might reduce DR capacity maintenance costs. In terms of DR plan building blocks, cloud providers vary substantially. The architecture section will briefly address some of these difficulties. Finally, each business or organization has distinct financial considerations. Will decommissioning infrastructure write down assets or reuse them? Moving to a cost structure where IT expenditures are expenses against the operating

budget can also affect cash flow for firms that rely substantially on capital investments and depreciation. Discuss these topics with finance and budget managers.

FRAMEWORKS IN CLOUD ADOPTION

This approach is more comprehensive since it investigates various issues that must be considered before businesses can migrate their operations to the cloud. Nevertheless, the availability of vendor knowledge in providing cloud services to a particular industry needs to be considered by this framework. When deciding to go to the cloud, the experience and availability of third-party vendors might be important considerations for businesses with less extensive IT knowledge (Tornatzky et al., 1990). A further distinction between adopting cloud computing and adopting other technologies is that adopting cloud computing requires shifting an organization's data, people, and processes onto resources that the vendor holds. Consequently, the vendor's competence has substantial consequences for issues pertaining to trust and security. If there is a shortage of vendors in an industry, businesses operating in that sector may be hesitant to adopt cloud computing because of the increased dependence on vendors.

Three-Phase Readiness Framework

Researchers Loebbecke, Thomas, and Ullrich (2012) developed the three-phase cloud readiness framework. Within this framework, they identified three steps/phases businesses interested in transitioning to the cloud should go through. This covers the identification phase, followed by the screening period, and then the categorization phase. During the identification phase, companies determine both the cloud-readiness of their information technology services and the cloud-readiness criteria that are most applicable to their specific circumstances. In this stage, you will also need to determine whether or not your staff is on board with cloud computing. In the subsequent step, companies analyze all of the identified IT services based on the criteria that have been established and aggregate values for each of the services based on the numerous criteria. In the last part of the classification process, companies decide on a threshold value and then compare the aggregated results for each service to determine whether the information technology services in question are "likely cloud ready" or "not cloud ready."

Analysis of a Critical Nature Core business and differentiating factors, importance and availability of services, standardization and simplicity of lifecycle, centralization, network connectivity requirements in terms of bandwidth and latency, identity management, and compliance are some factors that play an essential role in the readiness framework. When a company is ready to use cloud computing, one of the strengths of this framework is that it provides steps that the organization can take. On the other hand, this approach does not consider the impact that external environmental variables play in determining whether or not an organization has to use cloud computing.

Cloud Adoption Toolkit

A conceptual model is provided for businesses interested in adopting cloud computing by Loebbecke et al. (2012) through their cloud adoption toolkit framework. Technology appropriateness analysis is the first step in identifying whether or not a company is a good match for the cloud. In this stage, enterprises evaluate whether or not the properties of cloud computing satisfy their technological requirements and how this is accomplished. The following step is to conduct a stakeholder analysis to assess how well the company fits its environment in terms of resources and sociopolitical aspects. In order to comprehend estimates of both the operational expenses and the energy consumption costs associated with operating the IT service through the cloud, cost modeling and energy consumption analysis are carried out. In the end, responsibility modeling is carried out to understand how responsibilities would be assigned within the framework of the cloud deployment scenario, as well as the socio-political acceptability of interactions across key strategic departments within the business. When all of these processes have been finished, enterprises can assess whether cloud adoption is appropriate for them.

Indicating the relevant decision-making variables concerning the context and how these variables interact to form the final answer is one of the many reasons frameworks are helpful tools. Some frameworks include detailed instructions for conducting step-by-step assessments that can be used to determine whether or not a company is suitable for adopting cloud computing. They shed light on crucial concerns as well as challenging questions that enterprises need to ask in order to make the transition to cloud computing.

GUIDELINES FOR FUTURE RESEARCH

This article demonstrates how many points of view regarding the compatibility of organizations with cloud computing may be merged using an integrated methodology. Enterprises can evaluate cloud products in terms of how well they meet the requirements of their businesses using four primary criteria. As a consequence of this, the essay has significant repercussions, not just for research but also for practice. The fast checklist is available for practitioners to use so that they may evaluate how well they fulfill the criteria for various aspects of cloud organization fit. They can also comprehend how the probabilities of success with cloud adoption are affected by various circumstances. In the integrated approach, numerous micro and macro-level aspects are considered, ranging from the application to the environment. The fast checklist has the potential to operate as a road map, guiding organizations through the process of navigating the four main facets of cloud adoption through the use of pertinent questions. Future studies should strive to validate, test, and refine the questionnaire. The integrated perspective allows researchers to start on a well-grounded theoretical framework on many elements of cloud adoption rather than beginning with a laundry list of ideas as their point of departure. Researchers also have the opportunity to investigate how these viewpoints would change depending on the type of cloud service being used, such as SaaS, PaaS, or IaaS. In subsequent research, it may be possible to investigate how various factors, such as price and technical specification, may become increasingly significant in adopting a specific cloud product, such as PaaS. Businesses considering the implementation of SaaS, which is application-based and user-facing, can find it necessary to emphasize organizational aspects that define readiness.

CONCLUSION

The descriptive review method of study that has been carried out has various restrictions attached to it due to its nature. For instance, specific items not indexed in any of the four databases are presumably not included in the compilation. Because of the emphasis placed on academic research that has been peer-reviewed, a significant amount of practice-based literature has not been included. Another key disadvantage of the study is that the questionnaire must have been tested or

validated by speaking with firms who have already deployed cloud computing or are considering doing so. Consequently, the checklist's reliability and validity could be better. Migration to the cloud is becoming an increasingly important topic of debate in businesses concerned with the supply of technological services due to several different issues and demands. These debates extend beyond information technology and encompass business, finance, and customer and end-user communities. Several aspects of decision-making need to be considered before one can make educated choices regarding cloud computing and other opportunities that fall under the "as a Service" umbrella. The primary aspects of such a choice have been discussed, along with illustrative examples of the problems, factors, and debates associated with each of those aspects. The most critical aspects are examining the organizations or institutions overarching strategic goals and comprehending how those decisions fit into and match the IT strategy. The overall IT landscape, architecture, service needs (RAS), financial aspects, security, procedures, and people will all be considered during the decision-making process.

There have been enough high-profile service disruptions (and the subsequent losses of data, income interruption, etc.) to put a damper on the mind attitude and external pressures that "just throw it up in the cloud, everyone is doing it, it cannot be that hard." Thankfully, this has helped chip away at some of the naiveté that people had regarding clouds (of course, the degree to which this occurred depends on whether or not one was a witness or participant in those occurrences). An organization can make a more completely informed decision concerning the infrastructure and operational management of their technological assets if they consider the factors outlined above and engage business/finance and service consumers/stakeholders around these elements. Taking into account the factors outlined above may even make it possible to identify low-risk possibilities to gain expertise and traction, some of which may even be projects with a big payoff. The presented talks not only assist in charting a route for the execution of the decisions that are made, but they also lay the framework for a more widespread buy-in to the judgments made.

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