

## Cloud Sourcing Challenges in it Projects

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**Abstract:** However, organizations gradually found that using outsourcing activities and IT projects can focus on their key functions and core activities by the growth of cloud computing and providing services (Software, hardware, infrastructure, network, platforms and business processes) in the context of the clouds, the question is whether a new generation of outsourcing “Cloud sourcing” can be replaced its traditional models? Although previous studies regarding cloud services have described the various benefits of this model; in this studies, major challenges about cloud services and how to interact with services providers is claimed. Some of these challenges are composed of security, information confidentiality and standards and etc. This research describes the concept of cloud sourcing and identifying its challenges, also investigating its differences with the traditional outsourcing. Eventually more efficient management of the outsourcing model is recommended by using the previous research and the introduction of appropriate service level agreement.

**Key words:** Cloud sourcing challenges, outsourcing, cloud service provider, service level agreement

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### INTRODUCTION

Outsourcing has received extensive attention over the last several years as a key business trend, enabled in part by businesses’ pressures for cost control, advancements in information technology and new organizational structures. Information Technology (IT) outsourcing, in particular, has been in the spotlight but not always in positive terms. especially outsourcing of IT projects has been in the spotlight but this is not always positive and is associated with its own challenges. Among these challenges in outsourcing of IT, the right combination of resources and capabilities of IT to achieve the services’ configuration is successful. This issue in services management and outsourcing service providers has become important as has raised the new academic discipline called “services science” (Kutsikosa Konstadinos and Sakasb Damianos, 2014)

In recent years of Service-Oriented Architecture (SOA) that includes a group of methodologies, principles of software engineering and system architecture, a way to define projects and IT services as the service is provided. One benefit of services is abstraction of services and hiding the complexities of the service. In fact, service-oriented architecture provides the possibility of providing services on the ground “cloud” and has created a new form of outsourcing or cloud sourcing (Monteiroa *et al.*, 2013)

The term of “cloud computing” is mainly used about sale of hosting services means apply to provide remote services. National Institute of Standards and Technology (NIST) defines cloud computing: cloud computing is a model to provide easy access based on user demand

through the network to a set of changing and configuration computing resources (eg, networks, servers, storage space, applications and services) that the access can be provided with minimal need to manage or interact with the server at the highest speed (Liu Fang *et al.*, 2011).

Cloud computing technology is considered a new phase of evolution in the Internet world. The use of the word “cloud” means that access to various services such as computing infrastructure, applications, business processes and can be used as an online service wherever and whenever needed. The decision to choose cloud oriented architecture for an organization is a big decision. What distinguishes cloud computing from outsourcing approaches and traditional hosting is focus on output and consumption model. In this model, providers in the backstage use models of design, architecture, technology and successful methods to introduce and support from providing a scalable environment with the ability to serve to several consumers. They may create hardware, software or specific predefined processes based on each consumer demand. Cloud sourcing with responsibility for providing services to specialist external factors and by raising power of organization focus on core processes of internal business can meet the needs of customers of information technology in order to get fast, flexible and real-time services.

### CLOUD SOURCING CHALLENGES IN IT PROJECTS

Cloud sourcing as strengthening power of the organization to achieve a competitive advantage in the market has become the backbone of many businesses.

Table 1: The difference between traditional computing and cloud computing (Masud *et al.*, 2014)

Models	Traditional computing	Cloud computing
Acquisition	Buy Assets Build Technical Architecture	Buy Service Architecture included
Business	Payfor Assets Administrative Overhead	Payfor use Reduc eAdmin Function
Access	Internal network CorporateDesktop	Over the Internet Any Device
Technical	Single-tenant Non-Shared Static	Multi-tenant Scalable and elastic Dynamic
Delivery	Costly lengthy Deployment land and Expand Staffing	Reduced Deployment time Fast ROI

Among these organizations can point to companies of Google, Amazon, Facebook, IBM and Microsoft. Cloud computing is an evolution form of the outsourcing of IT resources and the main reason to use it is to reduce cost and focus on core activities of the organization. Currently, 74% of companies use some form of cloud services that this number is 25 % growth compared to 2009 (Muhic Mirella *et al.*, 2014). In Table 1, the difference between traditional computing with cloud computing is observed (Masud *et al.*, 2014). As can be seen in the table below, traditional organizations to meet their needs in information technology have to buy all needed infrastructure and their costly maintenance. Traditional organizations are also responsible for management, production, development and maintenance of enterprise applications themselves. This is because despite a lot of spending in the field of providing resources and more complex executive management and longer-term developments, the organization not achieve its developed objectives because the cost of the management overhead removes the organization from the mainstream and the ultimate goal and involved business in non-core activities. In some cases, due to long-term developments, rapid return of investment was not allowed and the organization lost the ability against competitors and was out of the competition. So the organizations recognized by outsourcing some tasks can be managed more effectively on the main core of their business.

Maybe this question is raised for the reader that what is the difference between traditional outsourcing of IT projects with cloud outsourcing. The following are some of the differences in cloud computing with traditional outsourced approach (Hon *et al.*, 2012).

**Active agency against services of self-service:** In traditional outsourcing, service provider, codes of programming, data processing or any other task is provided based on the command of final user (the ordered organization), in the case that if the order of employer is so great that contractor company fails to perform it alone,

the sub process is deposited to its partner companies. While cloud computing has the nature of self-service, so that the user (consumer) for a pre-made IT resources and by cloud providers are available pays costs. In such cases, users use the infrastructure or resources supplied by the provider and do not have to be the owner of the property.

**Sequence of events:** In traditional outsourcing, a processor (or contractor) can cooperate with the sub-processors to meet user's requirement. In terms of control and timing perspective, this method controls and more supervises the user (consumer). In cloud method, services are pre-packaged and standardized that may be provided the services that provide by smaller providers, or each sub- service provided individually by providers. In fact, the user should choose a pre-prepared service which has the most fitness to his need among the services offered by providers.

**Shared resources/infrastructure:** Shared infrastructure or environments are storage and processing resources that are primarily given to the users with competitive low prices based on the needs of each user, under public clouds. In some cases, there is the possibility of customizing these services by dedicating time and extra money. If the user needs to have more control and particular customization can benefit from private cloud, especially if the user tends to manage its required infrastructure. Although standard infrastructures may be used but it is unlikely that the sharing of resources happens as happens in the clouds.

**A degree of control:** The user (consumer) in traditional outsourcing more controls his contractor while according to the nature of clouds and their type, user control on pre-defined services is reduced.

## IT PROJECT TYPES PROVIDED ON THE CLOUDS

**Business Process as a Service:** This service will enable customers in various industries that move from a constant capital to variable capital model. In fact, they will achieve to cost structure model of consumption-based. So the organization can quickly change sources to achieve its changing demands. This issue will be done by high flexibility and great predictability. Many consumers are considered business process as a service as an agent to improve cooperation in global markets and increase competitiveness power in that market (Ciovic *et al.*, 2014). Moreover, the semantic technologies can model business process in IT projects effectively (Aynaz Taheri and Mehrmoush Shamsfard, 2011).

**Software as a Service:** It is a model of software deployment on the Web that a provider of services gives to customers as a service. This type of cloud computing, which provides a service in which users can use a software through their browser in Internet. In this model in the users' perspective, investing in buying software and hardware and support not has a meaning. They only use the features of the software and pay according to the consumed resources. For example, in this group can point to Salesforce.com that provides an appropriate service in the field of communication systems with the customers (Rountree Derrick, 2014).

**Platform as a Service:** A platform or context gives software to the final user. In this type of structure, all hardware management complexities is hidden from the user in lower layers and the possibility of creation and development of web applications will be given to him. This type of cloud computing provides the application development environment for programming, as a service. User implements software that works based on the infrastructure the provider of service and from internet and by his servers, will be available for final users. Including such services can be named Google App Engine and Force.com (Rountree Derrick, 2014)

**Infrastructure as a Service:** In this structure, computer infrastructures are used as a virtual server. The final user completely controls over virtual machine and can customize it. Infrastructure as a service gives the sources as a service to users. This computing is not a new idea but in fact this type of service gives a new life to all companies that provided a space for storage and retrieval of information by the users, such as Amazon, Sun, IBM. Also companies that perform virtualization services and provide virtual servers are considered in this category (Rountree Derrick, 2014).

**Cloud Service Provider:** Service provider provides a set of cloud services and manages the implementation of their effectiveness. The main activities of cloud providers

- Monitoring and performance monitoring of virtualization and service-level agreements
- Long-term capacities management and performance trend
- Analyze how to avoid the problems of providing services with expensive quality
- Ensure alignment of business with support systems from operations
- Create alignment between performance and efficiency with plans and business designs of services provider

## CLOUD CONSUMER

Cloud consumer is the user of cloud services. Consumer may be an individual, an organization or an information technology system of services applicant. The consumer manages entities provided by the cloud. The service consumer must pay the cost of the interaction in the use of cloud services. In this role may be more sub-roles. In public clouds simple scenario, all the role of the consumer can be aggregated in a role. Organizational consumer may be responsible for creating technical landscape of service or responsible for business with responsibility of the financial aspects of consumer services. In simple public clouds scenario, all the roles of the consumer can be aggregated in a role (Avram, 2013).

In Table 2, based on the type of services, the tasks of service consumer and service provider have been identified.

**Challenges of cloud sourcing:** Although there are many benefits in adopting cloud computing approach but there are some obstacles and challenges in the adoption of this approach as the main strategy of development and support of IT projects. Before adopting this approach, organizations need to be familiar with the results and the risk of the wrong choice. Some of these challenges are as follows (Avram, 2013; Bhogal Moninder, 2014).

Table 2: Cloud provider and cloud consumer Activities [12]

Service model	Consumer Activities	Provider Activities
Software as a service	Uses application/service for business process operations	Installs, manages, maintains and supports the software application on a cloud infrastructure
Platform as a service	Develops, tests, deploys, and manages applications hosted in a cloud	Provisions and manages cloud infrastructure and middle ware for the platform consumers; provides development deployment and administration tools to platform consumers.
Infrastructure as a service	Creates/installs, manages and monitors services for IT infrastructure operations	Provisions and manages the physical processing , storage, networking and the hosting environment and cloud

**The wrong choice of cloud-oriented approach:** In assessment of cloud sourcing should be determined which category of projects or IT services are a good candidate to move to the clouds. This issue is determined using analysis of the cost and benefit of this type of sourcing.

**Choose right IT partner and appropriate service model:**

One of the concerns related to implementation of clouds is inappropriate choice of development model and business partner (provider).

**Security and privacy:** Because cloud computing represents a new computing model, there are a lot of uncertainty about security at all layers of services (networking, software, infrastructure, data, etc.), this uncertainty in information security is the highest concern of Chief Information Officer. Thus, organization is faced with this issue that in the case of choosing this model of outsourcing, proper protection of information and data of organization and individuals is done.

**Connectivity and open access:** Potential and core capability of cloud computing depend on the availability of high-speed at all times and anywhere.

**Reliability:** IT resources and applications are now critical element of an organization and therefore must be reliable and available and supported as 7 \*24 (seven days a week in 24 hours a day). In the event of a problem and the risk of failure, plans dealing with events and programs of continuing design business and as alternative in service level agreements can be considered.

**Interoperability:** Ability to cooperate and exchange information between private and public clouds in an organization is the vital cases of business. Some organizations have significant progress in this area due to the standardization of processes and data via an integrated ERP system.

**Economic value:** One of the obstacles adapting cloud-oriented approach is return of predicted investment. Investigating the interaction of all the short-term and long-term costs is made difficult the calculating of investing value, as well as cases such as programs of events recovery, support, reform of resources and services, loss of data and transmission costs of business that are among the hidden costs can make difficult calculating the return on investment. Self-service feature and services based on demand sometimes lead to overuse of services by the final user and overflow the allocated budget.

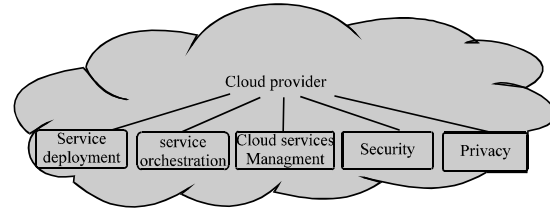


Fig. 1: The major activities of Cloud provider

**Changes in the IT organization:** Including cases that are influenced by adopting cloud-oriented approach is the change in the IT organization. Change in IT is raised in two dimensions. The first challenge is to acquire a set of skills to deploy new technology in dealing with business problems and the second challenge is to understand how changing role of IT in cloud-oriented approach.

**Political issues due to Global boundaries:** Because cloud services forget the global boundaries, diversity of laws of different countries in some cases creates the possibility of disruption in the provision of services.

In addition to the above challenges, according to the report of Harvard business review that are published about the level of concern of organizations on the clouds, the concerns of organizations and challenges of cloud-oriented approach is shown in Fig. 1 in priority.

**Service level agreement:** The use of cloud services includes the deployment of a defined service model and should always be underwritten by comprehensive service level agreements (SLAs). The secure delivery of any cloud service is dependent on the CSP's personnel, processes and technologies while the secure usage of cloud services remains the responsibility of the client.

Typically, cloud-hosting agreements are concerned with "up-time" and high availability, with little or no mention or assurance of security. However, the client is ultimately responsible for ensuring the service they're using meets their security requirements and compliance obligations (Fig. 2) [10].

Not adjusting the appropriate service level agreement cause to not properly ensure and provide the business needs. This Agreement and the other agreements between the client and cloud service providers should clearly cover the following issues:

- The responsibility of each party of agreement (includes responsibilities for implementing, security controls, etc.)
- Quality of offered services
- The services availability

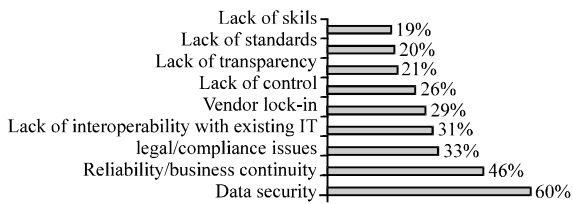


Fig. 2: Significant concerns associated with cloud computing [13]

- Integration of services
- Privacy of services and information
- Control measures of agreement
- Support 7 \* 24

Including a tool that enables the organization to manage the challenges of cloud sourcing is to adjust Service Level Agreement that covers many of the concern regarding cloud service providers and key criteria of the services provided by them.

## CONCLUSION

The issues discussed in this article can be concluded that organizations when choose cloud sourcing approach in providing resources and information technology projects; are faced with challenges that some effective measures in managing the levels of concern are as follows:

- Complete familiarity with rules of cloud sourcing
- Familiarity with dangers and risks of choosing cloud sourcing approach
- Determination of environmental readiness for transfer to the clouds
- Know the needs of business and informed choice of cloud sourcing solution
- Select the appropriate model (public clouds, private, hybrid or public)
- Develop program and projects needed to migrate to the cloud
- Choose the best and most appropriate cloud service provider

- Managing and controlling the use of the services offered on the clouds by final users (optimal management of cost)
- Adjust the Service Level Agreement, in accordance with the quality, security, accuracy and speed of needed services of consumer

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