Chapter 9
# Cloud Selection for E-Business:
## A Parameter Based Solution

**Hemant Kumar Mehta**
*Devi Ahilya University, India*

## ABSTRACT

*Cloud computing is a rapidly evolving area of distributed computing that has significantly changed the way e-business functions are performed. Cloud computing is proven to be an application enabler technology, as several new applications are being developed. These applications vary in size and scale of enterprise for which they are developed. Cloud computing provides solutions for enterprises of all sizes. Almost every commercial application is either migrated to or a candidate of migration on the cloud. Generally, the users of such applications face a big problem before their migration as a number of choices exist for cloud service models, cloud deployment models, and cloud service providers. This chapter presents a roadmap towards successful cloud implementation for enterprises of various scales. A parameter based approach is presented for (1) selection of the service model out of three major service models on cloud, (2) selection of a deployment model from among the four deployment models and (3) selection of a cloud service provider.*

## INTRODUCTION

Cloud computing is a latest major paradigm shifting that changed development and provisioning of the commercial applications. Cloud computing enables its client for rapid provisioning of their applications with reduced cost, increased scal-ability, standardized services, elastic allotment of resources, better fault tolerance, and so forth. Cloud delivers its computing facility through three kinds of services viz. Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). In IaaS cloud, hardware resources such as computing, storage and network

are delivered as a service to a heterogeneous set of end-users and their devices. On these hardware the end users are able to deploy and run their software including operating systems and applications. According to National Institute of Standards and Technology (NIST) virtualization is the key enabling technology of IaaS cloud (NIST). In PaaS cloud, a complete computing environment including operating system, programming integrated development environment, databases and application server, and so forth, are provided as a service to the end users. Developers can deploy the newly developed or acquired custom application onto the PaaS cloud. Runtime environments are a key enabling technique behind PaaS cloud. In SaaS cloud a specific software application is provided as a service to consumers. Consumers can access this application from various end devices. Web services and service oriented architecture are the key enabling techniques of the SaaS cloud.

There are four cloud deployment models; namely public, private, community and hybrid. In public cloud, its infrastructure is made available to general public. It is also called external cloud since it is openly available. The private cloud is owned and operated by an organization. Private cloud's accessibility is given to the consumers that belong to the owner organization of cloud. The infrastructure of community cloud is shared among the multiple organizations having similar interests. The hybrid cloud is combination of two or more cloud types.

Cloud computing is a promising concept that is well adapted in scientific and commercial applications. Cloud offers its services on demand and users have to pay only for the services used by them making it as fifth utility (Buyya, Yeo, Venugopal, Broberg, & Bandic, 2009). Deploying business applications on cloud is productive for all kinds of applications and all sized business organization. However, choosing appropriate cloud service model, cloud deployment model and cloud service provider is difficult and has to be analyzed. Moreover, there is no concrete

guideline in this area that may be used by new organizations to select appropriate cloud service and deployment model. Moreover, a range of technology exists for implementation of business applications, proper selection of the technology to be used is equally important. Finally, a number of cloud vendors are available in market, selecting the right vendor is also tedious.

A number of choices exist for the users to move/deploy their IT functionality over the cloud. Three cloud service models, four cloud deployment models, a large number of technologies and a number of cloud vendors are available to select from. This large number of choices makes it very complex to opt for the most suitable choice. This chapter focused on developing a roadmap/guideline for enterprises willing to move their IT applications on the cloud.

## LITERATURE SURVEY

A number of parameters must be considered for selecting cloud service model, cloud deployment model, and cloud service providers. These parameters are security measures, standardization of technology, service level agreement, reliability, location of data, regularity compliance, integration, and migration to name a few.

According to Armburst et al. (2009), the top ten obstacles to cloud computing are availability of service, data lock-in, data confidentiality and auditability, data transfer bottlenecks, performance unpredictability, scalable storage, bugs in large distributed systems, scaling quickly, reputation fate sharing, and software licensing. They have also mentioned that opportunities are exists to overcome these obstacles, these opportunities are great guidelines for the cloud service providers to proceed.

Ruiz-Alvarez and Humphrey (2011) have presented an application for automated selection of cloud storage services. They have defined an XML schema that contains the capabilities of cloud

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