Cloud Services vs. On-Premise Solutions Cost Comparison Calculator

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Abstract. There are different methods that can be used by product managers in order to set the subscription price of cloud services. No matter the methodology used, the price of a cloud service has to be able to stand against the total-cost-of-ownership of the cloud service on-premise equivalent. Calculating the cost difference between a cloud service and its on-premise equivalent can be a valuable tool for both customers and product managers. This paper will try to develop a Cloud vs. On-Premise Cost Comparison Calculator.

Keywords: Cloud Computing, Cloud Services, Product Development, Product Management, Total-Cost-of-Ownership, Product Pricing.

1 Introduction

Cloud computing can be considered as a new and disruptive service offering with the potential of disrupting current technology and business IT practices [3],[6],[7].

According to Moore [8], when a product or a service which is based on new and disruptive technology is in its introductory phase, it needs to be identified with an existing, established product or service in order to allow customers to understand its full potential. This comes from the fact that customers don't really understand the value of the new product or service until they actually start using it. In this case, special effort needs to be made in order to convince customers to try the new product/service.

Successful service providers and product manufacturers are correctly managing the several factors that affect the potential customer's decision to try the new product or service.

According to Cyta internal market data, price is one of the deciding factors affecting new product adoption in general and cloud services adoption in particular.

This is not a surprising finding as others in the academic community have identified [10].

Cloud service managers have several methods at their disposal when it comes to deciding the subscription price of a service. There are a lot of factors that affect service price setting. Strategic position of the company, strategic position of the service, customer target groups, the service's life cycle stage, competition, development cost, support cost, cost of sales and profit margins are a few of the factors in question.

Currently, there are efforts made by the academic community to define a blueprint that assists customers in choosing the right cloud service provider [4] and even though there are efforts by the academic community to offer insight on how cloud service providers formulate their pricing strategy [10], the academia hasn't really looked at a cloud service pricing model that takes into account its on-premise equivalent.

This paper will offer a definition of cloud services, will attempt to describe the current picture of the cloud services life cycle in Cyprus, will argue that, today, cloud services are positioned as an alternative to on-premise solutions and offer customers and product managers a method for cost comparison between cloud solutions and their on-premise equivalent (Cloud Services vs. On-Premise Solutions Cost Comparison Calculator).

2 Cloud Services Definition

2.1 Defining Cloud Services

According to the Goizueta Business School of Emory University, the term Cloud Computing was first used in academia by Dr. Ramnath Chellappa in 1997 [1]. Dr. Chellappa, in a talk titled "Intermediaries in Cloud-Computing" presented at the INFORMS meeting in Dallas in 1997, suggested that cloud computing is a new "computing paradigm where the boundaries of computing will be determined by economic rationale rather than technical limits alone."

NIST, the National Institute of Standards and Technology of the U.S. Department of Commerce, has the following definition of Cloud Computing: "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." [9].

According to NIST [9], there are three service models for Cloud Computing: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS).

On-premise
Off-premise

On-premise (private)
Off-premise
(private / public)

Off-premise
(public)

Off-premise
(public)

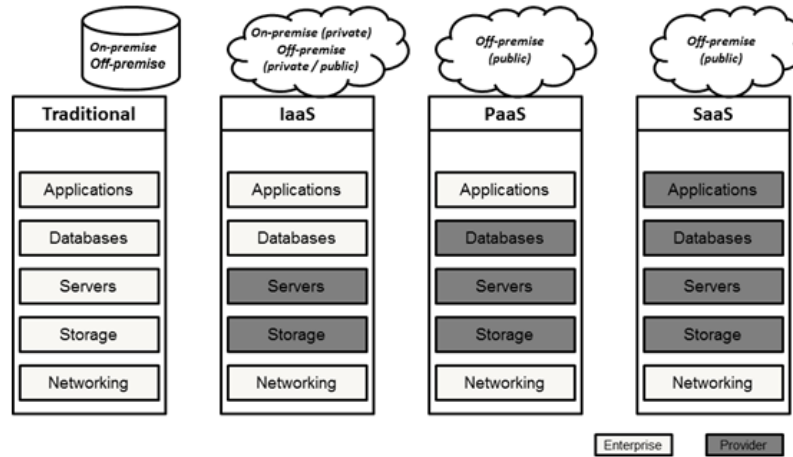| Traditional	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Databases	Databases	Databases	Databases
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

Enterprise   Provider

Figure 1: Cloud Computing Definition

2.1.2 Defining Infrastructure-as-a-Service (IaaS)

The term Infrastructure-as-a-Service (IaaS) is used to describe the ability of the dynamic datacenter to offer computational power and storage as an on-demand service. Customers of IaaS can modify on-demand the computational power and storage of the service they use and pay for.

According to NIST [9], IaaS is defined as "the capability provided to the consumer to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls)".

2.1.3 Defining Platform-as-a-Service (PaaS)

According to NIST [9], PaaS is defined as "the capability provided to the consumer to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment".

2.1.4 Defining Software-as-a-Service (SaaS)

Apparently, the SaaS acronym first appeared in 2001 in an article by the Software & Information Industry's (SIIA) eBusiness Division entitled "Software as a Service: Strategic Backgrounder" [12].

According to NIST [9], SaaS "is the capability provided to the consumer to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings."

2.1.5 Cyta's Cloud Services Definition

Cyta defines cloud services as "the provision of computational infrastructure and business software applications, via the internet, paid for via a monthly subscription fee, without the need for the customer to buy, install, operate and support any server infrastructure."

Cyta's portfolio of cloud services gives a strong emphasis on SaaS with small initiatives on IaaS and no offerings in the PaaS space. One can therefore assume that, for Cyta, cloud services are synonymous to SaaS.

Currently, the Cyta cloud services portfolio [2] offers communication/collaboration systems, anti-virus systems, CRM systems, Parking Management systems, Fleet Management systems, Facilities Management systems, eHR systems, Web Conferencing systems, Accounting systems, POS systems, Stock Control systems and ERP systems.

Almost all of the systems that are currently being offered as part of the Cyta cloud services portfolio are being hosted in Cyta's in-country datacenters. Cyta engineers are responsible for the correct operation of the servers and the network (and all related processes like backup, security, business continuity, upgrade and maintenance) and partner engineers (either from the ISV or an authorized SI) are responsible for the correct operation of the software solution. First level customer support is offered by the Cyta Business Call Center team, whereas second level support is offered by the partner that supports the specific solution in question.

2.2 The Cloud Services Industry Life Cycle in Cyprus

Based on Cyta internal market data, Cyta believes that the cloud services industry (and SaaS industry in particular) in Cyprus is in its Introduction stage and is slowly moving into its Growth stage.
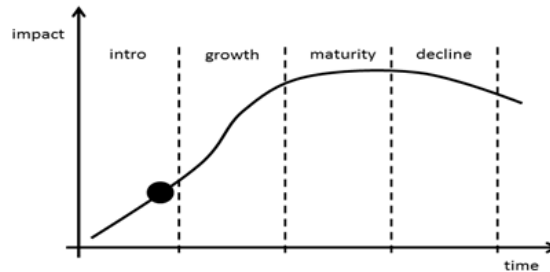
Figure 2: The Cloud Services Industry Life Cycle

Even though there are data in the academic community suggesting that the adoption rate of cloud services is slower than expected [13], the current shape of the Cyprus economy does not allow safe projections as to the speed of the adoption of cloud services by the Cypriot business community. Cyta believes though, that due to the tough economic climate, businesses will push cloud services to the Growth stage faster than originally expected. This belief is based on the fact that businesses are finding it extremely difficult to gain access to financing in order to fund expensive on-premise IT infrastructure installations.

2.3 Positioning Cloud Services against On-Premise Solutions

In his book "Crossing the Chasm", Moore [8] is making the point that when trying to push a new disruptive product to the mass market, product managers need to pay special attention to the positioning of the product in order to help customers compare the new product to other existing products that customers can easily relate to. Cyta cloud services product managers have found that positioning cloud services against their on-premise counterparts can help position cloud services in the minds of their prospective customers.

One of the critical parameters during product comparison is price. It is therefore important for product managers to understand that the price of a cloud service has to be able to stand against the total-cost-of-ownership of the cloud service on-premise equivalent. Calculating the cost difference between a cloud service and its on-premise equivalent can be a valuable tool for both customers and product managers.

3 Cloud Services vs. On-Premise Solutions

Once customers decide on the IT solution that would satisfy their needs, they can then start working on figuring out the best delivery model for securing the IT solution in question. Customers will need to choose between the traditional on-premise model where the customer buys and operates the solution and the cloud model where the customer pays a subscription fee for using the solution. Even though there are a lot of factors that can affect the decision between the cloud and on-premise model, one factor that undoubtedly is of importance is price. This finding is also identified by

academic research [10] that shows that price is one factor amongst others (Technical, Strategic & Organizational, Economic and Political & Legislative) that affect customer cloud services purchasing decisions.

3.1 Total-cost-of-ownership of an on-premise solution

The price of an on-premise solution is usually calculated based on a total-cost-of-ownership concept of the solution. The IT industry is familiar with the term total-cost-of-ownership due to the fact that the cost of purchasing an IT solution is usually a small fraction of the total cost of running, maintaining and upgrading the solution.

Even though there are several factors that affect the total-cost-of-ownership of an IT solution, Cyta product managers have defined the following elements as the major elements that are needed to be identified in order to calculate the total-cost-of-ownership of an on-premise IT solution.

@	Description	Cap Ex	Op Ex
1	Servers (number of servers, CPU cores, RAM, Storage)	√	
2	Server hosting (datacenter, electricity, HVAC, security, network, bandwidth)	√	√
3	Backup (replication, disaster recovery, up time)	√	
4	Operating systems licensing (perpetual, software assurance)	√	√
5	Supporting software licensing (RDBMS, backup, anti-virus) (perpetual, software assurance)	√	√
6	Business software application licensing (perpetual, software assurance)	√	√
7	Hardware installation (servers, backup devices, UPS, HVAC)	√	
8	Operating and supporting software installation (OS, RDBMS, AV)	√	
9	Business software application Installation	√	
10	System operation, support, maintenance, upgrades		√

Table 1: Total-Cost-Of-Ownership Elements of On-Premise IT Solutions

One has to note that all cost elements associated with the above parameters are affected by local currencies, tax laws, cost of capital, electricity costs, shipping costs and human resources costs.

3.2 Cost of a cloud solution

Service providers have sometimes used a free or free-mium business model in their effort to quickly secure market share. This has generated confusion in the business sector giving rise to a false impression that cloud services can be offered as a free

service. Businesses need to understand that using a cloud service doesn't mean that it is a cheaper alternative to its on-premise equivalent. Embracing the cloud means that the business customer will have a better management of his/her finances and it doesn't mean that he/she can enjoy the benefits of a cloud service for free [4].

Having a cost associated with both an on-premise solution (total-cost-of-ownership) and its cloud equivalent pushes the prospective buyer to compare the costs between the two alternative access methods to an IT solution.

3.3 Cloud cost vs. on-premise cost

Once the business customer identifies the costs associated with the cloud offering and the costs associated with its on-premise equivalent, a formula is needed to be used in order to advice the business of the most financially prudent solution.

If the cost associated with a cloud service reaches the cost associated with its on-premise equivalent at a point in time when the on-premise solution needs to be upgraded to a newer version that requires reinstallation then choosing the cloud offering would make financial sense to the business.

If the cost associated with a cloud service reaches the cost associated with its on-premise equivalent in less time than the expected life of the on-premise solution then the customer shouldn't have any compelling financial reasons for adopting the cloud alternative.
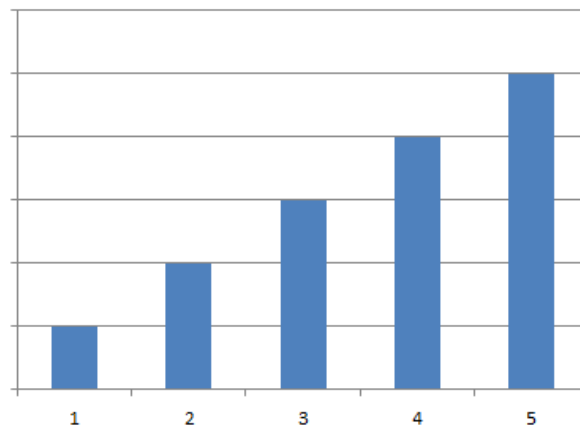
Figure 3: Cloud cost vs. on-premise cost

Based on the above reasoning, the price of the cloud service should be related to the cost and the life span of its on-premise equivalent.

Product managers need to be aware of the interdependency between the cloud offering and its on-premise equivalent when designing their respective pricing strategies.

4 Conclusion

When a service that is based on new and disruptive technology is in its introductory phase, it needs to be mapped in the minds of the customers next to an existing, established service in order to allow customers to understand its full potential.

Businesses and academia agree that cloud services offer a disruptive alternative to traditional IT solution offering. The cloud services industry in Cyprus is in its introduction stage and is slowly moving into its growth stage. Having cloud services being a disruptive offering which is in its introductory phase, pushes customers to think of cloud services in reference to their on-premise equivalents.

Cyta, therefore, believes that product development and product management processes should keep in mind that cloud services are to be compared to their on-premise equivalents. Since one of the major factors affecting customer cloud services adoption is price, Cyta believes that the price of the cloud service should be related to the cost and the life span of its on-premise equivalent. Product managers need to be aware of the interdependency between the cloud offering and its on-premise equivalent when designing their respective pricing strategies.

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