# KEY DETERMINANTS OF CLOUD COMPUTING Vs. TRADITIONAL IT OUTSOURCING-AN ASSESSMENT OF SELECTION STRATEGY

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## ABSTRACT

*Cloud computing is a hot topic to debate nowadays, especially in business community and the media. An alternate option to main stream IT Outsourcing, cloud computing, which is delivered on-demand via internet in a self-service fashion, free from specific device and location, customers pay for the arrangement as an operating expense without incurring any significant initial capital expenditure, with the cloud services employing a metering system.*

*The aim of this paper is to verify if it is possible to assess the decision making process used for cloud computing solution with the same concepts and theories that are used to evaluate traditional IT outsourcing decision making process. Additionally, the paper will further assess that what key determinants used in the processes, are to be included or excluded while considering a cloud computing opportunity compared to the traditional IT outsourcing.*

## I. INTRODUCTION

On the premise of the concept of utility computing given a kick start to a fresh idea in computing world to make computing independent from tangible resources and navigated a direction towards thoughtful thinking to market computer resources like water and electricity as a service (McCarthy, 1961).

Since inception of internet services it was become evident that certain types of computing offerings such network services are available as services to substantiate the McCarthy concept of utility computing. Users were able to login from remote location and transfer files through internet however in recent past internet services that are offered online has adopted an even new dimension all together. Software is presently fit for being offered internet including enormous quick machines in in another person data center running an application that is accessed using a commonplace web browser, despite the fact that another person owns the application. The payment is carried out by a fixed subscription fee.

As a result there is no need any more for stressing over the machines running the application as the supplier is presently dealing with that. There is additionally no dedication of time and assets required to create and keep up the application that is utilized.

However the approach has multiple challenges in adoption such as standard approach may not work

different size and distinct nature of business or confidential data processing may not suite a large population Henceforth organizations needed the convenience and simplicity of software as a service, yet the flexibility of traditional computing.

## 1.1 Aim and Objectives

The primary aim of the research journal is to identify. The key determinates of selection strategy utilized for traditional IT outsourcing practice and thereby to verify if it is possible to assess the decision making process used for cloud computing solution with the same factors used in assessment of traditional IT outsourcing decision making process.

## 1.2 Research and Problems

IT Outsourcing decision is crucial step as far as small and medium enterprises are concerned as it has potential to impact bottom line significantly as well as stress free from IT resources management, maintenance and updates. Considering the opportunity, a company has two possibilities for a transition.

The company may enter into a contract with a service provider and get the services where one or more resources are assigned to the company which will be assured to be up and running by the service provider. This arrangement is called traditional outsourcing.

Whereas the company may decide to opt for another kind of outsourcing arrangement where the applications that are being used by the company can run anywhere and be paid only by the amount of resources that are used. For the following paper this kind of IT outsourcing will be called cloud computing.

The purpose of this paper is to provide an evolutionary perspective of the process by which a technology solution is chosen from hence it becomes imperative to understand if decision making process to choose traditional way of IT outsourcing is actually different while assessing could computing solution. Additionally, we further assess that what key determinants used in the processes, are to be included or excluded while considering a cloud computing opportunity compared to the traditional IT outsourcing.

To achieve formulated objectivity of the paper, a theoretical framework has been designed and interviews were conducted with three companies in order to gather their general opinion and knowledge on the subject. Questions were asked in a way to minimize the possibility of manipulation or avoid deliberate/unintentional bias.

## II. CLOUD COMPUTING

Together with virtualization, clouds can be defined as computers that are networked anywhere in the world with the availability of paying the used clouds in a pay-per-use way, meaning that just the

resources that are being used will be paid (Armbrust et al, 2009). In the following the types of clouds will be introduced.

## 2.1 Public Clouds

A public cloud encompasses the traditional concept of cloud computing, having the opportunity to use computing resources from anywhere in the world. The clouds can be used in a so-called pay-per-use manner, meaning that just the resources that are being used will be paid by transaction fees (Armbrust et al, 2009; Johnston, 2009).

## 2.2 Private Clouds

Private clouds are normally datacenters that are used in a private network and can therefore restrict the unwanted public to access the data that is used by the company. It is obvious that this way has a more secure background than the traditional public clouds. However, managers still have to worry about the purchase, building and maintenance of the system (Armbrust et al., 2009; Johnston, 2009).

## 2.3 Public Clouds

As the name already reveals, a hybrid cloud is a mixture of both a private and public cloud. This can involve work load being processed by an enterprise data center while other activities are provided by the public cloud (Johnston, 2009). Below an overview of all three cloud computing types is illustrated.
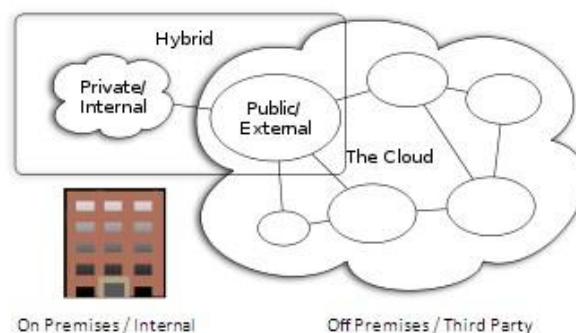


**Figure: Cloud Computing Types (Johnston, 2009)**

## III. TRADITIONAL OUTSOURCING THEORIES

The objective of the paper is not to discuss about merits and demerits of existing outsourcing theory however being utilized as a tool to gauge cloud computing solution hence the theories be covered briefly here :

## 3.1 Transaction Cost Theory

Transaction cost theorists assert that the total cost incurred by a firm can be grouped largely into two components—transaction costs and production costs. Transaction costs, often known as coordination

costs, are well defined as the costs of "all the information processing necessary to coordinate the work of people and machines that perform the primary processes," whereas production costs include the costs incurred from "the physical or other primary processes necessary to create and distribute the goods or services being produced.
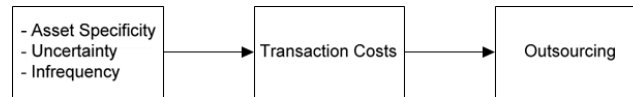


### 3.2 Agency Cost Theory

The theory focus is the reason for the principal-agent problem that treats the difficulties that arise under conditions of incomplete and asymmetric information when a principal hires an agent. Various mechanisms may be used to try to align the interests of the agent with those of the principal, such as piece rates/commissions, profit sharing, efficiency wages, the agent posting a bond, or fear of firing. The principal-agent problem is found in most employer/employee relationships, for example, when stockholders hire top executives of corporations.



### 3.3 Resource-Based Theory

The resource-based theory argues that firms possess resources, a subset of which enables them to achieve competitive advantage, and a subset of those that lead to superior long-term performance. Resources that are valuable and rare can lead to the creation of competitive advantage. That advantage can be sustained over longer time periods to the extent that the firm is able to protect against resource imitation, transfer, or substitution. In general, empirical studies using the theory have strongly supported the resource-based view.
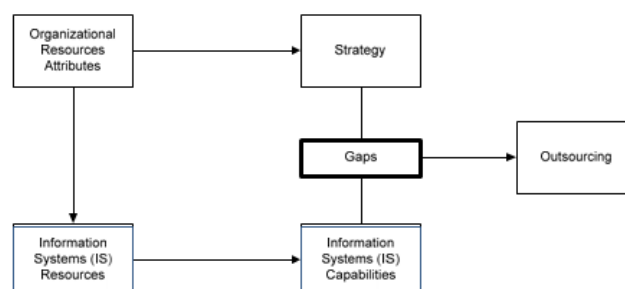


### 3.4 Resource Dependence Theory

Resource Dependence Theory proposes that actors lacking in essential resources will seek to establish relationships with (i.e., be dependent upon) others in order to obtain needed resources. Also, organizations attempt to alter their dependence relationships by minimizing their own dependence or by increasing the dependence of other organizations on them. Within this perspective, organizations are

viewed as coalitions alerting their structure and patterns of behavior to acquire and maintain needed external resources. Acquiring the external resources needed by an organization comes by decreasing the organization's dependence on others and/or by increasing other's dependency on it, that is, modifying an organization's power with other organizations.



### 3.5 Exchange Theory

Social behavior is an exchange of goods, material goods but also non-material ones, such as the symbols of approval or prestige. Persons that give much to others try to get much from them, and persons that get much from others are under pressure to give much to them. This process of influence tends to work out at equilibrium to a balance in the exchanges. For a person in an exchange, what he gives may be a cost to him, just as what he gets may be a reward, and his behavior changes less as the difference of the two, profit, tends to a maximum.
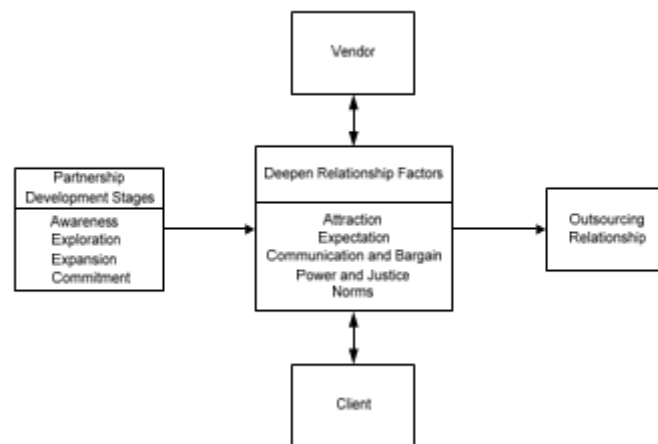


### IV. RESEARCH METHOD

Primary data sourced by interviews conducted with various companies as well as secondary data from the sources referred in reference section of the paper established foundation for data collection requirement in order to answer the questions at hand. The data gathered helped in developing understanding against the factors identified in theoretical framework and further turned up to be crucial in conducting comparative study between two outsourcing options.

### 4.1 Company and Interviewee Selection

Being new offer in the market, cloud computing selection process were mainly assessed through interviews of following type companies:

- Already outsourced traditionally and/or considering cloud solutions for outsourcing

- Already outsourced with cloud solutions

- An outsourcing service provider

For outsourcing service provider perspective a large IT outsourcing and cloud computing provider and for client perspective one small & medium enterprise and one large organization were preferred. In fact for the research at hand three companies have been declared as perfectly suitable for each one of our references.

### 4.2 Interviews

An unstructured interview was conducted in order to gather primary data which provided an opportunity to observe the initial interviewee's opinion regarding the topic hence minimized opportunity to adopt a standard model while answering the question of interest.

### V. THEORETICAL FRAMEWORK

With an intention to interrelate all factors involved in various outsourcing theories a conceptual framework is presented. The framework is fundamentally based on the work of Cheon et al. (1995) merged with a new perspective of IT outsourcing; the exchange theory. Cheon et al. (1995) emphasizes that various concepts depicted in the framework are interrelated. The factors associated in the framework will play role as key determinates to decide if these factors are well potentially equipped to be used as part of decision making process for cloud computing hence be determinants in conclusion of the study.
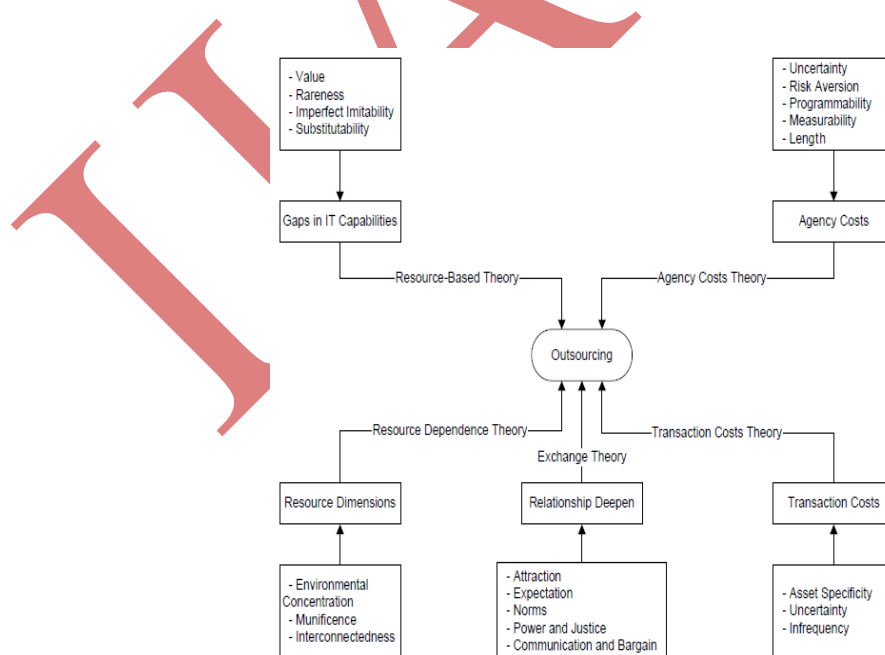


*Figure: Theoretical Framework for IT Outsourcing*

## VI. CONCLUSION

This study has explored through a rigorous analysis of the empirical observations collected against key factors highlighted as a part of theoretical framework by conducting interviews with the companies in order to gather their general opinion and knowledge on the subject thereby it could be concluded that key determinates used in traditional IT outsourcing theories are equally competent in assessing cloud computing solutions as an IT outsourcing option however additional concepts are also identified and assessed with conjunction to traditional factors while evaluating cloud computing solutions. Special attention was given to minimize possible bias from each side [interviewer as well as interviewee].

The initial part of the research enquires the confrontation of the data gathered against key factors associated in various traditional outsourcing theories. This confrontation advises that the key determinates used to assess traditional IT outsourcing can also be used to assess cloud computing solutions. The framework appeared to be comprehensive since it comprises different dimensions of IT outsourcing. Moreover, examining the thoughts associated with each IT outsourcing theory represented in the framework, demonstrated a reasonable level of transparency and highlighted the coherence between the analysis and findings. Enhancing level of transparency and to ease of the reader of the study a comparative study based on the key factors have been presented as per their suitability with both types of outsourcing solution.

The second part of the analysis suggests that Costing in terms of initial capital expenditure, availability of services through medium and susceptibility against security issues as well as nature of business and it's quantum are additional factors that must be given due diligence before finalizing a particular outsourcing solution. The additional factors provide enhanced suitability to cloud computing in order to assess the main strengths and weaknesses of the availability of cloud computing technologies. The study advocates blend of IT outsourcing theories and additional concepts are competent to provide a better insight in IT outsourcing decision process. Although this paper succeeds in revealing the intended answers and contributes with new useful information however it is imperative to emphasize the constraints that restricted the research process and limited outputs. Limitations as time, budget, geographical scope, confidentiality and the population size that already have opted cloud computing shaped the extent of details of research outcome. However the rationality with the research methods applied offers credibility to the outcomes and augments the insights and knowledge gathered in this paper.

**Comparison based on concepts suitability**

| Concepts | Applicability | |
|---|---|---|
| | Tradition IT Outsourcing | Cloud Computing Solution |
| Asset Specificity | ✔ | ✔ |
| Uncertainty | ✔ | ✔ |
| Infrequency | ✔ | ✔ |
| Uncertainty | ✔ | ✔ |
| Risk Aversion | ✔ | ✔ |
| Programmability | ✔ | ✔ |
| Measurability | ✔ | ✔ |
| Length | ✔ | ✔ |
| Value | ✔ | ✔ |
| Rareness | ✔ | ✔ |
| Imperfect Imitability | ✔ | ✔ |
| Substitutability | ✔ | ✔ |
| Environmental Concentration | ✔ | ✔ |
| Munificence | ✔ | ✔ |
| Interconnectedness | ✔ | ✔ |
| Attraction | ✔ | ✔ |
| Expectation | ✔ | ✔ |
| Norms | ✔ | ✔ |
| Power and Justice | ✔ | ✔ |
| Communication and Bargain | ✔ | ✔ |

**REFERENCES**

[1] Cheon, M. J., Varun G., & James T. C. Teng (1995). Theoretical Perspectives on the Outsourcing of Information Systems. Journal of Information Technology, 10, 209-219.

[2] [Szu-Yuan Sun, Tung-Ching & Lin Pei-Chen Sun (2002), The Factors Influencing Information Systems Outsourcing Partnership, 35th Hawaii International Conference on System Sciences, 2.

[3] Reyes Gonzalez, Information Systems Outsourcing: a literature analysis, 10-13.

[4] Leslie P. Willcocks, and Mary C. Lacity, Information Systems Outsourcing In Theory And Practice, journal of Inforrnation Technology (1995), 10, 203-207

[5] Barney, J. (1991). Firm resources and Sustained Competitive Advantage. Journal of Management, 17, 99,120.

[6] Blau, P. M. (1964) Exchange and Power in social life. New York: J. Wiley.

[7] Buyya, R., Yeo, C., Venugopal, S., Broberg, J. & Brandic, I. (2009). Cloud Computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility. Future Generation Computer Systems, 25, 599- 616.

[8] Chou, D. C., & Chou, A. Y. (2007). Software as a Service (SaaS) as an Outsourcing Model. An Economic Analysis. 386-391.

[9] Coase, R. H. (1937) The Nature of the Firm. Economica 4, 16, 386-405.

[10] Craig-Wood, K. (2009). The Differences Between IT Outsourcing and Cloud Computing. Thoughts on British ICT, energy & environment. Available at: http://www.katescomment.com/difference-it-outsourcing-cloud- computing/.

[11] Dawson, C. (2002). Practical Research Methods. How To Books Ltd., 20-79.

[12] Dibbern, J., Goles, T., Hirschheim, R. & Jayatilaka, B. (2004). Information Systems Outsourcing: A Survey and Analysis of the Literature. The Data Base for Advances in Information Systems, 35 (4), 6-102.

[13] Dwyer, F. R., Schurr P. H. & Sejo O. (1987). Developing Buyer-SellerRelationshi