Master Thesis
Information Technology and Management

- Cloud Computing Evaluation -
How it Differs to
Traditional IT Outsourcing

Master Thesis within IT & Management
Authors: Débora Di Giacomo
         Tino Brunzel
Supervisor: Wolfram Webers
Jönköping May 2010
“All truths are easy to understand once they are discovered; the point is to discover them.”

Galileo Galilei (1564 – 1642)
Preface

The research at hand deals with the evaluation process of cloud computing and how it is differing to the evaluation of traditional IT outsourcing.

The idea to write about cloud computing came after our presentation of that topic in the course "Societal and Industrial Evolution of the Connected IT Economy" conducted by Mr. Klas Gäre at the International Business School of Jönköping during our first year of master studies. Ever since the revolutionary IT potential of cloud computing fascinated us. When we then suggested the area during our thesis term, our supervisor Mr. Wolfram Webers recommended us to focus on the evaluation process of cloud computing. After further conversations, even a comparison to traditional IT outsourcing was taken into consideration and eventually into action.

We would like to thank Mr. Wolfram Webers for his incentive to the research at hand as much as his informative and honest advice that often went even beyond the content of the thesis.

We are also very grateful for the interviewees who gave us a huge amount of new insights for the research topic. With their expertise and uncomplicated communication to them, it helped a lot to add value to this thesis.

Lastly, we dedicate our thesis to our parents

Vera Lucia Ruiz Di Giacomo & Robson Luiz Di Giacomo and
Annekathrin Brunzel & Edwin Brunzel

who enabled us to get the opportunity to do this studies.

Jönköping, May 2010

Débora Di Giacomo Tino Brunzel
Master Thesis in Information Technology and Management

Title: - Evaluating Cloud Computing - How it Differs to Traditional IT Outsourcing

Authors: Débora Di Giacomo
Tino Brunzel

Supervisor: Wolfram Webers

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Abstract

Introduction
Cloud Computing, that is providing computer resources as a service, is a technology revolution offering flexible IT usage in a cost efficient and pay-per-use way. As for the evaluation of companies to whether which technology solution to use, it would be necessary to decide whether or not the evaluation of cloud computing would actually differ to the traditional way of IT outsourcing.

Problem Discussion
Outsourcing IT capabilities are a crucial and inevitable step for enterprises that want to survive in the currently high competitive climate. Until now most of the researches, that has been done so far, only consider the XaaS model only from a traditional IT outsourcing point of view rather than in the cloud computing context. This research will now include the evaluation of cloud solutions giving companies another possibility to outsource their IT resources.

Purpose
The purpose is now to see how the evaluation of cloud computing possibilities as an outsourcing option actually differs to traditional IT outsourcing. One aspect that needs to be covered with this purpose, is whether it is possible to evaluate the source through a cloud computing solution with the same concepts and theories used to evaluate traditional IT outsourcing. It will also be the purpose to see, which aspects need to be added or removed when considering a cloud computing opportunity compared to the traditional IT outsourcing.

Method
With help of the theoretical framework, interviews have been launched with three companies to see what their general opinion and knowledge is on the evaluation of cloud computing and its maturity. Questions have been asked openly so that answers could not be directed or manipulated by the authors of the research.

Conclusion
After challenging the theoretical framework against the data collected, the traditional IT outsourcing theories appeared to be valid also for the evaluation of cloud computing solutions. Some important concepts are added to the evaluation of cloud computing solutions in consequence of particularities present in the model.
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## Abbreviations

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<td>Agency Cost Theory</td>
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<tr>
<td>DAAS</td>
<td>Database as a Service</td>
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<tr>
<td>FTP</td>
<td>File Transfer Protocol</td>
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<td>HR</td>
<td>Human Resources</td>
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<td>IAAS</td>
<td>Infrastructure as a Service</td>
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<td>ISP</td>
<td>Internet Service Provider</td>
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<td>PAAS</td>
<td>Platform as a Service</td>
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<td>RBT</td>
<td>Resource-Based Theory</td>
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<td>RDT</td>
<td>Resource Dependence Theory</td>
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<tr>
<td>SAAS</td>
<td>Software as a Service</td>
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<tr>
<td>SME</td>
<td>Small and Medium Enterprises</td>
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<td>SP</td>
<td>Service Provider</td>
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<td>TCT</td>
<td>Transaction Cost Theory</td>
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<td>VPC</td>
<td>Virtual Private Cloud</td>
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<tr>
<td>VPN</td>
<td>Virtual Private Network</td>
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<tr>
<td>XAAS</td>
<td>Everything as a Service</td>
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1 Introduction

This chapter at hand will introduce the background of the research topic and provide information about the knowledge gap which this topic is about to fill by discussing the previous research around this subject. The argumentation will be enhanced by providing the research questions, purpose and delimitations of the topic. A time line will also be provided as much as a definition of terms.

1.1 Background

Information technology has become pervasive in organizations and an inevitable key success factor in business. Organizations can create, communicate and collaborate faster, more efficient and reliable than ever before.

In the late 1960’s, the computer scientist John McCarthy once brought the concept of utility computing into the technology world, predicting that the life cycle of technology will not only stick as tangible products. As a matter of fact, he took the conceptual leap to predict that computer resources will be provided like nowadays water and electricity – as a service (McCarthy, 1961).

Services are not brand new; there have been network services since the invention of the internet in the 1970’s (Martin, 2003). People were able to login remotely, transfer files via the ftp protocol in the early years of the internet already. However in the last couple of years internet services offered online took on an even new dimension.

Software is now capable of being offered online including big fast machines in someone else’s data center running an application that is accessed using a familiar web browser, although someone else owns the application. The payment is done by a fixed subscription fee (Motahari-Nezhad, Stephenson, & Singhal, 2009).

As a consequence there is no need anymore for worrying about the machines running the application as the supplier is now taking care of that. There is also no devotion of time and resources needed to develop and maintain the applications that is used.

However there are disadvantages that come along with this kind of transition:

- One-size-fits-all approach might possibly not work for enterprises with complex requirements
- Other companies might not like the idea of processing the data outside their firewall
- The subscription model does normally not align the costs of usage

Hence companies wanted the convenience and simplicity of software as a service, but still the flexibility of traditional computing.

With the concept of virtualization, servers could be utilized more efficiently, while applications and IT infrastructure are independent allowing servers to be easily shared by
many applications running virtually anywhere. That is as long as the application that is being used is virtualized (Armbrust, Fox & Griffith, 2009).

Virtualizing the application involves packaging the application bits with everything it needs to run, that could include database, middleware and operating system. This self-contained unit of virtualized application can run anywhere (Armbrust et al., 2009). With the premise that it can run anywhere it does not need to run in the datacenter or in the application provider’s datacenter, it can run in the cloud. The cloud is a computing service that charges based only on the amount of computing resources that are used (Motahari-Nezhad et al., 2009). This pay-per-use feature is one of the big marks of today’s cloud computing and one of the things that sets it apart from traditional IT services (Armbrust et al., 2009).

Going back to evaluate whether or not cloud capabilities are worth the investment, it is now assumed that the focus is first of all not about cloud computing but about the traditional way of IT outsourcing as such.

It is now very interesting to go back one step in time before cloud computing, find literature about evaluating traditional IT outsourcing solutions. It is important to understand the theories, methodologies and concepts that play a role in the traditional IT outsourcing’s decision making process. After that it can be discovered whether the evaluation of cloud computing solutions will be different or not.

1.2 Existing Research

IT outsourcing has been explored since the 1990’s in a reasonable amount of empirical, theoretical and “best practices” guides (Goles & Chin, 2005). Several studies focus on the determinants, advantages and disadvantages of IT outsourcing (Dibbern, Goles, Hirschheim & Jayatilaka, 2004). As a buzzword in the 1990’s, IT outsourcing was the main subject of most of the business magazines and periodicals in that decade.

Over time, researches in IT outsourcing address the advantages and disadvantages of this business model linked with methods and frameworks. The most recognized and used frameworks can be categorized according to three different perspectives of outsourcing; the economical, social or strategic managerial perspective (Lee, Huynh, Chi-wai & Pi, 2000).

The economical perspective focusses in the transaction cost economics (Williamsson, 1979) and agency cost theory as well as the structure whether or not to outsource IT in terms of monitoring costs, transaction costs and asset specificity (Hancox & Hackney, 2000). Following the same rational, Vining and Globerman (1999) frame outsourcing in terms of product and activity complexity, contestability, and asset specificity. The economical framework is about the firm’s understanding of tangible and intangible costs of IT services.

According to the strategic management perspective, the choice of outsourcing should be made according to the IT resources and capabilities and how the organization manages them. “Concentration in core capabilities can be a reason for outsourcing” (Hancox & Hackney, 2000). On the other hand the social point of view in IT outsourcing lies on the principle of partnership in the relationship model between vendors and customers. While the first two perspectives admit the opportunistic behavior of enterprises (Vining
Introduction

& Globerman, 1999), the partnership theorists believe that “the arrangement between two parties can transcend the organizational differences and cause the parties to work together in a common purpose” (Hancox & Hackney, 2000).

Whilst studies are done, that focus on highlighting frameworks isolated from each other, Hancox and Hackney (2000) present 4 frameworks together to understand the outsourcing decisions in different economic sectors. Cheon, Grover and Teng (1995) draw a very broad framework showing 4 different perspectives to evaluate IT outsourcing.

However there are several studies about IT outsourcing in general. The combination of the concepts involved in this research, that are IT outsourcing, cloud computing and software as a service (SaaS), are presented in different combinations and branches of studies within the literature.

The literature presents researches relating to IT outsourcing and software as a service and also some other services such as infrastructure as a service, database as a service and the business model in general that can be called X as a service (XaaS), which means everything as a service. The context of IT outsourcing considers the XaaS business model mainly focussing on the advantages and disadvantages. The conclusion of the studies points out the main benefits of cost savings, better resources utilization, more application scalability and global outsourcing spectrum possibility (Chou & Chou, 2007).

Cloud Computing as an academic keyword is emerging in the last two years, even though disciplines that are the base of cloud computing as grid computing, virtualization, software oriented architecture, web services, utility computing and distributed computing have been a theme of a vast number of researches (Motahari-Nezhad et al., 2009).

Moreover a common topic around cloud computing is a part of advantages and disadvantages of the model that refers to the business value and return on investment. A fact that could be noticed in the searching for previous studies is that most of the conducted until now were conducted by private research institutes such as Gartner and Forrester.

1.3 Problem Discussion and Research Questions

Until now, most of the studies that refer to XaaS as an outsourcing model do not mention the scenario where XaaS can be provided not just by the traditional outsourcing model but also considering cloud computing providers (Herbert & Erickson, 2009). The lack of information about cloud computing as an outsourcing option can be justified as “the model is in its absolutely infancy” (Hoffman, 2009). Although there are few studies in the academic world, the large vendors as Google, HP, IBM, and Amazon are investing in studies in their R&D departments and laboratories in a way to contribute with scientific knowledge that foments their commercial activities in cloud computing (Motahari-Nezhad et al., 2009).

This research underlines a topic that is neither present in the academic publications nor in the private research institutes; the comparison between traditional IT outsourcing and cloud computing in terms of the evaluation process. Around the media, where practitioners expose their doubts, concerns and opinions the question about the differences between outsourcing and cloud computing is frequently asked and answered (Craig-
This study approaches a market issue in a structured and deep analysis to identify and clarify the main aspects that differentiate the traditional IT outsourcing from cloud computing and also if the criteria of outsourcing evaluation is the same or not in both cases.

The process of IT outsourcing to an external service is a crucial step for small and medium enterprises (SMEs) as it can potentially save a lot of money, resources and hassle for maintenance and updates (Armbrust et al., 2009). A company has two possibilities for a transition:

In a traditional way a company can buy a service by another company and have a contract with a tender that provides them the services. The company will have to get the service from a certain location, where one or more machines are allocated to the company. This is financially assured by paying the supplier a monthly or yearly fee to take care of the IT resources so that they are assured to be up and running. For the following research this kind of IT outsourcing will be called traditional IT outsourcing.

On the other hand, a company has the opportunity to outsource to a cloud, 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 research this kind of IT outsourcing will be called cloud computing.

Both alternatives are illustrated in the figure below:

![Figure 1-1: Two Opportunities for a company in its IT transition phase](image)

The question that needs to be answered is therefore the following and can be broken down into two sub parts:

**How does the evaluation of cloud computing as an outsourcing option differs to the traditional IT outsourcing?**

a) Is it possible to evaluate the source through cloud computing solution with the same concepts and theories used to evaluate traditional IT outsourcing?

b) Which aspects need to be added or removed when considering a cloud computing opportunity compared to the traditional IT outsourcing?
1.4 Purpose

The purpose of this research paper is to discover which aspects there are to add or to remove when considering the evaluation of cloud computing instead of a traditional IT outsourcing opportunity. Both have their obvious reasons to be an alternative to corporate computing. But it is important to realize if there are differences in the evaluation of both solutions as an outsourcing option.

It will be also interesting to generally find out to the main aspects that are necessary to evaluate the business model alternatives and their importance for the final decision.

1.5 Delimitations

The focus on the research paper lies at companies that are interested in outsourcing their services. This can involve two types of companies that are the following:

- A company that is currently interested in IT outsourcing
- A company that is already outsourcing all or parts of its IT resources

This study is designed considering the constraints in the time frame and number of companies that will accept to be accessed and the considerable novelty in the topic.

1.6 Target Group

The fundamental idea behind the research is to provide companies with a comparison of traditional IT outsourcing and cloud computing opportunities.

Companies that are provider themselves and have their own employees using in-source IT resources will get the opportunity to read about two IT outsourcing models that are traditional IT outsourcing as such and cloud computing solution.

Organizations that are already using traditional IT outsourcing solutions will get an idea of how cloud computing solutions will differ from their existing IT resources and in what way it can benefit even further.

1.7 Definition of Terms

The following sub chapter encompasses a definition of key concepts as a basis of this thesis. All concepts are explained later in detail with their specific sources, so that in this chapter the references do not occur.

Cloud Computing: Form of cost-efficient and flexible usage of IT services. The services are offered just-in-time over the internet and are paid per usage.
Clusters: Locally distributed units with the same kind of hardware and operating systems being capable of processing a large amount of data collaboratively.

Grids: Globally distributed units with different operating systems and hardware being capable of processing a large amount of data collaboratively.

Hybrid Cloud: A mixture of a private and public cloud.

Infrastructure as a Service: Users being able to use servers, storage, network settings on-demand from other providers on a pay-per-use basis.

Platform as a Service: Developers being able to build their own applications offered on development platforms that are maintained and secured by other providers.

Private Cloud: Clouds that are used in a private network providing more security.

Public Cloud: Clouds that can publicly run anywhere in the world.

Scalability: Refers to the performance of handling growing amounts of work.

Software as a Service: Users can utilize software being offered over the internet without worrying about its maintenance, back-ups or security.

Supercomputers: Machines assembled with a lot of processors that are merged into 1 machine with high performance capabilities.

Traditional IT Outsourcing: Ordinary way of a company to choose an external tender to take care of their IT resources with physical assured locations.

Utility Computing: The very idea of computing resources being offered as a service.

Virtualization: With virtualization servers are utilized more efficiently enabling one server to be used by several customers.

1.8 Time Line

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<td>- Agreement on the research topic and its research questions</td>
</tr>
<tr>
<td>March</td>
<td>- Theoretical background and pieces of the framework</td>
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<tr>
<td></td>
<td>- E-Mails to potential companies/conduct further interviews</td>
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<tr>
<td></td>
<td>- Research Method, Research Disposition, Data Collection</td>
</tr>
<tr>
<td>April</td>
<td>- Further research for potential companies/ further interviews</td>
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<tr>
<td></td>
<td>- Start with analysis and findings part</td>
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<tr>
<td>May</td>
<td>- Finalize analysis and findings part</td>
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<tr>
<td></td>
<td>- Write-up of the conclusion and prospect part</td>
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2 Theoretical Background

The objective of this chapter is the elaboration and the response to the scientific concepts within the upcoming chapters.

At first it will be necessary to get a fundamental overview of the development of distributed computing, its first occurrence and how it evolved. It is also inevitable to clearly clarify what cloud computing is, which concepts it involves and how it distinguishes from all the other concepts that will be explained in the following chapter.

Secondly, the IT outsourcing theory is presented. Five different perspectives for IT outsourcing are explained in detail in a way to provide a basis to the framework development. Using different approaches, this research covers most of the literature published until now in terms of IT outsourcing.

Therefore, the convergence of IT outsourcing theories and the main concepts involving cloud computing are the foundation to understand the whole picture of this study and pave the way to answer the research question at hand.

2.1 Utility Computing

Utility Computing is a concept established by John McCarthy, who predicted already in the late 1960s that "computation may someday be organized as a public utility" (Foster et al., 2008), such as it happened with electricity. This statement was a ground-breaking step but not further followed by that, as hardware and software capabilities could not meet this vision (Foster, Zhao, Raicu & Lu, 2008).

As soon as the technology was not an issue anymore to fulfill the idea of providing computing resources as a service, utility computing has found its way to be realized in outsourcing providers and also cloud computing (Foster et al., 2008).

2.2 Distributed Computing

Distributed computing refers to the very idea of using distributed systems that are generally multiple computers connected to each other via computer networks to collaboratively process a common goal. Those computers communication can be homogeneous or heterogeneous, distributed globally or locally. According to the characteristics of localization or equality, distributed systems have different subsets, such as supercomputers, grids, clusters, web 2.0 and clouds (Foster et al., 2008).

Before going further into the subsets of distributed computing, an illustration is provided to visualize the interconnection between the concepts that will be explained in the following:
As an example for distributed computing, the Search for Extra-Terrestrial Intelligence, short SETI, is a prime example based on heterogeneous and globally located computers. Every participant is able to download the peace of software and then interconnect to a centralized server. The servers provide the input from their sensors with a huge amount of data, making the calculation of this data normally very complicated (University of Berkeley, 2009). While a single computer would not be able to do that in an appropriate amount of time, millions of computers that are interconnected anywhere in the world can.

### 2.2.1 Clusters

Characteristics of clusters are that the computers being linked to each other are normally distributed locally, and have the same kind of hardware and operating system. Therefore cluster work stations are connected together and can possibly be used as a super computer (Buyya, Yeo, Venugopal, Broberg & Brandic, 2009).

As an example, in the US Air Force hundreds of PlayStation 3 consoles are used to be connected together into one cluster. This merged machine is then utilized for high performance computing to calculate complex equations, which demand powerful computers. The PlayStation 3 is used as it is not only a gaming machine or blue-ray player, but also a high performance machine offered for a reasonable price compared to other high-performance servers (Heussner, 2009).

### 2.2.2 Supercomputers

Supercomputers can be easily compared to clusters, because it follows the same concept, except the fact that it is merged into one box already and is not locally interconnected with other machines (Buyya et al., 2009).
IBM is constructing those machines consisting with a lot of processors that are merged into 1 machine with high performance capabilities (IBM, 2009). The only disadvantage is that they are usually expensive and have the necessity of a huge amount of energy.

2.2.3 Grids

When defining grid computing it is necessary to differ it from clusters. While clusters are distributed locally and obliged to use the same hardware and OS, grids involve heterogeneous computers that are connected to each other and distributed globally. The OS and hardware that run on those machines can also be different from each other (Buyya et al., 2009).

The computers that are interconnected over the internet can come from anywhere while there is usually no obligation to pay. For this reason already it is obvious that grids being connected are not nearly as expensive as the supercomputers that are offered from IBM and other technology companies.

The SETI project mentioned earlier (see: Distributed Computing) uses those loosely coupled grids. In this project loosely coupled machines are connected with each other that are provided by different vendors and operating systems, but every machine involved in this distributed concept is able to run a specific piece of software to calculate something collaboratively for a common goal (University of Berkeley, 2009).

2.2.4 Clouds

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.

2.2.4.1 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).

2.2.4.2 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).
2.2.4.3 Hybrid 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.

![Cloud Computing Types](image)

Figure 2-2: Cloud Computing Types (Johnston, 2009)

2.3 Enabling Technologies

Before going into the idea of cloud computing, two technologies will be introduced that made the way of distributed computing and therefore cloud computing realizable.

2.3.1 Virtualization

With virtualization, applications and infrastructure are independent, allowing servers to be easily shared by many applications where applications are running virtually anywhere in the world. This is possible as long as the application is virtualized (Armbrust et al., 2009).

Virtualizing the application for the cloud means to package the bits of the application with everything it needs to run, including pieces such as a database, a middleware and an operating system. This self-contained unit of virtualized application can then run anywhere in the world (Armbrust et al., 2009).

Virtualization also allows building so-called sandboxes. Sandboxes assure a higher degree of security and reliability by providing a mechanism to run programs safely. It is commonly used to “execute untested code, or programs from unverified third-parties, suppliers and untrusted users” (Intel Corporation, 2007).
2.3.2 Load Balancing

Load balancing is the key to success for cloud architectures. It is capable of distributing the working processes evenly between 2 or more computers, so that resources can be used efficiently and therefore increases performance and availability (MacVittie, 2009).

A so-called load balancer is automatically able to deal with different amount of work capacity by adapting its distribution decisions according to the moments a request is made. A load balancing solution is often used in internet services, where the idea of load balancing is run by an application (MacVittie, 2009).

2.4 Cloud Computing

Cloud Computing is now the usage of the clouds that were introduced in the sub chapter 2.2.4. In this sub chapter, it will be explained how cloud computing differs to the concepts that were introduced before. This will give a distinct definition of what cloud computing is. Afterwards the types of services that are being offered under the name of cloud computing, that is Infrastructure, Platform and Software as a Service, will be explained.

2.4.1 Difference to similar concepts

When comparing the cloud idea to the existing clusters or supercomputers, it is obvious that clouds are located globally and is made of heterogeneous and mostly anonymous computer networks (Foster et al., 2008).

According to Foster et al. (2008) cloud computing and grid computing are the same when it comes to the vision, which is decreasing the costs of computing while increasing the flexibility, quality and reliability by outsourcing a service to a third party.

However the scale of how things were 10 years ago and how things are now, is different. The data that needs to be analyzed nowadays is huge and generates therefore even more computing demand. With virtualization and the huge investments of large companies such as Amazon, Google, and Microsoft it creates “real commercial large-scale systems containing hundreds of thousands of computers” (Foster et al., 2008). In other words, cloud computing has put distributed computing into another stage.

Now it needs just a simple bank account to access on-demand computers that are located in datacenters all around the world being able to compute a massive amount of data just-in-time (Foster et al., 2008). That makes cloud computing new and exciting for companies to invest in.

2.4.2 Types of Services

Cloud Computing encompasses different types of services. There are 3 classes of technology capabilities that are being offered as a service (Narasimhan, 2009) and which will be introduced in the following.
Before going deeper into the types of services, the following illustration shows the three technology capabilities offered under the name of cloud computing and three companies that currently offer those technology solutions.

2.4.2.1 Infrastructure as a Service

Statistically proven figures show that 80% of the computing power is not efficiently used, neither is 65% of the storage of servers. Hence there is a huge potential to share resources in order to use them in a cost efficient way rather than underutilizing them (Armbrust et al., 2009).

Instead of investing in their own corporate server or network infrastructure, companies are able to purchase those resources on a rental basis and use it on demand rather than having their own resources locally. The providers are taking care of the servers, storage and network settings, while the client has virtual instances of that (Armbrust et al., 2009; Buyya et al., 2009).

Amazon Web Services is one example of that, where infrastructure is available on a pay-per-use self service basis and get servers, storage, network configuration, set all that up and run it, while not having to worry about co-location, rental or datacenters (Amazon, 2009).

2.4.2.2 Platform as a Service

Platform as a service provides the facility to support the development lifecycle from design, implementation, debugging, testing, deployment, operation and support of rich internet applications (RIA) and online services. Here mostly the internet browser will be used for the development (Armbrust et al., 2009; Buyya et al., 2009).
With platform as a service an entire software environment can run at a service provider while not worrying about the technology underneath it. Just for the database and the application environment it needs to be taken care of (Armbrust et al., 2009).

Force.com is an example of platform as a service offered from Salesforce providing a development platform that makes it very easy for developers to build multi-tenant applications. The applications run on the data centers of Salesforce, so there is no necessity to take care of maintenance, security and back-ups (Salesforce, 2010).

2.4.2.3 Software as a Service

Companies can use software that is made available online on a rental or usage basis rather than buying the whole software package locally without being sure whether or not the investment will pay off on a long-term basis. No maintenance or updates are involved; this will all be handled by the software provider (Armbrust et al., 2009).

As an example the so-called Google Apps offer software for business or private entities online that can do the fundamental business action that a usual on-premise office suite can provide. Google Apps involve document collaboration within text documents, presentation and spreadsheets as much as calendars and e-mail services (Google, 2010).

2.5 Outsourcing Theories

IT outsourcing has an extended theoretical and empirical literature. Different approaches were developed in a way to complete understanding the IT outsourcing business model. The five approaches presented in this study are the most recognized and cited in IT outsourcing studies. The different points of view of each theory complement each other and bring excellent frameworks to analyze IT outsourcing and each aspect that influence its adoption as a business model.

The scope of this study does not include the evaluation of pros and cons of each theory. Therefore the usefulness of the presented theories in the IT outsourcing context is taken as a premise and can be assured in the broadly recognized researches made by Cheon et al. (1995), Willcocks & Lacity (1995), Vining & Globerman (1999), Hancox & Hackney (2000), Dibbern et al. (2004), and Lee et al. (2000).

2.5.1 Transaction Cost Theory

The transaction cost theory (TCT) is considered the start point theory to study IT outsourcing (Cheon et al., 1995) and the dominant perspective found in the IT outsourcing literature (Willcocks & Lacity, 1995). The theory is based in Coase’s (1937) statement that making use of the market is costly (Dibbern et al., 2004). The simple definition of transaction cost theory is that economic efficiency can be reached through the balance between production costs against transaction costs. The precursor of the TCT, Williamson (1981), defines transactions as exchange of services or goods between economical actors, who are technologically independent parts outside or inside an organization.
To evaluate a sourcing choice taking the transaction cost theory into consideration, two main aspects need to be considered; the outside providers can reduce production cost via economics of scale and transaction costs increase as a result of asset specificity, uncertainty and infrequency (Williamsson, 1985).

Asset Specificity is “the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value” (Williamsson, 1979). In other words, an asset is specific if it is necessary for the production of a good or service and has much lower value in alternative uses (Globerman & Vining, 1999). In the context of outsourcing, asset specificity refers to the inimitability of hardware and/or software architecture and/or uniqueness of human resources skills needed by a company. The result of asset specificity as an idiosyncratic investment is the increase of the transaction costs. Globerman and Vining (1999) relate the issue of asset specificity with the potential for opportunistic behavior; “no matter what prices are agreed to in the contracting stage, the other party can behave opportunistically by reneging and offering lower prices that only cover incremental costs”.

The second major determinant of transaction costs is uncertainty. In the literature, uncertainty is related with the complexity of the product/service to be acquired. More than the uncertainty about the actual cost of the production process itself, several aspects can contribute for a situation of a high level of uncertainty. Cheon et al. (1995) list the unpredictable market, technological, economic trends, contractual complexity and quality of outputs as important contributors for the high level of uncertainty. The attempt of mitigate the uncertainty through control policies or standards adoption may result in increasing of costs of enforcing transaction relationships (Cheon et al., 1995).

Additionally, infrequency of contracting can also increase transaction costs (Williamsson, 1985). The costs of relationship building, formulation of adequate contracts and ensuring consistency of goals between the contracting parties are the main costs generated by infrequency.

The transaction cost theory provides a very accurate framework to evaluate sourcing options since it exploits the differences between an outsider service provider (market mechanism) and in-house provider (organizational hierarchy) according to the relative costs. Cheon et al. (1995) also identify the importance of the framework for examining the outsourcing option as an “economic reorganization” of IT department and for formulating an action plan to decrease transaction cost and maximize the outsourcing rewards. The studies of IT outsourcing literature, written by Dibbern et al. (2004), concludes that the main theoretical argument of TCT “is concerned with the conditions under which certain characteristics of the transaction or the object of the transaction would lead its internal, hybrid or external governance”. The figure 2-4 illustrates the relationship between transaction costs, outsourcing and the aspects that drive this relationship.

Figure 2-4: A Transaction Cost Perspective of Outsourcing (Cheon et al., 1995)
2.5.2 Agency Cost Theory

The agency cost theory (ACT) was developed by Ross (1973), Mitnick (1975, 1986) and Jensen and Meckling (1976). Jensen and Meckling (1976) define the agency relationship as a “contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent”. The authors also craved the definition of transaction costs as the sum of the monitoring expenditures by the principal, the bonding expenditures by the agent and the residual loss (Jensen & Meckling, 1976).

The theory focus is the reason for principal-agents relationship developments and the problems inherited in them (Cheon et al., 1995). The major point of the agency cost theory is not about the choice between market (outsourcing) and hierarchy (in-sourcing) but rather about the contracts and the agency elements embedded in the agreements (Hancox & Hackney, 2000). The important choice is about the kind of contract that can be behavior-based or outcome-based. Choosing the kind of contract accordingly implies to opt also for a type of sourcing; the market governance and outsourcing in case of outcome-based contract or hierarchy governance and in-sourcing in case of a behavior-based contract. The results of this choice entail in the agency costs, “which are the costs incurred as a result of discrepancies between the objectives of the principal and those of agents” (Cheon et al., 1995).

In the context of IT outsourcing the agency cost theory presents a very good framework to study the aspects that influence the extent of agency costs. Cheon et al. (1995) highlight five aspects that should be considered for a company that aims to outsource considering the agency costs: uncertainty, risk aversion, programmability, measurability and length. The uncertainty about the outcome can be caused by several aspects such as changes in the technology, new moves of the competitors, new governmental regulations or economical environment (crisis/growth). Eisenhardt (1989) describes the risk aversion in the situation when the principals’ costs pass the risk to the agent, it will increase or decrease according to the agent risk aversion; more risk averse is the agent increasingly expensive to outsource (outcome-based contract). The definition of programmability is clearly defined by Eisenhardt (1989) as the degree to which appropriate behavior by the agent can be specified in advance. Measurability refers to how easy an outcome can be measured. The easier the measurement of an outcome is, the cheaper is the option for an outcome-based contract. The length of the relationship between a principal and an agent also has influence in the agency costs. In a long-term agency relationship, the principal is able to learn about the behavior of the agent while in short-term the information asymmetry is potentially higher. Consequently a long-term agency relationship is more favorable to a behavior-based contract.

Cheon et al. (1995) summarize the interaction between agency cost theory and outsourcing pointing that “agency costs (monitoring, bonding and residual loss) increase in outsourcing relationships with high uncertainty, high risk aversion, low programmability, low outcome measurability and greater length of relationship”. The figure 2-5 illustrates the relationship between agency costs, outsourcing and the aspects that drive this relationship.
2.5.3 Resource-Based Theory

The resource-based theory is part of the theories that consider the resources as the foundations for a firm’s strategy (Goles & Chin, 2005). Barney (1991) defines firm resources as “all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc”. Several authors cited by Cheon et al. (1995) characterize the resources as enablers of conceiving strategy and implementation in a way to improve the firm efficiency and effectiveness. In his extensive study about resource-based theory, Barney (1991) categorizes resources in three different groups: physical capital resources, human capital resources and organizational capital resources.

The main assumption of the resource-based theory is that competitive advantage can only be achieved when the firm resources present heterogeneity and immobility. Firm resource heterogeneity considers the firm resources and how diverse they are within the firm. On the other hand the inability of competing firms to obtain resources from other firms defines the firm resource immobility (Cheon et al., 1995). When no competitor can get a firm resource, the resources remain bound to the firm available for use over the long run. Thus they can be a source of competitive advantage (Peteraf, 1993).

Barney (1991) defines four criteria that must be attributes of the resources in order that they are able to provide sustainable competitive advantage: value, rareness, imperfect imitability and non-substitutability. First of all the resource must be valuable, it must be an enabler to the firm conceiving and implementing strategies. Moreover a resource needs to be rare or unique to among the competitors. Valuable and rare firm resources can only be a source of competitive advantage if the competitors cannot imitate them or have a huge level of difficulty, e.g. if they are imperfect imitable. The last attribute of a resource that provides sustainable competitive advantage is that there must be no strategically equivalent in the valuable resources that are themselves either not rare or imitable.

Concerning the resource-based approach to strategy, Grant (1991) argues that it does not consider just the current resources and capabilities but also the development of new resources and capabilities to the firm. In order both to fully exploit a firm’s existing stock of resources, and develop competitive advantage for the future, the external acquisition of complementary resources may be necessary (Grant, 1991).
Considering the IT outsourcing context, resource-based theory also provides a framework to analyze the set of IT resources and capabilities (financial environment, skilled human resources, infrastructure and facilities). The theory considers outsourcing as a strategic decision which can be used to fill gaps (difference between desirable capabilities and actual ones) in the firm’s IT resources and capabilities (e.g. information quality, IT support quality, staff quality, cost effectiveness and financial condition). The IT capabilities and resources should have the necessary firm’s resource attributes (value, rareness, imperfect immitability and non-substitutability) to support competitive advantage and consequently match the main streams of immobility and heterogeneity (Cheon et al., 1995). The resource-based perspective of outsourcing is summarized in the figure 2-6.

2.5.4 Resource Dependence Theory

The resource dependence theory shows that all organizations are dependent on some elements of their external environments to some degree due to the control that these external environments have on the resources (Pfeffer & Salancik, 1978). Even though resource-based theory and resource dependence theory center their view in the firm’s resources as inputs to firm’s strategy, the main difference between the two theories is that the resource-based theory focusses on a internal resources and capabilities while resource dependence theory focuses on resources in the external environment (Dibbern, 2004).

The organization dependence of the environment refers to the resources needed by the organization as land, labor, capital, information or specific product or service, and how they are available or hold within the environment. Consequently the firm’s success is directly linked to the adaptation of the environmental uncertainty, problematic interdependences and the management and controlling of resources flows (Pfeffer & Salancik, 1978).

According to the source and nature of the interdependence between the environment and the organization, based in the work of Emery and Trist (1965), Pfeffer and Slancik (1978) developed three dimensions of organizational task environments: concentration, munificence and interconnectedness. While the concentration part refers to the widely dispersion of power and authority among the environment, munificence refers to the
level of availability or scarcity of critical resources. Interconnectedness is about the number and pattern of linkages among organizations (Cheon et al., 1995). The resource dependence theory, in the context of the three organization task aspects, considers the assessment to scarcity and valuable external resources, which is the main point of firm strategy that enables the achievement of effectiveness and survival in the environment.

An organization that is not able to generate internal resources might develop a relationship with external organizations (providers) in the environment. This situation highlights the dependence of organizations on their external environment as stated in the resource dependence theory. In this context the theory provides an excellent perspective to evaluate the relationship between the decision to outsource IT functions and the firm’s effectiveness (Cheon et al., 1995).

Pfeffer and Salancik (1978) extend their work identifying three factors that are fundamental to determine the external dependence to one organization to another. The factors are: the importance of the resources, it means how much important are the resources in a way to support the organization operation; discretion, i.e. to which degree the interest group has discretion over the resource allocation and use; and finally alternatives, meaning how is the level of control the interest group exert over the resource.

Cheon et al. (1995) developed a representation (Figure 2-7) to illustrate the relationship among dimensions of organizational task environments, dimensions of resources, firm’s strategy and resources acquisition (outsourcing). An important framework is provided by resource dependence theory to investigate the influence of the dimensions of task environments that impact in the dimensions of firm’s resources. In the figure 2-7 it is also possible to observe the direct influence of the resources dimension in the resource acquisition, in this case represented as IT outsourcing. Additionally, the strategy affects the decision of IT outsourcing, since the acquisition of external resources can be needed to implement a strategy. Therefore Cheon et al. (1995) considers the IT outsourcing strategy as a composition of different degrees of dependence of one organization on another in order to obtain critical resources which are not available internally.

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**Figure 2-7: A resource dependence perspective of outsourcing (Cheon et al., 1995)**
2.5.5 Partnership, Relationship and Exchange Theory

Interorganizational relationships have been studied from several perspectives; Klepper (1995) reviews the literature of outsourcing and concludes that most of the IT literature in partnering has taken a non-theoretical approach. The partnering literature is presented in majority by the management and marketing literature, where several models and frameworks have been proposed, most of them supported by social exchange theory.

Blau (1964) defines social exchange as “voluntary actions of individuals that are motivated by the return they are expected to bring and typically do in fact bring from others”. In other words, the part that supplies rewarding services to another obligates the second. In order to discharge this obligation the second must provide benefits to the first in return (Dibbern et al., 2004). Goles and Chin (2005) also highlight the common point between the presented perspectives in the literature as conceptualization of relationships as a set of linkages and transactions that make the relationship participants interdependent, and thus require coordinated action and cooperation in order to achieve mutual benefits.

Goles and Chin (2005) integrate the concepts of outsourcing and relationship providing the definition of outsourcing relationship as:

“[...] an ongoing, long term linkage between an outsourcing vendor and customer arising from a contractual agreement to provide one or more comprehensive IT activities, processes, or services with the understanding that the benefits attained by each firm are at least in part dependent on the other.”

The main arguments of partnership and relationship in IT outsourcing is the risk reduction, increase of predictability and consequently decrease of uncertainty. Moreover, the literature of IT outsourcing that provides the general conclusion of a well developed contract is necessary but not sufficient for outsourcing success. The fact that emphasizes the role of the outsourcing relationship influence the outcome of an outsourcing arrangement (Goles & Chin, 2005).

To structure the analyses of the outsourcing relationship and its importance for the outsourcing arrangement, Klepper (1995) makes use of the framework firstly developed by Dwyer et al. (1987). The framework presents a stage model of relationship exchange development. The stages are: awareness, exploration, expansion and commitment. While awareness consists in the recognition of other parts that can be proper as a partner, exploitation is the phase that the partners have a proper experience so that the exchange and the development of deeper relationships can be possible. The expansion stage is characterized by the rewards collected for both partners and the increase of the interdependence between them. During the commitment phase the partners exchange results in such amount of benefits that they agree, implicitly or explicitly, to maintain the relationship and cement the partnership (Klepper, 1995). The authors also set five subprocesses that work within the phases and move the parties closer or further from the success in the outsourcing relationship.

The subprocesses attraction, communication and bargain, power, norms and expectations are considered the drivers that impact the phases of exchange relationship development and show how the phases would lead to a successful outsourcing agreement.
Klepper (1995) defines each of the aspects and how do they should be managed in each phase of the relationship exchange. In short, attraction refers to the rewards provided direct to the client by the vendor and rewards inherited in the characteristics of the vendor.

Communication and bargain are related to the exchange of information between partners. This information concerns more than just the necessary information changed in the projects, but open revelation of needs and resources related to the future of the relationship. Bargain take place when unforeseen circumstances happen and adjustments in requirements and/or performance is needed. As several relationship frameworks, bargain reflects an important concept in conflict resolution. A successful exchange relationship is remarked by the level of bargain and communication between client and vendor to solve conflicts in an easier way (Klepper, 1995).

As the outsourcing relationship underlines, the reciprocity is the first expectation of the partners. Expectation is based on trust and both concepts from a spiraling relationship that is critical to the development of a relationship and is a necessary foundation for an investment by both parties. To summarize, vendors who do not match the expectations can open the doors to the entrance of competitors that are better to build a relationship and actually fill the client’s expectations (Klepper, 1995).

Norms concern to the expected patterns of behavior in a relationship. These norms are developed over the time and strengthened according to the information shared between the parties. Norms pave the way of strong commitments; through norms, partners can build a solid knowledge about how to achieve the expectation of each other and construct a winner outsourcing relationship (Klepper, 1995).

Power and justice is tightly related to concepts presented in the economical and strategic outsourcing approaches. Klepper (1995) explains the power and justice in the situation when one party has power over a second party if the second is dependent on the first for valued resources, and this power is enhanced if there are limited alternative sources available to the second party. Power can be exercised in diverse ways and it can be considered just or unjust. In a partnership it is unjust if just one party enjoys the benefit of the power exertion. However it is just if both parties have adequate rewards when the first exercises the power. For an outsourcing arrangement a careful exercise of power is necessary to sustain and deepen the relationship.

The figure 2-8 illustrates the relationship among the partnership development stages; deepen relationship factors and partnering relationships as an outsourcing enabler.
Figure 2-8: Relationship perspective of outsourcing
3  Research Method

The methodology part of the research encompasses the kind of study that is being used (qualitative, quantitative or both) among other things. For the methodology different tools or methods can be used to collect the data (Dawson, 2002; Saunders, Lewis & Thornhill, 2009). There will also be discussed, which companies for the interviews were taken and why. Furthermore a statement on the research credibility will ensure that the research at hand provides data that is of high validity and reliability.

3.1  Methodology Model

The following illustration makes the reader get a better understanding of the research at hand. The overview, which goes from the research method that is used until the presentation of the conclusion, which will specifically analyzed in further sub and main chapters.

![Methodology Model for Research](image)

Figure 3-1: Methodology Model for Research
3.2 Research Study

A qualitative study gets insights about people’s experience, behavior and attitudes (Dawson, 2002). A quantitative research can certainly generate statistical proof through methods like a survey research or quantitative questionnaires (Dawson, 2002). However, for this specific research, numerical data will not be taken to answer the research question. The reasons will be explained in the following.

As the research at hand involves a lot of literature analysis, interpretation and interviews to even get some experiences about that topic and investigate the answers of all interviewees, the research will take place towards a qualitative study.

The research purpose is going towards an exploratory approach as insights are being searched within companies. Two of the three principal ways after Saunders et al. (2009) will be used to conduct an exploratory study that are:

- a search of the literature
- interviewing experts in the subject

The research is associated with a deductive approach, as existing theory is tested. Unstructured questions were asked to the interviewees to get as much valid data as possible. It was also very crucial for answering the research questions not to force the interviewees for answering a specific problem, but rather to let them talk about their experience so that it was then possible to relate these insights to the theoretical framework at hand.

For this approach a “clear research strategy” (Saunders et al., 2009) was necessary. As for the exploratory research at hand, every kind of research strategy can be taken, whether it is an experiment, survey, case study, action research, ground theory, ethnography or archival research. As this research was searching for a strategy that enables to explore an existing theory by including interviews, observations and documentary analyses, a case study strategy was taken for this research.

According to Saunders et al. (2009) another question that needs be answered to provide an elaborate research design is the time horizon. A cross-sectional study would involve a so-called "snapshot" to be taken at a specific time, while a longitudinal study provide a research that is rather pursued of a longer period of time. With the studies at hand there is no intention to investigate the companies over a period of a long time. Hence this research leads towards a cross-sectional study.

3.3 Data Collection

As for the data collection, secondary data as much as primary data were collected to answer the research question at hand. To understand the current stage of IT outsourcing in different companies and then connect the insights from their personal experiences into a theoretical model, interviews were chosen as a primary data collection method. This method enabled an agile and straightforward communication to the top management of every company that was scrutinized.
3.3.1 Company and Interviewee Selection

As cloud computing solutions are pretty new offers in the market (Narasimhan, 2009), for the selection process the companies were mainly preferred that were

- outsourcing their IT traditionally already and/or has attempts to move into cloud solutions
- outsourcing with cloud solutions
- provide services to outsource

As for answering the research questions the best, it was preferred to have a broad range of companies. Also it was crucial to establish contacts in the room of companies in Sweden, as internal information was shared. Hence it was deemed that companies in the area where the research was written (Jönköping International Business School) are better suitable for this research.

From a provider perspective a large IT outsourcing and cloud computing provider and from the client perspective one SME and one large organization fit into those preferences that were listed above. In fact for the research at hand three companies have been declared as perfectly suitable for each one of our preferences. They will be introduced in the following:

Capgemini

Capgemini is a management and IT consultancy acting world-wide in over 30 countries with over 92,000 employees. It consists of four strategic business units. In their service portfolio Capgemini offers strategy advisory and a broad range of IT-services. Clients of Capgemini are companies such as IKEA, Volvo, the Swedish Government and the Swedish Defense (Capgemini, 2010a).

In terms of traditional IT outsourcing and cloud solutions, Capgemini offers both services that will be presented in the following:

- Traditional IT outsourcing services are provided at Capgemini to leverage from “economies of scale, skills and technology to cut costs and deliver enhanced service levels” (Capgemini, 2010b). Companies can therefore outsource their IT in a tangible way (servers and data centers) while having external providers taking care of their assets.

- Together with Sogeti, the Capgemini Group subsidiary, a whole new package of cloud services has been launched to make sure clients see the huge benefit of cloud computing. Their so called Infostructure Transformation Services (ITS) enable companies to see a direct cost-reduction in their business with cloud solutions (Capgemini, 2010c).

As an interviewee, Hannes Vedin, a Senior Consultant with vast expertise in IT outsourcing and cloud computing, showed insights about Capgemini’s services and its clients. An overview of the interview is available in the appendix.
Talentia

Talentia is an HR recruitment consultancy that was found in 1999 by the current CEO Klas Karlsson. Until now Talentia has 15 employees spread in offices in Stockholm, Malmö and Jönköping (Talentia 2010).

To the research Talentia has been proven to be a crucial part of the research as they were moving from a traditional service provider to a cloud solution. Since the company has 15 employees, Talentia has IT expertise, which is rather limited. However that does not mean that their IT is not important.

Having a traditional IT outsourcing solution before, Talentia recently decided to move to a Microsoft cloud solution along with moving their physical offices anyway. The benefits that Talentia will get with this kind of change will be analyzed in Chapter 5. The write-up of the interview with the vice president of Talentia Helena Norder can be followed attached in the appendix.

Alstom

Alstom is acting world-wide making its business in power generation and transport with an annual revenue of over €18bn in year 2009. Alstom is acting in 70 countries with the support of currently around 80,000 employees (Alstom 2010).

For the interview the IT Manager Pernilla Lindsten was prepared to have a say in terms of Alstom’s global and local IT outsourcing strategies. Alstom has currently 2 data centers dedicated to their needs and is not based on any cloud architecture yet. Lindsten still claims that a cloud solution could be a very cost-efficient solution on a local basis. The telephone interview with Pernilla Lindsten can be followed in the appendix.

Hence Capgemini serves as an IT outsourc e provider while Talentia and Alstom are small and large-sized representatives from a client perspective. As for the selection of the interviewee, it was important for answering the research questions the best, to have someone to speak to that is really familiar or even involved in the IT outsourcing process. As for Capgemini and Alstom, both interviewees, the senior consultant Hannes Vedin and the IT Manager Pernilla Lindsten, fit into those prerequisites. At the HR Recruitment company Talentia the IT expertise was limited. However Helena Norder could give strategic business information about the new cloud contract and valuable reasons why Talentia decided to change to a cloud solution in its company.

For the interviews, 143 companies were contacted via e-mail and telephone by showing interest in their evaluation process of the IT outsourcing part of their business. With the information, it was made clear to the companies, the research would benefit by discovering whether or not the IT outsourcing process to cloud computing would be much different to traditional IT outsourcing possibilities.

3.3.2 Interviews

For the companies that were being interviewed, an unstructured interview was conducted. This enabled the opportunity to understand the initial interviewee’s view on the topic of traditional IT outsourcing and cloud computing without forcing him/her to follow a certain model.
The method how to relate the interview with the theoretical model is the following: When referring during the interviews to the theoretical model, the key concepts were not literally mentioned. Therefore reliability (see Research Credibility) was assured.

### 3.3.3 Sample and Population

According to Dawson (2002) in quantitative research, a sample of a population that is chosen carefully and in a right way can be generalized to the whole population. However for qualitative research it is not the main objective to generalize the sample that has been chosen. It is rather crucial to see people’s behavior in a smaller amount of group, which can then provide insights for a wider range of research population (Dawson, 2002).

This is why this research runs a series of unstructured interviews with a rather small sample of companies. This is not only because it becomes more manageable but also because of the limitless time for the research to pick a moderate amount of companies, as cloud computing is not used in lots of companies yet. It is therefore certain that conducting the interviews with another group of companies the results of the research could certainly differ.

As for the population an approximate number cannot be provided as there is no scientific source that proves what percentage of companies use cloud computing within their IT infrastructure. However it can be said that the sample that was chosen was generated from enterprises that were either

- outsourcing their IT traditionally already and/or have attempts to move into cloud solutions,
- outsourcing with cloud solutions or
- providing services to outsource,

so that it could be guaranteed that the answers give valid and reliable insights to the research.

### 3.3.4 Data Collection Constraints

In terms of the access of primary data, Swedish companies were very responsive to requests via telephone and e-mail. However, only 3 companies were spot on fitting needs to answer the research question properly. This is because of the fact that cloud computing solutions are not used widely in companies. Still, cloud computing solutions become more and more attractive to businesses (Capgemini, 2010), hence it shows a huge potential for future research to even more companies to take part in this research.

As for the access of secondary data a broad range of material could be accessed. The IT outsourcing concerns were fundamental to this research and have been researched for years. As the concept of cloud computing is not as mature as the IT outsourcing models (Vedin, 2010), companies that tend to sell cloud computing in a way to make the most money out of it. That is why in the research it was made sure to rather focus on the technologies that are behind cloud computing instead of citing companies’ cloud offers.
3.4 Literature Sources

There are usually two ways of getting data for a research that is primary and secondary data (Dawson 2002; Saunders et al. 2009). In the following both kinds of data collection sources for this research will be introduced.

3.4.1 Primary Data

Primary data is seen as the firsthand observations and investigations (Dawson, 2002; Saunders et al., 2009). This is done by getting data from personal interviews, documents, observations or other data that has usually not existed or used before.

In this research the primary data will consist of qualitative data that will be obtained by interviews. Further details about the interview techniques were explained in 3.3.2.

3.4.2 Secondary Data

Secondary data is deemed to be information that already exists from other researchers and scientific authors (Dawson, 2002; Saunders et al., 2009). In that respect, research books, reports, journal articles and websites of reliable authors and organizations have been used to get information about Cloud Computing and its roots as much as the IT outsourcing concepts. Crucial for this research was not to take sources from companies that aim to sell cloud solutions, as these materials might have been biased in terms of the hype that is currently existing about cloud computing.

3.5 Research Credibility

It is vitally important to make sure to deliver a high quality of the data that are being collected when researching. For the qualitative study at hand there are two main quality aspects that are being discussed within the following sub chapters.

3.5.1 Reliability

According to Saunders et al. (2009), there are 4 fundamental threats to reliability that are the participant error, participant bias, observer error and the observer bias, maturation and ambiguity about causal direction. All those threats will be discussed in the following:

As for the participant error aspect, there is the possibility that the interviewees were influenced by being a part of a research process (Saunders et al., 2009). However during the process of interviewing we could not see any of those issues applying to the interviewees.
There is also the hazard that the participants of the interview could be saying whatever they are supposed to say from their authorities, the so-called participant bias (Saunders et al., 2009). As the interviewees and its companies did not give an impression of being pushed by someone, as well as the fact that the questions that were asked were not involving any personal opinions, makes sure that this threat of reliability would not apply to this research at hand.

As the conducted interviews were taken in an unstructured way, the so called observer error can also lead to a threat of reliability as they are two interviewers having the potential of asking questions differently (Saunders et al., 2009). This threat was lessened by deciding that only one of the two authors of this research at hand will lead the interviews, while the other person was responsible for making notes.

The observer bias refers to the potential of the interviewers to interpret the answers differently (Saunders et al., 2009). The answers were not of interpretative nature, but rather based on concepts that could be associated with the theoretical framework. However it would be critical to lead the interviewees to the answers that are desired for the framework. Leading interviewees to answers that are expected from the interviewers would manipulate the very idea of the research. In order to keep reliability for the research, questions within the interviews did not literally mention the key concepts but rather the meanings of that while framing those concepts.

For the secondary data it was made sure that research books, research reports, e-books, journal articles and scientific websites that have been used are run by organizations and/or creators that are known and trusted.

### 3.5.2 Validity

As far as validity in a qualitative study is concerned there is the hazard that interviewees cannot be trusted, but instead give wrong answers about their information within their company (Dawson, 2002; Saunders et al., 2009). Also the answers could be interpreted wrongly from the interviewers.

As for the misinterpretation of the comments of the interviewees, the research have been sent to the companies, where it was offered to consult us as soon they see any misunderstandings within the findings and analysis part.

According to Saunders et al. (2009), there are 6 fundamental threats to validity that are history, testing, instrumentation, mortality, maturation and ambiguity about causal direction. All those threats will be discussed in the following:

As far as the history part of validity is concerned, Saunders et al. (2009) argue that when something has been recently changed the perception of someone, it would guide the findings into another direction than expected. In this research cloud computing has been indeed hyped within companies that offer those solutions. Hence it could influence interviewees to fall into the hype as well. However the respondents of Alstom and Capgemini had an IT background and could give valid answers to what is behind the concept of cloud computing. Talentia Vice President Helena Norder’s knowledge of IT was limited but she could also proof a fundamental understanding of cloud computing as she was part of the decision process and could make comments of the contract’s content.
In terms of testing, there is a validity hazard of people acting differently when they know they are tested so it is then likely to mislead the findings (Saunders et al., 2009). In this research at hand this specific threat would only apply to the extent that the interviewees act and talk differently than they would do without it. However there was neither an impression nor a necessity for the interviewees to act or talk differently when talking to the interviewers.

The threat instrumentation shows the hazard of participating employees trying to get across something that they are possibly interested in selling their own products (Saunders et al., 2009). As a cloud solution provider Capgemini could have had the option to take the opportunity to sell their cloud products.

The mortality threat refers to the fact that participants of studies could possibly leave the research process (Saunders et al., 2009). As this research is not aimed at being a longitudinal study, this threat would not apply to the research at hand.

Maturation refers to the fact that unforeseeable external events can be happening which could hence lead to a misguidance of the findings (Saunders et al., 2009). This threat could have happened to the research at hand as it is hard to influence those external changes. However there was no unexpected event happening that could have influenced the findings wrongly at the research at hand. Therefore the maturation threat would not apply here.

In terms of ambiguity about causal direction, correlations between cause and effect can be interpreted wrongly (Saunders et al., 2009). As there are no interdependencies of that nature existing at the research at hand, this threat would not apply.

### 3.5.3 Generalizability

Generalizability is a big concern for researches (Lee & Baskerville, 2003). By its very nature it refers to the external validity of the research and therefore whether or not the work can be applied to other research settings as well. For instance a case study within a small company would have difficulty to reason generalizability to bigger companies (Saunders et al., 2007).

According to Dawson (2002) the objective of qualitative research is not necessarily to generalize, but rather to choose a small amount of people or companies, which then can give insights to a wider range of population. However it is certain that in this case, if there was chosen another range of companies, the results could be different.

The research at hand was designed to offer as much generalizability possible. This is why it was decided to give not only a certain size of companies to have a say in the interviews, but rather to have broad range to offer for the qualitative analysis.

The generalizability concern existing for the research at hand is the reason, that three companies were taking part in this thesis. Every company represented one certain size of the company. It is therefore certain that if another group of companies within that population would be chosen, results can be different. However the insights that are taken from the three companies can show insights into the behavior of a wider range of research population.
4 Theoretical Framework

The challenge to construct a concise framework consists in the problem of structuring all the important aspects that will guide the empirical research and analysis. In order to get the whole picture of IT outsourcing, the theories presented in the theoretical background (resource based, agency costs, transaction costs, resource dependence and exchange theory) are put together. The conceptual framework maps the main variables and concepts in each IT outsourcing theory, aiming to provide guidance and coherence to the empirical inquiry.

Assuring the objective to connect all aspects involved in this study a conceptual framework is presented in the Figure 4-1. 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. However, considering the perspectives of each theory, they can be interpreted in different ways e.g. in economical, social and relational ways to understand the influence of each concept in the IT outsourcing environment.

![Figure 4-1: Theoretical Framework for IT Outsourcing](image)

Complementarily to the theories and linkages between concepts presented in the framework, the tables from Table 4-1 until Table 4-5 are developed in order to shortly define each concept involved in the framework. The short description of each concept works as an easy accessible summary that allows the connection of the data obtained...
with the theoretical concepts through a fast and clear tool. The tables are structured in a sequence of theory short definitions followed by the respective variables definition. Each definition makes sense in the context of the theory where each variable is cited. For example the definition of measurability is different according to the context in which it is applied; however the table makes clear that the definition of measurability refers to the agency costs theory. Moreover all the definitions provided in the table are already detailed in the section 2.5 of this work.

According to the methods used in this study, the framework and tables of concepts are the main tools used to analyze the data collected through the interviews. Indeed, this is the main link between the theoretical framework and the empirical work performed to answer the main questions touched by this study.

In fact, it is already proven that this framework is used in the traditional IT outsourcing. However, the point to be reached is the possible usage of the same framework in the cloud computing business model. In summary, the framework is not used in this work to prove if an IT outsourcing solution is recommended or not, but, in the opposite causal relationship, the objective is to take real cases and evaluate if the framework could be applied in the decision process.

Taking the research objectives in consideration, it is important to understand each concept and variable that is present in the framework. Therefore it is possible to go deep in the real cases, scrutinize the information and get each important aspect to be considered in the IT outsourcing decision making process.

The transaction cost theory refers to the economic efficiency that can be reached through balance between production costs against transaction costs. The outside providers can reduce production cost via economies of scale and transaction costs increase as a result of asset specificity, uncertainty and infrequency. The following table gives a summary of the sub concepts of the transaction cost theory.

<table>
<thead>
<tr>
<th>Table 4-1: Concept Definition of Transaction Cost Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transaction Cost Theory</strong></td>
</tr>
<tr>
<td>Asset Specificity: An asset is specific if it is necessary for the production of a good or service and has much lower value in alternative uses. Specificity increases transaction costs.</td>
</tr>
<tr>
<td>Uncertainty: Uncertainty can be a result of aspects, such as actual cost of the production process itself, unpredictable market, technological, economic trends, contractual complexity and quality of outputs. Avoiding uncertainty increases transaction costs and agency costs.</td>
</tr>
<tr>
<td>Infrequency: The costs of relationship building, formulation of adequate contracts and ensuring consistency of goals between the contracting parties are the main costs generated by infrequency. Infrequency increases transaction costs.</td>
</tr>
</tbody>
</table>
As for the agency cost theory the following can be said: The choice of the source of a product or service is the consequence of the type of a contract required. In case of outcome-based contracts, the market governance and outsourcing is the best option. The choice of a behavior-based contract implies in hierarchical governance or in-sourcing of services or goods. Transaction costs are the sum of the monitoring expenditures by the principal, the bonding expenditures by the agent and the residual loss. Uncertainty, risk aversion, programmability, measurability and length increase agency costs. All the concepts will be introduced in the following table.

Table 4-2: Concept Definition of Agency Cost Theory

<table>
<thead>
<tr>
<th>Agency Cost Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty</td>
</tr>
<tr>
<td>Uncertainty can be the result of aspects, such as actual cost of the production process itself, unpredictable market, technological, economic trends, contractual complexity and quality of outputs. Avoiding uncertainty increases transaction costs and agency costs.</td>
</tr>
<tr>
<td>Risk Aversion</td>
</tr>
<tr>
<td>Occurs when the client passes the risk to the provider (agent). The more risk averse the agent is, the more expensive it gets to outsource (outcome-based contract)</td>
</tr>
<tr>
<td>Programmability</td>
</tr>
<tr>
<td>The degree to which appropriate behavior by the agent can be specified in advance.</td>
</tr>
<tr>
<td>Measurability</td>
</tr>
<tr>
<td>Measurability refers to how easy an outcome can be measured. The easier the measurement of an outcome is, the cheaper is the option for an outcome-based contract (generally outsource provider).</td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>In a long-term agency relationship the principal is able to learn about the behavior of the agent while in a short-term the information asymmetry is potentially higher. Consequently a long-term agency relationship is more favorable to a behavior-based contract (generally internal provider).</td>
</tr>
</tbody>
</table>

As far as the resource-based theory is concerned, firms can fill the gap between desirable capabilities and actual ones by acquiring from an external source (outsourcing). However to ensure competitive advantage, the resources should match the criteria of value, rareness, imperfect imitability and non-substitutability. The firm does not need to be the owner of capabilities that do not generate a competitive advantage. The four sub concepts of the resource-based theory will be defined in the following table.
In terms of the resource dependence theory, it can be said that all organizations are dependent on some elements of their external environments to varying degrees due to the control these external environments have on the resources. A firm’s success is directly linked with the adaptation to the environmental concentration, munificence, interconnectedness. These three sub concepts will be explained in the following table.

Table 4-4: Concept Definition of Resource Dependence Theory

<table>
<thead>
<tr>
<th>Resource Dependence Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Concentration</td>
</tr>
<tr>
<td>Concentration refers to the widely dispersion of power and authority among the environment. A firm is less dependent of a provider if the power and authority is dispersed in diverse providers.</td>
</tr>
<tr>
<td>Munificence</td>
</tr>
<tr>
<td>Munificence refers to the level of availability or of critical resources. A firm is less dependent of a resource if it is easy available in diverse providers.</td>
</tr>
<tr>
<td>Interconnectedness</td>
</tr>
<tr>
<td>The number and pattern of the linkages among organizations. If the firm needs lots of connections and good relationships with other companies it is more dependent than other companies.</td>
</tr>
</tbody>
</table>

The exchange theory argues that a well developed contract is necessary but not sufficient for an outsourcing success. Therefore the theory emphasizes the role of the outsourcing relationship and its influence in the outcome of an outsource arrangement. An outsourcing relationship is set by attraction, expectation, norms, power and justice and communication and bargain, which will be defined in the following table.

Table 4-3: Concept Definition of Resource-Based Theory

<table>
<thead>
<tr>
<th>Resource-Based Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
</tr>
<tr>
<td>IT resources must be valuable, it must be an enabler to the firm to conceive and implement strategies.</td>
</tr>
<tr>
<td>Rareness</td>
</tr>
<tr>
<td>IT resources need to be rare or unique among the competitors</td>
</tr>
<tr>
<td>Imperfect Imitability</td>
</tr>
<tr>
<td>Valuable and rare firm resources can only be a source of competitive advantage if the competitors cannot (or have a huge level of difficult) imitate them, e.g. if they are imperfect imitable.</td>
</tr>
<tr>
<td>Substitutability</td>
</tr>
<tr>
<td>Sustainable competitive advantage explains that there must be no strategically equivalent valuable resources that are themselves either not rare or imitable.</td>
</tr>
</tbody>
</table>
## Table 4-5: Concept Definition of Exchange Theory

<table>
<thead>
<tr>
<th>Exchange Theory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attraction</strong></td>
<td>Attraction is generated by the rewards provided directly to the client by the vendor as much as rewards inherited in the characteristics of the vendor.</td>
</tr>
<tr>
<td><strong>Expectation</strong></td>
<td>Vendors who do not match the expectations can open the doors to the entrance of competitors that are better to build a relationship and fill the client’s expectations.</td>
</tr>
<tr>
<td><strong>Norms</strong></td>
<td>Norms refer to the expected patterns of behavior in a relationship. Through norms, partners can build a solid knowledge about how to achieve the expectations of each other and construct a win-win outsourcing relationship.</td>
</tr>
<tr>
<td><strong>Power and Justice</strong></td>
<td>In an outsourcing arrangement the careful and just exercise of power is necessary to sustain and deepen the relationship.</td>
</tr>
<tr>
<td><strong>Communication and Bargain</strong></td>
<td>A successful exchange relationship is remarked by the level of bargaining and communicating between the client and the vendor to solve conflicts in an easier way.</td>
</tr>
</tbody>
</table>
5 Analysis and Empirical Findings

This chapter refers to the analysis of the data collected in order to answer the research questions of this study.

Firstly, the framework developed in the chapter 4 is challenged as a valid model to a cloud computing evaluation. The analysis aims to find out if the theories could be used as a guideline in the IT outsourcing decision process, addressing the first research question of this paper. Each IT outsourcing theory and respective concepts are individually confronted against the insights and information obtained in the interviews. Each theory presented in the framework is scrutinized in a separate section. The concepts that support each theory are presented with examples extracted from the interviews. To provide a fast summary of the findings, the sections also present a table explaining how the concepts were or were not represented in the data collection.

Secondly, an evidence of the most important aspects to consider, when evaluating a cloud computing solution, is presented. The objective of this section is to identify important points which are not covered by the framework theories and could be added or changed as a consequence of particularities in the cloud computing solution in relation with traditional IT outsourcing. All the insights are results of the interpretation of the data collected and the interviews performed in this study.

5.1 Transaction Cost Theory – Findings

The research suggests that the transaction cost theory, that is the first theory to be applied in the IT outsourcing decision process, can also be applied to evaluate cloud computing business model. The theory’s ability to easily accommodate empirical data was highlighted by Willcocks and Lacity (1995) as well as Hancox and Hackney (2000) and was also observed in this study. The use of an external provider (market) in a way to reach economic efficiency was the main argument of the companies interviewed. The economics of scale were achieved by providers which use cloud computing architecture impacting directly in the price for the end users. SMEs could benefit immediately while large companies are more sensitive to the uncertainties present in a cloud solution, for example when considering the security of data.

Low-specificity of services was a common point in traditional IT outsourcing and cloud computing services. Companies tend to outsource parts of their IT department which are not specific and consequently have standard alternatives offered by suppliers. Other kinds of specificity, such as physical and human specificity, were also low in the cases assessed. There was no concern about the geographical location of the providers and their skills and knowledge about the applications and business. However the unanimity of the companies were concerned about the availability of the services contracted. As a matter of fact, price and availability were the two most important aspects in all companies contacted.
The level of uncertainty avoidance was found to be different from company to company and from industry to industry. From the supplier side the uncertainty in security and accessibility were fundamental when offering cloud solutions to clients. Talentia, a small-sized enterprise, appeared to be more flexible with uncertainty than Alstom as a large organization. Capgemini pointed out the sensibility in sectors of defense and government to the security issues in cloud computing. To reduce the uncertainty of availability and information security, Talentia opted for a well known brand (Microsoft) as the solution provider and also have a contingency provider with the database with “secret” information. On the other hand, Alstom opted for an in-sourced solution to avoid the security uncertainty having two global data centers and therefore to just outsource services that needs to be available 24x7, which was not possible to be provided locally. However it is interesting to reflect about the insights provided by the Alstom IT director that cloud computing could be used as an internal cost effective solution that ensures security and provide IT resources from Alstom’s current two global Alstom’s data centers saving local IT investments.

“[…] we are a global company and agreed on having 2 major data-centers worldwide. But I think it would be beneficial to use cloud computing internally in our company in order to reduce the infrastructure locally and having all the servers for example in Basel (Switzerland).” (Alstom, 2010)

The infrequency was avoided for all the companies interviewed. The value of the IT outsourcing relationship and the importance of contractual management were clearly pointed out for the company’s managers. Talentia changed the technological solution, but stayed with the same outsourcing supplier. Alstom outsourced through a global decision. However, the local management keeps weekly feedback after they had an underperforming start. Capgemini is working on pilot projects with the main clients showing the importance to keep the relationship links whatever technology is chosen.

Table 5-1: Findings related to the Transaction Cost Theory

<table>
<thead>
<tr>
<th>Transaction Cost Theory</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Specificity</strong></td>
<td>Outsourced services tend to present low-specificity. Companies showed to outsource parts of their IT department which are not specific and consequently have standard alternatives offered by suppliers in traditional IT outsourcing and cloud computing.</td>
</tr>
<tr>
<td><strong>Uncertainty</strong></td>
<td>The level of acceptance of uncertainty showed to be more sensitive in respect of security and accessibility. In a way to avoid uncertainty via cloud computing, the reputation of the provider was a key aspect in the decision process. Traditional IT outsourcing, in-sourcing and private cloud computing were options for large companies which are more uncertainty sensitive.</td>
</tr>
<tr>
<td><strong>Infrequency</strong></td>
<td>The infrequency was avoided for all the companies interviewed. Migration from a traditional IT outsourcing to a cloud computing solution showed the attempt to stay with the same supplier. Pilot projects with cloud solutions have been the best practice to keep the relationship.</td>
</tr>
</tbody>
</table>
5.2 Agency Cost Theory – Findings

The competition between market and hierarchical governance as a product or service provider is an essential characteristic of IT departments in the actual economic environment. The agency cost theory proved to be extensive to evaluate cloud computing business model as a market option of product and service sourcing. The companies interviewed pointed out two important aspects that aim to reduce agency costs: the preference for well-known and experienced suppliers, and the emphasis in the importance of the contract and its performance indicators. On the other hand the supplier side presented the uncertainties of the cloud computing model. The immaturity of cloud computing presents some risks that any of the parts (client and providers) want to assume. For instance, the responsibility for the data stored in the cloud is a blurry point in the cloud computing agreements.

The uncertainty aspects are directly linked with the concerns with provider reputation and contract performance indicators already cited. These two aspects also converge to programmability and measurability. Measurability is clearly stated in the Alstom’s IT manager discourse saying that in both, traditional outsourcing and cloud computing solutions, the key performance indicators should be part of the contract.

“In the contract we have some key performance indicators that they [suppliers] have to meet, for example availability. No matter whether it is a traditional IT outsourcing or cloud solution, the agreement is really important, that they are key performance indicators involved that they should meet.” (Alstom, 2010)

On the other hand, Talentia’s VP underlined the importance of a previous relationship with the supplier (intermediate) and the confidence with the reputation and expertise in IT solutions of Microsoft. In both cases the companies provide an obvious example of high level of programmability and need for measurability as a way to reduce agency costs. No difference between traditional IT outsourcing and cloud computing was encountered.

On the supplier side, Capgemini emphasizes the risks of the immaturity in cloud computing and how it influences the offer for different industries. The security issues and the dependence of internet connections shape the offers and the risks, which the supplier is willing to assume. The maturation of the model will decrease the level of risk and consequently the risk avoidance from the supplier side.

“Due to security reasons, some companies are very sensitive when it comes to a cloud solution, for example defense companies as well as the public sector, because they would not like the idea of depending on someone else. A lot of other companies though.” (Capgemini, 2010)

Finally, concerning to the contract’s length there was no evidence of difference between the traditional IT outsourcing and cloud computing modalities. The valorization of relationships between clients and suppliers was more important than the proper duration of contracts. The length of contracts stills not a pattern but varies case by case. Therefore even in outcome-based contracts the behavior of the supplier is taken into consideration and reflects in renovations to construct a new relationship representing an increase in the agency costs. The interviews show that a long-term relationship is the
objective of all companies. Talentia emphasizes the understanding of cloud computing solution as a “stable, long-term solution” (Talentia, 2010), on the other hand Alstom has global contracts in traditional IT outsourcing and Capgemini is working in pilots to evaluate the cloud computing solutions at their clients. All companies are working or have contracts that aim for the long-term client-vendor relationship.

Table 5-2: Findings related to the Agency Cost Theory

<table>
<thead>
<tr>
<th>Agency Cost Theory</th>
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</thead>
<tbody>
<tr>
<td>Uncertainty</td>
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<tr>
<td>Risk Aversion</td>
</tr>
<tr>
<td>Programmability</td>
</tr>
<tr>
<td>Measurability</td>
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<tr>
<td>Length</td>
</tr>
</tbody>
</table>

5.3 Resource Based Theory – Findings

The resource-based theory comes up with the question to acquire external products or services in order to fill the gap between desirable and owned capabilities. The theory proved to fit very well in the traditional IT outsourcing model where companies trace a strategy and outsource the parts that are not available internally and are necessary to achieve the strategy objectives. With the cloud computing business model the theory proves to fit even better; firstly because of the nature of services and secondly because of the affordable prices.
The services and products offered via cloud computing present a fundamental characteristic; standardization. The term “commoditization of IT” or “utility computing” is a clear result of diverse services and products which are offered in a standard format, for various suppliers and clients; basically these services are necessary to support common operations in different industries and companies. The characteristics of these services make them not a source of competitive advantage; however they are necessary to keep the lights on. The lack of IT capabilities can be a barrier to growth and development of businesses. IT is in most of the cases an enabler to business operations and without IT resources the firm strategy would turn out to be limited in terms of conceiving matters and implementation.

To summarize using the resource-based theory, cloud computing services are not rare because they are provided for several vendors, they are common and available to all players in the market including competitors (imitable) and they are easily substitutable for other services or other suppliers that follow the same standard (technical and functional). The value of the IT resources available in the cloud can be compared, for example with electricity. Standard and basic services that work as an input to several IT processes and enable the company to perform and to grow. However the value of these services, when not integrated in the company processes or needs, is not high. The properties and characteristics of cloud computing in the resource-based theory context justify the view of cloud computing as an outsourcing modality.

Another point is the affordable price that enables businesses which could not afford IT solutions before cloud computing, to implement adequate strategies. The prohibiting costs of IT resources and capabilities were in several cases a barrier to SMEs growth. In a context where many IT services are available for all companies in a pay-per-use model (reduction of initial investment) resource-based theory turns to be even a better theory to evaluate an IT outsourcing option. For Talentia and Alstom, IT is not the core business; however IT resources are a must when talking about their operational activities. Talentia’s VP stated the following in the interview:

"Since we are a company with 15 employees, we don’t have a CIO and the IT expertise of that company is rather limited. However our IT is very important to us. [...] IT infrastructure is an important issue that is coming along with this, we decided in the past weeks to move to a cloud solution to our company.” (Talentia, 2010)

Talentia, as a recruitment company, is totally based on the internet to communicate with employers and people that are seeking for a job. Therefore IT resources (database, storage, web services, web site, etc) are key elements to support Talentia’s business operation. Alstom is a multinational company supporting a huge amount of users, applications and processes through their systems and have a strong need for IT efficiency and availability to satisfy its clients and support its businesses. Both companies chose a cost efficient IT outsourcing model to achieve better availability and service quality. Alstom contracted an IT service solution available 24x7 for the end users what was not possible to do locally. Talentia migrated to a cloud computing solution that provides availability of the services and applications without the necessity of an internal IT infrastructure.

Capgemini as an outsourcing provider has the function to provide services that attend the needs of the clients in the most cost efficient way. The cloud computing model has been added to the broad range of traditional outsourcing services already provided by
the company. The objective to attend the demand for cost efficient solutions moves the suppliers to offer products that match the concepts of resource-based theory that are valuable, more rare, difficult to imitate and difficult do substitute. If more services are offered the client has more choices (less rare, easier to imitate and possible to substitute in-source services) and the supplier can increase sales. However the challenge of suppliers is to fit a cost effective technology with the business needs of the client companies. As assessed through the interview made with Capgemini Sweden, IT departments are enthusiastic with cloud computing solutions, however from the business side the differences between traditional outsourcing and cloud computing are not clear yet.

“From the IT perspective of the company, they are very enthusiastic, they like it. But when you speak from the business there is no big difference, which is actually the goal of this kind of a transition” (Capgemini, 2010)

The interview suggests that the decrease of prices and increase of products offered via a cloud will be a result of the maturation of the cloud computing model.

Table 5-3: Findings related to the Resource-Based Theory

<table>
<thead>
<tr>
<th>Resource-Based Theory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value</strong></td>
<td>Resources outsourced were standard and basic services that work as an input to several IT processes and enable the company to perform and to grow. Valuable in the operational level but not valuable as a competitive advantage provider.</td>
</tr>
<tr>
<td><strong>Rarreness</strong></td>
<td>The services contracted via cloud computing and also via traditional outsourcing were not rare. Cloud computing raises concepts such as commoditization of IT and utility computing.</td>
</tr>
<tr>
<td><strong>Imperfect Imitability</strong></td>
<td>Resources contracted in a traditional IT outsourcing or cloud computing modality were offered for several suppliers with very similar functionalities. The resources outsourced were easily possible to imitate.</td>
</tr>
<tr>
<td><strong>Substitutability</strong></td>
<td>Following the other concepts, outsourced resources were easily substitutable for other services or other suppliers which follow the same standard (technical and functional).</td>
</tr>
</tbody>
</table>

5.4 Resource Dependence Theory – Findings

The resource dependence theory presents an interesting perspective to evaluate IT outsourcing decisions. The theory considers that all firms are, to a certain extent, dependent on external resources and links the success of the companies with the ability to adapt to the environment. This theory proved to be useful in the evaluation of cloud computing solution as an outsourcing model. The aspects which influence the level of
dependence (environmental concentration, munificence and interconnectedness) can be clearly related with the evaluation of cloud computing adoption.

As a relatively new solution in the IT industry; cloud computing is an option to all companies, some of them can see the benefits immediately while some of them judge that they do not fit in the model yet. However, cloud computing promotes changes in the IT environment and changes the way how firms buy IT resources. Nevertheless, the changes promoted by cloud computing and the new options in the IT market can be evaluated using the concepts presented in the resource dependence theory.

A company can consider the environmental concentration and how dispersed the power and authority is within the suppliers to evaluate a cloud computing solution. Companies which are not much sensitive to the dependence of the suppliers are much more flexible to adopt cloud computing. An example from the interviews is the case of Talentia that adopted a Microsoft cloud computing solution. The level of power and authority of Microsoft is very high in relation of Talentia; however its competitors like Google apps and Salesforce decrease the level of environmental concentration. In case of Alstom, as a multinational company, the level of dependence the company is willing to assume is lower. Alstom outsources just parts of its IT functions (customer service) through a global contract; in this case the power is much more in the client’s side than in the supplier side. The study of adoption of a cloud computing solution is treated in the global level while the IT local director believes that private clouds can be cost effective in the case of Alstom. The change and environmental adaptation are trade-offs between benefits of the solution and dependence level. As a small company Talentia has more flexibility to adapt to external changes, on the other hand Alstom has the core rigidities of a global company.

In terms of munificence a cloud solution does not represent changes from a traditional IT outsourcing solution, a part of the maturity of the model. An enormous number of providers are today in the cloud business which makes the companies less dependent of a particular provider. Both Talentia and Alstom were able to choose among offers for a set of different providers. Capgemini states that the offer of cloud computing is not an issue for any company; however the accountability of each supplier could be a concern.

“It is very easy to provide something, but they are not the one being hosted when the catastrophe is coming. So we have some challenges here. Nevertheless, cloud computing will become enormous due to the fact that more and more people are using different kinds of services.” (Capgemini, 2010)

Finally interconnectedness is an aspect that can be verified by the pattern and number of connections a company need to have. Talentia is clearly more dependent than Alstom; however the different category of companies (SMEs against large companies) justifies different strategies and consequently different needs to acquire external resources. Talentia clearly stated in the interview that IT resources are not part of its core business and that they are not willing to own a complex IT structure. In this way the company decided for a cloud computing solution and increased the level of interconnection. On the other side Alstom can support its IT needs with their two existing global data centers. The option to outsource the customer services was based on improvements of availability and service and not necessarily the only choice the company had. The interconnections of Alstom are weak and define a low level of dependence.
Talentia’s strategy is very reasonable since it is part of SMEs and is not very sensitive to a high dependence level. The benefits that the company can experience acquiring resources via a cloud justify the choice. The strategy of Alstom is also coherent as a multinational company; however the interview also highlights a possible benefit of internal (private) cloud solutions.

### Table 5-4: Findings related to the Resource Dependence Theory

<table>
<thead>
<tr>
<th>Resource Dependence Theory</th>
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<tbody>
<tr>
<td><strong>Environmental Concentration</strong></td>
</tr>
<tr>
<td>According to the data collection it is possible to say that companies which are not much sensitive with the dependence of the suppliers are more flexible to adopt cloud computing.</td>
</tr>
<tr>
<td><strong>Munificence</strong></td>
</tr>
<tr>
<td>An enormous number of providers are in the cloud business today, which makes the companies less dependent of a particular provider.</td>
</tr>
<tr>
<td><strong>Interconnectedness</strong></td>
</tr>
<tr>
<td>The number and pattern of linkages among organizations presented in the data collection varies more according to the strategy of each company than according to the technical solution. The need of external resources is different among companies and depends of several aspects. There was no evidence of a distinction of an interconnectedness level between cloud computing and traditional IT outsourcing.</td>
</tr>
</tbody>
</table>

### 5.5 Exchange Theory – Findings

The exchange theory covers what could be called the “informal” part of IT outsourcing. Transaction and agency cost theories describe the contract and the tasks of monitoring the IT outsourcing agreement as sources of costs to the firms. In the same direction the exchange theory points out the difficulties to develop a perfect contract and highlights the role of the client/vendor relationship to undertake conflicts and increase the success of the outsourcing initiative. A set of concepts contribute to the success of the outsourcing arrangements according to the exchange theory: attraction, expectation, norms, power and justice, communication and bargain. It was possible to understand that exchange theory can be very useful in the evaluation of cloud computing as an outsourcing model. The concepts are easily related to the practice and the relationship outside the contract boundaries that also reflect the outsourcing reality.

Attraction was a concept clearly represented in the Talentia’s choice for cloud computing. The immediate benefit of the contract of a cloud computing solution by not having to maintain an IT infrastructure was the first step in the decision making process. Alstom also shows that the global decision to outsource the customer services was based on the improvement of availability. The company improved from local restricted working hours to 24x7 of availability provided by the outsourcing vendor. Capgemini, as a well known outsourcing provider, uses several channels to create attraction; for example web site, advertisement, outsourcing quality prizes and so on. However the interest-
ing action in the cloud computing initiative cited in the interview was that in most of
the cases Capgemini goes directly to the client to offer the cloud solution. The practice
of small pilot projects offered by Capgemini is a clear way to generate attraction and
improve the relationship as a vendor with the clients.

Expectation and norms are two concepts that appeared interconnected in the empirical
data. Knowing the norms, partners can build a solid knowledge about how to achieve
the expectation of each other and construct a winning outsourcing relationship. Talentia
proved to have a solid relationship with the outsourcing provider. The vendor was re-
sponsible for the traditional IT outsourcing solution maintaining the infrastructure and
applications. Changing the technological solution Talentia decided to maintain the rela-
tionship since the vendor was also a cloud provider for Microsoft solutions. The good
relationship and the quality of the services turned out to be a fundamental reason to
avoid the attempt of choosing another supplier.

“The re-seller is exactly the same vendor that we had for the old solu-
tion. I spoke to the company that is doing our IT right now and our
purpose of going into the cloud. This company was very responsive
and informed us about the fact that they would also be moving to-
wards cloud solutions with their customers.” (Talentia, 2010)

The expectations of continuance of the service level and the maintenance of the norms
in the relationship were fundamental aspects to the decision. Alstom’s outsourcing ven-
dor had an overperforming start of service providing. The alignment of the expectation
with vendor and local level was fundamental to adjust the performance. Capgemini has
a history of long-term outsourcing relationships. The set of norms pave the relationship
with giant clients such as IKEA or the government.

Some concepts such as power and justice, communication and bargain, are easily ob-
served in case of conflicts or necessary adjustments between partners. It was possible to
assess a necessary negotiation in the case of Alstom and the over performance of the
outsource service provider. As cited before the local administration had key requisites
that were not being attended by the supplier services. Even though a global contract
was set, the local Swedish administration entered in a negotiation with the supplier to
align the needs of the local level. The communication channel was enabled and partners
have set up periodical meetings to manage the relationship and requirements of perfor-
manence, which are constantly changing. The communication and the level of bargain in
this case were fundamental to both partners on one side (how the supplier improves the
performance) and on the other side the client that has its needs attended. The supplier
behavior showed the balance of power and how the right management of relationship
aspects can make an outsourcing initiative successful. The interview exemplifies how a
well balanced relationship foments a win-win commercial relationship in IT outsourc-
ing. As the relations with providers are still present in cloud computing, it is possible to
understand that, there is not a considerable change in the relationship of the exchange
theory considering traditional IT outsourcing and cloud computing solutions.
Table 5-5: Findings related to Exchange Theory

<table>
<thead>
<tr>
<th>Exchange Theory</th>
</tr>
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<tbody>
<tr>
<td>Attraction</td>
</tr>
<tr>
<td>Expectation</td>
</tr>
<tr>
<td>Norms</td>
</tr>
<tr>
<td>Power and Justice</td>
</tr>
<tr>
<td>Communication and Bargain</td>
</tr>
</tbody>
</table>

5.6 Additional Relevant Concepts – Findings

Some concepts appeared to be extremely relevant when evaluating a cloud computing solution. These concepts were spontaneously cited within the interviews and were treated as key aspects that differentiate cloud computing from traditional IT outsourcing. It is important to underline that both, weaknesses and strengths of the actual cloud computing model can be pointed out by using these concepts. Some of these aspects are cited in the previous sections where the theoretical framework is analyzed; however this section aims to scrutinize the special meaning of these concepts when inserted in the sourcing via cloud computing solutions.

Moreover this section directly addresses the part “b” of the research question of this study. It suggests some particular concepts that should be additionally considered when
evaluating a cloud computing solution as an outsourcing option. The following sub-sections describe in detail the concepts and how they were raised in the data collection.

5.6.1 Price Effectiveness and Cost Efficiency

Price effectiveness and cost efficiency appeared as complementary concepts when the interviewers raised the economical perspective in relation to cloud computing solution. Clearly they differ a lot when the definition of each concept is compared; however when inserted in the actual economical competitive context, where IT departments are obliged to cut costs and increase the level of the services provided, these two concepts are necessary together in the IT managers agenda.

In the data collection the importance of price appeared as an obvious issue in favor of cloud computing:

“Price always matters.” (Capgemini, 2010),

“Cloud Computing is a very price attractive solution.” (Talentia, 2010).

Supported by a cost efficient architecture (detailed in chapter 2), products and services could reach economics of scale and be delivered in better prices than traditional IT outsourcing possibilities. Talentia pointed out the reasonable price of the solution compared with the traditional IT solution they previously adopted. The price of the services contracted turned out to be much cheaper if the expenses with maintenance, hardware, software and personnel are included in the account. It is possible to identify some key statements in Talentia’s interview that emphasizes the price importance in the cloud computer solution:

“With the “old solution” [traditional IT outsourcing] we could see that it was quite expensive and also vulnerable. This is basically why we decided to go for the cloud. [...] Price and vulnerability were surely two main aspects to change. Cloud Computing is a very price attractive solution [...] Hence Cloud Computing is an easy way to keep up-to-date on a reasonable price level.” (Talentia, 2010)

On the other hand, Alstom highlighted the possibility to use cloud computing as a solution internally. The insights provided by Alstom IT director in Sweden suggest the development of a private cloud that are extremely more cost efficient than to have several local data centers. The fact that most of the IT resources (hardware and software) are underutilized is mainly because they are measured to support seasonal overload making the infrastructure costly for companies. Alstom points out that the IT resources’ performance is much more costly efficient managed using cloud computing and the technologies involved in it.

Capgemini forecasts that in 2 or 3 years cloud computing will play a very important role in the IT outsourcing modalities. From a supplier perspective, Capgemini points out that the initial costs to offer cloud computing and the reduced number of large companies that are using it are some of the reasons why the price is still not competitive enough. With the gradual adoption of large companies and consequently broader adoption by SMEs, cloud computing will be even cheaper to buy and even more costless to offer.
“As we are beginning with cloud solutions, they are not very common, hence it is not used by a lot of businesses yet. Those companies have to share the whole cost area. But the more and more business starts to enter cloud computing, the price will decrease.” (Capgemini, 2010)

The evidences pointed out by the experts interviewed confirm what theory, press and media advertise about one of the great economical advantages that cloud computing model can bring to the business.

5.6.2 Availability and Vulnerability

Availability and vulnerability showed up to be related mainly because the biggest strengths can be also the main weaknesses of the cloud computing model. The internet connection dependence is clearly identifiable in the conceptualization of cloud computing. The same internet connection, that brings the advantage of broad availability and independence of specific hardware, software and maintenance for the clients, can be the source of vulnerability of the model in case of a lack of internet connection. Another point highlighted was the data security, the advantage of access and storage of the data in a cloud that can turn out to be the vulnerability if considered as the lack of regulation, possibility of not authorized access or responsibility for corrupted data incidents.

The issue of availability and vulnerability was emphasized in the interview with Capgemini. As a provider Capgemini was more sensitive regarding the issues in the data accountability and availability of internet connection. When offering an IT outsourcing solution Capgemini needs to consider these concepts additionally to the traditional methodology; more than evaluate what or how to outsource the benefits of cloud computing that are still bounded by certain particularities as availability. Capgemini’s senior consultant gave an example of the tradeoff between availability and vulnerability in the cloud computing solutions; the benefit of availability:

“I could use my cell phone to do my day to day business work, go online get contacts from clients that I am visiting, their history of buying and their current location. You also have the certainty that the actual data you would be using on your cell phone will not be gone when the cell phone will be lost. The data would be in the cloud, which you can access on other devices as well.” (Capgemini, 2010)

And the disadvantage was exemplified as:

“Sweden is a developed country in terms of an internet connection. However, there are also spots where there is a bad internet connection. Hence in order for the cloud computing purpose to be fulfilled you need to have a perfect internet access wherever you are, because when there occurs spots where employees are unable to work, then you have a liability – Cloud Computing would then turn into a disadvantage.” (Capgemini, 2010)

Talentia is a prime example of SMEs that can immediately benefit from cloud computing since they are less sensitive to the issues presented in this section. As clearly stated in the interview Talentia believes in the cloud computing solution as a better solution in terms of availability since the company was supported by small in-source infrastructure
considered not as reliable and stable as a powerful cloud (stamped with Microsoft brand). Alstom IT resources are structured in a mix of in-sourcing and traditional outsourcing; cloud computing was an option considered on a global level but not adopted there. The level of key performance indicators and availability imposed by Alstom made a cloud computing solution not an option for the management team. The vulnerability of the solution, in the perspective of a multinational company, continues to be a constraint to adopt a cloud computing solution.

The level of importance of availability and vulnerability and the impact of these two concepts in case of failure justify a special analysis when evaluating cloud computing solutions as an IT outsourcing option.

5.6.3 Company Size and Industry

Company size and industry emerged in the data collection as important aspects to be considered when evaluating cloud computing as an IT outsourcing option. The benefits that cloud computing can bring showed to vary according to the company size and industry. The interviewed experts agreed that cloud computing solutions can be extremely beneficial to SMEs, which, before cloud computing, could not afford big IT investments and consequently could not support their business with the best IT solutions. On the other hand large companies were described in terms of the structure, complexity and consequently difference of requirements for IT outsourcing solutions. Moreover the legacy systems and infrastructure of large companies need to be taken into consideration and they are not always designed to easily integrate with cloud technologies. In terms of the industry some of the points already cited, such as security and availability, come up again as a critical issue for cloud computing solutions.

The difference of sizes in the companies interviewed was a great evidence that company size matters when evaluating the benefits of cloud computing. Alstom IT director, Pernilla Lindsten (2010), raised the company size issue in large companies as Alstom and refers that SMEs could better benefit from cloud computing:

“I think Cloud Computing is a good solution, but I am uncertain, whether it would work for our company that will benefit of that. [...] Cloud Computing is a really good idea for smaller companies than us (Alstom, 2010).”

Talentia, on the other hand, represents the SMEs that are already benefiting from cloud computing solutions. The fifteen employees company considered cloud computing as a natural choice, since other SMEs were also migrating into the cloud. Moreover, Talentia’s vice president Helena Norder, highlights the fact that cloud solution is “an easy way to keep up-to-date on a reasonable price-level” (Talentia, 2010). Capgemini is focused in the large companies’ IT outsourcing market. Additionally to the importance of companies’ size the interview showed the relevance of the industry type in the relation to the benefits extracted from cloud computing solutions. The senior consultant interviewed, Hannes Vedin (2010), exemplified that different industries benefit differently from cloud computing:

“For instance, when you are running a production line within the car industry, you can have cloud solution, but the benefits are not as big as if you are running a company with people in logistics, where you
have drivers all over the world and they are out on the field needing to access all kinds of information (Capgemini, 2010).”

Moreover, the relevance of the industry in the evaluation of cloud computing solutions is also showed in the interview underlining the importance of security in defense and public sector, and how the issue of security represents a barrier for the adoption of cloud computing in these industries.

This study does not cover the characteristics that differentiate SMEs and large companies; however it considers the existence of these differences as a premise. Industries definitions are also broad and out of the objective of this study. The main objective of considering company size and industry is the possible linkage between both concepts and benefits from cloud computing solution.
6 Conclusion

This study has explored two important topics within information technology and business management that are IT outsourcing and cloud computing. IT outsourcing has been playing a relevant role in the current competitive environment, enabling several kinds of IT resources arrangements and aiming to improve business efficiency. The recent business model provided by a combination of cost efficient technologies are called cloud computing and appears as a new option of IT outsourcing.

Facing the novelty of the cloud computing model, the comparison with traditional IT outsourcing evaluation was a gap encountered in the academic and professional literature. Therefore the research question was stated in terms of how the evaluation of cloud computing as an outsourcing option differs to the traditional IT outsourcing. Aiming to answer the research question this study thoroughly investigated whether or not cloud computing can be evaluated using the set of the most recognized IT outsourcing theories (transaction cost theory, agency cost theory, resource-based theory, resource dependence theory, exchange theory). Complementarily, this paper highlighted important concepts, which should be specially analyzed when evaluating a cloud computing solution.

Initially, this study provided a broad technical and business explanation about cloud computing and its particularities. It was important to clarify that the technologies involved in the solution are not recent, however the maturation of the business model and the market needs for more cost efficient solutions leverage the business success. A detailed review of the most recognized IT outsourcing theories was performed in a way to develop a theoretical framework effectively to challenge the data collection and to verify whether the theories are suitable or not for the evaluation of cloud computing solutions.

The data that was collected from three Swedish companies represented three different groups; SMEs, large organizations and IT outsourcing suppliers, which was extremely important for the research at hand. The analysis of these three different groups was an important feature firstly because the companies represented three main groups involved in IT outsourcing arrangements. Secondly, the content that was obtained through unstructured interviews provided a valuable raw material to perform the analysis and bring insights to this study.

The first part of the research question is addressed through the confrontation of the data collected against the theoretical framework. This confrontation suggests that the theories used to evaluate traditional IT outsourcing can also be used to evaluate cloud computing solutions. The framework appeared to be very complete since it involves different perspectives of IT outsourcing. Moreover, scrutinizing all concepts, involved in each IT outsourcing theory represented in the framework, demonstrated a reasonable level of transparency and highlighted the coherence between the analysis and findings.

Extrapolating the framework boundaries and considering the particularities in the cloud computing solution, the second part of the research question is fulfilled. The analysis of the data collected suggests that “Price Effectiveness and Cost Efficiency”, “Availability and Vulnerability” and “Company Size and Industry” should be considered when eva-
luating cloud computing solution in addition to the IT outsourcing theories. The additional concepts would provide a better understanding of the suitability of cloud computing and assess the main strengths and weaknesses of the availability of cloud computing technologies. The study advocates that combined IT outsourcing theories and additional concepts are able to provide a better output to the IT outsourcing decision process.

Although this study succeeds in answering the main research question and contributes with new useful knowledge for professionals and scientific community, it is important to underline the constraints that bounded the research process and limited outputs. Constraints as time, budget, geographical broadness, confidentiality and the small number of companies that already have adopted cloud computing shaped the level of detail of this research outcome. However the coherence with the research methods applied provides credibility to the outcomes and enriches the insights and knowledge generated in this study.
7 Reflection and Prospect

As mentioned in the data collection constraints, there is a huge potential for future research to get more and more companies involved in cloud solutions and therefore more data collection possibilities. However, as for now a broad range of consumers and vendors has been provided and gives an incentive for further investigation.

For further research, other countries could be taken into account. For this specific research it was important to possibly reach the company’s representative also in person if possible, as it was asked for data that was rather sensitive to them. As the research was written at the International Business School in Jönköping (Sweden), companies from Sweden were more likely to agree on a personal or telephone interview with us than other companies operating abroad.

As mentioned in Saunder's et al. "Research Methods for Business Studies" (2007), exploratory studies has the potential to being pursued much further. This research at hand indeed deserves further research. Cloud Computing is a revolutionary IT trend that will change a lot of companies’ IT infrastructure and make the usage of their IT more efficient. To write about this topic can attract a lot of potential companies that want to know more about this topic and/or even would like to implement a cloud solution.

The unstructured interviews were picked to firstly qualitatively analyze the insights of the companies and due to the fact that a limited amount of companies actually had experience with cloud computing solutions. However, as one of the interviewee’s experts assured, cloud computing solutions will get more and more attractive to companies within the next 2 or 3 years. Further researchers could therefore apply a quantitative method to the research to reinforce the findings made in this qualitative study and hence make a more confident statement about generalizability. For that, a questionnaire could be implemented with an amount of companies that is statistically significant for the results.

The maturity of cloud computing model is also a subject for further investigation. As stated in this paper, the cloud computing business model is a novelty and has been developed considerably in the past two years. Therefore it is possible to forecast several changes in the business model increase the number of solutions hosted in the cloud and generate possible growth in the adoption for SMEs and large organizations. Future studies could explore the evolution and impact of the model in diverse areas of IT resources arrangement.

To summarize, this research has put together a fundamental analysis of a broad range of companies that can certainly be scrutinized further. The framework and the questions to be asked in the appendix can be used to further investigate the differences of the evaluation process of traditional IT outsourcing and cloud computing solutions. Also quantitative methods can be applied for further research to reinforce the findings in this paper as soon as cloud computing has become more mature in the companies.
References


Appendix

A-1. Interview with Talentia

Interviewers: Débora Di Giacomo, Tino Brunzel
Interviewee: Helena Norder, Vice President of Talentia AB
Type of Interview: Telephone Interview
Date: 16 March 2010
Duration of the Interview: 20 minutes

About the company:
Talentia is an HR recruitment consultancy firm with 15 employees headquartered in Stockholm.

Interview:
After getting to know each other via telephone and getting across our topic of the thesis, the interview proceeded as follows:

Do you outsource in your company?

Since we are a company with 15 employees, we don’t have a CIO and the IT expertise of the company is rather limited. However our IT is very important to us. Since we will move our office in three weeks and the IT infrastructure is an important issue that is coming along with this, we decided in the past weeks to move to a cloud solution in our company.

That really sounds good to us, as we currently write our master thesis about how companies, that are in this position right now.

Did you enter in a process of evaluation for the cloud solution before you decided to move there?

Actually we are already outsourcing to a service provider so we were familiar how that worked. We had another company with whom we have kept our facilities together so that we were sharing the infrastructure. We had a deal with them to do the installation and the maintenance every other week.

Why did you decide to go for a cloud solution?

With the “old solution” we could see that it was quite expensive and also vulnerable. This is basically why we decided to go for the cloud. In terms of vulnerability we will not be obliged to have a server in our own facility. We will only have the clients while the other stuff will be taken care of.

So can we conclude that price and vulnerability were the main reasons to change?
Price and vulnerability were surely two main aspects to change. Cloud Computing is a very price attractive solution. However more important was the stability for us as a small company, as we don’t want to employ internal expertise on IT issues, for us it just needs to work.

We consider Cloud Computing as a stable long-term solution, because of the fact that Microsoft is behind this. It was therefore a natural choice for us towards this direction as many companies are going there as well. It demands a minimum amount of knowledge from Talentia AB and still we make sure to use the most advanced technology available. Hence Cloud Computing is an easy way to keep up-to-date on a reasonable price level.

**Are the contracts with Microsoft long-term or on a pay-per-use basis?**

We are not contracting directly through Microsoft but through a re-seller, so they will support the computer clients and install the solutions. We have a service contract with them. How the contract exactly looks like I can e-mail it to you later.

**Who is the re-seller?**

The re-seller is exactly the same vendor that we had for the old solution. I spoke to the company that is doing our IT right now and our purpose of going into the cloud. This company was very responsive and informed us about the fact that they would also be moving towards cloud solutions with their customers. Also their proposal was very competitive to other alternative that were on the table. That is why we kept our current vendor but moving apart from an old server solution.

**As we came across cloud solutions, we read that the only aspect that keeps cloud fear amongst some companies of entrusting their data to the servers, as they can be anywhere. Would you apply this fear to you and your company as well?**

Not at all. We trust the system to work. Moreover our information that we are working with is not state secret. However, our most secret information is outsourced with a different vendor, which also the vendor of the database solution.

**For the moment we have a lot of information that we could use to proceed with even more questions for you. Could we get another opportunity to talk with you? Thank you very much for having the interview with us.**

No problem. You can call or e-mail me whenever you want. I hope I could help you for your thesis.
A-2. Interview with Capgemini

Interviewers: Débora Di Giacomo, Tino Brunzel
Interviewee: Hannes Vedin, Senior Consultant of Capgemini
Type of Interview: Personal Interview in Göteborg
Date: 8 April 2010
Duration of the Interview: 60 minutes

About the company:
Capgemini is a Management and IT-Consultancy acting world-wide in over with 92,000 employees.

Interview:
After getting to know each other and getting across our topic of the thesis, the interview proceeded as follows:

On your website we have seen that Capgemini offers a broad arrange of cloud solutions. How do you see Capgemini’s role in that area?

First of all, we have to define what is cloud computing, what is cloud computing to us, there are a number of definitions out there, I would say cloud that computing is all about having a distributed system. On the other hand we have the regular outsourcing, which could encompass different situations, for instance a client, where Capgemini takes over their personnel for example the whole IT department with the aim of having their costs cut by using more efficiency.

Nevertheless I would say that Cloud Computing in a couple of years will experience an explosion in the development, it will be much more important in 2 or 3 years. I would say the market is not mature enough yet. People are talking about it, but there are quite a few that are realizing it.

There are a lot of pilot projects that aim and try to do this, but there are very few companies that are actually taking benefit of the entire possibilities we have in cloud computing.

Due to security reasons, some companies are very sensitive when it comes to a cloud solution, for example defense companies as well as the public sector, because they would not like the idea of depending on someone else. A lot of other companies though.

Furthermore you will benefit from the synergies from the company that actually hosts the cloud architecture, because some company has to host it anyway. If you can have one host for about 500 companies and you pay 20% of the original host costs, it turns out to be a great strategy for the companies using it.

Furthermore there are even more benefits. I could use my cell phone to do my day to day business work, go online get contacts from clients that I am visiting, their history of buying and their current location. You also have the certainty that the actual data you would be using on your cell phone will not be gone when the cell phone will be lost. The data would be in the cloud, which you can access on other devices as well.
However there are also disadvantages playing a role when talking about cloud computing. At first I think we are not really there with cloud computing for example in terms of internet connections. There is not a high-speed internet connection available everywhere in the world. There are a number of countries that have not the infrastructure to provide internet on a usable level for the business. Hence a cloud computing solution would not be as efficient as it should be.

Sweden is a developed country in terms of an internet connection. However, there are also spots where there is a bad internet connection. Hence in order for the cloud computing purpose to be fulfilled you need to have perfect internet access wherever you are, because when there occurs spots where employees are unable to work, then you have a liability – Cloud Computing would then turn into a disadvantage.

Another issue with cloud computing is the security. In general providers have not come to that part where we know all the effects yet. Because in the end we will have to have the information somewhere: Therefore we would have the IT security as much as the physical security challenged.

What happened when 500 of the biggest companies in the world would use cloud computing? Obviously there would be advantages. What if someone “drops a bomb” within that server? As you can you will have to have a different kind of security there.

That is why there are a number of questions that need to be answered

However a lot of providers are already offering cloud computing services.

Sure, but that’s the easy part. It is very easy to provide something, but they are not the one being hosted when the catastrophe is coming. So we have some challenges here. Nevertheless, cloud computing will become enormous due to the fact that more and more people are using different kinds of services.

When did Capgemini start to launch a Cloud Computing solution?

That is a really good question. It has been offered gradually and slowly within the last 2 years. But in the start if was very difficult to offer it.

And what aspects played a role when switching from the traditional IT outsourcing solutions to a cloud solution?

That would be the personnel perspective. Suddenly you don’t have to worry about IT staff anymore; the provider will do all the technical work for you.

Another aspect is the availability. With cloud computing you are able to offer a service 24/7.

With cloud computing you can concentrate on your core competencies. The IT capabilities will be taken care of from others.

Are there any differences about the contracts between both IT outsourcing opportunities?

There is a difference in terms of usage of the hardware of course. Capgemini is not responsible for the hardware since the cloud solutions that we offer have a distributed system.

When it comes to the evaluation of IT outsourcing opportunities, does this differ in any relation between traditional and cloud solutions?
No, the evaluation appears to be pretty much the same. The customer’s business stays somewhat the same so that the evaluation process will applied equally as it was a traditional IT outsourcing opportunity. That’s not the big difference, so that it can be said that the implementation and integration part stay pretty much the same.

This is also because Cloud Computing has not reached the next level yet. For the evaluation you have to pretty much do the same work but the benefits are when something is up and running, then you can have a lot of advantages with a cloud solution.

For instance, when you are running a production line within the car industry, you can have cloud solution, but the benefits are not as big as if you are running a company with people in logistics, where you have drivers all over the world and they are out on the field needing to access all kinds of information.

What about price? It is easier for companies that are more sensitive to price and less security reasons.

Price always matters. As we are beginning with cloud solutions, they are not very common, hence it is not used by a lot of businesses yet. Those companies have to share the whole cost area. But the more and more business starts to enter cloud computing, the price will decrease.

But even when the price decreases, there will always be the security aspects, which will be on greater importance in the future, so that is why cloud computing is so hard to be predicted in the future.

How to the clients experience the transition from the traditional to cloud solution? How is their feedback?

From the IT perspective of the company, they are very enthusiastic, they like it. But when you speak from the business there is no big difference, which is actually the goal of this kind of a transition. The internet connection is one issue that is coming back then again.

Losing an internet connection in a traditional environment, you are handicapped, but most likely have some of your data on your hard drive. Within a “modern” environment this is not possible. And a lot of people do not realize this yet.

Who is coming to whom when considering cloud computing?

I would say in 9 out of 10 cases we go to the client introduce him to the cloud possibility.

Thank you very much for the interview!
A-3. Interview with Alstom

Interviewers: Débora Di Giacomo, Tino Brunzel
Interviewee: Pernilla Lindsten, IT Manager of Alstom
Type of Interview: Telephone Interview
Duration of the Interview: 20 minutes

About the company:
Alstom is acting world-wide making its business in power generation and transport with annual revenue of over €18bn in year 2009. Alstom is currently acting in 70 countries with the support of around 80,000 employees.

Interview:
After getting to know each other and getting across our topic of the thesis, the interview proceeded as follows:

How is the current IT outsourcing situation of ALSTOM?
If I relate to the outsourcing part, we have already outsourced a part of our IT area. We have outsourced what we call the service function. There was made a global decision in our company. I have to say that the important thing is that you maintain the contract otherwise you will not succeed. Otherwise there might be the possibility to receive penalties from the provider.

How long have you been outsourcing?
For almost 1 and a half year.

Did you evaluate this in certain way?
The decision was made on a global rather than on a local level. This was being handled by our executives. Locally we thought it was not the right choice. But we now have changed our minds locally because of the fact that we are able provide 24/7 service to our end users. We could not do that in Sweden before.

Where you part of the supplier selection of the contract?
We received copies of the different tenders that we could have a say for which company we think is better. I voted for a certain company but the final decision was made to go for another company.

How is the relationship with the current tender? Can you complain, and talk about improvements?
Yes, we have direct contact with the supplier. At the moment we weekly need things. Since they have performing quite bad at first, it has become better. We have a good relationship with the tender, so we don’t see that as a big issue. The supplier is not in Sweden, but in Spain. I feel that sometimes they are not as flexible as you could be locally. You need to add resources in order to meet the requirements that are changing time to time. This is quite hard to get them to understand. From another point of view they have this 24/7 service. For example our help desk today is open by Swedish speak-
ers 7am – 6pm but outside of the time the help desk is just available in English. Since we have a lot of end users who travel a lot and working worldwide

**Have you come up with an idea to implement a cloud solution in your company?**

Cloud discussions have been done on a global level. Before I joined ALSTOM I was managing other IT Business. There we started a cloud solution a couple of years ago. As it was too new for the company, it failed. I think Cloud Computing is a good solution, but I am uncertain, whether it would work for our company that will benefit of that. The reason is that we are a global company and agreed on having 2 major datacenters worldwide. But I think it would be beneficial to use cloud computing internally in our company in order to reduce the infrastructure locally and having all the servers for example in Basel (Switzerland).

**Is the methodology to go for a cloud solution or a traditional solution?**

You need to have some kind of operations level agreement. You need to have to some kind of contracts that makes comments about delivery availability and so on. Cloud Computing is a really good idea for smaller companies than us.

**How does the contract look like?**

The contract we have locally is on a yearly basis.

**Do they provide the service for a fixed price or per volume taken?**

In the contract we have some key performance indicators that they have to meet, for example availability. No matter whether it is a traditional IT outsourcing or cloud solution, the agreement is really important, that there are key performance indicators involved that they should meet. Otherwise the key performance indicators will reduce the costs for you once the providers perform in a bad way. I see the benefits of it. Today you are using a minor part of the server’s performance. With cloud computing you don’t have any problems regarding performance. Often they are virtual services, so they can often decrease the memory so it is a cost efficient way.

**Thank you very much for the interview!**