Factors in Cloud Computing Adoption

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Abstract

Many organizations today are striving to gain competitive advantages and work efficiently in the demanding market through the adoption of ICT (Information and Communications Technology) solutions such as ERP (Enterprise Resource Management), CRM (Customer Relationship Management), and Business Analytics Systems. However, these Information Technology (IT) solutions can be quite expensive for small organizations (Misra and Mondal, 2011; Benlian and Hess, 2011).

On the other hand, small organizations are trying to contend with large enterprises yet lack the capital to invest in ICT solutions (Wei, 2009). Cloud Computing can play a major role in this area as it helps organizations to use these solutions in a cost effective and affordable manner. Due to the fact that Cloud Computing is a fairly new technology, enterprises are either oblivious to its existence or lack confidence in its capabilities and solutions.

During the conduction of this thesis we discover the factors organizations to consider prior to the adoption of the Cloud Computing solution while assigning each with its relevant level of significance only in relation to small organizations. The factors presented will be important to be noted as it is concluded that Cloud Computing is rather suitable for small organizations.

Keywords:
Cloud Computing, Factors, Small Organizations, Adoption, IT Solution, Information Technology.

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1. Introduction

This chapter will introduce the Cloud Computing concept, its importance in the current era, and the need for these kinds of studies in Information Systems research. The Research Question along with the underlying purpose will be presented, and finally the potential target group along with the possible contributions to Information Systems knowledge will be discussed.

1.1. Background

In our day and age, businesses are trying to survive through the harsh economic crises along with keeping up with the demanding and competitive market. Information Systems have provided organizations with more efficient means of data management, collection, and mining at the cost of hardware, software, and Information Technology solutions. Hence, these organizations are striving to find more suitable and cost-efficient means of conducting their IT-sector using better tools and technologies, hence Cloud Computing can be a suitable candidate to play this role (Subashini and Kavitha, 2011; Benlian and Hess, 2011; Misra and Mondal, 2011).

The extensive adoption of Service-Oriented Architecture, virtualization, utility and autonomic computing has made Cloud Computing grow significantly, and the major driver for this widespread adoption is the economic benefit that cuts expenses for existing applications (Sandhu et al., 2010). The emergence of the Cloud Computing concept has changed the way IT Services are developed, deployed, used, maintained, and paid for (Marston et al., 2011).

The term "Cloud Computing" can actually be defined as a service where resources, information, and software can be provided to computers over a network, which is mainly the Internet.

"Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."
(Mell and Grance 2009, p. 1).

Cloud Computing promises to be a cheap alternative to specialized clusters and super-computers. It's also a much more reliable platform when compared to grids and its scalability is much more flexible and dynamic when compared to resource pools (Simon et al., 2009).

In spite of the important opportunities which are included in Cloud Solutions and the great business values that can be achieved in companies according to IT providers and some researchers, other researchers predict a decline in the adoption of Cloud Solutions as a result of its potential risks (Benlian and Hess, 2011).

1.2. Problem Area

Cloud Computing is a main trend in the current ICT world and is one of the top ten Technology Priorities for CIOs in companies according to Gartner (2012)[1]. "Accenture's Tech Labs has listed Cloud Computing as number 1 of overall key technology trends for year 2011-2015" (Rosengren, 2012). It could be really useful for third world countries and small companies as they do not have enough funds to have their own IT infrastructure and services (Transcript - Cloud Concept, Appendix A.3.2). (Benlian and Hess, 2011).

Cloud Computing is mainly based on web-service technology which is also an important trend in the software industry, reaping more interest from authors and practitioners. (Rai et al, 2006) states that "important questions emerge on customer perceptions and the economics of digitally enabled services." (Rai and Sambamurthy, 2006, p. 330). Therefore there is a strong need to study the user response to these IT services, the author suggests "The economics and customer experiences [should be examined] with these services" (Rai and Sambamurthy, 2006, p. 330). Cloud Computing can come to serve as an efficient medium during the transformation of software to a service.

This need is mainly urgent in the Cloud area where most studies are currently dealing with Cloud Computing technologies. As Marston, S. (2011) stated "While a lot of research is currently taking place in the technology itself, there is an equally urgent need

[1] http://www.gartner.com/it/page.jsp?id=1897514

for understanding the business-related issues surrounding cloud computing." (Mary and Rodrigues 2011, p. 1)

Furthermore, some studies focus on the decision of adopting Cloud Computing but without going into details like which factors are more important and effective, how these factors affect the customer decision, how customers respond to these factors, and how companies try to handle these issues (Benlian and Hess,2011). Moreover, more empirical studies such as surveys, qualitative case studies, and interviews should be conducted in Information Systems research, and researchers in this area should be closer to the IT practitioners to enhance research in Information Systems. (Arnott and Pervan ,2008).
Consequently, we aim to focus on finding the effective factors when adopting Cloud Computing in small companies, the degree of importance and role of each of them in the transition of Cloud Computing through the conduction of some qualitative interviews with industry professionals.

1.3. Research Question and Purpose

The study will deal with the risks and the opportunities which affect the decision of adopting Cloud Computing in companies as it is seen by IT providers. The purpose of this thesis is to find the factors and indicate their importance in relation to the adoption decision of Cloud Computing in organizations. Hence, the research question will be:

What are the factors which organizations take into account when deciding about adopting Cloud Computing and how important are these factors?

1.4. Delimitations

We will not study the technology behind Cloud Computing, analyze the product's functional specifications, or study a company's detailed business work flow.

Furthermore, we will target the Cloud providers rather than its adopters as a source of empirical information because we believe that the providers are those who deal with different companies of different types. Accordingly, the providers know the effective factors regarding the adoption of Cloud Computing.

1.5. Target Group

We will target researchers in the Information Systems area by developing a discussion about the research topic based on the related published literature and from practitioners in the industry.

We believe that the results of this study will be interesting for Cloud Computing providers who look for enhancing their services in addition to the customers who are planning to adopt Cloud Solutions and look at these solutions as a potential IT alternative compared to the traditional costly IT solutions.

1.6. Knowledge Contribution

During our study we will check the validity of the literature claims about Cloud Computing risks and opportunities by conducting interviews with different practitioners in the Cloud Computing area more of which will be discussed in the following chapter.

Previous studies in this area have not provided researchers with the factors for the adoption of Cloud Computing coupled with the indication of their importance specifically for small organizations. Therefore, our study will present the factors along with their level of significance.

2. Literature Review

To start our research, we did a literature review in the area of Cloud Computing to understand all related technical/business issues and indicate the factors to consider prior to adoption.

2.1. Definition

The main idea of Cloud Computing is not a new one but it has already existed through the grid computing systems and time sharing systems. The reason which made it as a trend in Information Technology (IT) nowadays is the advances in web technologies, virtualization, and software technologies (Kim et al., 2009; Etro, 2009) defines Cloud Computing as an Internet-based technology where data is stored on servers and made available to customers as a service (SaaS) and on-demand to clients.

The Cloud Computing service is provided to users in a new service model independent of location, device, and time. It will be provided by a network of interconnected, virtualized, and powerful computers (Misra and Mondal, 2011; Marston et al., 2011).

The computing resources in Cloud Computing can be dynamically allocated, scaled up, or de-allocated which means that the users do not have to invest in new infrastructure or licensing new software as their needs increase and they do not even need any upfront capital investments in IT (Subashini and Kavitha, 2011).

The new service model in Cloud Computing comes with a new on-demand service model and a "pay as you go" payment method where the users use the service when they need it and pay only for what they used of computing resources (Marston, Li, Bandyopadhyay, Zhang and Ghalasi, 2011).

Kim et al. (2009) stated that if the technology does eventually take root, it will have a real impact on the IT landscape. First of all, a big change in the deployment and pricing method of software will happen. Secondly, as the whole processing operations will take place in the remote servers the user devices will become lighter and less expensive.

Finally, they also believe that the adoption of Cloud Computing will create a new IT ecosystem between different type model providers.

2.2. Core Technologies

To be able to deal with the different factors affecting Cloud Computing Adoption we need to understand its background technologies which together make its new service model (Marston et al., 2011). The core technologies are the following:

Virtualization: The hiding of the physical background IT resources from the end user and presenting an abstract emulated computing platform, which in turn can be configured independently. This leads to a better IT resource utilization resulting in a lower operational and upfront cost.

Multi-Tenancy: The sharing of IT resources and software between different consumers which results in a cost effective service model, and better utilization of the IT resources.

Web Services: Which is defined by the 'World Wide Web Consortium' (*W3C*) as a software system used to enable interoperable interactions between different machines over a network.

2.3. Type Models of the Cloud

Cloud Computing services are provided in many forms to customers according to their specific needs and these models are clarified in Figure 2.1 with the possible deployment models. (Ahronovitz et al, 2010) categorize the types of models of Cloud Computing as Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS).

In Software as a Service, the client would use an application but would not be able to control the operating system, access the software design or that of the network infrastructure or hardware which it is running.

In Platform as a Service, a hosting environment is used by the client to host their applications, where they are able to control and access the applications running but do not control the operating system, hardware, or network infrastructure. Here, the platform is usually an application framework.

"Fundamental Computing Resources" are used by the consumer such as storage, processing power, middleware, or networking components in Infrastructure as a Service.

The operating system, network components, storage, and installed applications in this type of model can be used and accessed by the client, but not that of the infrastructure.

2.4. Deployment Models of the Cloud

The deployment model of Cloud Computing is an important issue when adopting Cloud Computing. Ahronovitz et al. (2010) lists the types of services a client can purchase or access through Cloud Computing:

In a *Public Cloud,* a third party service provider gives clients access to cloud services through the Internet. Although the word "public" can be thought of as free, it is not always the case. However, public cloud computing can be free or quite inexpensive to use. The client's data is also not publically available or visible, and the vendors provide their clients with control mechanisms to allow access to their data. Public clouds make for a cost-effective and flexible means to deploy solutions.

A *Private Cloud* offers everything the public cloud does in the computing environment such as being service-based and elastic. Yet unlike the public cloud, bandwidth restrictions made by the providers are lessened so that clients are able to manage their data and processes more effectively. A greater control of the cloud infrastructure to the client is also available which in turn improves resiliency and security because the networks and user access are designated and restricted.

The *Community Cloud* is used and controlled by a group of organizations sharing similar interests such as a common mission or security requirements. The members of the community have shared access to the cloud applications and data.

A *Hybrid Cloud* is basically a combination of private and public clouds. Non-business-critical information and processing are usually outsourced by the clients to the public cloud, while the business-critical services and data remain in their control on their own private (Cloud) server.

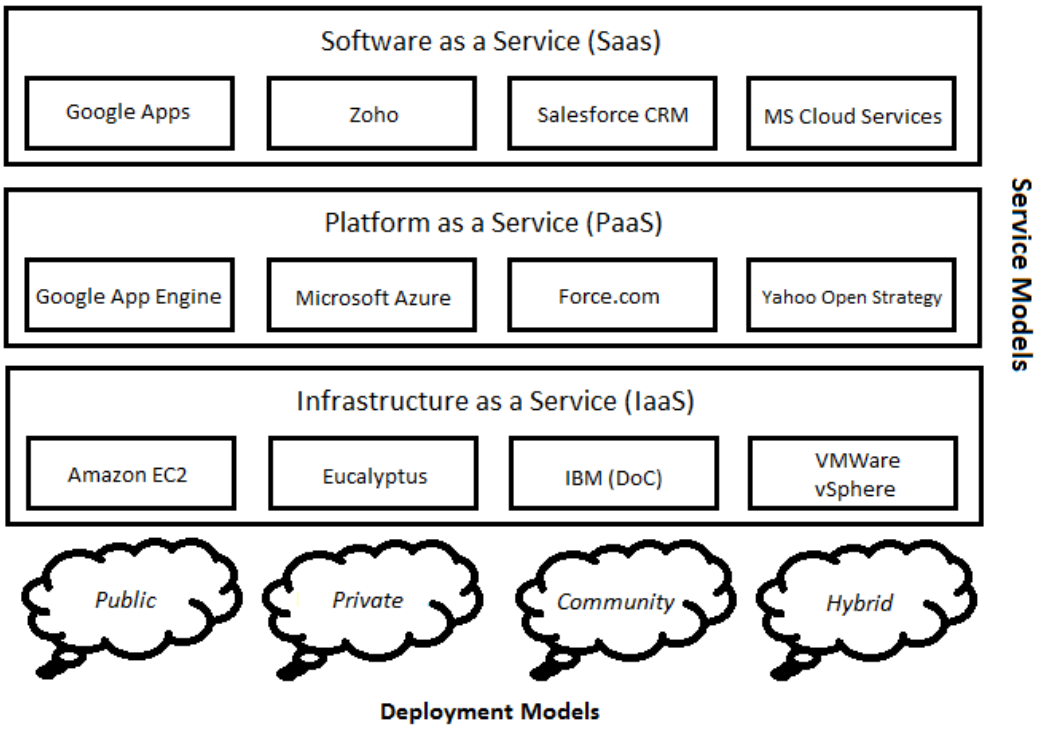

Figure 2.1: The deployment and service models of cloud computing (Own Figure)

2.5. Stakeholders

Marston et .al (2011) have listed three main types of stakeholders who play the main roles in the adoption of Cloud Computing services.

The *corporate users* are the subscribers of Cloud services who will use the service and pay for using it so that their IT departments will be more innovative as they do not have to care about the administration of the services as Marston et al. (2011) claims.

The *service providers* are the ones who own the servers, operate, maintain, and upgrade the service. They work on providing high level of up time to the third party customers. *Enablers* simplify the adoption of the cloud services. They will be responsible for selling these services from the providers to the end customers and facilitating the delivery and use of the cloud service.

In our study we focus mainly on the enablers and the providers as we think that they have in-depth experience in the Cloud Computing area through their work with different customers which have variable requirements.

2.6. Factors to be Considered in Cloud Computing Adoption

As a main step in the study, a thorough literature review of the perceived factors, risks, and opportunities of adopting Cloud Computing was conducted to be able to analyze these factors, measure their importance, and discover other potential factors during our study. Researchers in the area have studied the possible influential factors of adopting Cloud Computing and identified the possible risks and opportunities:

Reliability

An outage is the absence of the Cloud service. Kim et al. (2009) stated that an outage is unavoidable and users should take it into account before adopting Cloud Solutions. It might happen for a short or a long time, a few or many times. Even large companies such as Google and Amazon experienced many similar cases in the past and they will have many more in the future. In short, 100 % availability of the service is impossible.

Consequently, Kim et al. (2009) recommends that critical applications should not be taken into the cloud. Actually, most of the applications hosted in the cloud are currently non-critical such as back up and software testing. Moreover, users who are using Cloud Computing solutions should make sure to have backup of their data in other places. Nowadays, Cloud providers are trying to avoid outage and promise a high level of availability in the Service-Level Agreement (SLA) and try to compensate their users in the case of an outage of the service. This factor represents a risk and it is one of the effective factors in Cloud Computing adoption. It will determine the kind of applications that can be used in the cloud along with its adoption strategy. (Kim et al., 2009)

Security

Users of Cloud Computing give the cloud provider full control over their data and they should trust that this third party will take care of their business, secure the data, and do backups for them. This issue can be partly solved by Service-Level Agreements (SLA) where the conditions of security issues in the contract will be clarified (Benlian and Hess,2011, p. 1).

Benlian and Hess (2011) found that the security issue is one of the biggest doubts when users think about adopting Cloud Computing as the users do not have their own data in their companies anymore. "Our findings suggest that in respect to both SaaS adopters and non-adopters, security threats are the dominant factor influencing IT executives' overall risk perceptions" (Benlian and Hess, 2011, p. 1).

Marston et al. (2011) asserted the same idea stating that "almost 75 percent of IT executives and CIOs report that security is their primary concern" (Marston, Li, Bandyopadhyay, Zhang and Ghalasi , 2011, p. 7). However, Kim et al. (2009) argue that

security issues is a concern in all computer systems not only the cloud hosted ones and achieving a 100% secure computer system is almost impossible as expert hackers will have new ways for breaking the security strategy in any system.

Kim et al. (2009) argue that we can enhance the security of the computer system by hosting it in the cloud as we will have some expert people who will care about securing the server and the computer system which might not be possible for small and medium companies. Moreover, the same technologies which are used for securing the on-premise computer system can be also used in the cloud. Finally, the cloud providers today are employing the latest technologies and the highest standards in securing their servers and hosted applications. "We believe, however, that the clouds are not less secure than on premises computing systems" (Kim et al., 2009, p. 2). Marston et al. (2011) also agrees that this issue is being enhanced now and it also has some advantages by giving the company more control options over their data.

In conclusion, security issues can be seen as an opportunity and a risk at the same time, but it is mainly a doubt as it is seen by cloud adopters and non-adopters. It plays an important role in determining the kind of applications which are taken into the cloud and the industry type which can adopt cloud solutions. For instance banks, hospitals, and governments are used to avoid adopting cloud solutions because of the security concerns (Benlian and Hess, 2011; Won Kim, Soo Dong Kim, Eunseok Lee and Sungyoung Lee , 2009 ; Subashini and Kavitha , 2011).

Performance

The main source of performance problems come from the connection quality between the user and the Cloud Computing server, mainly when more users are connecting at the same time and large amounts of data are transferred between the end user and the cloud server. This results in a slowdown in the cloud service. (Kim at al., 2009 ; Benlian and Hess, 2011).

The performance issue is an important factor which companies have to think about when adopting Cloud Computing. Companies should measure their possible current and future bandwidth and processing requirements before they decide to adopt Cloud Solutions. Performance is seen as one of the main risks, and an important opportunity at the same time, (Marstonet al., 2011).

Scalability

Scalability is an important factor that should be taken into account in terms of performance. As the requirements of the Cloud Computing adopters increase, the cloud provider should be able to scale up their resources and infrastructure to satisfy the

adopter's new requirements of storage, processing, and connection bandwidth. (Kim at al., 2009 ; Benlian and Hess, 2011).

On the other hand, scalability in Cloud Computing is one of the main strength points and constitutes an important opportunity for companies. As these companies' requirements change, their infrastructure will be scaled up or down dynamically providing a high level of strategic flexibility (Benlian and Hess, 2011; Marston et al., 2011).

Compliance and Physical Location

Since Cloud Computing is a fairly young technology, no rules and governmental regulations really exist to set the boundaries and laws regarding the storage of data by enterprises on third-party computing facilities that are shared with others. Moreover, some old regulations already exist concerning the enterprise data privacy, access, and location without taking Cloud Computing into account, and these regulations might be violated by Cloud Solutions (Kim et al., 2009).

For instance, while many countries have regulations concerning the physical location of enterprise data, the cloud providers cannot guarantee the exact physical location of the data, and even some of them have policies to hide such kind of information from the end user. However, some companies are now trying to solve this issue and comply with the local regulations. For example, Amazon Web Services (AWS) has started a new service called the Amazon Virtual Private Cloud which allows users to connect their own infrastructure to AWS computing resources (Marston et al., 2011).

Compliance with regulation is a real risk when adopting Cloud Solutions and it is being handled by cloud providers now. "Perhaps the biggest factor that will impede the adoption of the cloud computing paradigm is regulation at the local, national, and international level" (Marston et al., 2011, p. 7).

Integration with other Services

Companies need to adopt different types of applications from different cloud providers and these applications might need to interact with each other. At the same time, some companies might adopt a hybrid strategy of Cloud Solutions as public clouds have different characteristics from that of private clouds.

Consequently, the integration between the data from these different applications needs to be achieved and this issue poses many technical and business challenges for cloud providers and adopters. (Marston et al., 2011 ; Kim et al., 2009).

On the other hand, Mashups can be a real opportunity in cloud solutions. Mashups are a web service providing data or functionality relying on different external sources.

Nowadays, we can see new types of Mashups relying on Cloud Services; Integrating two or more Cloud Services into one new service. Amazon's 'GrepTheWeb' is one example of Cloud Mashups (Marston et al., 2011).

Environmental Issues

Environmental issues constitute a real concern for companies in this era as more regulations are issued to minimize the carbon footprint organizations leave behind. A previous 'Forrester' survey concluded that most workers in IT departments believe that the efficient use of energy and recycling IT resources are important issues that should be handled properly and these factors constitute the main element of green IT. By migrating the IT functionality into the cloud, companies not only reduce their IT infrastructure but also use the energy in an intelligent way (Marston et al., 2011). However, other researchers suggest that cloud servers are consuming a huge amount of energy and not all cloud providers are following the best standards in energy efficient consumption, consequently, moving to the cloud does not reduce the global CO2 emissions necessarily (Kim et al., 2009).

In conclusion, moving to the cloud can reduce the IT infrastructure by sharing with others and cloud providers can follow best standards in energy efficient consumption which might not be possible for the small companies as a result of the economy scale, but adopters of Cloud Computing should make sure that these providers are applying these environmental standards before adopting their solutions.

Cost

Cost is a very important factor and opportunity in Cloud Computing. "Cost advantages are the strongest driver affecting IT executives' perceptions of SaaS opportunities" (Benlian and Hess, 2011, p. 1)

Marston et al. (2011) stated that companies need to spend a big part of their balance on the IT infrastructure, while less than 10 % of their servers can be really utilized, resulting in a big waste of money. In addition, these servers need to be replaced almost every three years and need to be maintained and administrated, increasing the total cost of IT operations radically (Marston et al., 2011).

Cloud Computing can reduce these costs remarkably."Economies of scale for datacenters cost savings can lead to a five to seven-time reduction in the total cost of computing" (Marston et al., 2011, p. 6).

Furthermore, Cloud Computing reduces the cost of entry for small companies and developing countries. By adopting Cloud Solutions, small companies can use expensive business analytic software, which require high level of IT infrastructure to enhance their

business at relatively low cost, while this kind of applications was available only for large companies or enterprises before (Marston et al., 2011).

However, other researchers point out some possible economic risks. Benlian et al. (2011) argued that there is a hidden additional cost in Cloud Solutions more than the anticipated one. For instance, Cloud Solutions adopters might need to customize these common solutions to fit their specific requirements and consequently they will be responsible for maintaining the customized code and have to pay additional cost more than what they expected at first.

Kim et al. (2009) asserted the same idea and mentioned that adopters of the cloud solutions take the "only pay for what you use" into account and they forget about the other potential hidden costs. Kim et al. (2009) gave an example that adopters cannot totally rely on the providers to administer their solutions and maintain them, they still need to do monitoring of performance and availability of resources in the cloud which require additional time and cost, moreover, they will need to pay for the additional bandwidth they might use in the future. Finally, adopters should choose the suitable pricing strategy for the adopted solutions which fit their needs. For instance they might choose to pay per use, monthly, or yearly.

In conclusion, cost is seen as an opportunity as it reduces cost for Cloud Solution adopters but it still has some potential reasonable economic risks.

Innovation

Cloud Computing is considered as an innovative disruptive technology and it results in new types of applications with richer functionality than their in-house counterpart. The service helps IT departments' employees to innovate new core business applications instead of doing the daily backup and maintenance routine tasks. "Cloud computing can lower IT barriers to innovation" (Marston et al., 2011).

IT Department's Stand and Changes

While many people might see Cloud Computing as an innovative technology simplifying IT operations, some IT specialists might see it as a real challenging threat. They believe that it will be a threat to their job security by outsourcing their daily IT tasks to a third party company. Even some companies might see Cloud Computing as a big change in handling IT operations which is somewhat different from the method they used to follow for a long time in handling these operations (Marston et al., 2011).

Benlian et al. (2011) confirmed the importance of these psychosocial risks, stating that outsourcing IT operations by adopting Cloud Computing can result in the loss of jobs and seen as a failure of the IT departments in conducting their jobs which would harmfully

impact the reputation of the IT managers. Consequently, IT managers might respond negatively to the Cloud Computing technology. These psychosocial issues also affect the adoption decision of Cloud Computing.

Cloud Model

The kind of applications that can or cannot be implemented in the public cloud is an important issue that companies should think about when they decide to adopt Cloud Solutions. Companies might have some critical applications which require a high level of availability with sensitive data such as banks and hospitals. These types of applications might be better to be hosted in a private cloud. At the same time, these banks and hospitals have other types of applications which can be taken to the cloud to benefit from its advantages (Marston et al., 2011).

The public cloud applications have different functionality characteristics from its private counterpart. They are generally suitable for the common purposes' applications such as CRM systems, while the private cloud would grant more control to its owner compared to the public cloud, and it will be suitable for customized applications. At the same time, the private cloud can provide some of the advantages of the public one.

"It is also clear that not all applications are currently ripe for moving to the cloud. General-purpose applications (like office, email, collaboration technologies) are prime candidates" (Marston et al., 2011, p. 9).

In this case we can have a hybrid cloud of private and public model-types depending on the sort of applications. This strategy allows us to use the advantages of the two types and has many other potential capabilities for example when the capacity of the private cloud is exceeded we might start using the public as well by moving the workload from the private to the public cloud.

However, the hybrid cloud can bring some new technical challenges as both clouds will need to have the same hypervisor, file system, and chipsets for their servers (Kim et al., 2009 ; Marston et al., 2011).

Time to Market

Another factor which should be taken into consideration prior to the adoption of Cloud Computing is the time to market. Abhinav (2011) states that time to market with Cloud Computing can be reduced from months to weeks or even days for the companies who adopt the solution. The Cloud solution helps by eliminating procurement delays for software and hardware, the upfront capital and time investment for purchasing hardware for proof of concept work, and accelerate computer power for when applications require to run at peak loads.

According to (Jinesh, 2010) time to market can also be considered a success criteria where an organization can launch new products much faster depending on its goals and culture.

Ease of Use

According to a survey conducted by CIO Magazine, one of the top-rated factors when evaluating Cloud Computing technology was ease of use where "senior and mid-level IT managers (both with a 63% incidence) are more likely to feel ease of use is very important when compared to other IT professionals (46%)"[2].

Moreover, ease of use can be considered an important factor in Cloud solutions as user experience in human-computer interaction is a significant criterion when evaluating whether an application is successful or not. The adoption of Cloud Computing will result in improving user experience unlike traditional systems like grid computing. Therefore, ease of use can be easily achieved because of Cloud Computing and valuable resources can be easily accessed by its adopters (Chunye Gong , 2010, p. 278).

2.7. Cloud Computing in Small Organizations

Small organizations usually lack the human and financial resources to invest in ICT due to their size and because of this they struggle to gain competitiveness and productivity in the market. Research indicates that organizations in the United Kingdom are quickly shifting to the Internet to tackle potential business opportunities yet they hesitate to accept e-business for communications and transactions (Wei, 2009).

For startup businesses, Cloud Computing may be an attractive opportunity. According to the United Kingdom's National Computing Center (NCC), small organizations can reduce the cost of ownership of technology hosted solutions. This is reinforced in a survey conducted by the Cloud provider "Gooroo" which revealed that small organizations in the UK will accept Cloud Computing in order to decrease costs during the economic downturn (Nabil, 2009).

Like all technologies, Cloud Computing has its advantages and disadvantages. Taking the Cloud provider "Amazon" as an example, they offer their customers Elastic Compute Cloud web services which has many advantages ranging from elasticity and flexibility to decreased costs and reliability. Another service Amazon offers is S3, where business information is stored in the cloud, saving organizations a lot of expenses for storage and

[2] Available at: http://mkting.cio.com/pdf/CIOCloudSummary.pdf

backup. Moreover, the web service can also decrease the expenses of new servers, cooling, and server administration and management. (Adbulaziz, 2012).

Moreover, Amazon's Elastic Compute Cloud services can save companies a lot of money on hardware expenses along with the number of employees they should hire and this is ultimately beneficial for new (small) businesses which are trying to get started. Cloud Computing can help reduce required personnel for a certain task and due to the reduction of acquired hardware, the number of operations once required to maintain and manage them would be significantly lowered (Adbulaziz, 2012).

During these tough economic times and as businesses are beginning to downsize their staff, Cloud Computing can serve not only as a tool to decrease cost but also to increase profit, remain current on technological advances, and strengthen their business relations. Cloud Computing services can be used by all business types yet they can be more ideal for smaller and especially startup businesses and their adoption will help organizations gain a competitive advantage over their rivals, which can in turn increase business value (Wei, 2009 ; Adbulaziz, 2012).

2.8. Conclusion

The thirteen factors mentioned throughout this chapter may play a role in post and pre-implementation of the cloud solution. Hence, it can be deduced that all can be interest to the companies willing to adopt Cloud Computing.

According to the number of emergences of the factors in our references, mainly the references which are related to Cloud Computing Adoption, we ranked these factors to indicate their level of significance based on our literature review. To do so we were looking for each factor in each article and make sure that the factor is mentioned in the right context (see table 2.1.). Each Factor will be given either type I for related factors, II for important ones, or III for critical ones (Table 4.1).

Some factors such as reliability were searched for using some of its synonym such as availability which indicates the same idea behind the reliability and the rank was increased accordingly.

Through the empirical part the degree of importance of these factors will be questioned and measured and new factors will be searched for. Both perceived and new factors will be discussed in the fourth chapter of this thesis.

Table 2.1. Overview of the factors and their level of significance based on the literature.

Factor	Significance
Reliability	Type III
Security	Type III
Performance	Type III
Scalability	Type III
Compliance and Physical Location	Type II
Integration with other Services	Type I
Environmental Issues	Type I
Cost	Type III
Innovation	Type II
IT Department's Stand and Changes	Type I
Cloud Model	Type II
Time To market	Type I
Ease of Use	Type I
Features	Not mentioned

3. Research Methods

This chapter will describe the research method which will be followed in our thesis to reach the final claims. We will start by motivating the data collection method, the analysis method of the collected data, and the quality procedures along with the ethical issues which were followed in the conduction of this study.

3.1. Method Choice

It is imperative to identify the research method before conducting the study. Hence, the research question will play an integral role in defining the type of the research. The question revolves around "what" are the factors that small organization should take into account before adopting Cloud Computing, and this poses for a descriptive nature. (Yin, 2009).

The main methodology of data collection will be interviews, which shall be of a semi-structured type. Cloud Computing providers have been chosen due to the fact that they have experience in the area and they would bring forth the factors being explored in the research. Every interview can be considered a case where the data collected shall be used to present all the factors that will be found, studied, and rated in terms of importance. Therefore Cloud Computing providers have been contacted in Abu Dhabi and two others in Sweden, hence, three providers are investigated in our research.

3.2. Data Collection

Qualitative interviews would benefit all qualitative researchers due to the fact that it provides a considerable amount of data collection both in quantity and quality (Kvale, 1996), and because interviews will play an essential role in data collection, the pragmatic approach presented by Creswel (2007) was adopted since the individuals we interviewed have a direct relation to the technology being studied, in this case being Cloud Computing.

Managers and businesses owners were targeted for data collection as they are experienced individuals in their fields and have rich knowledge in Cloud Computing deployment. Semi-structured interviews were conducted with them in order to keep the discussion as open and flexible as possible. Kvale and Brinkmann (2009) discuss how this type of interview will give the informant the time to answer both the set questions along with any follow-up, probing, specifying, direct, structuring, and interpreting questions.

Therefore, the interviews can be defined as Research Interviews, where knowledge will be produced primarily by the interviewee. Taking into account the research conducted by Kvale (1996), scripting the interview through dynamic or thematic questions and stressing the roles of the "why", "what", and "how" were adopted. The interview questions were structured to be concise and straightforward, and categorized into introductory, probing, specifying, indirect, direct, structuring, interpreting, and follow-up questions. Furthermore, scientific and journal articles which are publicly available were incorporated into the research to provide an extensive description of the case.

Yin (2003) advises the use of multiple sources to achieve strong evidence through triangulation. Alongside supporting documentations and literature review we conducted several interviews to gather the necessary knowledge. The summarization of the interviews will shed light onto the important and comprehensive data collected which will directly tackle the subject being researched in this paper.

3.3. Design of Interview Guide

Interview questions should aim to provide knowledge production and interview interaction (Kvale and Brinkmann, 2009) hence, an interview guide was designed in order to collect the relevant or important data from the interviews without straying from topic or accumulating irrelevant information.

The structure of our interview questions are designed so as to lead the interviewee to the information we are seeking. Therefore, the first set of questions aim to define Cloud Computing from the perspective of each informant, then allow them to discuss the factors and opportunities which affect the decision-making process of organizations - particularly small organizations - for the adoption of the system and how they are affecting both the Information Systems departments and the businesses. The introductory questions will allow the informants to define Cloud Computing according to their own general knowledge which will then enable us to find if there is a trend in its adoption.

Due to the fact that the informants are managers or businesses owners from different organizations and regions of the world, it may result in the finding of new factors or the gaining of new knowledge on universal factors, then bring forth the topic of whether

Cloud Computing is affecting the ways businesses operate, and how much of an impact they make on Information Systems in our day and age. Therefore, the structure of the interview guide is as follows:

- Cloud Computing definition and trend
- The factors which affect the decision-making process for Cloud Computing adoption
  - Degree of importance
  - Relevance to small organizations
- The strategic business value of Cloud Computing
  - Motives for adoption
  - Importance of adoption

The factors in the interview guide were derived by the Research Question and Purpose which were presented in Chapter One. By applying this interview guide we can expect that the interviews will be organized and concise. The questions can be found in the Appendix (A.1), where each and every one was thoroughly discussed and approved in order to maximize the efficiency of empirical data collection.

3.4. Interviewing

The main source of empirical data in this study will be from interviews, hence a concise description of the interviewing method and design is presented in the following section.

According to Kvale and Brinkmann (2009, p. 191), one should initially tackle the questions of the 'what' and 'why' of the study before posing the question of the 'how'. The following questions are the focus of this research, and they will be emulated in the interview structure:

- What is the informant's general perception of Cloud Computing?
- Are cloud solutions a viable answer to small organizations' processing needs?
- What are the factors that should be taken into consideration prior to the adoption?
- How important is each factor according to a small organization?

The empirical findings derived from the interviews will help us discover or reveal new factors, gaps, or contradictions in the published literature of whether Cloud Computing can be both easily adopted by small organizations and prove to be a valuable investment for the future.

3.4.1. Interview Outline

In order to find the suitable candidates for our study, we contacted a plethora of companies which core business is in the Cloud Computing industry. Furthermore, we attended the EEE Job Fair hosted in the Lund University School of Management and Economics in order to find the companies who are providers of the system. We were given the personal contact cards of some employees who patched us to their managers after e-mailing them for a request to interview them.

We had a contact in Abu Dhabi prior to the conduction of the study who has extensive experience in the area of Cloud Computing. We were granted interviews by two companies located in Sweden and Denmark which were CityNetwork and Accenture, along with another company located in the Gulf area of the Middle East called Cloud Concept. All of these organizations work with Cloud Computing and both use it as a means to operate their businesses along with providing it to their customers either through their on-premise servers or from other providers such as Google. A brief overview of the conducted interviews is presented in the table below:

Table 3.1. Overview of Interviews

Company	Position	Duration	Date	Type
CityNetwork (Sweden)	Business Owner	45 Minutes	March 29th, 2012	Skype Video Call
Cloud Concept (UAE)	Project Manager	50 Minutes	April 4th, 2012	Skype Video Call
Accenture (Denmark)	Consultant	40 Minutes	April 19th, 2012	Skype Video Call

The interview commenced according to the time they dedicated in order to meet with us. All interviews were conducted by Voice over IP (VoIP) or Skype, but a video stream was present in order for the informant to see us and vice versa. No questions were sent prior to the interviews, but our Research Proposal along with a summarized overview of our thesis was sent in order for them to understand the topic and theme of the research. If the interviewees had any question regarding the research or the interview itself they were more than welcome to contact us. All interviews were in the English language but we allowed the informants (particularly the Project Manager of Cloud Concept) to speak freely and express themselves in Arabic if they considered it necessary in order to accumulate clear and concise data from them, and according to Kvale and Brinkmann (2009), qualitative interview questions should be straightforward and concise so that they can be both understood and accessible by the informants.

The Interview Guide was in front of us at all times during the interview, but we did not strictly ask the questions in their order. However, we allowed the informants to speak

freely and adapt to every topic at hand, asking follow-up questions when the time was appropriate while driving the interview in the right direction in order to have the time to ask all of the pre-approved questions.

3.4.2. Interview Questions

The different types of interview questions which are presented by Kvale (1996) will be used in the interviews and will be further elaborated in this section of the chapter. As mentioned, the interviews will be semi-structured to allow more open ended discussions and to give some freedom to the interviewees in order to express any potential related issues, at the same time, after doing the literature review and having the suitable knowledge about the perceived factors, Introductory, Follow-Up, Specifying, Direct, Structuring, and Interpreting questions shall be adopted.

- Introductory Questions

"What is the core business of your company? What is your role in the organization?"
These introductory questions will allow us to establish the position of the informant in his organization which would bring validity to the data they would later on provide. The above questions may seem irrelevant, where they might not add any value to the study itself, however according to Kvale and Brinkmann (2009), these opening questions can present us with unforeseen results and return rich descriptions.

- Follow-up Questions

"So you're saying that the problems that arise are more due to human error rather than technicalities?"

Answers which might seem vague or require further explanation are addressed with follow-up questions. It is imperative to perfectly understand and note vital elements in the informant's answers and bring forth these types of questions which can open new means of discussion and present more accurate data. These questions will not be used very often as to not keep interrupting the interviewees and allow them to make their points comfortably.

- Specifying Questions

"Which one of these factors are the most critical for the customers?"

Specifying questions, according to Kvale and Brinkmann (2009), are implemented when the aim of the interviewer is to find more accurate or precise information from the informants. These types of questions can be dependent on the follow-up questions, but will be used more frequently throughout the interviews to ensure efficient data collection.

- Direct Questions

"Is it safe to adopt Cloud Computing? What are the guarantees in terms of data privacy?"

According to Kvale and Brinkmann (2009), these types of questions indicate which parts of the study are essential to the interviewer, and it is thus compulsory to develop direct questions in order to focus on them.

- Structuring Questions

"What are the main doubts (if there exists any) of your potential clients? How can you solve and help them avoid the potential risks of adopting cloud solutions?"

According to Kvale and Brinkmann (2009), since it is imperative to keep the interview moving sinuously, the informants can delve into other topics that may be irrelevant to our study or they may explain certain paradigms that can be unclear to the interviewer. Therefore, the adoption of structuring questions that are inter-related to develop an overarching conclusion will be implemented in the interview process.

- Interpreting Questions

"But you do not know where the physical locations of your servers are located, correct?"

Interpreting questions might be a matter of re-structuring certain questions, or serve as a direct interpretation of the interviewee's answers. This would open up new ways of discussion or allow further elaboration from the informant, which can prove valuable when more focused answers are presented.

3.5. Data Analysis

As mentioned previously in this Chapter, the empirical findings gathered from the interviews will help us discover or reveal new factors, gaps, or contradictions in the published literature of whether Cloud Computing can be both easily adopted by small organizations and prove to be a valuable investment for the future.

3.5.1. Transcription of Interviews

Kvale and Brinkmann (2009, p.195) introduce the analysis of the recording by transcription. The interviews were all conducted through video calls on Skype. Using the Sound Recorder found on the Windows Operating System, we were able to record the

interviews. Furthermore, a small voice recorder was placed next to the speakers in order to have two versions of the audio file. At the end of the interview, both audio files were duplicated as a means for recovery and backup in the event of an accident. Afterwards, the recordings were used to transcribe the interviews.

According to Kvale and Brinkmann (2009), the process of transcribing interviews means to transform them from audio to text. This can lead to the abstraction of body language and tone, but would prove imperative if the data will be studied and analyzed. The process of transcribing the interviews was conducted by both researchers as it would enable us to learn from each of them and reflect upon the findings separately before conjuring to discuss them. Each transcription was written word for word with a few modifications added to make the interview more fluent on paper. Kvale and Brinkmann (2009) advise researchers to avoid boring and tedious transcriptions, and stress the researcher to conduct a fluent and concise transformation. Moreover, transcribing the interviews will help in the analysis and study of the research topic significantly.

The factors encompassing the ethical or reliability factors which must not be overlooked will be discussed in the following sub-chapters.

3.5.2. Coding the Transcription

The interview guide follows a set of questions which set to discover the factors and their importance in terms of adopting Cloud Computing by small organizations. Hence, coding played an integral role in the development of the interview guide. The important or key statements in the transcription were marked in light green, then categorized in Table 7.1 in the Appendix.

The goal here is not to find whether the interviewees believe Cloud Computing can be considered as a good solution for small organizations, rather, it is to find the factors which may affect the decision-making process of the business owners prior to the adoption through the exploration and categorization of said factors such that we can derive the most important aspects. The interview will provide insights about the relationships, importance, and magnitude of the factors so that a model can be derived from the eventual findings.

3.6. Scientific Quality and Ethics

The accuracy, honesty, and importance of data collection in the preliminary stages of the study will make the difference between success and failure of the emerged model. It is

therefore imperative to gain the trust of the informants in order to obtain concise and truthful information.

The issue of confidentiality and informed consent of the informants is a subject discussed by Kvale and Brinkmann (2009). The interviewees were asked if the interview can be recorded prior to its conduction and they were informed that if they wished us to omit any information they did not wish us to include in the paper we would certainly comply. The subjects felt that it is not necessary to hide their identities or that of their organizations, and at the end of the interviews felt that they had not uncovered any sensitive information, and thus gave us permission to use all that was recorded accordingly.

Using the audio recorders along with computers to transcribe the interviews would ensure the quality of the transcriptions and make the process of searching for information, particularly keywords easier to find (Seale, 1999). Seale (1999) advises to give transparency to the data to ensure the external and internal validly of the paper. Hammersley and Gomm (1997) discuss how researchers should be aware of bias in their study, where irregularity from a source or invalid conclusions are based on either conscious or unconscious analysis of the data.

It is thus imperative to consider the interrelations and conclusions found by other scholars or authors of the area as to avoid bias and steer it from negatively affecting the eventual conclusions. However, Hammersley and Gomm (1997) state that the definition of bias may vary and can sometimes be vague. However, seeing how the study itself is approached from a technical perspective and based on universal factors in which to study Cloud Computing, the subject of bias when it comes to the importance of the factors themselves can differ from one informant to the other or prove to be equivalent not for erroneous reasons.

Here, the question of reliability and validity occur, yet there does not exist a clear definition of how to measure the quality of a qualitative research (Seale, 1999). High reliability and validly was our aim throughout our scientific research and that was set forth by a structured approach both towards the interviews and the scientific sources used throughout the study. However, there is no clear definition of how to measure quality in qualitative research which does not imply that quality and quality insurance does not matter (Seale, 1999). Yet to ensure quality in the study, the researchers have decided to send every interview transcription and interview analysis to each informant to check the document and give us permission to include it in the final thesis and assert the validity of the work. Hence, our findings and interpretations are supported by rich and reliable sources along with the interview transcriptions to ensure the quality of our eventual empirical findings can be trusted by the readers.

4. Empirical Findings

With the use of the interview guide (Appendix A.1), the empirical findings are structured accordingly. Each interview is commenced with the informant's general knowledge about Cloud Computing and the factors that should be taken into consideration when adopting the technology in the small companies. The presentation of the empirical findings encompass the suitability of the new trend for small companies and the related factors; Reliability, Security, Performance, Scalability, Compliance and Physical Location, Integration with other Services, Environmental Issues, Cost, Innovation, IT Department's Stand and Changes, Cloud Model, Time to Market, Ease of Use, and Feature involved in the adoption. After interviewing the organizations, each factor will be given a rating of Type I, Type II, or Type III (Table 4.1). The way factors will be rated will be in accordance to how the informants responded to them along with what was derived and collected from empirical sources. Moreover, these rates were checked and accepted by the respondents after we sent our interviews' findings to them. This will allow us to categorize each factor according to their importance for small companies and present them accordingly at the end of the study.

Table 4.1. Factor level of significance

Significance	Interpretation
Type I	Not very important but should be noted
Type II	Important
Type III	Critical

4.1. CityNetwork

The interview was done on March 29th, 2012 through a video call on Skype with Mr. Johan Christenson, the founder of CityNetwork. It is a business which supplies over fifteen-thousand customers across Sweden with services ranging from running and maintaining small websites to providing hundreds of servers for their customers.

Building their main data center in Karlskrona along with another one in the capital city of Stockholm, they were the first organization which ensures and guarantees a 100% uptime

for their server co-location customers. They are constantly growing with the promise of providing the best services in management solutions coupled with high quality and value.

Due to the fact that they operate all their data centers, no third party can affect their operation in any way. CityNetwork acquires Internet from three different Internet Service Providers, and thus ensures that no problems arise or affect the operation of their consumer's businesses. In case of any power failure, the organization is able to operate indefinitely on diesel fuel to ensure that all their services are up and running properly. Their main data center is located in a converted bank vault and boasts all the physical and technical security measures to ensure the privacy and security of data which belongs to their customers. CityNetwork runs mainly on wind power and takes advantage of the cold during winter season to cool their servers naturally, and because CityNetwork guarantees 100% uptime of all their services, customers are given refunds if any downtime does occur.

CityNetwork's core business is shared and cloud hosting. Due to the fact that they are a Swedish company, their main market is in Sweden, however, they have entered new markets only last year. The majority of their services are that of providing sheer computing power, where they provide software solutions to their customers. CityNetwork utilizes virtualization in order to bring their consumers the cloud service, but focus solely on hosting, rarely providing professional advice and guidance to their customers.

4.1.1. The Informants/Interviewees

Johan Christenson is one of the founders and owners of CityNetwork. His tasks include general administration issues of the company's operations and contracts. He takes part in managing the company's relations with its main customers and partners.

4.1.2. Definition of the Technology

Mr. Christenson, believes that one should not confuse virtualization with cloud computing, where the former is merely a form of technology which utilizes hardware in an easier fashion, and the latter where a consumer purchases computing power and run their data off a web browser.

4.1.3. Suitability for Small Organizations

Mr. Christenson mentioned that all small companies should rely on Cloud Computing heavily in their work. He believes that almost all organizations should start adopting hosted networks. For banks, allowing a third party to control some of their data might be risky, but if they do not look at the innovation, their competitors would then gain a competitive advantage because they would then be able to deploy services they would be unable to.

CityNetwork has a consumer base ranging from governments to large international companies in the industry. However, each consumer's dedication to cloud computing differs where one industry type is usually more dedicated to the technology than others. According to Mr. Christenson, this does not matter very much as long as the organizations have a certain investment in the technology. Mr. Christenson believes that almost all companies today are looking at cloud computing, and the question which remains is how much they will use it rather than if they will use it.

4.1.4. The Factors According to CityNetwork

The following subsection will present the factors which should be taken into consideration prior to the adoption of Cloud Computing according to CityNetwork.

Reliability: When it comes to the reliability aspect of cloud computing, Mr. Christenson elaborates on how problems are surely bound to arise eventually when an organization runs a few thousand servers. There exists many areas in which troubleshooting and error-prevention can be improved.

For CityNetwork, two factors play an imperative role in their business: The servers and Uptime. Servers must be built, installed, and managed correctly and this in turn affects the uptime of the system itself. CityNetwork has a high level of uptime and Mr. Christenson believes it has to do with redundancy in the sense of hardware. Companies should not be afraid to spend the required resources to enable as much computing power as possible for their business. He also stresses how it relies heavily on the human aspect of management which plays an important role in the efficiency of the system itself. According to CityNetwork, the reliability factor of Cloud Computing should be noted with a Type III level of significance.

Security: The security aspect of cloud computing is almost always asked by potential future customers of CityNetwork, taking into account that these customers do not have the control over their data any more after adopting Cloud solutions.

However, CityNetwork suggests that providing IT solutions through Cloud Computing has also some advantages in terms of security and privacy. Especially that hosting companies do not only focus on the technical security aspects of their data centers, but they also ensure an experienced, professional staff able to run their data center in a secure manner. Providing the same level of professional security protection is difficult in the small companies. Moreover, Mr. Christenson notes that most of the time, security problems arise due to the customers' human errors rather than the technical aspects of the system. Hence, the security factor according to CityNetwork is of Type III level of significance.

Scalability: The most important factor in a company according to Mr. Christenson is flexibility or elasticity of the system. With the feeling of unlimited resources and flexible use of these resources. Thus, the scalability factor according to CityNetwork should be noted with a Type III level of significance.

Compliance and Physical Location: When asked about whether companies outside Sweden accept that their data will be physically located outside their territory, Mr. Christenson estimated that a large population of their customers had no problem with it, for he believes that markets located in continents such as Europe or North America are usually safe and good places to host data centers, but stressed that the local aspect of hosting is an important factor when it comes to cloud hosting as the customers can get better user support in the local language. Therefore, according to Mr. Christenson the physical location of data centers according to their end-users is of Type I level of significance.

Cost: Another factor companies should note when deciding to adopt cloud computing is cost because companies today always look for ways to cut costs or save money. Mr. Christenson believes that it is a very important factor to consider before adopting Cloud Computing. Consequently, the cost factor should be noted with a Type III level of significance.

Innovation: Mr. Christenson also believes that organizations who consider innovation in their businesses start thinking in different ways, especially organizations who do so whole-heartedly because they would then be tackling the heart of their business which rests in computing power and thus evolve to better compete in the market. Hence, the innovation factor according to CityNetwork is of Type II level of significance.

Cloud Model: Regarding what type of cloud solution organizations should adopt, Mr. Christenson believes that all big companies today should have a hybrid model of the cloud, where some aspects of their systems should be on-premise to maximize security, while others can be on the cloud and still operate efficiently.

Connecting to a public cloud will save large corporations the money they would otherwise need to upgrade or build their own data centers, ensuring that they would save the money and resources needed to deploy their in-house solution. Hence, all large companies should have both public and private clouds as a means to better balance and utilize their services to their own consumers. It is not important to protect all the data in an organization, but organization should be able to better manage and organize their data in a way that does not lead to unnecessary spending only to have "ease of mind". Yet the aspect of security and privacy differs from one organization to the other, which relies on the policies in every individual company. Therefore, the Cloud Model according to CityNetwork should be noted with a Type II level of significance.

Ease of Use: Small organizations should consider ease of use in Cloud Computing with importance because they do not need thousands of servers to be able to run their businesses. The system should be easy to understand and operate. Accordingly, it will be denoted with Type I level of significance.

Other Remarks

Regarding the other factors an organization should take into consideration before adopting cloud computing, Mr. Christenson believes it is very individual. How suitable is the technology for your organization? How much can the organization gain from it? It's these questions that bring forth the answer to whether any technology should be adopted into an organization.

In summation, the following (Table 4.2) will present the factors and their levels of significance according to the data collected from CityNetwork.

Table 4.2. Overview of the factors according to CityNetwork

Factor	Significance
Reliability	Type III
Security	Type III
Scalability	Type III
Compliance and Physical Location	Type I
Cost	Type III
Innovation	Type II
Cloud Model	Type II
Ease of Use	Type I

4.2. Cloud Concept

This interview was done on April 4th, 2012 through a video call on Skype. According to their website, Cloud Concept focuses entirely on Cloud Computing. The organization offers solutions and services using leading cloud technologies. They are a salesforce.com partner in the Gulf, particularly in Abu Dhabi, and have done many successful implementations of the technology.

Their goal is to help enterprise customers improve services and cut expenditures, and help with the integration process with Amazon Web Services and Google Apps as well. The focus of Cloud Concept lies in quality of service, and customer success. Having an experienced and certified staff, the organization has delivered business applications which run thousands of transactions.

4.2.1. The Informants/Interviewees

The interview was with Mr. Geo Morjane who is a Project Manager, Consultant, and Google Apps Deployment Specialist at Cloud Concept. Mr. Morjane used to manage the project after the deal is done with the customers representing his company and making sure that the project will be delivered under time and cost conditions. He used to analyze the customer's business, customize and deploy a suitable IT solution accordingly.

4.2.2. Definition of the Technology

For Cloud Concept, Cloud Computing is the transformation of Information Technology into a service. Instead of owning an internal team or technical team, the hardware and software along with every IT resource needed to operate a data center which can prove to be a big burden on small to medium organizations, the former can lease software and hardware services which come in the form of Cloud Computing.

According to Mr. Morjane, the Internet has become the medium in our day and age. Enterprises and organizations are able to rely on the Internet to conduct their business. He proposes three models of modus operandi which can be on-premise, where an organization has everything they need regarding the software, hardware, and human resources needed to operate and maintain a data center. The second model is hosting where the software is installed locally on an organization's system but rely on a third party to provide the hardware. The third model is the hosted application, where both the hardware and software used are hosted from a third party infrastructure.

4.2.3. Suitability for Small Organizations

Mr. Morjane moves on to state that medium businesses can range from one to two-hundred-and-fifty employees or users, and it wouldn't be effective if they had a data center which is on-premise in order to operate a single application or e-mail system.

Mr. Morjane made it clear that only enterprises or large corporations have the resources to afford and manage an on-premise data center. He believes that it is a great investment for small companies and it makes a lot of savings for them in terms of cost. While large companies do not see cost as a real opportunity. Moreover, Mr. Morjane argued that security is not a concern for small companies, and it can even be an opportunity for them as they do not have the skills and resources to secure their data and solutions. In addition, the big companies have more restrictions in terms of the physical location while small ones do not really care. Mr. Morjane mentioned that they mainly target small and medium size companies because it is more proficient and less problematic for them.

4.2.4. The Factors According to Cloud Concept

The following subsection will present the factors which should be taken into consideration prior to the adoption of Cloud Computing according to Cloud Concept. Mr. Morjane believes that it is important to capture an organization's requirements and try to analyze it in order to map its business needs prior to the adoption of a certain technology.

Reliability is another factor Mr. Morjane brings to light. Downtime can cause problems to businesses but providers such as Google which have a guarantee of 99.9% uptime are willing to refund businesses which experience downtime. Reliability is thus an important factor which should be taken into consideration by organizations willing to adopt Cloud Solutions and should be noted with a Type II level of significance.

Security: Stressing the security and privacy of cloud computing, Cloud Concept always receives questions regarding how secure their servers are. Mr. Morjane states that no person is able to hack into enterprises such as Google or SalesForce, implying that the security of cloud computing is still under question even though it is of high standards but should be a factor that should definitely be inquired about by organizations who wish to adopt Cloud Computing. Therefore, the security factor according to Cloud Concept should be noted with a Type III level of significance.

Scalability: Mr. Morjane fears that once businesses start growing, there will be some complications in terms of how scalable the system is. Hence, scalability and flexibility of the cloud system itself is also an important factor to take into consideration. Hence, scalability should be noted with a Type III level of significance according to Cloud Concept.

Compliance and Physical Location: Another factor that was focused on was the regulations and policies in medium to large enterprises when it comes to the physical location of the data and Mr. Morjane stated that it is an individual aspect within each organization, as some companies would not mind having their data physically stored in a country not their own, while for others it might prove as a discouragement for them to adopt cloud computing. Mr. Morjane brings up the topic of Service Level Agreements to convince enterprises that their data is confidential and secure. As an example, he brings forth SalesForce.com and Google where their engineers are oblivious to the exact location of their data centers. Thus, for small companies the physical location of data centers according to Mr. Morjane is of Type II level of significance.

Cost: Businesses with their own data center tend to have their own IT resources and infrastructure along with an IT department to manage said data center, and such small companies do not have the sufficient resources to do so. Hence, it would be a great solution to adopt cloud computing cost-wise because then these small organizations would have no responsibility for the maintenance of their data and that would only cost the company a monthly subscription. As for medium businesses, it would also be cost-effective to adopt cloud computing.

As for the pricing strategies, there exists two models where you either pay on a monthly or annual subscription. Mr. Morjane believes that companies who adopt Customer Relationship Management Systems or Google Apps, for example are more likely to go with the annual subscription due to the fact that such applications are adopted for a long commitment, and it would not make sense to pay a monthly fee when the organization is going to use them for a long time. Therefore, according to Cloud Concept, the cost factor is of Type III level of significance.

IT Department's Stand and Changes: Mr. Morjane moved on to state how cloud computing is changing the job descriptions of the Information Systems staff. If an organization adopts could computing, their IT department will start losing their jobs by outsourcing these jobs to the Cloud providers. However, Mr. Morjane suggests that the time needed to run and maintain a data center, can be invested in other systems or projects that can evolve the organization and put it ahead of the competition.

As for who's decision it is to make the transformation to cloud computing, Mr. Morjane stated that nowadays it is rarely the IT department as CEO's, CFO's, or business owners are the people who give the permission to make the transition, where the IT department

are often constituting boundaries in this transition to Cloud Computing. Therefore, IT Department's Stand and Changes' challenge should be noted with a Type I level of significance.

Cloud Model: All cloud models, whether public, hybrid, or private are types of services. Regarding Infrastructure as a Service, Mr. Morjane believes this service is not yet mature, but it's on its way to becoming so. Hence, small to medium organizations who lack the resources required to build their own data centers adopt cloud computing in the form of Software as a Service only by purchasing the licenses required to run the software they require. As for Hybrid clouds, Mr. Morjane does not consider it as an option to the aforementioned businesses. Platform as a Service comes into place when organizations require tailored customer applications. Thus, the Cloud Model factor is an important factor to consider, but it is not critical according to Mr. Morjane's discussion, therefore it will be noted with a Type II level of significance.

Time to Market: Mr. Morjane made it clear that cloud adoption saves a lot of time and money when compared to on-premise systems. Small to medium organizations who wish to install CRM applications would take them six months do start using the program when they can easily adopt the cloud solution and start using the application within a month, without missing any of the program's features where it may be that of sales process automation, reporting functionalities, campaign management, lead management, and so forth. Therefore, time to market should be noted with a Type III level of significance according to Cloud Concept's interpretation of the factor.

Features (Updates): Moving on to more factors, Mr. Morjane presents how Feature is yet another important aspect in the adoption of cloud computing. Incremental update, which is the policy of providers such as Google, is imperative to the efficiency and maintenance of an organization's systems. If features are released in small bundles every month, for example, it would be preferable to the programs such as Microsoft's Exchange software which are being updated once every year. Moreover, these new updates are added to the software for free without any additional cost or effort. Therefore based on Mr. Morjane's discussion regarding features, it should be noted with a Type II level of significance. In summation, the following (Table 4.3) will present the factors and their levels of significance according to the data collected from "Cloud Concept".

Table 4.3. Overview of the factors according to Cloud Concept

Factor	Significance
Reliability	Type II
Security	Type III
Scalability	Type III
Compliance and Physical Location	Type II
Cost	Type III
IT Department's Stand and Changes	Type I
Cloud Model	Type II
Time to Market	Type III
Features	Type II

4.3. Accenture

Accenture is a global company. It has branches in 120 countries around the world. It works in the IT & Business consulting area and provides advice to companies in IT & Management. Accenture itself does not have many products but they provide advisory, implementation, training, configuration, integration, etc for companies, using different IT products from different providers. For example, they study the business requirements of companies to choose a suitable IT system in order to guarantee good results of the IT investment. (Accenture 2012)

According to their website: "Accenture is a global management consulting, technology services and outsourcing company, with more than 246,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world's most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. The company generated net revenues of US $25.5 billion for the fiscal year ended Aug. 31, 2011.[3]" (Accenture 2012).

4.3.1. The Informants/Interviewees

The interview was with Mr. Nicolas Rosengren, a Senior Manager in the Copenhagen office, responsible for Infrastructure/Cloud services in Denmark and DataCenter services in the Nordics. He works as an IT consultant and deal mainly with larger enterprises, with analysis and advice in these areas.

[3] http://www.accenture.com/us-en/company/overview/description/Pages/index.aspx

4.3.2. Definition of the Technology

Accenture believes in Cloud Computing and it started in adopting its solutions for Accenture itself and for its customers. Furthermore, Accenture considered Cloud Computing as No 1 of the technological trends in the next few years "Accenture's Tech Labs has listed Cloud Computing as number 1 of overall key technology trends for year 2011-2015" (Accenture 2012). According to Accenture Cloud Computing is "Internet-based computing, whereby shared resources, software, and information are provided to computers and devices, on demand". Mr. Rosengren compared it to the use of electricity or water, it is from somewhere out there, you don't care where or how it's coming from, and you get and pay after how much you use it.

4.3.3. Suitability for Small Organizations

Mr. Rosengren believes that Cloud Computing is even more suitable for small companies as they do not have the required capacity, scale, knowledge and resources to have their own solutions, e.g. IT infrastructure hosting.

He believes that bigger companies will take longer time to adopt these new technologies and trends. Moreover, the bigger companies will have more complex challenges when adopting Cloud Computing in terms of integration with other IT solutions, in addition they will not find as big opportunity in terms of cost savings as they already have made big internal investments (in e.g. IT infrastructure and applications). In short, Mr. Rosengren agrees that Cloud Computing is even more efficient for the small companies.

4.3.4. The Factors According to Accenture

After the conduction of the interview with Mr. Rosengren, he has provided us with a sample table of the reasons (from a CIO Research study as referenced below) which make their customers decide to adopt Cloud Computing solutions (Figure 4.1).

Is Cloud Computing On Your Organization's Tech Roadmap?

Yes, currently using or implementing	30%
No, not on our technology roadmap	29%
Yes, on the radar or actively researching	17%
Yes, plan to use within one year	10%
Yes, plan to use within one to three years	5%
Not sure	5%
Yes, plan to use within three to five years	2%

Primary Reasons You're Using or Plan to Use Cloud?

Scalability on demand, Flexibility to the business	50%
Reduced hardware infrastructure costs	38%
Reduced IT staffing/administration costs	35%
Access to skills/capabilities we have no interest in developing in-house	28%
Data Center capacity	5%

SOURCE: CIO Research: http://www.cio.com/article/455832/Cloud_Computing_Survey_IT_Leaders_See_Big_Promise_Have_Big_Security_Questions

Figure 4.1. Reasons for adopting Cloud Computing (CIO Research, 2012)

The following factors are suggested by Mr. Rosengren to be the important ones which companies care about when adopting Cloud Solutions.

Reliability: Accenture deals with many Cloud Computing providers, these providers often promise a high level of availability (far above 99.9%), but they compensates companies if they do not manage to provide this level. The fines are substantially lower than what you see and get at traditional outsourcing providers.

Mr. Rosengren suggested that the internet connection is more important to the perceived uptime and he claimed that Cloud Computing providers worry about their reputation and provide high up-time, but he accepted that uptime and availability of Cloud Computing solutions is a challenge for Cloud Computing adoption. Hence, Reliability will be ranked with a Type II level of significance.

Security: When it comes to challenges, Mr. Rosengren thinks that security and privacy issues are big doubts for companies when they have to move their critical data into the cloud. However, he argued that people already trust the Cloud Solutions as they already use email and social networks and it can even be safer to have your data in the Cloud because the Cloud providers have the skills to protect it. Generally, Mr. Rosengren believes that it is all about how you feel about it and the uncertainty might be more of a feeling than actual threats. Hence, Security issues will be also ranked with Type II level of significance.

Performance can be another issue when adopting Cloud Computing, as when you have your Cloud Computing solution in another part of the world you will experience more latency in the network when you send or receive data. Performance will take level II of significance.

Scalability: Flexibility to business and scalability on demand was the first reason for adopting cloud computing in the results of the conducted survey which were done by

Accenture and sent to us by Mr. Rosengren. He suggested that it should also be noted as a real opportunity for companies. Accordingly, it will be given a Type III level of significance (Figure 4.1).

Compliance and Physical Location: The physical location of the hosting can also be a (legal) issue when adopting Cloud Computing. Mr. Rosengren mentioned some cases where local companies and governments had to keep the hosted data inside EU when they were dealing with some sensitive data. However, Mr. Rosengren claimed that the physical location of the Cloud is not a big problem as they can have dedicated servers in certain places especially when you deal with the big players in the Cloud Computing market. Hence, the physical location will be ranked with level I of significance.

Integration with other Services: Mr. Rosengren noted another challenge for companies when adopting Cloud Computing, he mentioned that if a company has a simple system it is quite easy to be taken to the cloud without integration problems. However, if it is a complex application integrated to many internal systems, it will be challenging to move to the cloud in terms of integration between the different internal and external systems. He suggested that companies in this case might consult a third party to help them with the integration issues (as e.g. Accenture does). As a result, Integration will be given a level III of significance.

Cost: Mr. Rosengren thinks that cost is a main reason for adopting Cloud Computing solutions and sees that a lot of savings can be achieved through adopting Cloud solutions. Moreover, according to the survey which they conducted, their customers said that cost was a main reason for them to adopt Cloud Solutions (Figure 4.1). Accordingly, the cost factor will be noted with a Type III level of significance.

IT Department's Stand and Changes: Mr. Rosengren argued that CIOs and IT departments are concerned about Cloud Computing adoption as they feel that they are losing their power, control and jobs, which can make a real challenge to adopting Cloud Computing. However, he suggested that other types of skills are needed in the IT market as a result of this new trend such as integration skills with the cloud services. Mr. Rosengren added that CEOs and CFOs on the other hand can see the real benefits of adopting Cloud Computing and they will be the driving decision makers in this case.

Accordingly, IT Department's Stand and Changes should be noted with a level I of significance.

Cloud Model: As a best practice of adopting Cloud Computing, Mr. Rosengren suggested that some critical applications with sensitive data can stay in-house. While other types of applications such as E-mail can be taken into the cloud. In this hybrid strategy organizations can find the Cloud Computing benefits of cost and scalability and avoid its

risks for critical applications. "It's not 'all in', it's about what you should put in the cloud or not." (Rosengren 2012).

Mr. Rosengren believes that the Cloud model is an important aspect during the adoption and should be noted by companies and consequently it will be ranked with level I of significance.

Time to Market: According to Mr. Rosengren, Cloud Computing solutions are really fast, he exemplified if we need e.g. a server for a project: In e.g. an Amazon EC2 cloud, it will take about half an hour to have it up-and-running with IP-addresses, etc,it is quite simple and we can pay by credit card. On the other hand, if we decided to get the same thing from a traditional in-house or outsourced hosting provider, it might take weeks to complete it (if hardware needs to be procured first). Therefore, Time to market should be ranked with level III of significance.

In summary, the following Table 4.4 will introduce the factors and their levels of significance according to the data collected from "Accenture".

Table 4.4. Overview of the factors according to Accenture

Factor	Significance
Reliability	Type II
Security	Type II
Performance	Type II
Scalability	Type III
Compliance and Physical Location	Type I
Integration with other Services	Type III
Cost	Type III
IT Department's Stand and Changes	Type I
Cloud Model	Type I
Time to Market	Type III

5. Discussion

In this chapter we will discuss our findings concerning the effective factors small organizations should consider prior to the adoption of Cloud Computing. We shall base our discussion on the theoretical foundation which is presented in Chapter two, evaluate the factors according to our empirical findings from the conducted interviews, and finally rank them in relation to all of the previous concluded levels of significance derived from the interviews.

5.1. The Influential Factors

The following are the influential factors in adopting Cloud Computing in small organizations. (See Table 5.1).

5.1.1. Reliability

All systems should be reliable in order to work efficiently and be worth the investment. Cloud Computing has not reached a 100% uptime availability yet the same can be said about other kinds of ICT technologies where no perfect system is void of errors, crashes, or problems (Kim et al., 2009). Small organizations should expect downtime and it would be best to adopt Cloud Computing from the providers who are willing to compensate them in case of downtime or system failure. Yet the organizations who wish to adopt Cloud Computing must play their own part to ensure the reliability of the system (Interview 2 – Appendix A.3.2).

The informants of this study have stressed that hardware should be utilized efficiently in the sense of both investment and human management. Furthermore, a reliable and fast Internet connection should be available to decrease latency in the system and ensure fast processing between providers and adopters.

All of the interviewees asserted the importance of this factor and mentioned it as a driving point for adopting Cloud Computing. While the first two interviewees gave it a Level III of significance, Mr. Rosengren gave it only level II as he thinks that all providers make sure to guarantee a high level of availability to avoid compensations.

Based on the information gathered from empirical sources in Chapter 2 and the literature review we made, an approximate estimate of the level of significance of each factor will be given, accordingly, reliability for small companies will be denoted with a Type III level of significance.

5.1.2. Security

Due to the fact that small organizations lack the resources to run their own data centers they can find it easier to adopt Cloud Computing at the cost of handing over their data to the providers of Cloud Computing. The security and privacy of data is a factor which should be taken seriously as 75% of IT executives and CIOs believe that security is a primary concern for organizations willing to adopt the Cloud Solutions (Benlian and Hess, 2011). Yet providers who sell the solution as derived from the interviews conducted throughout this study stress that they ensure an experienced and professional staff to run their data centers with all security measures in mind. Organizations who offer Cloud Computing such as Google and Amazon are almost impossible to hack into and clouds are as secure as any on-premise computing system (Kim et al., 2009).

Small organizations can find the security factor both a risk - in terms of handing over their data to other organizations - and also an opportunity as they would then be free of the expenses required to manage and protect their own data centers (Interview 2 – Appendix A.3.2). Moreover, the efficient management of data in the sense of its migration into the Cloud plays an integral role in its safety (Interview 1 – Appendix A.3.1). Not all data should be taken into the cloud as well. Critical applications would be best left in-house while non-critical ones moved to the cloud for safe measure (interview 3 – Appendix A.3.3). Therefore, the way small organizations will manage and migrate their data will play an integral role which will affect the security factor of their data.

Security and reliability of data within all organizations regardless of size and industry type is a critical factor in all systems but it is less risky in small companies, hence and in the same method mentioned earlier it will be denoted with a Type III level of significance.

5.1.3. Performance

The physical location of the data can impact the performance of the system if it is located in another part of the world. Consequently, Cloud solutions might experience delay in the service in this case (Kim et al., 2009). However the interviewees confirmed that performance problems are caused mainly by the low internet connection the adopters have in their companies (Interview 1 – Appendix A.3.1). Accordingly, small organizations should ensure having a fast Internet connection which would decrease latency (Marston et al., 2011).

Hence, performance is another factor for organizations who wish to adopt Cloud solutions and use them efficiently. In conclusion, in the same followed method this factor will be denoted with a Type II level of significance.

5.1.4. Scalability

Small organizations whose goals are to expand, enter new markets, or grow should consider scalability an imperative factor prior to the adoption of Cloud Computing (Kim et al., 2009). Moreover, scalability offers a high level of strategic flexibility which will in turn enable small organizations to better compete with larger companies and businesses (Benlian and Hess, 2011). Accordingly, small organizations should choose providers who are capable of scaling and providing them with computing power which will accommodate their processing needs for the future (Interview 1 – Appendix A.3.1).

One of the main opportunities Cloud Computing can provide to the small companies is Scalability and it was mentioned by all of the interviewees. Hence, it is critical for small organizations who wish to thrive in the future through the adoption of Cloud Computing. In conclusion, this factor will be denoted with a Type III level of significance.

5.1.5. Compliance and Physical Location

Cloud Computing is a fairly new technology, hence not many laws or governmental regulations exist to specify the boundaries regarding the storage of data on third-party computing facilities and some old regulations concerning the enterprise's data privacy and its physical location needs to adapt with these new trends. Yet this factor is more catered to an organization's culture and leadership specifications. According to the data gathered from empirical sources and all the informants of this study, it's been concluded that such a factor is merely a matter of preference for organizations willing to adopt Cloud Computing even though Marston et al. (2011) believe that this factor will play an imperative role in the local, national, and international level regarding the impediment or progression of the cloud solution.

Such laws and regulations are still to be defined by governments, yet this does not deem this factor irrelevant to small organizations who wish to bring their businesses to the world of virtualization. If Service-Level Agreements (SLAs) are able to convince potential adopters of the safety of their data in relation to their physical location it would not impede the progression or adoption of Cloud Computing. Moreover, certain providers only host their data centers in safe locations and countries such as the United States and Europe (Interview 2 - Appendix A.3.2). Therefore, compliance and the physical location of data will be denoted with a Type II level of significance.

5.1.6. Integration with other Services

Organizations willing to adopt Cloud solutions should be able to move their applications and data with little or no compatibility and integration problems. This factor can bring forth many technical and business challenges for both providers and adopters (Marston et al., 2011). Yet this factor should be noted based upon an organization's own system complexity and small organizations in general are devoid of such systems.

If an organization has installed many complex applications composed of many internal systems it will be a real challenge in terms of integration, yet third party companies are able to help such organizations with such processes (Interview 3 - Appendix A.3.3). Integration with other services is yet another factor which is dependent on each organization's systems and culture, yet is an imperative factor to be taken into consideration prior to the adoption of the Cloud Solutions. Hence, it will be denoted with a Type I level of significance.

5.1.7. Environmental Issues

Environmental issues are a concern for enterprises in our day and age due to the regulations being issued by governments regarding the carbon footprint industries are causing. In this case, Cloud providers should decrease the electricity demand of Clouds and take steps in adopting renewable energy which in turn can be a way to decrease expenses (Garg and Rajkumar, n.d.).

Organizations who wish to adopt Green solutions should look into how providers operate, maintain, and run their data centers to check whether they are following sustainable methodologies or not but it does not rest entirely on adopters. Here it depends upon the ethics and culture of organizations regarding the environmental issues of Cloud Computing yet does not play an integral role regarding the adoption itself.

Cloud Computing itself is a step toward Green IT as the biggest Cloud providers can invest in generating their own requirements of energy from renewable resources. However, this factor was not mentioned or discussed by any of the interviewees. Hence, the environmental factor will be denoted with a Type I level of significance.

5.1.8. Cost

Based on our literature review, cost is a main reason for adopting Cloud Computing. It can provide IT solutions at a very low cost with minimal efforts as a result of economies of scale and server utilization in Cloud providers' data centers. The cost factor is important mainly for small companies which do not have sufficient resources for adopting expensive IT solutions (Marston et al., 2011).

All the three interviewees asserted that cost plays a major role in the adoption of Cloud Computing. Mr. Morjane was focusing mainly on the small companies which are their main target for marketing the IT Cloud solutions, considering that large companies will not care about cost when they decide about their IT infrastructure. Accordingly, the cost factor will be denoted with a Type III level of significance.

5.1.9. Innovation

From our readings we found that Cloud Computing is a new innovative technology resulting in new ways of thinking and new types of applications (Marston et al., 2011, p. 3).

Only one of the interviewees mentioned innovation as a possible factor for adopting Cloud solutions. Mr. Christenson from City Network believes that IT operations are becoming part of everything and doing IT in a different innovative ways leads to innovation in all business areas. Therefore, for adopting the technology in small companies, the innovation factor will be denoted with Type II level of significance.

5.1.10. IT Department's Stand and Changes

Based on the literature part of our thesis, Cloud Computing adoption will result in a change in conducting IT operations from the traditional way which might be questionable by IT departments. Moreover, IT people and CIOs will have doubts concerning adopting Cloud solutions as they will be afraid of losing their power and jobs. These possible changes in IT culture constitute a barrier to adopting this new trend. (Marston et al., 2011 ; Benlian et al, 2011).

Our interviewees confirmed that Cloud Computing will make a change in the IT department. Mr. Morjane and Mr. Rosengren confirmed that this adoption's decision is usually taken by CEOs who can see possible benefits in Cloud Computing and do not have these doubts which CIOs have about IT culture. However Mr. Morjane said that IT employees can have more time to innovate in other IT areas instead of wasting their time in conducting the daily IT operations such as backups. Mr. Rosengren mentioned that adopting Cloud Computing will create new needs of new skills such as integration with Cloud services.

For small companies, they do not have these big IT departments and resources (Benlian and Hess, 2011), consequently, the possible IT culture change will not be a risk for them. The IT Department's Stand and Changes factor will be finally ranked with Type I level of significance for small companies.

5.1.11. Cloud Model

Cloud Model is about deciding the type of the cloud where the application will be hosted. Hybrid Cloud strategy of public and private ones was recommended by many authors according to the application type and its critical tasks and data for the company. (Kim et al., 2009 ; Marston et al., 2011).

All of our interviewees mentioned the Cloud Model which will be adopted for hosting the IT solutions as one of the factors the companies think about during the adoption process. Mr. Christenson confirmed that the Cloud Model factor is important mainly for big companies which have different types of applications with different requirements that might fit either the public or the private cloud model. Mr. Morjane asserted that the hybrid model is not an option for small companies which used to adopt Cloud Computing in the SaaS Model mainly. Accordingly, the cloud model factor for small companies will be noted with Type II level of significance.

5.1.12. Time to Market

Cloud Computing provides immediate access for the companies to the IT resources without wasting a lot of time installing the new required infrastructure (Abhinav, 2011). Therefore, short time to market is suggested by many authors as a main opportunity and success factor in Cloud Computing. Two of our interviewees mentioned time to market as a success factor in Cloud Computing. As a proof of the efficiency of Cloud Computing in terms of time to market, Mr. Rosengren gave an example about installing a new server in Amazon which will take only thirty minutes to be done. Hence, the time to market factor is a big advantage and an important factor according to the interviewees and empirical findings. It is mainly important for small companies and will be noted with Type I level of significance.

5.1.13. Ease of Use

Usability is one of the success factors in software development. In Cloud Computing, simplicity and ease of use along with implementation are among the basic rules controlling development of Cloud Computing solutions. Users can start using IT solutions in no time and with minimum effort as these IT solutions are developed and tested to be operated by many users around the world (Gong et al., 2010).

Ease of Use was mentioned by one of our interviewees as an effective factor where users can use sheer computing power and professional IT solutions without the need for thousands of servers or deep IT knowledge to operate them. This factor is mainly important for small companies as they do not have deep IT knowledge and will be ranked accordingly with Type II level of significance.

5.1.14. Features

Cloud Computing solutions are provided with automatic updates and continued increments. In this case companies do not have to pay for the new features or do the updates by themselves (Interview 3 – Appendix A.3.3). Only one of the interviewees mentioned the features factor as an opportunity for companies. Therefore the features factor will be denoted with Type I level of significance.

5.2. Suitability for Small Organizations Factors

In the discussion we listed the influential factors of adopting Cloud Computing in small organizations and ranked these revealed factors according to the related ranks in the empirical part and the suitability for small companies. We found that some risky factors will pose fewer threats for small organizations such as security which might be even an opportunity for them as they do not have equivalent security skills in their organizations (Won Kim, Soo Dong Kim, Eunseok Lee and Sungyoung Lee , 2009). While other factors might play the major role such as cost which is the turning point in their decision as they usually have limited resources (Interview 2 – Appendix A.3.2).

In the following tables we present the final ranking of the factors according to their significance to the adoption of Cloud Computing in organizations. In (table 5.1.) the findings are presented from each interview. In (Table 5.2) the findings are based on the empirical interviews by taking the average of the given rates of level of significance for each factor and on the literature review we did.

Table 5.1 The Influential Factors and their Level of Significance from the interviews.

Factor	Level of Significance according to CityNetwork	Level of Significance according to Cloud Concept	Level of Significance according to Accenture
Reliability	Type III	Type II	Type II
Security	Type III	Type III	Type II
Performance	Not mentioned	Not mentioned	Type II
Scalability	Type III	Type III	Type III
Compliance and Physical Location	Type I	Type II	Type I
Integration with other Services	Not mentioned	Not mentioned	Type III
Environmental Issues	Not mentioned	Not mentioned	Not mentioned
Cost	Type III	Type III	Type III
Innovation	Type II	Not mentioned	Not mentioned
IT Department's Stand and Changes	Not mentioned	Type I	Type I
Cloud Model	Type II	Type II	Type I
Time to Market	Not mentioned	Type III	Type III
Ease of Use	Type I	Not mentioned	Not mentioned
Features	Not mentioned	Type II	Not mentioned

Table 5.2 The Final Influential Factors and their Level of Significance.

Factor	Level of Significance based on the empirical search	Level of Significance based on the literature review
Reliability	Type II	Type III
Security	Type III	Type III
Performance	Type I	Type III
Scalability	Type III	Type III
Compliance and Physical Location	Type I	Type II
Integration with other Services	Type I	Type I
Environmental Issues	Not mentioned	Type I
Cost	Type III	Type III
Innovation	Type I	Type II
IT Department's Stand and Changes	Type I	Type I
Cloud Model	Type II	Type II
Time to Market	Type I	Type I
Ease of Use	Type II	Type I
Features	Type I	Not mentioned

6. Conclusion

Cloud Computing has been proven to be beneficial for organizations as it provides the illusion of infinite computing power which is available on demand and in turn eliminates the need for companies who adopt the solution to plan far ahead for provisioning. The solution also eliminates an up-front commitment by the adopters which proves to be especially valuable for small companies as they can increase their hardware requirements when needed. Furthermore, Cloud Computing offers a range of pricing strategies such as the ability to pay for use on a short-term basis as required by the adopters (Armbrust et al., 2010).

During this study, we found that future research can further explore the factors behind the adoption of Cloud Computing particularly for small organizations. To make it focus on small Companies here we suggest a research question to be: "What are the factors which *small* organizations take into account when deciding about adopting Cloud Computing and how important are these factors?"

The purpose of this thesis was to find the factors and indicate their importance in relation to the adoption decision of Cloud Computing in organizations. A total of fourteen factors with varying levels of significance were identified, most prominent of which were Reliability, Security, Scalability, and Cost as all were found to be of Type III level of significance for small organizations. In other words, organizations should thoroughly and seriously consider these factors for their businesses prior to the adoption of Cloud Solutions.

Performance, Compliance and Physical Location, Innovation, Cloud Model and Ease of Use were all denoted with a Type II level of significance, yet the researchers stress that such factors should not be over-looked by organizations as they are all inter-related. The aforementioned factors can be found to be more significant depending on an organizations systems, applications, and IT model.

Integration with other Services, Environmental Issues, IT Department's Stand and Changes, Time to Market, and Features were all denoted with a Type I level of significance, yet this does not mean that these factors are insignificant in reality. All of the discovered factors in this study play a role in deciding whether Cloud Computing will best fit organizations considering the adoption. Therefore, it is advised that the readers of

this thesis take all factors into account yet in accordance to their specifications, goals, and regulations.

Due to the fact that small organizations are unable to commit financial and human resources for large ICT investments in order to gain competitiveness in today's markets, research from the European Union (EU) and the United States show that such organizations are not taking advantage of e-Business solutions (Wei, 2009). We believe that such findings can stem either from the lack of knowledge or obliviousness regarding Cloud Computing. This thesis has been conducted with the hope of providing organizations with the knowledge specifically regarding the factors to consider if they consider adopting the solution.

Appendix A

A.1. Interview Guide:

The following interview guide was used as a guide for directing the semi-structured interviews with the IT providers to make sure that we covered all the related areas.

The Interview Questions:

1. What is the core business of your company?
2. What is your role in the company?
3. What kind of products do you provide to your customers?
4. What does Cloud Computing mean to you? Can you define it as you understand it?
5. What are the reasons that make your customers adopt Cloud Solutions, the opportunities?
6. What are the main doubts (if there exists any) of your potential clients?
7. How can you solve and help them avoid the potential risks of adopting Cloud Solutions?
8. What are the main questions which you used to hear from your customers before and after the adoption?
9. What are the reasons that might make some of your customers de-adopt, cancel, or avoid renewing their adoption of the Cloud Solutions?
10. What are the main points which you make sure that you tell your customers when interviewing them regarding the Cloud Solution?
11. Which of these factors are the most critical for potential customers?
12. What kinds of applications are used to be taken into the cloud?
13. What are the main differences between the cloud dependent products and the traditional ones?
14. What is the main industry type of your customers?
15. What is the size of your customers' companies?
16. What are the possible pricing strategies? And which one of them is preferred by customers?
17. Is it safe to go to the Cloud? What are the guarantees in terms of data privacy?
18. When do you recommend a Private Cloud instead of the Public one?
19. How do you deal with different regulations which might restrict the adoption of Cloud solutions in different countries? In terms of the physical location of the servers?
20. How do you guarantee the integration with other services as we are in the era of IT services?
21. How do you guarantee the availability of the solutions 24/7?
22. Can I ask who's decision it is to adopt Cloud Computing? Do you think that the IT department constitutes a barrier in Cloud Computing adoption?
23. Let's presume I'm the manager of a small school and I want to use IT resources. What would you say to convince me to adopt the Cloud and use the services of your company

A.2. Overview Table of Transcripts:

The table below shows a summary of the conducted interviews and was used to show the key answers to the interview questions from the different cases.

Table A.1 Overview Table of the Transcripts

Question	CityNetwork	Cloud Concept	Accenture
Q1	Shared hosting and Cloud hosting	We do consulting on sales force custom applications. We're Google partners we're partners with Amazon as well our company business is basically based on the cloud computing industry, we provide custom solutions, but the main thing we provide is professional services.	Accenture is an IT and business management-consultant firm. We advise companies within IT and provide other services, mainly consultancy and advisory. In general we mainly consult in IT and management, which is a big part of our businesses and we also do outsourcing.
Q2	I run the company.	My official title is project manager. I am the delivery for the business perspective. I hand projects from after-sales, I play multiple roles basically. I play a project manager role, I play a business analyst role, I play a CRM consultant, and from the Google Apps I play the employment specialist.	What I do is advisory in IT and Cloud Computing.
Q3	We focus solely on the hosting part. But every service that we provide is built off of the hardware and software, it is either a sheer computing power or more software to provide, where you shouldn't worry about anything, we offer one-click install.	We provide Google Apps in terms of e-mail collaboration from the e-mail and collaboration systems We do reselling for Amazon with services we develop that application using the platform of sales force.com, capture your requirements and try to	We mainly do consultancy and we don't have a lot of products. We have started to use some for development and actually now within Cloud Computing training, integration to their internal systems, configuration and other services around, not

		analyze it and then try to map your business needs.	just software, and we look into these things.
Q4	Cloud service becomes something were you don't have to do anything, you have a web browser to pretty much run your own data. So we take care of everything the back-end with your servers	Cloud Computing for me is transforming the IT into a service. Instead of having your own internal team of IT, which can be a huge burden, you can lease those software services, and it could be hardware as well. You can source the IT services in general to a Cloud computing provider.	Accenture itself has a specific definition of cloud computing which is an "Internet-based computing, whereby shared resources, software, and information are provided to computers and devices, on demand". My definition is that if you have a service from software to infrastructure, and you provide services over the internet for a fee that you pay over time it can be per use or per month, or per annual. Accenture's definition of Cloud: (It is like electricity, it is from somewhere out there, you don't care where or how it's coming from. Regarding IaaS it is more or less next generation data center outsourcing.)
Q5	Most companies focus on cost, the most important piece in a company is flexibility. Also it creates an innovation where people start thinking in different ways. Most people see cost and flexibility and time to market.	The first thing I would say is the scalability. Now the second important thing is the feature, new feature releases you don't pay for the upgrades. The third factor I would say is the reliability where you have an SLA and have a commitment from the provider that the service is going to be up 99.9% overtime. medium businesses and enterprising, cost will likely not be the key factor of going to cloud	Cost and the time to market is quite fast.

		computing, but if you talk about small businesses and some medium businesses, definitely cost is a big factor	
Q6	Security is always on everybody's mind, I think it's very individual. Those reasons become fewer.	Now security and privacy majorly are the concern of cloud computing. So when it's a small company they don't really care. But usually it's not the cost because cloud computing in terms of cost always wins.	Integration problems and security concerns.
Q7	It's not necessarily how secure is the server, More issues have come for sure from humans, you have to trust us and what we do. We do certain things, we utilize full scale virtualization separating data or shared dedicated storage systems	If you have a fail down with Google more than 99.9%, they get you credit and pay you for the down service. They give you money if the service is not guaranteed So the service level agreement is not provided by my company	Privacy: "When it comes to moving your core and essential data, it would be a valid point to make from the customer's side" Physical Location: "Can setup dedicated servers in certain places so it can be possible in some cases. Up Time: "You're much more dependent on network connectivity for uptime". Integration: "If you just have stand-alone systems like a webpage just move it out of the cloud should be fine, but if you have complex applications it's a lot of work to get that through the internet.
Q8	Is it secure?	Now the objections that we have is most probably in terms of privacy where my data is, how can I make sure that Google or SalesForce doesn't access my information. How secure is it?	The main concerns we get about are integration and security
Q9	amount of support good uptime is for sure		No I think that it hasn't gotten that far I think it

	a very big driver		will take time before people experience issues and take it back again. That will only happen after a period of time and for certain areas.
Q10		So the first thing I would say is the scalability. Now the second important thing is the feature The third factor I would say is the reliability where you have an SLA and have a commitment from the provider that the service is going to be up 99.9% overtime	It's all about the advantages we talked about but we are used to convince them to adopt cloud solutions and give them ideas of what can be done and they understand how big players are doing it, and the get more confident to do it
Q11	Cost, flexibility, Innovation, security, up time, and support.	Security and privacy, this is the main challenge and up time but when it's a small company they don't really care. Scalability. Features, reliability, are opportunities. Cost will likely not be the key factor of going to cloud computing, but if you talk about small businesses and some medium businesses, definitely cost is a big factor.	Integration.
Q12	most simplistic one, doesn't require the super security	Now when you have a very tailored customer application that you need, this is where the PaaS comes in place, not SaaS.	it's not "all in", it's about what you should put in the cloud or not. So basically core and sensitive applications should remain in-house or at your out-sourcing provider obvious one is like email for example to be taken into the cloud. Another one is web applications. Systems that are already on the internet, why should be running in cloud solutions? Web services for

			example. CRM systems when it comes to these software is another example systems like ERP and Oracle you wouldn't want to have in the cloud. So basically core and sensitive applications should remain in-house or at your out-sourcing provider.
Q13		on-premise You're maintaining the hardware for it, you have your own IT resources to manage this implementation, you pay for them to maintain the version of upgrades or any software technicalities. In Cloud computing, Your software is on the cloud, but you are a business user for the service, you have to pay a monthly subscription you don't have any IT involved, you don't have any resources, an update will come automatically to you	
Q14	We have every type of customers today, everything from cities to governments to very large international companies	We try to avoid government sectors, banks, health insurance, insurance in general We have media companies, telecommunication companies, and everything that doesn't usually have those kinds of regulations or they don't really have a big budget.	media and communications companies and insurance companies are more laggers. They will take more time to move to cloud computing. it is more industry-specific, but I also think it is specific to the leadership you have in the companies. Some are reluctant and other would like to try it, so it's up to the specific companies, but I agree with you when it comes to the industry

			perspective, especially banking or insurance
Q15	Any small entity or organization should use it heavily. we have every type of customers today, everything from cities to governments to very large international companies	if you're a small company, usually you don't have the IT resources. So it's great solution cost-wise because you don't have any responsibility, you don't have any IT issues if you're a small to medium enterprise there is no way you can build your own data center they don't really have a big budget.	larger companies will take longer time to adopt these trends and technologies. I think it's more than efficient for smaller companies, also it's difficult for small companies to have all the IT or recourse or infrastructure knowledge they need
Q16		You pay on a monthly basis, or on an annual subscription and you will get like a five or ten percent discount. Trial version is available for a month once they implement, afterwards, they usually go for a yearly subscription. We don't really go for a monthly-base subscription because once the client has selected the CRM or Google Apps for the mailing system, it means that it's a long commitment thing with the provider.	pay-per-use is what people are asking for and you just pay for the capacity per hour basis is possible. It has the preferred way to go. Of course you still have traditional ones.
Q17	one can always wonder which one is more secure than the other It's not necessarily how secure is the server threats are not necessarily different in the cloud, you have to trust us	Now security and privacy are the concern of cloud computing. The questions usually comes from the medium in enterprises because they have a lot of regulations. When it's a small company they don't really care, in this case relying on security or privacy from SalesForce is really superior and better than having it yourself. They have	I use it personally so I trust it. If you're looking at e mail as one example, people are using Hotmail or whatever cloud solution, or Facebook, so people are using that in general so I think it's more accepted to people use cloud than companies. it may be safer because they have the skill to do it well, it's also about the feeling.

		provided a lot of documentation and how their data is secure and encrypted and no one will be able to access it.	
Q18	Any big company today should have a hybrid solution, meaning that there is always going to be certain things that you want to provide a very heavy security aspect just to deal with internally You should have a private cloud there you should also have on-demand type so that when they do need resources simple enough, doesn't require the super security to bring outside	In big companies the hybrid model could be a choice. When you're talking about a private cloud is when you're having you virtualized environment on-premise If you are a government sector or big enterprise, money is not an issue for you, they prefer private cloud solution where everything is under their control, if you're a small to medium enterprise there is no way you can build your own data center. You usually go to the SaaS model where , hybrid cloud I don't see it even as an option for small to medium businesses. When you have a very tailored customer application that you need, this is where the PaaS comes in place.	When it comes to moving your core and essential data, it would be a valid point to make from the customer's side, but of course every company has some systems which are not critical, so it's not "all in", it's about what you should put in the cloud or not.
Q19	The local aspect is of importance. About half of the population is okay if it's outside countries that get into so a country might have a very bad internal infrastructure You probably don't want to have your servers in Argentina to begin with.	SalesForce and Google don't say where their servers are they don't really know where their data centers are. When we try to approach some government clients they have a problem that their data is not residing within the UAE because they have some policies Google, and sales force have provided a lot of documentation how their data is secure and encrypted.	When it comes to the location aspect it can be solved because you can get a dedicated server in a specific country if that is necessary

Q20		There was a huge conflict between having the end user to bring them access to two different browsers because this would confuse the end users or just stick with Explorer and lose the functionalities that come with Chrome, like for example if you're using Google Apps obviously we're going to recommend using Chrome as your default browsers	If you're having a cloud solution maybe in another part of the world, you have a lot of latency on the network, so you could have some issues in terms of performance for example. It could also be security issues in the firewall and can't connect between the internal and external systems And that If you just have stand-alone systems like a webpage just move it out of the cloud should be fine, but if you have complex applications integrated into 20 or 30 internal systems, it's a lot of work to get that through the internet and through whatever provider you use.
Q21	our SLA is 100% uptime It's not a guarantee, you are eligible for money back should we mess up that, as soon as there is downtime, we owe you something	They guarantee a level of 99.9% uptime if you have a fail down with Google more than 99.9%, they get you credit and pay you for the down service So the service level agreement is not provided by my company, but by the cloud computing provider. If you're not a really big enterprise with your own data center with your own technical team you will not be able to make it to this number.	99.9% uptime, if you don't succeed in doing that companies who get downtime will get compensated. network connectivity that you have is very important here so if you're just running out of the internet
Q22		It's usually not the IT manager but the business owner. The CFO, the CEO, but it's not the CIO. This is one of the challenges.	When we talk to IT departments and so on, like IT directors or CIO's, they are a bit concerned, because they feel that they will

		Unless the IT guy really has an open mind, as these people are going to lose their job; the roles of the IT people are changing.	lose power and jobs and so forth. The CEO's and CFO's can see the cost benefits.
Q23	You don't want to own one single server. Schools today spend too much money on their IT and they can do that much more cheaper and much more efficiently. Make sure you don't go down and have plans if that happens. if you're a student you expect that your school computer can connect to your hard drive online when you get home.	If you're looking for CRM, I will show the customization is very easy when comparing to an on premise solution. you'll be up and running in one month an on-premise CRM, it's going to take you six months. It's very cheap, there will be a lot of feature that you're going to have.	

A.3. Interview Transcripts

The following section contains all of the transcripts derived from the conducted interviews.

A.3.1. Interview Guide - Transcript CityNetwork

29. March 2012, 2:00h – 2:45h

S= Student
H= Johan Christenson

S: What is the core business of your company, sir?

H: We're a company with a strict focus on shared hosting and cloud hosting. We do offer dedicated hosting and domains which are somewhat are on the outskirts of things so the main business in shared hosting and cloud hosting.

S: So what is your role in the company?

H: I run the company.

S: You are the owner of the company?

H: Yes.

S: Alright. So what kind of products do you provide customers? Do you only provide hosting solutions or some software solutions such as ERP systems for instance?

H: That's a tricky question because just about every service that we provide is built off of the hardware and software, sometimes other things as well, so the majority of our services so to speak is either sheer computing power where we simply just give you the software to do that with cloud solutions, where you use your web browser to get to computing power, and then I would say on the sharing side, just as if you look at a host gig or anybody else that does share hosting, there is more software to provide, a more smooth solution where you shouldn't have to worry about anything, all the way to the fact that we offer one-click install, as simple as that. Then it installs the software for people who shouldn't have to know anything about it.

S: That's good, but how can we differentiate between cloud computing and virtualization. I mean, the same concept was already in the market by virtualization and posting , like traditional hosting. What is the difference as you provide it?

H: Well first off virtualization so to speak, that's just a form of technology to utilize hardware in a more easy way so one shouldn't confuse that with cloud because a lot of people virtualize of course in-house really, with the one sole factor trying to utilize our hardware better. As an example, we actually decided to question yesterday as an example, at one point we had a company come in to look at the hardware utilization in our data center here in ... and were utilizing some 7% of our CPU's. If you take two-thousand servers, 7% becomes a pretty bad utilization grid. So a lot of people especially large companies and smaller

just use virtualization as a form of utilizing hardware better. Now, we start talking about cloud servers or cloud in general, of course, that's such a frequently misused term because everybody uses it for services that are, just services, so to speak. But if you compare straight-up virtualization with for example what we offer in cloud, the cloud service becomes something were you don't have to do anything in order to have a web browser to pretty much run your own data. So we take care of everything the back-end with your servers. Now sure, we utilize virtualization to bring you that service but it doesn't become the full cloud service until we deliver that in a web browser to you, just like Amazon and anybody else like Rackspace who all have two-clicks the most on the server and today frankly you don't need that with full-blown API to write your own scripts that pretty much takes care of any type of scaling effort and so forth, so that's really when it becomes the cloud solution more so than just the virtualization part. Just like we need hardware, we also need virtualization to provide the cloud service. Now in general, for you to talk about IAAS you will have a number of things that are required for you to call ... you have the flexibility to go up and down in hardware, but you also have the scaling with more servers and you have the feeling of unlimited resources. Like Amazon, if you used them a lot you'd know that at the end of the month they run out of hardware too, and sometimes you can't spin out the machine because there's not enough hardware, so there is no 'unlimited thing' but it should have that sense that you truly can do anything out there so to speak and a few other variables as well. Of course, paying per hour where it's more a virtualization model than anything else is a big part of that so there is a big difference. Virtualization is merely a small part of delivering a cloud solution when it comes to infrastructure as a service.

S: As I understand that you care very well with the technical side, but what about the requirement side? I mean the business aspect of a company. Each company has a different requirement from other companies. Do you also take these issues into consideration where you for example send IT Consultants to study the business of the company, to choose the best solution, to customize it for them or something like this?

H: We focus solely on the hosting part. We do give some advice, you know some our larger customers certainly contact us outside our partner program where we try to be able to just make sure partners know all these things. Europe has been lagging behind the U.S. There are a lot of companies that focus solely on advising on how to bring an enterprise kind of company and utilizing properly. Sweden is a little behind in that. But we don't do all those service, we do give guidance and when it's beyond what we do, we make sure we have partners who can do it for us.

S: I would like to ask you about payment solutions. What are the main payment methods you utilize in your company? Do you use Pay-per-use, of a monthly basis fee? And what are the preferred ones by the customers?

H: So we are a Swedish company so our main market is Sweden. So it wasn't like last summer where we ventured outside of Sweden at all. Today you go to CityCloud.eu for the English version, you can go to citynetworkhosting.com for the shared English version. We also have Poland and Argentina this point but as far as payment solutions it'd been very heavily focused on just straight-up international. So in Sweden you can everything from bank transfers such as Gyro which is what we normally do for payment methods, and we use Internet banks today to pay invoices. From an international perspective we support any credit card that's out there and PayPal, that's about it. The idea is that we're going to have more localized solutions in our team as well.

S: I have read that your Data Centers are mainly located in Sweden, right?

H: Yes.

S: But how about the international companies, for instance the companies from Argentina? Do they accept that their data is going to be physically located in Sweden and in other countries? I mean some countries for example have some restrictions about the physical location of their data, correct?

H: Yes, you are completely right. We estimated that about half of the population is okay if it's outside. You have also to consider what countries that get into so a country might have a very bad internal infrastructure so let's say you're in Argentina and you're a gaming company: You probably don't want to have your servers in Argentina to begin with. It's actually better for it to be in the States or Europe, who probably so far have the best connections out there. You have Korea for example but from a local market, so Europe in general and the U.S are usually a good place to be located in. But we completely agree with you that the local aspect is of importance so we have a plan ourselves where the West and the East coast of the States, some parts of Europe like Frankfurt are targets for us next year to add CityCloud nodes that you should be able to use in any of those continents.

S: When you do think companies are willing to adopt the cloud? What are the opportunities they take when they try to adopt cloud computing? What are the most motivations that you make sure to tell your customers about when you are informing them about cloud computing?

H: We've been doing this for a while now and we were the first ones in Sweden to launch a cloud server solution so we've seen it from a lot of different angles and today they change like that. So if I'd do a presentation today I'd say that most companies today focus on cost where they look to save money, and there's definitely money to be saved, and I think the most important piece in a company is flexibility. The fact that you work with computing power in different ways that people start thinking in different ways. So all of a sudden the companies that were not used to, or thought that they have to order servers like you were saying, had to call their IT department to virtualize and get one machine. They would start thinking in different ways and say "No, no, we're going to start this by ourselves and we're going to use API for this". So what we see happening is that it creates an innovation where people start thinking in different ways. The fact that they are thinking differently and paying differently is a whole different flexibility and how you use things, other thoughts start coming out and all of sudden all they're thinking about is "Look at this process we have over here: Why are we doing it that way?" And that has little to do with the saving on the number of machines that we have whether it's in the cloud or outside our internal machines so I actually believe now and I don't have any proof for this, but I believe that any larger organization that do this whole-heartedly, their biggest gain will be the fact that they're creating innovation in the company because a lot of services today are with some form of computing power, at least in the bottom, then of course it grows in stack from there.

S: So it's mainly the cost, as you said, correct?

H: Well, no, what I'm saying is that most people see cost and flexibility and at times market. Those are the three factors everybody else will tell you because that's kind of what we all think and certainly those are all three very important aspects of it but I think the fact that if you have two competitors doing the same type of thing that one which really starts adopting this, yes it will save some money, yes it will be more flexible, and yes it will be better time to market and that in itself is reason enough to do it but I think what company A will be able to do is that they will actually leap-frog company B because they'll start coming up with services around that wasn't possible before, and that's because now they're thinking in different ways. I think that innovation part that may be a year or two out from starting to utilize these services might be the bigger point in moving up.

S: Do you think that these companies, or in general the IT professionals, don't have enough knowledge about cloud computing? Do you think it is not ... this culture of cloud?

H: Yes. They don't. I mean, going into any room where you hold a presentation and you say "How many of you have ever spun up a machine in a public cloud?" and you'll find that maybe ten to twenty percent have ever even tried it. So trying and seeing is believing, right? Everybody talks about it but people have very little experience doing it so the people underneath which make the decisions also have fairly limited

knowledge of it but I'll say this: The last year, 2011, a ton of things happened so I think that if I just look a Sweden things have really started to tick and I'm surprised that it took so long for a country like Sweden to actually get a grip in these things.

S: I would like to ask you about the main questions you used to listen from your customers? Like their main doubts and some questions you used to listen to all the time and you're already prepared to answer them because you've got used to them, what are these questions?

H: It's the same old stuff as always: "Is it secure?". I think that there's a big difference between the U.S versus Europe. So if you go to a U.S company they're very much drilled to see opportunity, they're very aggressive, or if you look at a Swedish company or Europe in general to be honest with you it's more like "This won't be as secure as we have today" and that becomes the topic. All of a sudden you have European people talking about security whereas Americans would be thinking about the stuff they could do and then think about the security, so they move things forward because they have such a big possibility. So I think security is always on everybody's mind and the funny part is you know is if you think about it just the last year, or just a matter of fact, today the news is that our taxes authorities here in Sweden were hacked. They used nothing in the cloud. So one can always wonder which one is more secure than the other.

S: But it's a logical point, correct? They have a right to doubt about these issues. It's really important. How can you respond to it? How do you deal with these issues in your company?

H: There's a very logical reason. As soon as you start trusting a third party whether it's Amazon or Rackspace or us, it's a third party. It's not you, even though you have employees who can also do bad things but it's still you. But the very first thing you got to start looking at is whether you trust those people that are working there, right? It's not necessarily how secure is the server, because any of these people might have access to your data so that's usually the first step and what we try to say is that in addition to the fact that you have to trust us and what we do I believe that our people are the kind that do not make mistakes and a lot of times we try to look at the most common things of why things go wrong and it's not necessarily a hacked computer. It's usually an employee who messes with the password and usually an un-patched machine. So if you take those five most common things which are regular things that can happen anywhere that's like 90% of the issue so we try to look at things more broadly and say "You're not getting away with that anyway" so to speak, so we're trying at least to make some sense of where those threats are and not they're not necessarily different in the cloud or how they are for you as a whole.
Then there's some very legitimate questions like any cloud for us to deliver the services we do for the price that we do we have to share resources, right? So there's no doubt about it, it's a shared resource. We do certain things, we utilize ... full scale virtualization, not half, because they have their own kernels for example so one kernel is not going to mess with another kernel even though they're sharing the same ways for encryption where there are certain things you can do as far as separating data or shared dedicated storage systems. But yes, there's still the shared aspects. If you're a bank it's going to be a tough pill to swallow and you might not swallow the pill but for about 90 to 95% of the businesses out there there's more positive to come out of it and if you weigh risk versus reward so to speak you'll see that doing it, and I think it's a forced thing because if you don't do it you're going to lag behind in innovation, cost, and flexibility and so forth. It's going to be a forced thing at some point just in general and the security risks will be dealt by companies like ourselves.

S: So do you think that banks for instance might avoid adopting the cloud because of these issues. So what kind of companies or industry types do you have in your company? For instance, like transportation or specific kind of industry who go to the cloud, or specific kinds of industries who avoid going to the cloud?

H: If you look at vertical in general we have every type of customers today, everything from cities to governments to very large international companies. So today I would say there are very few companies that don't have some dip of their toes into the water of the cloud. Now, how big of a dip into it is different but

it's the whole spectrum today that in some form uses cloud, and those that are not are looking into very heavily as to how they should utilize it.

S: But governments and large companies for instance, do you think having a private cloud might be more interesting or more useful than having a public could? I mean what is the benefit you can provide other than the private cloud? How can you differentiate yourself from the private cloud they (large organizations) can have their own data centers, for instance.

H: Yes, but it's not a matter of us trying to differentiate between private, public, or hybrid. Any big company today should have a hybrid solution, meaning that there is always going to be certain things that you want to provide a very heavy security aspect just to deal with internally. You should have a private cloud there, you should virtualize it, you should also have on-demand type of building and allowing your employees to access those in a similar way that you do in Amazon public clouds, meaning that an employee should be able to log on to a private cloud and start the machine like they do in a public cloud. So it's not a matter of 'this or that' it's a matter of both. Now, for a big company not to overspend, they should also connect to a public cloud so that when they do need resources and it's something that in nature fits in the public cloud they should utilize that, and most of the time they can find it much cheaper in public clouds so it can be a price and resource differentiator meaning that if your data center is full and harder to utilize then you use CityCloud or Amazon or somebody else.

If it's cheaper to use properly and it's a service that's approved for them, meaning that you have the processes and policies that actually states this service we might as well have in the public cloud because it's half the price that we can provide ourselves. So it's not a matter of 'if or that' we're not trying to differentiate ourselves to say that you should not have a private cloud, on the contrary, any large company should have a private cloud and because that's how they utilize their resources the best in-house, and then you come to ... like ourselves ... extremely efficient and do not over-buy any type of hardware or stuff like that.

S: So you think it's better to have a hybrid solution instead of a private cloud. So there are some application types that are preferred to be taken into the cloud, correct? What kind of applications can be used to be taken into the cloud for instance and what kind of applications are used in a private cloud?

H: I mean when we start to work with larger organizations it's usually the whole security thing like "Oh my God, can we do this and can we do that?" so what we try to do is find the most simplistic one. For example there's one large company that we are working with and setting up servers for their educational part. There's no security issues or anything like that but they need servers for these people to go out and teach people around the world. Now take this example, like a bank who might spend twice the money in a data center than a normal person, right? Because they need extreme security, both facility-wise as well as software and hardware-wise. Now would it make sense for that bank to also host any other type of services in that data center more than the ones that truly need that extremely expensive stuff? No. Most of the time they should be smart enough and say "Okay, we can only build this data center and the stuff that we need. We don't necessarily need to protect everything in the same extreme way that balances people's account". Right? So they should look for something that's simple enough, doesn't require the super security to bring outside because that usually gives them a certain level of comfort. It gives them enough time to learn about what it's all about, what are the true benefits, and somebody can stand there and say that you're going to save money until you're blue, but ultimately you're going to have to take the dip yourself and jump in and say "Okay, yes we did get this, now let's see what else can we do that makes sense". And I think even if you think a lot of things will be policy-based in private and public clouds allow for some of us to say "Okay, these ten services that you run are approved for public service or public cloud". Meaning that when an employee spins up a machine of that type, it can be easily spun outside of the company as easily as it can be spun inside. It's all policy-based.

S: As I understand from what you said about it's mainly about security. How do you think we can organize these issues. I mean, can we for instance, as you suggest, have a third party or a kind of algorithm to make a kind of encryption for the data, or to be regulated by the government? I mean, how do you see the future of this problem? For instance, a company like a bank can trust it completely and forget about IT stuff, and give it to somebody else who they trust 100%? What are your thoughts about this?

H: There's two sides. On one side it's actual encryption "How do we deal with data and so forth", and on the other side it's mental. Cultural, mental, and other things like you have people sitting in IT departments who are like "No, no, no..." and sometimes they can't even give you the reasons as in why.

Some of them say 'No' because I don't want to lose an employee because that might change my job and a lot of things within the organization, and I don't want that. So half of it is mental or cultural, and the other half there are certainly a lot of things that can be improved, a lot of thing that are there now for us it's a matter of monthly work, you know what we look at, how can we continue to improve aspects of security, so to speak, and frankly you know, we've learned a lot already because we've seen customers once you have a few thousand servers in the cloud problems are bound to arise, and when that happens you start learning from them. And so the same thing can be applied to us. We've learned a number of things over the last four to five years learning about the cloud and there are a lot of things that can go wrong, you know, but if you don't take the leap so to speak, you'll probably never see all of those so yes, there are a lot of things that can continue to be improved from all aspects but again, don't ever forget that issues arise from bad passwords or an employee that was disgruntled or a lot of those type of things too, so I can put that back to you and say "How do we deal with those things in your organization? Have you documented and researched your employees? What's your policy when somebody quits? And when that happens with you, how do you change your passwords then, and how do you go over your systems then?".

So a lot of them are from above, and then sure, you have to make sure that it's encrypted and all those things and maybe the data should not be shared in some cases and so forth. But frankly, that layer that you're talking about security from a software and hardware perspective is less of an issue in my world, but I've seen more issues up here than I have down here at least from a hacking perspective and so forth so that's what we see. Sometimes it comes down to people not managing their patching properly and having issues for those reasons.

S: So you're saying that the problems that arise are more due to human error rather than technicalities?

H: I'll just say this from our experience. More issues have come for sure from humans being messed up passwords which have been cracked or from an unpatched machine because people have not taken that seriously. That stuff is weekly for us. If we had a breach of any other stuff such as 'We shouldn't have shared that data on the same disk', that never happens. I can't tell you that we've seen anything like that. We've had our fair share of issues all around but I think most of the time that the common issues are those, and that's not saying that it's not important, of course we have to look at that layer as well and say "We have to get this fixed" but the volume of issues have been up here. Companies do not take care of policies properly when it comes to security.

S: Other than security, what are the other doubts for customers?

H: I think it's very individual. If you've got past the security aspect it then comes down to your business. Is your business suitable for it? How much can we gain from it? Are we ready? Do we have the people that can take care of it? There are so many different other issues that could be there but I think that with time, to be honest with you, again we've been doing this for over three years. With time I sort of feel that those reasons become fewer and fewer and it's more a matter of timing. If you talk to any large organizations today they'll say they're either using the cloud in some fashion or they're looking at it and how they can do it and so forth. So it's just a matter of how will they use it not so much if they will use it.

S: Are there some companies that adopted your solutions and for some reasons they decided to stop the contract? If yes, why did it happen for them to de-adopt? What problems did they have and why did they decide to cancel the contract or stop renewing the contract and get back to the private cloud of private data center?

H: I'm sorry I did not quite get that but you're saying that if somebody leaves us what are the reasons behind it?

S: Yes. Exactly

H: Okay. I'd like to say no body leaves us but that's not true. You know, the thing is we run a public cloud similar to Amazon, and we don't know most of our users. We've grown fairly quickly, but let's just say out of one-hundred new customers I might personally find out about two. We have systems that notify us if somebody goes over a certain number of machines or stuff like that to say that "You know what, these guys are pretty good customers they got fifty machines with you, maybe we should get all". But this is a service where you log on and you spin up machines and we don't necessarily hear from our customers unless they have issues. So many times I would say this: If it's not a natural reason such as "Our company went bankrupt" or something like that happened, or "We don't need the service anymore" or something like that it comes down to two things for us. One, our servers. Our servers have to be good. People become angry if they have to wait, and I just got a Tweet come by here saying that "I've waited 3 days for an answer", and that's not good.

That customer might be angry enough to say "I'm going to leave you guys because I think somebody else can do better than you". The second thing is uptime. I think everybody has got used to downtime at this point. Amazon has been down for four days, we had a big problem with ... for even days which took out several cities for seven days which made it a national thing and a national security thing even, where the government is feeling that if these big companies can't keep it up people can't get medicine for a week, which is a pretty bad thing. So I think uptime is for sure a very big driver as well. So if you don't mess that up too much and you have a decent amount of support, these are the two things that are critical to keep your customers.

S: Sir I read from your website that you can provide 100% availability of the service.
Do you think it's realistic, and how can you provide it?

H: You know it's interesting, here in Europe we're not so used to that. It's not a guarantee able uptime, meaning that we know that if somebody comes and bombs Sweden which could happen, we will be unable to keep that up. It's a guarantee similar to the one you have when you but a TV. So when you buy a TV you get a warrantee that says if you have issues, we take it upon ourselves to do something about it. So our SLA is 100% uptime guarantee so to speak, and that guarantees you that you are eligible for money back should we mess up that. So as soon as there is downtime, we owe you something. So it's not a matter of being realistic, and we think we can keep the service running up all the time. No, we don't think that's realistic, but we're putting something on the line saying "Our customers know that if we are down, they know they are losing money. If they know we are losing money we know that's their only driver for us to try as much as we can to get things back in order again. So we're taking a little bit of a risk in giving that guarantee. If it's down you can call upon it.

There are certain limitations and so forth, for example, we have the right to do two planned maintenance downtime but that doesn't go into the guarantee so we realize we have to do maintenance a couple of times a year, but we try to be very good about getting it all in one shot, so to speak. So it's more a matter of saying it's not realistic to think you're going to be up all the time, but it's realistic for us to give you money back if we failed, yes. This in States is very common, so there are a lot of servers that do this and all it does is

allow you to get money back if it fails to provide the service. A lot of customers are just happy to see it, you know what, it puts a lot of pressure on us to make sure that they're up and that's the sense they get from that. We do keep our stuff up a lot but we've certainly been down as well so we had to pay out quite a bit of money.

S: How can you manage to have a high level of uptime availability? What are the techniques that you use, like ... or some other solutions or techniques?

H: It's a matter of redundancy in the sense of hardware and that kind of stuff. You can have two or three of everything but then it's also a matter of having good people who know how to run systems and so forth because frankly it all boils down to having redundancy. I mean most of the time Amazon goes down or ... it all came down to storage and really messing up the storage and stuff like that, and not having proper failovers and so forth. Keep in mind that not all people are willing to pay for true failover. There are companies today that can take large applications and have a failover to a different data center, but the cost of doing that is great so unless you're running a bank very few people are willing to pay for it, so most people set up a single server and then they become angry if that server goes down. So if it's an OS memory leak or whatever that takes it doesn't really matter. It went down but nobody realizes that it will go down from time to time so I think there's a lack of a risk analysis and there's a lack of willing to ... so we see big companies cheap out on things, so everyone gets angry when it happens but nobody wants to spend the money.

S: Sir, I can say that you have some big competitors like Amazon. How can you differentiate with them? How can you compete with these international companies? You are only a company in Sweden and it might be difficult to compete with Amazon and their reputation for instance, correct?

H: For sure. It's very difficult. But that goes with everything. If you want to start any business today and you're not the one coming up with the new idea nobody has then you're going to have competitors that do similar stuff. So there's always a number of things that you can compete with. One is 'price' of course, because people are very price sensitive. In our case there are a few other things that we go for. I'll challenge you guys to in and set up an account on Amazon. If you haven't done this before I bet you will be running our servers in literally three minutes but you will be stuck after three minutes thinking "What's the next step?". So ease of use is actually a big driver too unless you know you need thousands of servers and you have to use Amazon because they're the only ones who have that type of power. Ease of use is a big driver for us, especially if you look at small customers and such, but you know what, that kind of goes for everybody. We all become angry if it's difficult to use today. Whether you're a System Administrator and you actually know your stuff. You're going to have to sit there and work a bit longer. Today you're kind of spoiled, having a server done in two minutes. The other one of course for us today is that things are still fairly local. Not just from server and language perspective because that's local too. When a problem arises it's nice to call up ... about my issues, right? Have you ever tried calling Amazon? Have you ever tried calling Google? They really do not care for you whatsoever so that's a whole aspect of things we can compete with as well. And another aspect is of course where data is stored today so in Sweden, Europe or a British ... they don't match the U.S at all, and a city today cannot run the apps without the standard agreement that Google has without breaking laws: Piracy laws in Sweden. Our strict laws makes it pretty hard to guarantee that the data doesn't leave Sweden. If you're a government or a city or agency for example they have very strict laws on that, but even if it's just financial data you're not allowed to take it around the world ... That's a good benefit for us but in five or ten years frankly, I'm off for the whole free Internet thing and I don't care where my data is.

If I hit a web browser I don't care if it's in China or the States or South America. But until the E.U and U.S make things better and get the piracy laws and stuff like that in a better way and the U.S stops the terrorist thing with the Patriot Act where, you know you can't host on Amazon today without allowing at the U.S government to look at the stuff you have. You can't do that with Rackspace either so if for some reason

you're some type of agency and you're not okay with having the U.S government spy on your data you really can't host on Amazon. Even the European and nation entities are under the Patriot Act. So there's some of those aspects there that we utilize in a nice way where we think that hosting with us is much more secure from that perspective not that kind of security you guys are thinking about. I mean Google has confirmed that there's not a week that goes by without the U.S government asking for data from their services, and that's a pretty scary aspect as well. I mean, I think ten years ago we were all ... as a "Oh my God, they don't do anything wrong". Today they're okay torturing and they're okay doing a lot of things that are necessarily viewed by your countries as good things so there's a number of things we can differentiate ourselves with.

S: One last question please. Let's presume I'm the manager of a small school and I want to use IT resources. What would you say to convince me to adopt the cloud and use the services of your company?

H: If you're a new school, yes.

S: A small one.

H: Without a doubt. I think you're seeing that already. Any small entity or organization, school or not school they should use it heavily. As a matter of fact, it's funny you mention it, I have a friend of mine who is setting up a school here locally. You know, Sweden is very popular in setting up private schools today, and each city has a lot of them. So he was asking what he should do. I said he should first talk to someone who has done this before but then think about how you should do that outside. You don't want to own one single server. Make sure you're no breaking any connections and don't go down, and have contingency plans if that happens. Schools today spend way too much money on their IT and they do that much more cheaper and much more efficiently. Plus, not to be smart but if you're a student who is above 10-12 years old, you expect that your school computer can connect to your hard drive online when you get home because that's where I got all my stuff and a school is not as good as a data center to try to get you the proper language and to try to give you the proper everything when it comes to that stuff so I think more schools are trying to give each user e-mail their own storage and that other stuff.

S: Sir, thank you very much for your time.

H: No worries.

S: Is there any possibility we can contact you again for any follow-up questions via e-mail or any other medium?

H: Sure, sure.

S: Have a good day.

A.3.2. Interview Guide - Transcript Cloud Concept

4. April 2012, 6:00h – 6:50h

S= Student
G= Geo Morjane

S: Hello Geo. Can you tell us what the core business of your company is?

G: We do consulting on sales force. We do custom applications on sales force as well. We're Google partners. We provide Google Apps in terms of e-mail collaboration from the e-mail and collaboration systems. And we're partners with Amazon as well. We do reselling for Amazon with services. So our company business is basically based on the cloud computing industry.

S: Very good. So you can say that the core business of your company is about providing cloud computing software solution, correct?

G: Yes we do provide custom solutions, but the main thing we provide is professional services. You know in terms of SaaS model where the customer pays the subscription they need someone to actually implement the software for them. For example if you are using sales force as your CRM you can't just buy the licenses and start using it, you need someone to understand your business. To capture you requirements and try to analyze it and then try to map your business needs into the CRM, so that's what we basically do. Now in other cases with other clients where they need very custom applications we develop that application using the platform of the sales force.com which is the first .com and we do the customer development of the platform.

S: So can we say you work as a third party between the customers and the cloud service like hosters, like for instance Amazon?

G: Usually these companies like SalesForce or Google or even Amazon they don't usually communicate directly with the end customer. They deal through their partners, their resellers, their distributors. Every company has their terms. But these big companies don't interact with their end users unless they're very multi-national companies. Like for example Dell as a customer of SalesForce. So then SalesForce then sells SalesForce team like doing the implementation for Dell for example. But when it comes to the GCC region, SalesForce doesn't have an official representation in that area. That's where the partners come in place and provide those professional services.

S: I got your point. I think it makes sense because the cloud provider which we met in Sweden, for instance, he said that these big international companies make for competitors but they don't provide local services as you said, so I agree with you one-hundred percent. Can I ask you about your responsibilities in your company?

G: Sure, my official title is project manager. I am the delivery for the business perspective. I hand projects from after-sales. So when the sales cycle ends we get the contract from the end user. This is what I do as a project manager. I play multiple roles basically. I play a project manager role, I play a business analyst role, I play a CRM consultant, and from the Google Apps I play the employment specialist. So I put different hats with each customer, but basically you can say I'm exactly a software consultant because even in project management, I understand and analyze business needs, and then I deploy it. The project management comes in terms of documentation, making sure the project meets the time, and if there are any problems I make sure that I communicate it. Usually there is a project manager from the client's side so it's a software consultant/project management job.

S: Can I ask you what cloud computing means to you? Can you define it as you understand it?

G: People usually misunderstand cloud computing with internet applications. Cloud computing for me is transforming the IT into a service. To give you an example, if you want to have a mobile phone: So instead of you going to a new mobile industry company, you just go the provider of the telecommunication service and then buy the service from it. If you wish to have electricity in your place, you don't go and create a new generator or build a solar power system to provide electricity for your place. Cloud computing is the same thing for IT. Instead of having your own internal team, technical team, or having your own hardware or software, or your maintenance team or all the IT resources, which can be a huge burden for any company whether SMB's or enterprises, you can lease those software services, and it could be hardware as well. You can source the IT services in general to a Cloud computing provider and relief your company from a couple of issues. So basically it's turning the IT into a service model for SMB's and enterprises.

S: For instance to have a better understanding, what is the difference between the traditional ERP system which is hosted locally for instance, and the Cloud computing ERP system?

G: Alright. I would actually like to break it into three things. I want to talk about the applications which are on-premise. There are applications which are hosted applications and there are cloud-based applications. The three of them are different models. So the first model is when you have software regardless of whether it is an ERP, CRM, mail system, accounting systems, regardless, if it's on-premise you have the following challenges: You're maintaining the hardware for it, you have your own IT resources to manage this implementation, you pay for them to maintain the version of upgrades or any software technicalities. Most probably if you're enterprise level you have the Disaster Recovery setup in case the service goes down. So there's a lot of complication when you have on-premise. Basically the cost, the license, and your IT resources. Now previously let's say 5 years ago it was a challenge for enterprises in the world to have either a cloud based or hosted solutions just because everything relies on the internet. The internet is the medium now. If you look 5 years ago basically in the area of GCC. In America, Canada and Europe it's a different case because getting access to the internet is cheap. In the GCC area was expensive 5 years ago. Companies and enterprises are able to rely on the internet to do their business. That's on-premise. The second option is the hoster where you have your software installation locally on your network but you have it on a third party hardware provider. The third model is the hosted application where you don't have your software or your applications on-premise but you have them on a hosted infrastructure. Sometimes it comes with a service level agreement, sometimes it comes as a managed service where a third party manages your instances, sometimes your IT resources will still patch and update and configure the software, but what you don't have is the behind part of it. That's the hosting applications. I'll give you an example to make the picture clear. In Cloud computing it's a different model. Your software is on the cloud, but you are a business user for the service. All you need to do is pay a monthly subscription and you get the service regardless of what it is. You don't have any IT involved, you don't have any resources, an update will come automatically to you. There are multiple aspects of Cloud computing which we can maybe touch after a while. So let's say as an on-premise software model, I'm going to take Exchange as an example: If you're a company and you want to have an email system in Exchange for example is a classic model, where you have your Exchange instance on-premise, locally on your network, or one of the biggest problem is if your internet got disconnected all the e-mails will be lost because your Exchange system will be offline. If you have a public IP connected to your Exchange if your ISP for some reason, and we recover a lot of clients in Egypt and just because of the revolution and all the political issues, you remember the internet was cut. So a lot of companies were affected because they have their Exchange online and when you get out of the internet you've not just lost the connection, but lost all those emails that were being sent because their exchange was offline. You can have another version of the Exchange which is a hosted Exchange but that will be on the cost that you don't have full control on your Exchange because most probably the provider is going to charge you for any additional service. So even if you want to settle a forwarding email address, which is a default feature in Exchange, if you want to request that, you have to pay for it. The cloud solution is Google Apps that we're dealing with and people would pay a monthly or yearly subscription and

you mailing functionality. Basically it's hosted on Google infrastructure, you have an SLA or 939.9 for availability of severs and there is really nothing there is no downtime, you get the features, and other things.

S: Okay. First of all you have been talking about the cost. Do you think it's cost-effective? Is it better for some customers to have this ERP or CRM system in their companies so that they don't have to pay whenever have they use it?

G: Yes. Now let's classify customers into two sections. Let's talk about SMB's which are small to medium enterprises, and let's talk about enterprises. Now SMB's I mean, you know, they could be company from one person, let's say until 250 users. I consider 250 users are still medium businesses. Now when you have your software on-premise first of all let's bring you to small businesses from one until fifty users, and then from fifty to 250 and 250 and above. So if you want 250 users imagine having an Exchange system on-premise. That's going to involve driving an IT department and IT resources, and if you're a small company, usually you don't have the IT resources. So it's great solution cost-wise because you don't have any responsibility, you don't have any IT issues. All you need to do is to just pay the subscription. So for any small business, it's great in terms of saving. Now moving to the medium businesses it's still a great for saving, but once the company is growing bigger in numbers we will have other complications. Like for example I'm going to talk about the exchange again. When you are a medium to enterprise level, when you get the Exchange you don't just get that alone. You usually get the license agreement from Microsoft which they provide you with a package of software, like the operating system, the update, the office, and the Exchange. So when you look in terms of cost, you're not replacing the Exchange with Google Apps, you'll be replacing Google with the whole suite of Microsoft where you know eventually you will need SQL and Office for your users, an operating system upgrade, etc.. So the cost here will not play very critically because they will be already paying for the Microsoft agreements, for example, but the issue will be more in technical and availability, and will be a different challenge. So for medium businesses and enterprising, cost will likely not be the key factor of going to cloud computing, but if you talk about small businesses and some medium businesses, definitely cost is a big factor of why they want to go for cloud computing.

S: So you were suggesting it's good from small and medium companies, correct?

G: Yes.

S: So what about other pricing strategies? Is there only one strategy to pay, which is pay as you go?

G: There's usually two models. It's either you pay on a monthly basis, or on an annual subscription and you will get like a five or ten percent discount. This will show how committed you are. Now in terms of the way that we do business here, we don't really go for a monthly-base subscription because once the client has selected the CRM or Google Apps for the mailing system, it means that it's a long commitment thing with the provider so we make sure during the sales process that we understand this is what they're working for, and then we suggest the yearly subscription because there is no point in having the CRM for two months and then changing your mind. Because as I told you, we reset the licenses, but our main work is professional services, and the professional services cost a lot, so we make sure that the client is happy with the software because he's going to pay for the professional services and then he wants to use the system. He won't pay and 'X' amount of money and throw it away. So usually we provide for example a month free of trial in terms of CRM or even Google Apps. We have a trial version for a month where they can try to check it out, but once they implement it in the system, they usually go for a yearly subscription. Now myself as an end user, I am subscribed of a couple of SaaS model software, where I prefer to pay on a monthly basis. I'll give you an example: Netflix. I pay a monthly subscription on Netflix, because it's an online, on-demand, video streaming service. So this month if I have some free time and watch some movies, but next month I know I'll be busy and don't want to pay for it, so I halt the subscription and next month I'll renew it. But that's me as an end user, but as a business, they usually go for a yearly subscription because this is what they decided, this is the software they'll be sticking with for the next year at least.

S: Can I ask you about the physical location of your servers? Are they in Dubai or out of it? And is it a problem for you customers? I mean, they don't know where the location is and they don't control it. Are there some regulations for instance in the U.S, I think there are some regulations that the data shouldn't be out of the country, perhaps?

G: That's absolutely true. The questions usually comes from the medium in enterprises because they have a lot of regulations with special need where we try to approach some government clients, they have a problem that their data is not residing within the UAE because they have some policies. What we usually do to handle this objection in terms of Google for example, they have provided an even sales force, they have provided a lot of documentation and how their data is secure and encrypted and no one will be able to access it. Now security and privacy majorly are the concern of cloud computing. It's not the technical functionality, it's the security and the privacy. So when it's a small company they don't really care. Because if you have your software within your company and if you are a small company you don't really have, you know we always ask questions for the customers: When was the last time when you checked for an intrusion detection? When was the last time you updated your firewall or antivirus. The answer is usually never because they have a small team. So relying on security or privacy on SalesForce is really superior on having it yourself. So when we talk about enterprises, we face some challenges in regulation because the data is not hosted in the UAE but try to convince them at the end of the day, when you subscribe for the cloud computing services, there is an agreement you sign that your data is confidential and with an SLA statement and again its' eventually a matter of trust. To be honest, yes we provide all the legal documentation, but again if the client is not really open to the idea we might have some issues.

S: But you don't know where the physical location of the server is, right?

G: I'll tell you what. For security reasons, SalesForce and Google don't say where their servers are just for a security server. I mean even for a very senior Google engineers, they don't really know where their data centers are. I think it's a good idea but no one knows why. We know that there is at least one year in the region and we know for example it's in Singapore, and we know we have a lot of data centers in the US, but we don't really know the actual physical location.

S: You talked about mostly security and cost when it comes to cloud computing. What other factors do your customers ask about when they want to adopt cloud computing? Are there other factors they stress about?

G: So we have security and privacy, this is the main challenge. Now let me tell you what other benefits come with cloud computing. The first thing that is really important the way I see it is elasticity: The level of how scalable the service is. So today we're a company with 20 employees, next year you're jumping from 20 to 150 users, so instead of investing in your hardware, you can just buy new license. That's all that you need to be involved in. So the level of scalability that you get with cloud computing, you can't really find it on-premise level. Just today for example a Google customer called me and said "We just have 20 users on board today, can I increase the level?" I said yes and within an hour they get 20 extra licenses. NO let's compare it with an on-premise solution, if you need to have 20 licenses, you need to approach Microsoft first to buy the Exchange license, you need hardware to get the storage, you need to make sure that if you're running a backup solution, you need to make sure that you enough licenses for your backup, you need to make sure you have space and storage. And there is no way to provision 20 users within an hour of an on-premise model. So the first thing I would say is the scalability. Now the second important thing is the feature. Again I'm going to take Exchange as an example. Microsoft has a release life cycle of three years. Every three years they bring a new software version like Exchange 2007, 2003, and 2010, so there is a gap of three years,. Now what we tell them is Google for example on the other side it releases small incremental features every two weeks, so instead of waiting for three years to have a big change you can at least, and it's good form the change management perspective, so instead of getting your users when a new completely version after three years, we can provide them with small incremental upgrades where you can manage and introduce it to the system instead of waiting for long times to have new features. So I say scalability, I

would say new feature releases, and the third factor is. Let me make sure, you don't pay for the upgrades. Now let's take Exchange for an example, you don't have to upgrade from 2000 to 2003 you have to pay for it. When for example on SalesForce on Google Apps all the upgrades come for free, you don't have for it, where on the other side you have to pay for the upgrade. The third factor I would say is the reliability where you have an SLA and have a commitment from the provider that the service is going to be up 99.9% overtime, where it's highly if you're not a really big enterprise with your own data center with your own technical team you will not be able to make it to this number.

S: Do you guarantee a very high uptime for your services?

G. Yes. Not the service level agreement usually comes from the cloud computing provider, which is SalesForce, Amazon, and Google in this example. I can provide you a link with the Google SLA. Let me look for it. I will paste it to the chat window. So this is the link for Google SLA, and you can see that they guarantee a level of 99.9% uptime and the cool thing for example is each company they handle the downtime in a different way. So for example if you have a fail down with Google more than 99.9%, they get you credit and pay you for the down service. They give you money if the service is not guaranteed. Where in SalesForce they give you three subscriptions for additional days, something like this. So the service level agreement is not provided by my company, but by the cloud computing provider.

S: So up to now the factors we were talking about are the features, scalability, cost, and reliability. Other than these factors, are there any opportunities your customers ask for when they come to adopt cloud computing?

G: So usually this is what we are approaching. Feature, cost saving, not involving the IT department in it, scalability. I mean again everything is turning into the cloud nowadays. Usually the cloud is the trend for the future, so this is mainly here in the region. They are a little early adopters but if you look at the US or European market, it's a completely different picture. I'm just giving you the idea here of the Arab world of the GCC area pacific. But the cloud is the general adoption of the software providers. They're moving into cloud-based model. Think about nowadays you want to install a CRM. Instead of approaching and trying to install, and getting the hardware and making sure you have the resources. All you need to do is to go to SalesForce.com, get your credit card, and that's it. You're working right the next day unless you need someone like a consultant who comes and configures the CRM for you, but if you're a small business you don't need that so you're up and running next day. We can't do this on on-premise solutions.

S: We have been talking about the factors in terms of opportunities, but what about the challenges and doubts. I mean what are the main questions and doubts that you used to hear from your customers? You used to have very popular questions and you are already prepared to answer these questions? What are they?

G: Now the objections that we have is most probably in terms of privacy where my data is, how can I make sure that Google or SalesForce doesn't access my information. How secure is it? No one will be able to hack SalesForce or Google. We usually have some deployment challenges, like for example if you're using Google Apps obviously we're going to recommend using Chrome as your default browsers. But for some enterprises if you have multiple geographical locations and have a big number of user, it's a challenge to deploy Chrome for example and they would be using Explorer. I have client case where they have invested a huge amount of money into an ERP system which can only work with Explorer. So when they came and they got Google Apps, I said that you should use Google Chrome. There was a huge conflict between having the end user to bring them access to two different browsers because this would confuse the end users or just stick with Explorer and lose the functionalities that come with Chrome got Google Apps. So the challenge is security, privacy, and some technical deployment challenges. But usually it's not the cost because cloud computing in terms of cost always wins. Now there is another challenge which is funny, which you won't find on websites, and it's when you go to a medium company or a big enterprise and you

cannot tell the IT people "Hey guys, you know what, there's no Exchange system anymore, there is no backup anymore..." You would be taking their kingdom from their hands so the challenge is obviously the roles of the IT people are changing. They are losing their positions. They are not in control. Now if I tell them that were going to move to Google Apps, no one is going to administrate the Exchange anymore, so you have three people in the company and what they do is everyday Exchange work. Backups, upgrades, patching, a file was corrupted, they go the end user, they reset the mailbox, all the stuff. So these people are going to lose their job. This is where the challenge is because cloud computing is changing even the job description. So things are going to change. This is one of the challenges. Unless the IT guy really has an open mind and is open to the idea of using cloud computing, now usually what we tell those people instead of doing the stupid things, you can evolve your IT department in doing other creative stuff that can be evolving your business instead of letting them update the Exchange. Give the resources in other challenges that serve your business instead of them doing the regular options if you know what I mean.

S: Can I ask who's decision it is to adopt cloud computing? Is it the IT manger's decision or someone else?

G: It's usually not the IT manager but the business owner. The CFO, the CEO, but it's not the CIO. It's not the IT because usually in our cases, IT is a burden, they wouldn't let go of the control, they would love to be in control. So we usually would over to approach the business users which are usually in terms of CRM, there is a sales manager or the owner of the company, the CEO, but where we're implementing the Google Apps for example, we have to involve the IT because eventually they're going to support the users in terms of help desk and if any problems happen they're still proving the support for the users, but the decision is definitely not for the IT, it's the business user, it's the general manager at the business level. Not the technical department. Obviously the business user would like to have the approval because they think they're going to provide the support, they're going ask the IT, but the IT is not the decision maker.

S: We have many types of cloud computing. We have public and hybrid for example. What kind of cloud do you suggest or see in the public cloud, and what kinds of application is better to have in the private cloud? And when can we adopt the hybrid, for example?

G: What you're talking about is really more in terms of virtualization rather than software or platform as a service. When you're talking about a private cloud is when you're having you virtualized environment on-premise and then you install the software and provide it to the public. I mean this is really about the strategy of your IT. If you are a government sector, money is not an issue for you, usually they prefer to go for a private cloud solution where everything is under their control, they have the encryption, and money is not an issue for them. They have their location. The virtual cloud, the private or public cloud in terms of virtualization is in terms of a platform of a service. So in terms of cloud computing there are three major terminologies. You have the SaaS which is software a service, the PaaS which is platform as a service, and you have the IaaS which is the infrastructure as a service. Now the private and public cloud come as an infrastructure. Amazon provide private and public cloud to the clients but I don't see it as mature yet because imagine that you're running your operating system on the cloud. Now today with the handheld devices like the iPads and all of those stuff you can access the internet all the time and all you need to have is your operating system residing on your virtual machines, let's say on Amazon, and you can then fire up the operating system from the cloud and you can have if very cheap and they call them a thin client, and then you can fire up the operating system and everything is in the cloud. Now basically this is a big challenge because if you don't have enough bandwidth and the internet is down you're completely dysfunctional.

So I don't see the infrastructure as a service is mature yet but it's becoming more and more mature, it's not mature yet. But if you're talking about the virtualized environment, the only thing that you can go for it if you're really a government sector or big enterprise where money is not an issue, you already have all the technical resources, and would like to have everything on-premise. This is where software like VMware or

Sun Solaris where components come in place and you can deploy all those private and public and hybrid models of the cloud.
S: The target companies we have in focus are mainly small to medium organizations, would you believe that it would be better for them to adopt public or hybrid clouds, for example?

G: I'll tell you what. When you're talking about the public cloud term its' specifically means that you have your software virtualized. This is what the private/public cloud, because this has nothing to do with the SaaS or PaaS model, this is infrastructure as a service, so usually if you're a small to medium enterprise there is no way you can build your own data center and provide you software as a private solution to an enterprise. You usually go to the SaaS model where you don't have to invest in a data center, you just buy the license that you need and then provide it to the end user. So as a hybrid cloud I don't see it even as an option for small to medium businesses.

S: You know Geo, for banks for instance it's almost impossible to have their data on the cloud. I mean they must absolutely have their data inside their companies. But for instance in some applications where they don't need that much security and privacy, in banks they have different applications. They can then for instance accept some applications which are not that much secure and send it to the public cloud, and for me I see it as an option to have a hybrid cloud, especially in this case when you really have private data such as banks, correct?

G: True. Banks, insurance companies, hospitals, governments, military, these are form a sales perspective, we try to usually avoid these kinds of sectors because banking is a money-making machine and they don't care about the money, they have the support. Government, military, hospitals, insurance, they have the financial capitals to build their own data centers. So SaaS is not an option for them, PaaS is not an option. So they build their own data center and have everything virtualized. Having a public or private model is a decision that goes back to the IT, where how much they want to lease their infrastructure to the public, but yes in big companies the hybrid model, the private model, the public model could be a choice, this is really depending on what services those enterprises provide.

S: Can you please differentiate between this concept as you see it? IaaS, PaaS, and SaaS? Your main focus if SaaS, correct?

G: No, as a cloud concept we provide the three models: IaaS, PaaS, and SaaS. Now the most common service that we do is the SaaS obviously. Let me tell you the differences. SaaS is when the end customer pays for a monthly subscription and they get the service like SalesForce where they just buy the subscription. In PaaS, I'm going to give you an example, one of them is first.com the other one is Google Apps Engine where you have your own software deployed on the first.com hardware. Usually if you're running an application you would have a server and then you install the software on it and then you run it. In the PaaS the platform itself where you're deploying your application is sitting on the cloud. That's the platform as a service. Obviously the IaaS you don't have anything. All you have is a very thin client that's connected to the internet and then you're accessing your actual operating system is sitting on the cloud.

S: Perfect. So can we say that there is a specific kind or a group kind of industry which go to the cloud? Your customers for instance are mainly from transportation, for instance? Are there a specific kind of industry that you work with?

G: I'll tell you what honesty what everyone is willing. I'm going to tell you the other way around. I'm going to tell you the customers we're trying to avoid. Obviously we try to avoid government sectors, banks, health insurance, insurance in general. We have media companies, we have telecommunication companies, and everything that doesn't usually have those kinds of regulations or they don't really have a big budget, we don't start up with them. I mean one of the major airlines here in the UAE is a SalesForce customer. They have the financial capabilities, but they choose to go to SalesForce in terms of the CRM. So those are really

exceptions, but there exists some big enterprises to select SalesForce like a cloud computing base, but this is just an exception.
S: Can we say for instance that the custom applications which need to be studied and analyzed very well are not used to be taken to the cloud and the public propose of applications like CRM for example are in the cloud, correct?

G: Yes. I'll tell you what. That's true. CRM is a very broad terminology or word. CRM is the Customer Relation Management. Now every business has their own way of handling CRM. If you are a bank, if you're selling credit cards, if you're a media company you're selling advertisement, if you're a service providing you're using your CRM as a ticketing messaging. This is usually where the consulting companies come in place and try to implement the CRM to those customers. Now when you have a very tailored customer application that you need, this is where the PaaS comes in place.

S: Ok, I want to ask you about your providers. Which providers do you have and which ones do you personally prefer, and why?

G: Now we deal with SalesForce.com, we deal with Google, and we deal with Amazon web services. And you know usually three of them are different types of service. This first one provides CRM, the second provides email, and the third one provides IaaS. So it really depends on what the client needs. I like them all but eventually CRM is easier to sell. In Google Apps, the sales process takes longer, and the Amazon web service is really rare. So I mean it's a business decision eventually about what the user wants. We are willing to provide the three of them, but let me tell you personally for example, as an end-customer, I'm a subscriber for example to Spotify. Spotify is a music, on-demand music streaming service. I pay 5 dollars per month and get all the music in the world. I'm extremely happy with it. I highly recommend it. You can listen to music on your iPhone, and you're just paying 5 dollars per month. If you go to the store and buy a CD now, it's going to be more expensive and you're getting access to only one album. But here you're paying a monthly subscription and getting the world music library for a very cheap price.

S: You used to give presentations about cloud computing. Let me suppose that you have an interview with me and I'm school manager. How would you convince me to adopt cloud computing?

G: It depends about the model you're looking for. If you're looking for CRM I'm going to show you how the functionality that you have and the customization is very easy when comparing to an on premise solution. The customization SalesForce is very easy. It's very cheap. I promise you that you'll be up and running in one month if you're planning to have an on-premise CRM, it's going to take you six months to get the service and maybe a year. So with an online cloud computing solution, after a month you're working on the system, you're cutting your costs. It's very cheap, there will be a lot of feature that you're going to have, reporting functionalities, sales process automation, campaign management, lead management, and everything is included. That's if I'm pitching you for CRM. If I'm pitching for an email solution, it's cheap, Google Apps have 25 GB of storage, and no one else provides that. Any other solution provided 1 up to 10 GB and you pay for it, whereas in Google Apps 25 GB is almost unlimited storage for email. It's more secure SLA, and it really depends. Every customer has a buying end factor that we as sales or presales engineers try to understand what is the catch. Why do those customers come for us in the first place? We try to understand that and then we try to shed the light on this aspect in itself.

S: Going back to the downtime. How much can it affect your customers? If downtime does occur eventually?

G: Alright. Let's talk about the CRM for example. Usually let's say you're managing your sales process through a CRM and you want to send a customer quotation, if SalesForce is down, obviously you won't be able to send the quotation, and your wholesales process is going to be delayed. It's really important to send the quotation to your customer in the right time because you might be considering buying from someone

else if you don't send them this quotation at the appropriate time, there's a problem with your business. If you're talking in terms of Google Apps, if you don't have access to your email, you can't do anything because businesses today use email as an official medium and they use it heavily. So it really affects the business but again let me give you another example. If you're using FedEx and you're a shipping company, if you're using cloud computing and you're tracking your shipment through cloud computing and then the system is down, I mean your whole business will be down. But let's say in terms of CRM, if it's down for one hour and you don't have that customer that you need to send the quotation, it won't be that critical. So it really depends on the solution you're providing with cloud computing but as in general, all those providers respect the business aspect for the end client and they provide high SLA to guarantee that this is a much better solution than an on premise solution.

S: But mainly you can't do anything about it. It's not your problem, it's that of the provider, right?

G: That's absolutely true. We as a professional service provider, we make sure that the customer understands us, we show the agreement, but then there is nothing because when you buy the license, you're buying it from Google or SalesForce, you're buying it from cloud concept. You're just getting the professional services from our side.

S: Ok Geo, we are really thankful for your time.

G: No problem, I will give you a resource I was looking at previously to tell you about.

S: Take your time. Of course.

G: Now another big provider of cloud computing is Rackspace. Now Rackspace is a competitor for Amazon, that's why we deal with them You can check them out if you wish.

S: Of course, we really appreciate everything. Is it possible if we can ask you some follow-up questions via email or any other medium you prefer?

G: I'm usually busy throughout weekdays, but I can definitely get back to you during the weekends which is Fridays and Saturdays here.

S: Thank you very much for you time, you've been really helpful.
G: The topic you guys are researching is the future. I'm really glad that you're doing this and I wish you all the best.

S: Thank you very much. Take care Geo.

G: You're more than welcome. You too.

A.3.3. Interview Guide - Transcript Accenture

19. April 2012, 2:00h – 2:40h

S= Student
H= Nicolas Rosengren

S: Hello Nicolas. Hope you're fine. I wish to ask for your permission to record this interview if you don't mind?

N: Hello. Ofcourse, it's okay. It'll be fine.

S: Thank you. Sir, now we are working on our Master Thesis and it's about Cloud Computing adoption. Mainly we are supposed to read and write a literarture review, understnad what people have studied in this area, and conduct interviews with people from practice who work in this industry to see the differences, similarities, and find a way to enhance research in the area of cloud computing adoption. So we are 2 Master's students and this is the last task in our program. So can I ask you about the core business of your company.

N: Accenture is an IT and business management-consultant firm. We advise companies within IT and provide other services, mainly consultancy and advisory. If you're asking what I do it's in advisory in IT and cloud computing.

S: That was my second question, so what you mainly do is to go to cusomters but not give specific advise about cloud computing. You give advice in general IT, correct?

N: In general we mainly consult in IT and management, which is a big part of our businesses and we also do outsourcing for example.

S: So I want to ask you, do you have some IT products, do you have your own software or you just connect some software providers with customers?

N: So we manily do consultancy and we don't have a lot of products. We have started to use some for development and actually now within cloud computing. Just to give you an example with somthing called exchange components for the insurance indsutry, that's specific with that type of companies. We provide previously a package that came with when we did the implementation at the companies, there we provided the cloud solution. But consultancies is the core business, but we're increasing products within the software aspect.

S: Do you also provide hardware services like hosting or others?

N: Actually no. We have the infrastructure outsourcing where we take infrastructure from other companies, but we don't provide our own infrastructure. So often we use hardware from other providers. If we provide cloud solutions for example, it will not be our hardware it will that of someone else, like NTT or others.

S: How much cloud computing products constitute of the products you provide? More than 50% for example?

N: It's much less. We believe a lot in cloud computing and we're moving towards that and we believe that much of the software products that come today will go to the cloud in the future. But if you have the situation it's slim how much we have cloud cpmuting in our company.

S: So we can call it a trend that's happening in your compnay now, corect?

N: Absolutley. Because we do a lot of advisory also on cloud computing and we take our own medicine you could say. Even if we look at our internal IT department we're looking at how we can cloudify our infrastructure internally. So you can say that it's somehting we believe a lot in.

S: So I want to ask you what clound computing means to you? How do you define and see it?

N: Accenture itself has a specific definition of cloud computing. I can send you an email on that if you wish.

S: Yes, please, we would appreciate it.

N: I think that my deifintion is that if you have a service from software to infrastructure, and you provide services over the internet for a fee that you pay over time. So it can be per use or per month, or per annual. I will send you the document soon.

S: Do you ask customers if they want cloud computing, or is it the customers who come to you and ask for clound computing?

N: Mostly it's consulting companies like ours or IBM that are interested in cloud computing so we make discussions with the companies, so we don't get a lot of requests but it comes forth in our discussions and they start to ask about it. But it's a hot topic if you don't know what's going on in the industry and it's the number one trend in the next five years. We believe in cloud computing, but if you're looking at the number of projects and clients who are using it or asking about it, it's quite limited so far.

S: Okay. What about the opportunities that your customers see in cloud computing? How do you convince them to adopt it, and what are the factors that convince them to adopt cloud computing?

N: I think there are several advantages with cloud computing. One, if you look at the time in 2010, and there were alot of cost-capping in companies, and it was a hot topic then, because if you look at housing infrastructure it's much less if you go to Google or Amazon or one of the cloud providers unlike traditional provders like IBM and CC. Of course you don't get the same benefit, but you get a lot of extra services form these types of providers. You get more SLA's, guarantees and so on but if you just look at raw cost for your storage like 1G per month, it's a big difference per cost if you use cloud computing. So that is one factor for companies. When we talk to IT departments and so on, like IT directors or CIO's, they are a bit concerned, because they feel like they are being of some of their powers, if you can say. So some of them have less cost when you have less people working on-site. SO the CEO's and CFO's can see the cost benefits and round it. But we want to show they we are proactive, that we are considering cloud computing and we have to calculate what we can and cannot take into the cloud. But what we're saying it to start using it, it's not like we're saying move everything to the cloud. We try to convince them to either do a strategy or have them look into what they can move into the cloud, or give it a try in a test environemtn for example for a certain system, try to move to the cloud and see how it works with you. So most of the time we deal with customers trying to move to the cloud.

S: So can we say it's mainly cost which attracts comapnies to adopt cloud computing?

N: I think that is one if the top drivers. Reasons where companies do not like cloud computing could come from integration probelms, security concerns when moving out your critical data into the cloud, but I can send you a list that can furhter delve into these things.

S: That would be really helpful because that also asnwers my second question. So you think for the doubts it's manily security and integration, right?

N: Yes so I think those are the two main topics and if you look at pro-sides, it's manily cost and time to markte it's quite fast. If you want a server at Amazon it will take you half-an-hour maybe. If you need an IP address you pay with your credit card and it's pretty easy to do it. If you're looking at a traditional hosting provider and need your own server it usually takes weeks or months before you can get it and it takes a lot of time. If you have a fast project that would be a plus for using cloud computing. So the main advantages I think are the cost and the time to market and then the main conerns we get about are integration and security.

S: HOw do you deal with these doubts? What do you answer when somone tells you they don't believe cloud computing is the answer?

N: A couple of things. When it comes to moving your core and essential data, it would be a valid point to make from the customer's side, but ofcourse every company has some systems which are not critical for example it could be the test and development providers that I talked about. It could be e-mail, so instead of using outlook which is the standard in some companies and exchange servers from Microsoft, you can instead have your own cloud soution from Microsoft. Where you pay per use or per month and your data is in the sky basically. So that is something you can try out and we have done this before. We have moved all our e-mail to Microsoft cloud solution. So that's one example of what we could do, so it's not "all in", it's about what you should put in the cloud or not.

S: I want to ask you who are the main providors you deal with? Like Amazon or Google?

N: We were working with them all mostly, we are a global company, we have 250 thousand people working for us, so it's mostly all providers and when it comes to cloud computing and we're talking about infrastructure outsourcing and we're using underneath, so we can use anybody basiacally. But right now we're using NTT, they're got telephoine, telegraph, and they're a Japanese telecommunications company.

S: Have you ever had some of your customers adopt cloud computing and then decide to de-adopt it?

N: No I think that it hasn't gotten that far. If you're using it for outsourcing or infrastucure or data centers, so we have seen a lot of companies doing alot of outsroucing and you're seeing the companies taking in on-house again. Some companies offer data center services and take it in-house again. I think we have seen a similar trend in cloud computing but right now it's more about what to bring in the cloud. I think it will take time before people experience issues and take it back again. That will only only happoen after a period of time and for certain areas.

S: When you meet for instance new customer and want to convince them about cloud computing. I think you already have a list of points to make sure to tell them about. What are they?

N: It's all about the advantages we talked about but we are used to convince them to adopt cloud solutions and interanlly we have to know how they operate and give them ideas of what can be done and they understand how big players are doing it, and the get more confident to do it. So for example where I work we have made a couple of cloud implementations, and one is where they had a solution which basiaclly where small or meduim sized companies put all their invoices to the Danish government into play and this was a solution put forth by Accenture and then as a later step we moved that solution to the cloud on an Amazon infrasturcutre and they got a lot of cost-savings doing that. It's something we encourage customers and governmental sectors to do. Data from theses sectors have moved to the cloud and it gives also companies confidence that it is possible. Another issue we had was with a compnay that needed to stay

within the EU. Because of some data the sensitive data should stay within the EU, another wanted it in the US, so it was okay to move for them as long as this was possible.

S: But I know big compnaies like Google and Amazon don't tell the exact location of their servers.

N: That is true. They are shifting around capacity around the globe. But you can setup dedicated servers in certain places so it can be possible in some cases.

S: When you have these regualtions, does it constitute a problem when it's a big problem, right? But is it the same response from companies like Google, Amazon or others?

N: You don't get the same faciliteis form the cloud providers. When it comes to the location aspect it can be solved because you can get a dedicated server in a specific country if that is necessary. But you have other issues like 99.9% uptime for example, but if you don't succeed in doing that companies who get downtime will get compnesated.
S: Can we say that this flexibility lies only with big companies like Accenture? I was speaking with a small company owner and he was saying that they don't give any kind of flexibility (big companies) and so forth.

N: You're probably right. If you're working with bigger companies and have big problems you can get more flexibiltiy. But it's not like if you're working with smaller providers because then you can tailor-shape your solutions more. So that's one drawback for moving into the cloud.

S: The product is already provided by the cloud provider and the customer is here, what is the role of your comapany exactly?

N: That is a good question. First of all we do advisory work and we say what we should move to the cloud, the strategy to use and so on. So it's consultancy/advisory. We talk about implementing and configuring systems, so if you have standard system or self-process service for example or if you have another system or software and want SaaS it's about the configurations and intergrations and that's where we come in play. We come in and help them from that path, so we look over projects and systems for example SaaS, like SalesForce. Costs could include training, integration to their internal systems, configuration and otehr services around, not just software, and we look into these things.

S: Can we say there is a problem of ease of use in these kinds of software? Is that why we need third party companies to help us in configuration or use?

N: First of all we have the experience, we have the skilled people to deal with them and companies could have a probelm themselves. So if a problem arises they don't have the staff to do it. To implement a new system it will take you a year and instad of hiring people to do it you take consultancy with that specific project.

S: You mentioned one of the points we can tell customers what can be taken into the cloud. Are there specific kinds of applications that can be taken into the cloud and that of cloud computing?

N: One obvious one is like email for example to be taken into the cloud. Another one is web applcations. Systems that are already on the internet, why should be running in cloud solutions? Web services for example. CRM systems when it comes to these software is another example. So there are things you can move to the cloud and other things when for example when you're a large company and have a couple of days or weeks when you have a lot of visitors on the website nad you take a lot of capacity from the cloud, and you pay for that instead of buying new hardware. What we believe is we move stuff like that out of your core business. If you know systems like ERP and Oracle you wouldn't want to have in the cloud. So basically core and sensitive applications should remain in-house or at your out-sourcing provider.

S: You mentioned that some integration problems can happen? What kind?

N: If you have your own data center and out-sourcing provider, all your services and other applications are closed on the same network basically, it's easy to make communication between that. If you're having a cloud solution maybe in another part of the world, you have a lot of latency on the network, so you could have some issues in terms of performance for example. It could also be security issues in the firewall and can't connect between the internal and external systems. And that If you just have stand-alone systems like a webpage just move it out of the cloud should be fine, but if you have complex applications integrated into 20 or 30 internal systems, it's a lot of work to get that through the internet and through whatever provider you use.

S: Is there a specific kind of company that goes to the cloud? Can we say that banks don't go to the cloud or perhaps partly like specific kinds of applications? What about media and telecommunications companies? Are they willing to move to cloud computing?

N: That is a good question. What you said about media and communcations companies and insurance companies are more laggers. They will take more time to move to cloud computing. As you said it is more industry-specific, but I also think it is specific to the leadership you have in the companies. Some are reluctant and other would like to try it, so it's up to the specific companies, but I agree with you when it comes to the idustry perspective, especially banking or insurance.

S: Does it also depend on the size of companies?

N: I would say yes. I think larger companies will take longer time to adopt these trends and technologies. I think it's more than efficient for smaller companies, also it's difficult for small companies to have all the IT or recourse or infrastructure knowledge they need. If you have different databases and uploading systems, you can't have that in-house or out-sourced to pay for theses types of services, you see a cloud solution is easier for smaller organizations. So I agree with you also there, I think larger companies take more time to adopt cloud computing.

S: But why? What are the factors that make small companies adopt and large companies not adopt so quickly?

N: One reason is because they have a large volume and it's not easy for them to move and they could have their onw solutions internally, so they have the scale. Another one is goverments and regulations as to move to the cloud. It's not easy with large companies. A lot of poeple will need to agree in order to move to cloud computing.

S: After I adopt cloud computing, I have to pay for it. What are the pricing strategies available in the market and which ones are prefered by customers?

N: So I think it's not that flexibile as its meant to be, but pay-per-use is what people are asking for and you just pay for the capacity per hour basis is possible. It has the prefered way to go. Of course you still have traditional ones which forecasts your usage, then you can often decrease costs because the provider would know how much you're using. But then there's more flexibility in usage.

S: You said when you go to cusomters you help them with the applications and strategies, but what do you mean when you say strategies?

N: You tell them what they're looking at, what type of technologies and applications that they should move to, and how they should mix between cloud in our data center and out-sourced data center so in 3 or 5 year

time frame what they should adopt and change. It could be advice of how to have good security and so on, so it's about the direction of how to adopt cloud computing for example.

S: What about the decision of adopting cloud computing? Do you think the change of IT culture affects the decision of adoptiong cloud computing and how does it affect it? Some IT people can start losing their jobs, how can cloud computing change it?

N: Absolutely and that's what I meantioned here as well. Poeple can be reluctant to it becasue they feel that they will lose power and jobs and so forth. If you're looking at CEO and CFO's could be more intricate, but to be more honest, you have this large scale of cloud providers and they will deal with less people. But on the other hand more jobs will be needed in terms of making it happen. Making the integrations and configurations and so on there will be another type of work probably, and new types of skills will be needed though there will be still a lot of work. I think that if you look at outsourcing you will see a similar trend, before everybody did everything themselves, more or less, and then they came to move things to India and China and doing implementation and programming with off-shore, low-cost companies. Now it's much more standard. Some jobs have been lost and moved because of that, but other jobs are being created as well so we will see a similar trend in cloud computing and it will be only the begining, but we're trying to have more and more every day when it comes to usage. So I think it will take time, if you look at analysts ofcourse it will take more time than expected.

S: What about availability? For instance I'm using a product and rely on it, and it's not in my compnay, so I might lose connection to the servce. How can you solve this? Is there a way to solve it by having a hybrid solutoin or it doesn't happen at all because they provide 100%?

N: That's a good question, I mean we provide high reliability, but the networks and the network connectivity that you have is very important here so if you're just running out of the internet, so you have an SSL connection on the internet, that could be unstable and you might lose the connection so if you have servers running you might lose your data. Ofcourse if you have a large installation you could have a leased line or cable or fiber (dual location), but that's the concern with cloud computing. You're much more dependent on network connectivity for uptime.

S: So we can say it's not the provider's problem regarding the availability? It's the problem of the adopters?

N: Yes, exactly. Cloud providers don't have a lot of penalties. They care about their reputation and they can have a good uptime for exmaple, but if something should happen it's mainly the problem of their customers because they will lose a lot.

S: I want to aks you personally if you see it secure? Do you trust it personally regarding securtiy and privacy?

N: I use it personally so I trust it. If you're looking at e mail as one example, people are using Hotmail or whatever cloud solution, or Facebook, so people are using that in general so I think it's more accepted to people use cloud than companies, so there will come when companies will adopt it as well.

S: But you know Facebook is a social network, not a business of someone, and we still have doubts about Facebook and how they deal with our data, so I don;t trust Facebook 100%.

N: It's true and I believe that it will be so for many poeple and if you look at some compnies which is one of the issues (moving sensitive data into the cloud) they move to the cloud because even if might be safe as you have in-house then it may be safer because they have the skill to do it well. So it's also about the feeling.

S: I have read that some of the oppertunities in cloud computing is about flexibility, and you didn't mention it at all. Is it not seen by the cusomters?

N: It could be other things, it could be if you're running on a certain amount of usage of your hardware of infrastructure, then maybe once a month you build it, then you need another capacity, but then you take things to the cloud and run whatever you need to have for one life, and then you buy the capacity again, but I think flexibility is one factor that should be takne into consideration.

S: Just one last question about SaaS, IaaS, and PaaS. Do you think that specific kinds of companies go to each or other factors that determine what type model of the cloud these companies adopt?

N: Absolutely. I think from my perspectvie if you look at company sizes and industries and all it doesn't vary that much. I think IaaS will probably be used by smaller companies who don't have the capacity to do the procurement of hardware themselves. Larger companies have agreements with other hardware companies so they can still provide their infrastucture through them. I think it's basically the same. You can probably think about it in a matter of industry and size because it might be a small company using cloud computing for email and another for CRM and that can happen in most cases and won't make a big difference in adoption.

S: One more question please.

N: Of course!

S: Now I see applications like CRM going into the cloud, do you think that soon we will see specific kinds of applications being moved to the cloud?

N: I think we will see a lot of providers make cloud solutions more and more and you could say they would make specific software for specific companies like oil companies for example, so there will be different solutions for different industries and for different parts of companies. We're in the .com era so there's a lot of different companies doing a lot of new stuff and we will see a lot of new players with the cloud solution tyring to have a piece of the cake from the larger traditional players from the software side. So far it's the Infratruscutre part like from Google or Amazon. I think we'll see the same on the SaaS side so a lot of players will try to do their CRM and ERP system which will be easy, fast, and so forth.

S: Can we say it's manily a trend in third world countries or maybe more as they don't have the infrastructure for it, and maybe less interest is given in Denmark and Sweden because they have a stringer infrasturcure?

N: That's a good question. I've been looking at Accenture as a global company and I don't see a trend like this. But it's mostly about the technologies....

S: Thank you very much for you time and we will send the thesis to you as soon as it's done. Can we ask you any follow-up questions if it's possible?

N: Ofcourse, you're welcome anytime. Take care.

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