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Research paper

Cloud Computing in Industries: An Evaluation Regarding Cost and Security

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Abstract

In this study, the companies which their data being handled by external parties has investigated and the parameter of cost as well as security have been considered. Moreover, an over view has been presented as to analysing the cost reduction and security of data. In this regard, cloud computing in industry has been introduced so that internet-based access to different computing resources such as software, platforms, and infrastructure provided to be facilitates. Adapting the method of cloud computing, Companies put faith and trust into a third party to handle the company's electronic-based services, where security might poses as a concern. In conclusion, Companies can be then free from IT related matters and focus on the business productivity. Additionally, it has been proved that, in this case the benefits outweigh the security and privacy. Therefore, this essay recommends industries, particularly new SMEs, to utilize and benefit from Cloud Computing. However, this essay discussed only the cost and security factors more research should be done on evaluating other aspects that might concern industries such as Cloud Computing performance.

Keywords: *Cloud Computing; Security in data; the cost reduction; IT related matters*

1. Introduction

Most companies have an information technology (IT) infrastructure, used to electronically create, process, store and distribute information and data, managing its activities. They usually have on-site databases to store their data and IT framework. This can be considered as the traditional typical method of handling IT solutions (Hoy, 2012). These solutions are based on computer technology, which has evolved tremendously in the last decades. One of the main improvements is the internet revolution, the wireless anyplace anytime available network, which contributed to the usage of cloud computing technology. Cloud computing (CC) is defined by The National Institute of Standards and Technology (NIST) as a model that facilitates upon-request internet-based access to different computing resources such as software, platforms, and infrastructure provided by a third party (Mell & Grace, 2011). These resources are stored off-site and accessed through the internet. For example, the CC provider Amazon's Elastic Compute Cloud can offer an infrastructure as a service, where clients rent a huge amount of computing power and use it (Hoy, 2012). CC is a trending concept in the IT world (Georges cu and Matey, 2013). This affects the way industries handling their technical-based solutions (ibid).

There are industries who have already switched or are trying to switch their IT infrastructure from the traditional way to CC. In contrast, there are others who do not consider it as a worthy technical solution because they are troubled about the idea of their data being handled by an external party (Rostov, Gusset and Kostoska, 2012). Accordingly, this essay will target the latter kind of companies and will discuss the cost and security factors, the two main aspects that are important from these companies' point of view. It will also present an overview about CC, examine the cost reduction and investigate the data security. Finally, the essay will conclude by recommending these industries to implement this state-of-the-art technology despite the security issue.

2. Overview

CC is able to transform the traditional way of hosting and handling the IT resources. It has the capacity to virtualize computer facilities by providing them as a service through the internet from CC providers (Lenk, Klems, Nimis, Tai & Sandholm, 2009). Consequently, industries only have to use a computer to access the services of CC without the need to physically build the IT infrastructure on-premise (ibid). CC can provide "everything-as-a-service" for the companies (ibid) on a pay-per-use basis (Keskin & Taskin, 2014).

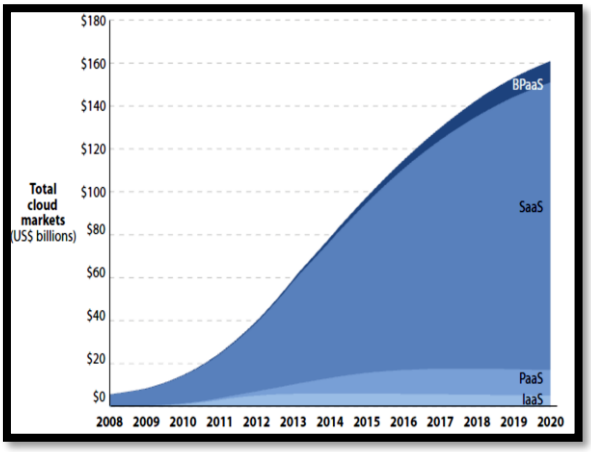

Fig. 1: Global Cloud Market Size from 2011 to 2020 (Georgescu & Matei, 2013)

Many companies, particularly Small and Medium Enterprises (SMEs), have the desire toward adopting CC to empower and enhance their functionalities. As Höfer and Karagiannis (2011) reveal, several businesses, even those who are not technology-based enterprises, would like to discover the potentials and advantages of CC. Moreover, according to Mcafee (2011) the Chief Information Officers of the US called for moving $20 billion of federal IT expenditure into CC environment in 2011. Furthermore, figure 1 shows that CC market is currently worth $80 billion, and it is projected to reach $160 billion by 2020 (Georges cu & Matey, 2013). This demonstrates how significant the future of this market is.

Main companies have changed their view about CC in just one year and decided to move to CC (Georges cu and Matey, 2013). For example, Microsoft and Oracle, two of the main IT companies in the world, changed their view about CC. The Chief Executive Officer (CEO) of Microsoft was considering CC as an inferior method and currently all Microsoft use it (ibid). Moreover, the Oracle CEO was undermining the credibility of CC, but at this moment Oracle is one of the largest CC providers worldwide (ibid). These leaders encourage the rest to accept CC and understand its intensity. However, they should also evaluate its possible issues.

3. Cost

One of the main goals of any business is reducing their expenses. Since businesses spend an enormous amount of money on technology-based solutions while trying to rise their Return on Investment (ROI), CC can facilitate the expenses reduction (Keshavarzi, Haghighat & Bohlouli, 2013). For example, instead of spending money on building IT departments hosting the technical infrastructures and data centres, and instead of employing workers to maintain them, companies can hire a third party that will provide all of these by subscription-based fees (Zhao, Scheruhn & Rosing, 2014). According to CuriousRubik (2014) survey, around 82% of companies used CC reported a reduction in cost.

Critics may argue that well-established companies should build their own IT infrastructures on-premise. They might claim that this kind of companies is able to meet the expenses of wide-ranging enterprise software, obtain data centres and make them accessible through different devices to employees, contractors, traders, and partners (McAfee, 2011). However, CC is seen as much more than a financial prudence tool for companies (Keskin and Taskin, 2014). Georges cu and Matey (2013) list three different benefits of CC implementation; it is cost-effective, quicker to execute, reliable and scalable. Moreover, according to the NIST, CC has five main features that answer most of the businesses' needs. It has an "On-demand self-service" feature, supplying the clients with the needed resources automatically. Also, it offers "Broad network access" where it can be accessible through different platforms such as mobiles, personal computers and workstations. Moreover, it provides "Resource pooling" where it is able to supply several clients by allocating physical and virtual resources based on the clients' desires. It has "Rapid elasticity" capability where it can flexibly adjusted. It has the "Measured service" ability where it can measure any given service. As a result, the company can gain all the benefits and cut the IT staff, the purchase price and the maintenance cost, also reducing electricity needed to operate the datacentres (Hoy, 2012). Companies will only pay for operating cost, leading to decrease the expenses. Furthermore, organizations tend to improve their IT framework towards supporting their performance by ready and up-to-date technology-based resources. In order for companies to accomplish this goal in the traditional way, they need a high-quality IT staff to sustain the work and carry out the maintenance, the administration, the capacity planning, the troubleshooting and the backups (McAfee, 2011). This might be difficult to accomplish, especially for SMEs, along with the fact that it may distract the company from the chance of development and inventiveness.

CC offers means for companies to pursue their objectives cost-effectively without being concerned about all of these technical-related requirements (McAfee, 2011). Additionally, it is a time saving method. The time necessities for the implementation and installation of new IT systems can be reduced (Zhao, Scheruhn, and Rosing, 2014), which consequently might be beneficial for the business. A case study (Cloud Director, 2014) shows that thanks to CC, about 90% of Pactum Asset Management firm IT responsibilities were eliminated, which contributed in saving time and money. Moreover, Keskin and Taskin (2014) state that adopting CC in industries offers several business continuity features such as system discontinuation eradication, network and information security management enhancement. Over 80% of the companies with CC revealed a growth in production (CuriousRubik, 2014). This can be advantageous especially for SMEs that cannot afford the adoption of all of these requirements (Zhao, Scheruhn, and Rosing, 2014). Therefore, they can take benefit of the CC features along with the fact that it allows them to pay only for what resources they require when they need them (Georges cu and Matey, 2013).

4. Security

The main issue that companies concern about is privacy. Privacy advocates claim that CC raises some information security questions (Mahajan & Singh, 2013), and also some CEOs have concerns regarding how safe a CC environment is (McAfee, 2011). They base these conclusions on the fact that the data is stored outside the business boundaries (Zhao, Scheruhn, and Rosing, 2014). These concerns are valid to a certain extent. The danger of an outside access in Europe companies, for example, is about 57% in large enterprises and 38% in SMEs (Giannakouris and Smihily, 2014). Data security on CC means the security of data while communicating through the internet and also the security of the data stored in CC's datacentres (Singh, Sharma, Lehal, 2011). Privacy supporters may also point out that if a provider failed to secure the data, catastrophic consequences might occur such as losing a fortune or causing lawsuits and problems (Hoy, 2012).

CC vendors, however, must grant at least the basic security features such as data protection and integrity (Singh, Sharma, Lehal, 2011). Data protection is to guarantee that personal data is not accessed without the approval of the company, to prevent unauthorized users from accessing the data and control internal IT security by not undermining the data protection (ibid). While data integrity is regarding the data transactions between the company's computers and CC's databases. These data must be accurate, stable (not changeable), isolated (not accessible), and fault-tolerant (ibid).

However, it is fair to say that these security threats exist in the traditional method similarly. Many businesses receive hundreds of threats i.e. malware, viruses, spam (McAfee, 2011). Having the IT infrastructure on-premise does not guarantee data safety (Hoy, 2012). Privacy advocates and CEOs may also assume that there are many well-defined multiple security standards for the traditional way, and because CC is a new technology, they may assume that it struggles with defining its security standards (ibid). However, a variety of international standards and best practice credentials are currently covering CC security (Singh, Sharma, Lehal, 2011). For example, Rostov, Gusset and Kostoska (2012) confirm that almost all the providers are ISO 27001:2005 certified. This means that they use ISO 27001 standard from the International Organization for Standardization (ISO). This standard is designed to guarantee that sufficient and well-balanced security controls are being selected to provide assurance to concerned parties (ISO/IEC 27001:2005, n.d.). Moreover, studies propose that CC provider quality certifications such as ISO standards help in assessing their overall quality and capabilities in security (Son, Lee, J. Lee, Chang, 2014). Additionally, in CC there are many technical solutions to secure the data that are already in use such as the utilization cryptography method (protecting data by encrypting it from others) (Mahajan &

Singh, 2013). It seems, therefore, that CC can be considered as a safe environment. Statistics show that around 50% of the companies utilizing CC send important data through it (CuriousRubik, 2014). Arguably, businesses might obtain security on the traditional way of hosting by monitoring the threat settings continuously, having excellent protection technologies and also employing skilled security specialists (McAfee, 2011). All of these and more are available in CC. The providers should be able to deliver them because they have more dedicated resources and expertise (Hoy, 2012). In conjunction, providers tend to have technical specialists who are capable of handling the threats (ibid). These facts can give companies the confidence to utilize CC. Moreover, in order to achieve security in CC, they should choose a reliable provider and understand what the contract includes in the case of breach or data loss.

5. Conclusion

In conclusion, CC is the next generation for obtaining IT facilities, where almost every computational resource is reachable as a service (Singh, Sharma, Lehal, 2011). There is a huge impact on businesses today, due to the increase in the adoption of CC method. CC adoption exceeds the implementation of the traditional way at 51 to 49 ratio (CuriousRubik, 2014). CC proponents have a "Pay as you go!" slogan (Georges cu & Matey, 2013), which also represents the transformation of the means of acquiring technology-based solutions. A company pays for the provider, who runs all the professional management of the IT solutions, to acquire the required services. This contributes to reducing the need for human and technical resources that will help in decreasing the expenses (Zhao, Scheruhn, and Rosing, 2014). In addition, CC is able to grant companies a competitive advantage in the market with its features (Mahajan & Singh, 2013). Moreover, it could increase the system's scalability, agility and availability. It offers, additionally, large databases and backup mechanisms (ibid). Importantly, via the utilization of CC, institutions will focus more on accomplishing their goals without concerning about the technical infrastructure (ibid).

Adopting CC will make companies to put faith and trust into a third party to handle the company's electronic-based services, where security might poses as a concern (Hoy, 2012). However, greater confidence in data security might be reached by employing a specialized trustworthy CC provider (Georges cu and Matey, 2013). Companies can be then free from IT related matters and focus on the business productivity. Additionally, the benefits outweigh the security and privacy concerns as argued above (Hoy, 2012). Therefore, this essay recommends industries, particularly new SMEs, to utilize and benefit from CC. Yet, to achieve a successful implementation of CC in a business, the right provider should be chosen after considering all the threats, vulnerabilities and security concerns (Singh, Sharma, Lehal, 2011). However, this essay discussed only the cost and security factors more research should be done on evaluating other aspects that might concern industries such as CC performance. Further research should be made also on the appropriate method for companies to switch to CC.

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