Cloud Computing for Increased Business Value

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Abstract

In today's business world with the amount of economic downturn and loss happening every day, the need for reliable, yet affordable technology is needed more than ever; cloud computing fills that void. Cloud computing offers its customers reliable service at flexible prices that do not break the bank. However, as good and innovative as cloud computing may be, it does not necessarily mean that cloud computing is good for all businesses. By researching the cloud computing services available, this paper explores the benefits, as well as the drawbacks of cloud computing within the business realm. By using Amazon's cloud computing services as a model, this paper determines which types of businesses would most benefit from using cloud computing as part of their everyday operations. The author finds that in most situations small businesses reap the most benefits of cloud computing. Finally, looking to the future of cloud computing, the author comments on the role that cloud computing can play in businesses in the future.

Keywords: cloud computing, small business, Amazon, benefits, drawbacks, technology, infrastructure, grid computing

1. Introduction

Nowadays, companies continue to grow larger and larger, not only in the number of employees, but in the number of departments and type of employees. In cases such as these, cloud computing is a resource that is readily available to help companies meet their needs and accomplish their goals. Especially in small businesses, cloud computing is an excellent technological tool that can benefit the business. All businesses need to respond to competition by making better use of Internet services and offering more incentives than their competitors. Cloud computing can help business shift their focus to developing good business applications that will bring true business value. It can serve as a vital improvement to the business by acting as a potential disruptive innovation for its employees. However, these businesses should be mindful of the uses of cloud computing, as well as which services provide suitable public or private clouds (Staten, 2008).

Since businesses are constantly trying to outwit their competition, cloud computing technology has become a popular idea and service. Countless companies make use of cloud computing, and in various ways. Cloud technology does not need to be created by the company that uses the cloud; rather it is provided by a cloud company infrastructure. For example, every company in Benchmark's portfolio uses Amazon's cloud infrastructure in one way or another (Ha, 2009). Even though, cloud computing is an innovative way to increase business value and productivity in the workplace, the use of this technology should be only for the people or workers who have access to the Internet right away. In some case, offline workers cannot use this technology because it is solely offered online (Miller, 2009). Therefore, cloud computing, in order for it to be used successfully, must only be used by companies that meet specific criteria with specific needs and resources.

This paper will discuss the use of cloud computing and how cloud computing technology focuses on delivering true value to the business. Section II will provide a definition of cloud computing and how it is currently being used. Section III will explain the benefits and drawbacks of cloud computing technology. Section IV will focus on the financial benefits that Amazon's cloud computing services can give, more specifically how it can decrease expenses. Furthermore, this section will explore which type of businesses benefit most from cloud computing. Finally, the paper will conclude by reiterating some of the benefits of cloud computing before looking to the future of cloud computing.

2. An Explanation of Cloud Computing

Cloud computing is still a hot topic today. However, even with all of the talk about cloud computing, there seems to be some debate as to a set definition of cloud computing.

It is basically a technology that is used to access different services on the Internet "the cloud." For the purpose of this paper, Haag and Cumming's definition will be used. According to Haag and Cumming (2010), "cloud computing is a technology model is which any and all resources-application software, processing power, data storage, backup facilities, development tools… literally everything-are delivered as a set of services via the Internet"(p. 205). Users of this technology can access the provided services on the Internet without having any previous operational knowledge. It is divided into a number of segments that include the cloud infrastructure, cloud platforms, and cloud applications. This type of technology involves a number of researchers and engineers from different backgrounds, such as grid computing contains software engineers and database experts (Wang &Laszewski, 2008).

When it comes to competition, of course, each business wants to be better than the next. Its goal is to increase their profits with minimal output. To do this, many turn to cloud computing, but the use of cloud computing is not just spreading between different businesses; it is also about who provides the best service to its customers. Cloud computing has a number of different providers that a business could choose from. These providers are Amazon, Google, IBM, Yahoo, eBay and Microsoft. However, each one of these providers offers different functions within their cloud computing service. For instance, Google and IBM have already built different data centers that students can tap into over the Internet to program and research remotely (Lohr, 2007). Most of these companies have built services that use cloud computing to predict the market, tailor pricing and optimize their procurement and manufacturing. Moreover, these companies have come up with different Internet consumer services like social networking, email and Internet that use cloud computing.

Cloud computing is considered to be better than other computing, meaning it offers better services and features than other computing options. This can be seen in that some cloud computing interfaces do not require users to change their working habits and environments (Wang &Laszewski, 2008), which is just one feature that makes cloud computing different than others, such as grid computing. In grid computing, users have to learn all the commands to access the service. It is essential in cloud computing to use virtualization, but in grid computing it is only necessary in the beginning. Also, a major different between these two types of computing is the application development. Cloud computing varies from grid computing slightly, where development applications are actually in the cloud, while in the grid these applications are only local. Moreover, the use of grid computing is more complex, whereas cloud computing is simpler (Weinhardt, Anandasivam, Blau, &Stößer, 2009).

Cloud computing has different types of developments. Three important models or developments will be explained to give a better understanding about what cloud computing is. One development is called software-as-a-service (SaaS), this model allows users to pay for the software per one use. Another development called hardware-as-a-service (HaaS), which means that computing processing capacity is purchased on the web. For example, Amazon allows their customers to purchase data storage online from a service called elastic compute cloud. Lastly, another development is infrastructure-as a-service (IaaS), which allows cloud computing users to pay for the technology on a pay per use basis. The technology includes firewalls and anti-viruses software (Haag & Cumming, 2010).

3. Cloud Computing Advantages and Disadvantages

Today, cloud computing tends to be different than other computing. People use cloud computing in countless ways. Some people see cloud computing as virtualized computer resources. On the other hand, other people see it as a dynamic development or a deployment of software fragments. As previously mentioned, this kind of computing is not only different from other computing, but it also supports interactive, user-facing applications, such as web applications. Some of these web-based applications are accessed via browsers to not only to access these applications, but also to get the taste of desktop programs. The use of cloud computing is an easy thing for developers. As a result of this, developers can retrieve application fragments such as a very simple web service or the third party software libraries because cloud computing implies component-based application constructions (Weinhardt et al., 2009).

Also as mentioned before, cloud computing is a new technology, however like all technology it comes with both benefits and drawbacks. Cloud computing can be seen as a beneficial tool for businesses for several reasons. To begin, businesses can have lower cost computers for users. This means that the user does not have to have a high powered computer to run cloud computing web-based applications as these applications run in the cloud, not in the desktop or PC. Again, because the applications are run from the cloud instead of running them on a computer, cloud computing can improve the performance of a desktop PC.

It is not unusual for many companies to have very high IT infrastructure costs and it is with the use of cloud computing that it actually lowers the costs of these infrastructures. As a result companies do not have to invest in a large number of powerful servers; the IT department of companies can then use the computing power of the cloud to enhance or change the internal computing resources. Another benefit is that cloud computing drives to lower software costs. Software can be an expensive resource for organizations. Organizations do not need to buy separate software packages for every single computer in the organization. Software can be accessed from the cloud by the business' employees. This type of technology provides a higher capacity of memory storage, so users do not have worry about their PC's memory storage (Miller, 2009). Moreover, cloud computing technology is actually able to improve compatibility between operating systems (OS). The user's OS can be connected to the cloud and still share documents with other users who have a different type of OS.

Lastly, cloud computing provides the ability for multiple users to collaborate on projects or documents in the cloud. This point has been reiterated and reinforce recently as a major selling point to businesses. TV commercials and print advertisements have attempted to gather support for cloud computing by selling the idea that employees can work remotely, yet still efficiently through the use of the cloud. Cloud computing provides the ability to access documents from a distance. This may come as a relief for the forgetful employee that left his/her document in work or for companies that require employees to travel by giving him/her access to these documents from the cloud. The only requirements are a computer and an Internet connection. If these requirements are available for the user, documents can be easily accessed from anywhere (Miller, 2009).

Yet still, while there are many benefits to using cloud computing, like all things there are some disadvantages as well. First of all, the use of this technology requires a constant Internet connection. In order for users to connect remotely to documents or applications stored in the cloud, users need to first access the Internet. Moreover, the Internet connection needs to be a strong speed connection. For example, if the user is downloading a larger document from a web-based application, it requires a large bandwidth for the connection. Also, if a high-speed connection is not used, the cloud can be slow in some cases due to the speed of the connection.

The cloud seems to have limited features in applications as well. This can be seen when doing presentations in Google's doc. in the cloud; it is not the same with doing these presentations in Microsoft PowerPoint. Some features might be lacking when it is used in the cloud. One of the important disadvantages that users should be aware of is that it can be a little difficult for users to just simply store their documents in the cloud. Furthermore, data stored in the cloud can be unsafe. If the cloud was to go down and the user does not have a backup of her/his document, he/she will simply lose the document. It is also hard to trust cloud computing to store confidential document, in that it is possible for the cloud systems be hacked and accessed by unauthorized people (Miller, 2009).

4. The Use of Cloud Computing to Improve Business Value

The concept of cloud computing in business may sound ideal and easy to implement, but like all new technology being introduced into a business that already has a system and method in place it has both positive and negative aspects. As previously mentioned, cloud computing has both benefits and drawbacks, however it is vital to examine if these benefits and drawbacks are beneficial or detrimental to businesses when deciding whether or not to implement cloud computing. Although cloud computing has been recognized as a way to improve business, not all businesses are the same. So, is cloud computing for all businesses or is it more beneficial for a certain type of business with certain infrastructure already in place? One service provider that has been paving the way for businesses is Amazon. To narrow the scope of this research paper, Amazon's cloud computing services will be used to give a better idea of the uses of cloud computing in business, as well as how it can improve business.

Amazon's cloud computing services serve as a model for this paper to describe cloud computing services due to the fact that its cloud computing services are one of the best available. Amazon has different branches of its company in seven different countries. Also, it has more than 79 million active customer accounts around the world, along with around one and a half million active seller accounts. Moreover, it has around 400,000 registered Amazon web service developers along with 17, 000 employees around the world (Vaira, 2008b). Amazon's platform includes the web services. Furthermore, Amazon provides its customers or sellers with web services that they can use to have easy access to documents, share files and applications, as well as store documents in the cloud (Vaira, 2008b).Taking a closer look at some of the services that Amazon offers will help determine what the business benefits of cloud computing are and who benefits the most from these services.

Amazon offers its customers Elastic Compute Cloud web services. This web service has several advantages for customers, including elasticity, flexibility, decreased costs, and reliability. Another one of the services that Amazon offers is S3. This service is mainly created to securely store business's information in the cloud. Many companies like to store their information in the cloud as a way to reduce the expenses. By doing this, companies can save money instead of buying various powerful servers for storage. Rather these companies can just pay for this service and use Amazon's storage to store their information and allocate their funds to other areas within the business.

The point of any business is to increase profit, while decreasing cost. Amazon's cloud computing has the ability to decrease costs in several ways. Especially, as businesses begin to downsize as a result of economic hardship, cloud computing can serve as a tool to not only decrease costs, but simultaneously increase profit, build better business relations, and remain current on technological advances. To begin, Amazon's Elastic Compute Cloud web services can reduce the costs of cooling and power, new servers, and server administration and management (Greggo, 2009). Thus, with these reductions a business is able to then reduce the amount of space, equipment, and energy needed to run the same business only cheaper and more effectively. Moreover, it enables businesses the ability to provide standardized and lower cost services (Etro, 2009). As a result of these reduced expenses, businesses will be able to free up operational budgets for new investments for direct business benefits.

Also, Elastic Compute Cloud services can not only save companies money on the amount of hardware they must invest in, but also in the number of employees that they must hire (Varia, 2008a). This point is extremely beneficial for new businesses trying to get started. Also, for companies looking to reduce personnel because of limited resources or cutbacks, cloud computing can come to the rescue. The use of cloud computing will allow businesses to cut the cost of numerous employees for a task that can be completed by a few employees through the use of cloud computing (Galarneau, 2009). Furthermore, as a result of the reduced amount of hardware needed, business can cut the number of operations personnel once needed to manage hardware. However, while management may see this point as a benefit, for those working in IT departments this issue would be seen as a negative. What's more, is that by using Amazon's services, the hardware requirements can be increased or decreased within minutes, making the service elastic for its customers.

While cloud computing can limit the number of employees needed on a given project, it can also bring together the key players in business. Amazon's cloud computing services can help teams, customers and suppliers meet, share ideas and basically do business more effectively and without delay (King, 2008). Given that team members, customers and suppliers can be given access to the cloud, business can be conducted like never before. The use of cloud computing in any given company can help give them the edge over their competition, which ultimately increases business value. This shared access also essentially shortens the time it takes for customers or suppliers to access the market (Klems, Nimis& Tai, 2009). When the market is virtual and constantly accessible, both business profits and relationships can grow.

In addition to shortening the time it takes for buyers and sellers to get to the market, Amazon architectures also shorten the amount of time that it takes to process "compute-intensive or data intensive jobs." Amazon cloud architectures offer parallelization, which can reduce processing time. For example, "If one compute-intensive or data-intensive job that can be run in parallel takes 500 hours to process on one machine, with Cloud Architectures, it would be possible to spawn and launch 500 instances and process the same job in 1 hour" (Varia, 2008a, p. 2). Therefore, it can be seen that Amazon's cloud computing services can not only reduce costs in terms of hardware, but also save money by saving time in turn allowing for the business to grow. Still though, business growth can also be a problem. Even though business growth is what businesses essentially strive for, if a business outgrows its infrastructure then they may begin to slip backwards. Through the use of Amazon architectures, businesses not only have room to grow, but also scale back if need be. Pay-per-use services allow for businesses to only pay for what they need. This service will save system administrators from worrying about hardware procuring or making better use of excess and idle capacity (Varia, 2008a). Now, system administrators can have the applications either request more capacity or relinquish unused capacity.

Moreover, Amazon's system does not require a specific amount of capital to be invested, providing for inexpensive services. Amazon allows for customers to pay for the services used, instead of paying for a service, only to find that the business did not used the services paid for or greatly exceeded the amount of service purchased.

Specifically, Amazon's Elastic Block Store only charges $0.10 per gigabyte of storage and $0.10 per million IO transactions (Kondo, Javadi, Malecot, Cappello& Anderson, 2009). This demonstrates the flexibility of Amazon's services for users in that it allows them to choose the specification of each individual instance of computing power purchased (Varia, 2008b). Although the use of Amazon's cloud computing services can be seen as highly beneficial, not all businesses are ready to jump on board. Many businesses have doubts about whether cloud computing services, like Amazon, are able to service large businesses in a way that is cost efficient and reliable (Seeley, 2008). Large businesses have voiced concerns over the use of cloud computing. Some of the concerns include initial start up costs and data center constraints. These large business concerns are not unfounded; however their reasoning may be under informed. The initial start up cost for large businesses may be expensive, as switching between any services can not only incur new costs, but most importantly can be time consuming (Staten, 2008); and in business, time is money. However, the long-term costs of switching services may be more profitable for large businesses willing to make the shift. Using the costs of Google Apps and Microsoft Office Professionals as an example of the cost of switching services, it can be seen that Google Apps only costs $50 per user per year in contrast to Microsoft Office Professionals which retails at $499.00 (King, 2008).

Likewise, Amazon boasts reliable services because it makes use of Amazon data centers and network infrastructure (Vaira, 2008b). Large businesses fear that data centers may not be able to keep up with their extensive needs. Also, the possibility of outages forces these same large businesses to rethink the use of cloud computing services. Data center downtime would result in profit loss. Still though, outages can happen both within a business' own IT department, as well as with Amazon services. However, it seems more likely that outages would happen within a business' own IT department, rather than with Amazon's services (Seeley, 2008). This is not to say that Amazon's service has never had an outage. In 2008, Amazon's S3 service was down for six hours (King, 2008). With less server outages, system administrators can focus their attention on driving innovation to improve business growth allowing for increased business value. So, it can be seen that cloud computing services, like Amazon's, can be used by all business types. Still though, they may be more ideal for smaller businesses or especially ideal for businesses just starting.

5. Conclusion

As demonstrated throughout this paper, cloud computing has numerous benefits. Although, like all technology, cloud computing services have many drawbacks as well, it can be seen that the benefits of cloud computing outweigh its negative aspects. Making use of cloud computing correctly and efficiently in a business can not only increase profits for a company by allowing fewer employees to work remotely, but it can also increase the productivity of a company. Employees no longer need to wait for its members to gather to work on a single project, rather they can commute to the cloud via the Internet to work from wherever, whenever while still remaining up to date with their project partners. As more and more companies turn to cloud computing to save money and to increase business value, the future of cloud computing becomes more uncertain. It is uncertain how cloud computing service providers will react to their competition. How will these service providers continue to try and outdo their competition? What seems to be certain is that the popularity and userability of these services will only continue to increase, especially while companies are continually forced to adjust to decreased budgets, layoffs, and a struggling economy. Cloud computing offers its customers the services it needs to be successful, innovative, and in step with their competition.

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