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Cloud computing: Does every cloud have a silver lining?

Introduction

Up in the clouds, we go. Ever wondered where pictures uploaded on your Facebook profile are stored? How about files that you keep on your DropBox, that you conveniently access wherever you are and whenever you need them? Perhaps, it is more intriguing to ask where videos you have uploaded in YouTube are being kept. Are you not curious enough to ask why your Google mail can provide additional storage capacity when needed? All the answers to these questions lead us to a single direction—to the clouds.

The cloud defined

Cloud computing, as defined by National Institute of Standards and Technology (NIST), is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. It is an advanced IT model that enables sharing and hosting of resources from both hardware and software. Organizations share a pool of IT resources and applications as a service, without the need to hold physically these resources internally (Brobber, et. al, 2011).

According to Rawal (2011), cloud computing can be compared to an electric power supply that is availed on per usage or per need basis. The main concern is to have a service that is seamless and uninterrupted wherever it comes from. Similar to such concept, users will be able to rent virtual machines, software and applications as the business need arise. It then facilitates the access to an organized pool of computing resources that is being reserved and released as the users' needs.

Cloud computing has made IT resources widely accessible to a vast range of users that allows the performance of various functions such as data storage, hosting and communicating, in a less costly and more efficient manner. Various IT solutions have been made available thru the cloud that would not have been present under traditional IT models.

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Cloud nine: Benefits of cloud computing

Cloud computing as a service has promised numerous benefits to its users. Majority of the qualitative researches in this field has identified perceived and actual benefits of cloud computing. The topmost benefit derived by enterprises that migrated to the cloud would be cost reduction. In a survey conducted by Alkhalil et al. (2013), they noted that majority of small and medium enterprises in the United Kingdom has significantly reduced costs associated with IT investments through cloud computing. This further confirmed an earlier study by Craig (2012) who emphasized that for most small businesses, cost reduction is a priority area. Since IT resources are being rented and not purchased, costs are controlled and long-term capital investments can be substantially reduced (Agarwal et al., 2012). Clients are not required to physically setup an infrastructure or hardware for a specific purpose—the Internet would be sufficient. Maintenance costs were also reduced significantly since the burden of meeting maintenance requirements has shifted from the user in an in-house IT infrastructure to the service provider under the cloud.

Scalability and improved flexibility are also among the expected benefits provided by cloud computing. Under the cloud, businesses would not be constrained towards being stuck with an IT investment that would not address a changing need. As their business environment changes along with their information needs, cloud computing would easily adapt to such changes (Alkhalil, 2013). Services are being availed on a per module basis, which implies that businesses would only avail modules specific to their needs, as opposed to availing an entire general-purpose IT software (Aserkar, 2011). This reduces the risks of overprovision such as wasting business resources since they will only be paying for resources that they actually use and under provision such as loss of revenues due to unnecessary and uncertain business flows (Alali, 2012). Since the cloud is a pooled resource, it also accommodates changes in terms of capacity requirements that would facilitate handling and managing business transactions, regardless of the change in volume.

Aside from the abovementioned benefits, mobility is also one of the most evident benefits provided by cloud computing. Users are able to access data and information that they need regardless of how physically close or remote they are from the infrastructure (Agarwal et al., 2012). Users are then able to access information whenever the need arises and wherever they would be, allowing for faster decision-making. Data are not confined to a specific location where physical access would be a requisite to obtain the necessary data.

One of the most glaring benefits of deployment in the cloud is the access towards new business technologies. Aserkar (2012) noted that through cloud computing, small businesses are able to use state-of-the-art and latest computing resources, to which they have little access. The pooling of resources in the cloud brings about a wide array of sophisticated computing resources. Small businesses are then able to cope with the pace of innovation in technology through the cloud (Agarwal, 2012). In line with that, ease of software upgrade, which is a major consideration of businesses, is also evident in the cloud (Aserkar, 2012). Service providers take care of the necessary software upgrades, ensuring the most recent version of software as a service is deployed in the cloud.

In a case study conducted by Agarwal et al. (2012), improved operational efficiency is one of the resounding benefits of cloud computing in reference to three manufacturing companies. Significant reduction in order-processing time, reduction in inventory carrying costs through increased inventory turnover, efficient tracking of materials and improved multiple location management were specific areas under which operations has significantly improved. The integration of cloud computing along with specific business operations has reduced non-value adding time that could be devoted to enhancing the business' core competencies.

Clouds bring rain

Cloud computing has provided a spectrum of promising benefits that adopters, specifically small businesses could greatly take advantage of. However, it also exposes users to various risks and challenges that make cloud computing as an unattractive business solution. Duta et al., (2013) specifically defined cloud computing risks as occurrence of an event associated with cloud computing adoption that can have undesirable or unwanted consequences to users.

Concerns on data security and privacy are among the top barriers to cloud migration. Unauthorized access to sensitive data deployed in the cloud that is isolated through a remote server in the Internet is a major security concern for businesses (Alkhalil, 2013). This would entail access to sensitive data that could lead to alterations and damages. Data leakage and loss is a critical security concern in the cloud environment that could be due to technical deficiencies. This could further lead to financial losses, reputation damage and even operations disruptions (Peng, 2009).

Furthermore, data security and privacy concerns in the cloud stem from a control and trust issue (Almorsy et. al, 2012). Deployment in the cloud reduces the IT manager's control and thus, reduces the direct oversight of the IT manager. IT managers often believed that something beyond their direct oversight heightens the risk of security compromise, which will only be identified once the compromise has happened. It is an inherent feature of cloud computing services that IT operations outsourced to a third party will impose lesser transparency to users who have limited control over cloud-subscribed services (Chow, 2009). Security concerns in the cloud are further heightened by the loose monitoring process implemented by service providers given the complexity of the cloud environment (Jaeger, 2008).

Along with privacy and security concerns comes the lack of standardization in the cloud. Pearson (2009) and Amburst (2010) both argued that cloud data are often stored by cloud providers in different countries, as a strategy to reduce costs and maximize their profits. However, this exposes users to risks associated with inconsistent protection laws for business data stored among countries. For instance, European entities adopting cloud services provided in the United States are concerned with the US Patriot Act, which gives the government access to sensitive data (Amburst, 2010).

The nature of the cloud in itself has also raised concerns regarding constant availability of cloud services. Instances have been noted wherein cloud services have been temporarily unavailable or out-of-service due to inadequate system maintenance of vendors and internet disruptions that could prejudice system reliability and availability (Williams, 2010) Another highly perceived threat relating to cloud availability is the occurrence of denial of service attacks (DoS). Dutta (2009), for example, revealed that 69% of the IT experts surveyed believed that there is a medium to high possibility of a DoS attack in the cloud. A DoS attack happens when legitimate users of Internet services are being prevented by attackers or hackers to use effectively such related service (Lau et al., 2000). This attack leads to interruptions in the entity, which would cost users a considerable time in order to restore normal operations. Since the cloud is an internet-based service, it is then very susceptible to such interruptions and service disruptions.

An inherent feature of cloud services would be the presence of a vendor that provides the needed service under a contractual agreement. This, however, leads to another risk in cloud-based services, vendor-lock-in. Different cloud vendors would provide cloud services that would vary significantly and would pose satisfaction issues on the end of cloud users. No matter how dissatisfied users are, they would have a hard time switching from one cloud vendor to another (Armbrust, 2010).



The only way to answer these uncertainties is to take the big leap forward and try the cloud itself.

In addition to such, potential costs and time associated in moving applications and data across cloud servers would hinder users from switching cloud vendors. Legal restrictions that are also imposed in the cloud contract agreements further locks cloud users to a specific service provider.

Are we cloud ready?

Cloud computing is anywhere and everywhere. It has changed the IT landscape among businesses across the globe. However, one primary question to deal with is—are we cloud ready? Adopting an innovation such as the cloud gives us answers to problems existing in traditional IT models. However, it also raises questions to be dealt with.

First, it is critical to establish how individuals understand the concept of cloud computing, or if they are even aware of such. In a study conducted by Alkhalil, Opara-Martins and Sahandi (2013), 48.5% of the respondents were either unaware or not sure as to what cloud computing is. As a relatively emerging concept in IT, it is essential that an understanding of cloud computing be established. Before fully scrutinizing the benefits and threats associated with cloud usage, understanding what the cloud is and how it works should be done first. Cloud service providers along with IT experts could aid in the process of educating individuals with what cloud computing is, so that individuals will not just see one side but both sides of the coin.

Aside from establishing a clear understanding of the cloud, an extensive assessment would come next. Does the cloud meet the needs of businesses? Prior to migration to the cloud, individuals should first assess their business processes, along with their strategies in order to see if the cloud is a viable

solution for them. The extent to which the cloud would be an advantageous solution for businesses would depend upon how addresses specific business needs. The cloud is not a one-size-fit-all solution, thus, it must be carefully assessed and evaluated. The success of one organization in the cloud does not automatically translate to the success of another.

Does the cloud really have a silver lining? Cloud computing, as a relatively new innovation is set to transcend traditional IT capabilities and exceed expectations in terms of providing benefits to its users. However, as in any innovation, risks and threats that greatly hinder the growth of cloud computing cannot be eliminated completely. The greatest challenge today is how cloud computing could be widely understood and eventually be widely accepted by a wide range of users. Fear and uncertainty brought about by the threats and risks in cloud adoption could overshadow all the benefits it provides. Is the cloud a double-edged sword that could both make and break a business organization? Cloud computing gives us both answers to our previous problems in the past, and at the same time, raises questions that must be addressed today. The only way to answer these uncertainties is to take the big leap forward and try the cloud itself. Let our firsthand experiences with cloud usage and adoption take us a step further, to fully improve the cloud and make it an ideal IT solution.

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