Cloud Computing: 
Should it be Integrated into the Curriculum? 

Chuleeporn Changchit, Texas A&M University, Corpus Christi, TX, USA

ABSTRACT

Cloud computing has become increasingly popular among users and businesses around the world, and education is no exception. Cloud computing can bring an increased number of benefits to an educational setting, not only for its cost effectiveness, but also for the thirst for technology that college students have today, which allows learning and adopting to these new technologies easier for them. This study aims at investigating how cloud computing is perceived by college students and which factors have a tendency to encourage or discourage them to accept the cloud computing as part of their course curriculum. The results in this study reveal that all five factors, perceived usefulness, perceived ease of use, perceived security, perceived speed of access, and perceived cost of usage are factors that play an important role in encouraging students to accept cloud computing as part of their core curriculum.

Keywords: Cloud Computing, Education, Perceived Cost, Perceived Security, Perceived Speed, Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA)

INTRODUCTION

Nowadays, technology tends to serve as a driving force for the advancement of economic systems and the quality of life. In a workplace, technology plays a major role in improving productivity and efficiency, reducing costs, and enriching customer services. Technology also changes the way many people are doing business. Technology continues to develop and become a big part of the world each and every single day. People all over the world are adopting new technologies in order to fulfill their needs. One major benefit of technology nowadays is the ability to process big data at lightning speeds, which also requires a larger capacity for data storage. Cloud computing has attracted much attention in both commercial and academic settings. It is estimated that by 2013, the cloud market will have reached $8.1 billion (Lin & Chen, 2012). This computing model has become tremendously popular due to its benefits such as cost-effectiveness, scalability, usefulness, ease of use and worldwide accessibility; although security is still a top concern. Those are some of the benefits that are attracting users and institutions to adopt the cloud services.

Education is a driving force for the continuous improvement of cloud computing. Students can gain a lot with this model as the technology makes a convenient mobile storage space (Singh & Veralakshmi, 2012). Cloud computing can bring an increased number of benefits to an educational setting (Behrend, Wiebe, London, 

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& Johnson, 2011). It is not only the cost effectiveness, but also the thirst for technology that college students today have, which allows learning and adopting these new technologies easier for them. Cloud computing can be used to students’ advantage in an educational setting for completing assignments, online classes, group projects, creating and editing papers and presentations; as well as for work or entertainment. With many benefits yielded by cloud computing models, it is interesting to find out how students perceive this technology. The success of integrating a course into a curriculum depends a lot on students’ attitudes toward such topic. Therefore, it is crucial to examine the factors that encourage or discourage students to accept cloud computing as part of their course curriculum.

LITERATURE REVIEW

The cloud computing business model has been around for decades in various forms such as Application Management Services (AMS) and Application Service Providers (ASP). However, due to the higher cost at that time (both for hardware and services), the technology was only feasible as an outsourcing solution to very large organizations who could realize savings based on economies of scale (Altaf & Schuff, 2010). Although the concept of cloud computing has been around since the beginning of the computing industry in the 1960s, the technology has only recently become robust enough to provide computing services via the Internet (Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011).

Cloud computing is defined by the National Institute of Standards and Technology (NIST) as a model for enabling ubiquitous, 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 (Santalesa, 2011). The high demand for more advanced and efficient technology has contributed in the creation of new advancements in technology such as cloud computing. The popularization of cloud computing by companies like Amazon®, Google®, and Apple® ensure that the usage of the cloud as a storage medium for music, movies, and other media content files, will be ubiquitous in the next 10 years.

Cloud computing is a promising prospect for educational institutions, especially during budget constraints. Research in cloud computing adoption in educational settings has focused parts of its efforts to understand the drivers and constrains of students and schools to adopt this computing model. With today’s technology, students’ learning is no longer confined within the classroom. The educational environment could be improved to allow students to access learning resources anywhere and anytime (Wu, 2013).

One study examined the factors leading to adopting cloud computing as a virtual computing lab for a class (Behrend et al., 2011). The authors in this study found that students’ ease of use perception would positively affect intentions for future use, but not for actual use. Students who complete their work faster and in a more practical manner were more likely to recognize cloud computing as an effective service, and use it more if there is no “effort to learn”. This study also found that students with anxiety about new technologies had a negative effect on perceived usefulness. Another study also suggested that in order to deal with technology anxiety, it is important for universities to plan a hands-on training to help students become more familiar with these new technologies (Blue & Tirotta, 2011).

Cloud computing is found to be extremely useful and having a “tremendous potential” in classrooms (Denton, 2012), because of its “pedagogical advantages”. The high demand for cloud computing, as well as the scalability and reduced cost on IT services has made it more likely for cloud computing to be part of university curricula (Chen, Liu, Gallagher, Pailthorpe, Sadiq, Shen, & Li, 2012). Integrating cloud computing services such as collective note taking, presentation creating and editing, spreadsheets, and more will influence students...
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