Users' Acceptance of Cloud Computing in Saudi Arabia: An Extension of Technology Acceptance Model

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ABSTRACT

Cloud computing has become a popular topic in the research community because of its ability to transform computer software, platforms, and infrastructure as a service. However, cloud computing literature currently lacks user studies despite the fact that users play a crucial role in the success and failure of emerging technologies. This paper presents a study aimed at investigating users' acceptance of cloud computing in Saudi Arabia. As a baseline, it utilizes the Technology Acceptance Model (TAM) along with five additional factors believed to affect users' acceptance of new technology in the region in order to achieve the study goals. These factors are gender, age, education level, job domain, and nationality. The results demonstrated a high level of acceptance of cloud computing and a valid TAM in its standard form. The results also indicated that age, education, job domain, and nationality have a significant effect on users' attitudes toward the adoption of cloud computing. However, no difference was found in the attitude toward the adoption of cloud computing between male and female employees.

Keywords: Cloud Computing, Cloud Computing Acceptance, Saudi Arabia, Technology Acceptance Model (TAM), Users

INTRODUCTION

In 1955, a new concept was proposed, aiming to provide computing services for public utilities, such as gas, water and electricity was proposed (Parkhill, 1966). This concept remained a dream for approximately 40 years. In a trial to make this dream real, grid computing was proposed in the early 1990s as way to make supercomputer capabilities available to all who need them (Foster & Kesselman, 2004). Currently, cloud computing has emerged as an important topic that differs from grid computing in providing Software as a Service (SaaS) and Platform as a Service (PaaS). By taking a look into the literature of cloud computing, it can be ascertained that researchers have focused on finding the most appropriate definition of cloud computing, technical and economic potential, and so on. Researchers also have proposed various tools and models of cloud computing that help in solving different problem domains. However, the literature lacks user studies in cloud computing in spite of the fact that users
play an important role in the success and failure of technologies.

Therefore, this paper presents a study aimed at investigating users’ acceptance of cloud computing. This case study was applied to employees of information technology organizations in the kingdom of Saudi Arabia. The Technology Acceptance Model (TAM) (Davis, 1989) is one of the dominant models currently used in determining users’ intentions to use a new technology. It assumes that acceptance of new technology can basically be predicted based on two principles: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). These principles are believed to significantly affect users’ attitudes toward using the technology. Moreover, Behavioral Intention (BI) to use a technology, as posited in the model, can be determined by users’ attitude together with perceived usefulness. As such, behavioral intention defines Actual Use (AS) of this technology.

Previous studies have shown that TAM is an effective indicator for predicting the acceptance and usage of new technologies in different domains, such as information security (Fahad Al-Harby, Qahwaji, & Kamala, 2010; Boswell & Reithel, 2006; Lai & Li, 2005; Polatoglu & Ekin, 2001; Wang, Wang, Lin, & Tang, 2003), learning technologies (Sek, Lau, Teoh, Law, & Parunowo, 2010), gender differences (Al-Harby, Qahwaji, & Kamala, 2009; Gefen & Straub, 1997) and new systems and interfaces (Amoako-Gyampah & Salam, 2004). Therefore, the Technology Acceptance Model (TAM) was used as baseline to predict users’ acceptance of cloud computing in Saudi organizations. It was extended with five factors: gender, age, education level, job domain (i.e., profession) and nationality. These factors were anticipated to affect users’ acceptance of new technologies in the region. The results of this study can be used as a basis for researchers and IT practitioners in the region who would like to adopt cloud computing effectively.

The paper begins with a brief description about cloud computing in terms of definitions, classifications, architecture, economic values and benefits, and current cloud services. The paper then describes the adopted research model and presents the hypotheses. Then, the experimental instrument used to collect the data is described prior to discussion of the obtained results in terms of validation tests, sample profile and hypotheses testing. The paper concludes by interpreting experimental results into recommendations and guidelines that would help IT practitioners to adopt cloud computing effectively in Saudi Arabia.

CLOUD COMPUTING

Various efforts were made in order to find an appropriate definition for cloud computing. For instance, Hays defined it as on-demand computing, software as services or the Internet as a platform (Hayes, 2008). However, this definition seems to be general and does not give a comprehensive technical view. In an effort to give a more descriptive definition, Armbrust and colleagues defined cloud computing as applications that deliver services over the Internet where the hardware and software systems in the datacenter provide these services (Armbrust et al., 2009). In this definition, cloud refers to the hardware and software in the datacenters, and the applications can be defined as software as a service (SAAS). Based on these definitions, it can be noticed that cloud computing helps in adopting IT services without considering the infrastructure and hardware required running these services.

There exist various technical terms that need to be understood when speaking about cloud computing. SaaS, for example, is an important term related to cloud computing and is defined as the delivery of applications to users through the Internet-based infrastructure in different locations (Knorr & Gruman, 2008). Platform as a Service (PaaS) is also a term related to cloud computing, which is the delivery of development environments and software systems as a service (Knorr & Gruman, 2008; Luis, Luis, Juan, & Maik, 2008). Buyya, Yeo and Venugopal (2008), on the other hand, defined cloud computing differ-

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