Chapter 74
An Analysis of the Factors Affecting the Adoption of Cloud Computing in Higher Educational Institutions:
A Developing Country Perspective

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ABSTRACT

This article aims to examine the main factors that may hinder or facilitate the adoption of cloud computing (CC) services by higher educational institutions in developing countries, exemplified here by Oman. A conceptual model was developed through extending the technology-organization-environment (TOE) framework. Data was collected from 387 IT decision makers working in four higher educational institutions in Oman using a cross-sectional survey. Data was analysed using structural equation modelling based on AMOS 22.0. The results show that behavioural intention (BI) towards adopting CC services in higher educational institutions was influenced by top management support, relative advantage, attitudes towards change, technology readiness, complexity, government regulation, peer pressure, and data concerns in their order of influencing power. These all together accounted for 58.3% of the variance in BI. However, compatibility, vendor lock-in and external expertise did not have an influence on BI. This research provides original insight for cloud computing adoption within Oman from a managerial and IT professional perspectives. Specifically, this research would be helpful for government agencies,

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cloud computing providers and policy makers at higher educational institutions. It will also explain the relatively low penetration rate of cloud computing services at present, which will help in formulating strategies to encourage the adoption and acceptance of CC services by Omani higher educational institutions, where CC is still considered an innovation.

1. INTRODUCTION

Technology today is one of the most important elements of development in various sectors (Gangwar, Date & Ramaswamy, 2015). As a result of the interest in technology around the world, all organization and information technology managers try to implement new technologies that help them to improve the quality of their work, increase the productivity, reduce the cost and increase the benefits (Arvanitis et al., 2017). A new technology concept has emerged which is termed CC. Cloud Computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the data centres that provide these services. Some researchers define CC as an updated version of utility computing. For example, Arpaci (2016) describes CC as a distributed computing technology that provides dynamically scalable computing resources including storage, computation power, and applications delivered as a service over the Internet.

The cloud-based services free organizations in setting up IT infrastructure by allowing them to use services and pay the charges only for the extent of the usage (Lal, 2015; Ratten, 2015). CC has advantages of location independence, cost effectiveness, maintenance, and scalability which support the organization's approach in sustaining competitive advantages (Tariq et al., 2017; Priyadarshinee, 2018). However, there are some barriers that may hinder the adoption of CC services (e.g. security, privacy, trust, compatibility, and data concerns) (Priyadarshinee et al., 2017; Gupta et al., 2017; Palos-Sanchez & Correia, 2018). Other factors slowing the adoption of CC services include lack of top management support, vender lock-in and external expertise (Alharthi et al., 2017; Loukis et al., 2017).

In recent years the Internet has accelerated the use of cloud services to support the educational online system. CC is known as a recent model that enables users to have computing resources on demand and pay by use (Sultan, 2010). It has been used widely in education; educators and students store and share their data widely in the cloud (Sultan, 2010). Nowadays data can be stored in the cloud enabling its access to be more flexible. CC has changed the structure and elements of high education in a positive way. Furthermore, the CC is beneficial to students in terms of flexibility, scalability, and supporting online learning (Sabi, 2016). Once CC services such as Google Drive, Dropbox, SkyDrive, and iCloud are integrated into educational settings the learner can have a learning advantage in terms of performance, effectiveness, and efficiency (Oliveira et al., 2014). The availability, flexibility, and ease of use are other benefits of CC in higher education (Lee, 201; Haffar et al., 2017). In addition, CC adoption in educational institutions has reduced the research and learning cost through IT infrastructure, data centres and applications (Sultan, 2010). For instance, various IT services can be rented at The Washington State University in USA (Sultan, 2010). CC in the US educational sector has improved efficiency, reduced costs and provided convenience (Yatim, 2016). For example, Microsoft live @edu provides student access to email, Office package, as well as SkyDrive (Yatim, 2016). The University of California (UC), Berkeley used CC on developing and deploying SaaS Applications for different courses (Alshuwaier et al., 2012).