

Chapter 103

Benefits and Challenges of Cloud Computing Adoption and Usage in Higher Education: A Systematic Literature Review

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ABSTRACT

The aim of this article was to provide evidence pertaining to cloud computing (CC) adoption in education, namely higher education institutions (HEIs) or Universities. A systematic literature review (SLR) of empirical studies exploring the current CC adoption levels in HEIs and the benefits and challenges for using CC in HEIs was performed. A total of 20 papers were included in the SLR. It was discovered that a number of universities have a keen interest in using CC in their institution, and the evidence indicates a high level of successful CC adoption in the HEIs reviewed in the SLR. In conclusion, the SLR identified a clear literature gap in this research area: there exists limited empirical studies focusing on CC utilisation in HEIs.

1. INTRODUCTION

Cloud computing (CC) according to the National Institute of Standards and Technology (NIST) is “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. This cloud model is composed of five essential characteristics, three service models, and four deployment models.” (Mell & Grance, 2011) In Sultan’s view, CC is a computing style where elastic and scalable IT-driven capabilities are made possible via internet technologies (Sultan, 2010).

Krelja et al. indicate that CC is a highly innovative technology for businesses to adopt and provides a new technology platform to enable them to develop and deploy their own applications. For the end-user, CC is a more cost-effective and flexible way of using applications (Krelja et al., 2014; Kyriazis & Jeffery, 2018). Through the delivery of many cloud-based applications to potential users, such as teachers and students, which can support their educational needs, CC can provide greater scalability, flexibility and mobility in the utilization of resources for teaching purposes (Alharthi et al., 2015; Scholten, 2017; Stergiou et al., 2018).

Since CC is an internet driven technology, it brings many advantages and also disadvantages, besides to the educational cloud (Alharthi et al., 2015; Lakshminarayanan et al., 2013; Yuvaraj, 2016). The benefits include cost efficiency, collaboration, greater flexibility, improved availability, reduced environmental impact and user satisfaction (Krelja et al., 2014; Shayan et al., 2014; Sultan, 2010; Verma & Rizvi, 2013), whereas the limitations include security, maturity and cultural resistance (Alharthi et al., 2015; Amron et al., 2017; Haider, 2014; Shakeabubakor et al., 2015; Sultan, 2010). In addition, CC is a highly compatible technology, which makes it usable in a number of everyday activities, including education. As well as delivering various cloud-based applications and services to teachers and students, which can be used in both formal and informal education, CC can provide greater scalability, flexibility and mobility in the utilization of computing resources for teaching and learning purposes, increased collaboration, communication and resource sharing, and allows institutions to establish virtual communities for teaching and learning i.e. a customised learning environment (Askari et al., 2018; Kayali et al., 2016; Willcocks et al., 2014).

1.1. Research Motivation

Existing research on CC usage in education only focus on CC frameworks, security and implementation, and there is a lack of studies that explicitly focus on the benefits and challenges of CC adoption and usage the in education context, particularly in higher education institutions (HEIs), such as Universities (Hussein & Omar, 2015; Jawad et al., 2017; Mokhtar et al., 2016; Scholten, 2017).

This paper aims to identify and evaluate empirical evidence pertaining to the benefits and challenges of CC adoption and usage in the higher education context by employing a systematic review method. This research will help to identify the potential challenges and gaps in the existing literature and recommend areas for further research going forward.

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