Organisational factors affecting cloud computing adoption in small and medium enterprises (SMEs) in service sector

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Abstract

This study focuses on the organisational factors that affect the organisation’s decision to adopt cloud computing. Data were collected by employing a questionnaire research design to SMEs (particularly SMEs in service sector) in Malaysia. Results indicate that of the three factors hypothesised to affect cloud computing adoption, only information technology (IT) resources were found significant. Nonetheless, there is no adequate evidence to support the importance of top management support and employee knowledge on cloud computing adoption. The findings would benefit the theory and practice. For academia, this study can serve as a useful reference for future studies in this area. For practitioners, the findings would benefit them in terms of making decision toward cloud computing adoption and formulating better strategies for cloud computing adoption.

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1. Introduction

Cloud computing, which emerged around 2007\textsuperscript{1}, is rapidly adopted by organisations, including small and medium enterprises (SMEs), in various sectors. Traditionally, organisations have been implementing applications using a software that needs to be installed on one or more physical servers\textsuperscript{2}. In a cloud computing environment, the organisation running an application does not typically own the physical hardware used for the applications and does not usually know where the computation work of the applications is being processed\textsuperscript{2}.

Cloud computing has been used by millions of people in various manifestations, including free email services (e.g., Yahoo Mail and Gmail) and free office productivity applications (e.g., Google Apps). The technology offers organisations its unique features, including high availability, elastic scalability, less complexity\textsuperscript{3}, speed, agility, flexibility, and economic advantage\textsuperscript{4}. Despite its importance, limited research has however studied the adoption of cloud computing in SMEs in Malaysia, especially in the service sector. This paper aims to examine the organisational factors that affect the cloud computing adoption in the SMEs in service sector. This paper will contribute to existing literature on factors affecting the technology adoption in the SMEs. For practitioners, such as managers, government agencies, and technology providers, the finding is hoped to benefit them in terms of making decision toward cloud computing adoption and formulating better strategies for the adoption.

The remaining of the paper is organised as follows: Section two presents literature review on cloud computing. This is followed by the research model of the study in section three and research methodology in section four. Key findings and its discussions are presented in section five. The final section elaborates on the conclusion, limitations, and suggestions for future research.

2. Literature review

Cloud computing has generally been conceptualised in different ways. The most common definition is provided by the National Institute of Standards and Technology (NIST) which refers cloud computing to “…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”\textsuperscript{5}.

Several factors, including IT friendliness, financial wealth, geographical location, and political stability, may impact cloud adoption worldwide, leaving various countries with different cloud adoption rates\textsuperscript{6}. Malaysia, for instance, has shown noticeable interest in adopting cloud computing in various sectors\textsuperscript{3}. A report by the BSA cloud readiness revealed that Malaysia was ranked 13th among 24 countries around the world and 8th in ASEAN countries\textsuperscript{6}. Malaysian SMEs, in particular, are ranked 11th out of 14 countries\textsuperscript{2}. In this context, the Malaysian government through its agencies, such as Multimedia Development Corporation (MDeC), has been putting a lot of efforts to accelerate the adoption of cloud computing solutions, especially among the SMEs, aiming at elevating the competitiveness and efficiency of the organisations in doing business. For example, the organisations are provided with a 6-month subscription fee rebate or up to RM1,500 of the total subscription fee for any software as a service (SaaS) solution from any Multimedia Super Corridor (MSC) Malaysia Status companies.

Diffusion of cloud computing has become a significant research topic as it enables organisations to execute data transactions along value chain activities, including manufacturing, sales, customer service, information sharing, and collaboration with trading partners\textsuperscript{8}. Since its emergence, much ground has been covered in the field\textsuperscript{9,10}. For instance, in a study of cloud computing adoption by the SMEs in the north east of England, relative advantage, uncertainty, geographic restriction, compatibility, trialability, size, top management support, prior experience, innovativeness, industry, market scope, supplier efforts, and external computing support were found significant in the SMEs adoption of cloud services\textsuperscript{8}. The effect of competitive pressure was, however, not supported.

3. Research model

The research model of this study is developed based on existing literature (Fig. 1). Three organisational factors are hypothesised to affect organisation’s decision to adopt cloud computing. These factors are top management support,
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