Chapter 2
Antecedents to Individual Adoption of Cloud Computing

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ABSTRACT

This chapter examines factors that influence individual adoption of cloud computing measured by the intentions to use cloud computing for personal needs. Drawing upon the cloud computing and online service literature, it recognizes eleven antecedents to individual intentions to use cloud computing. An empirical test on undergraduate and graduate students shows that of these antecedents a person's attitude toward cloud computing, subjective norm, perceived behavioral control, and perceived usefulness have direct impacts on intentions, while other antecedents, including perceived ease of use, transferability of computer skills, vendor reputation, perceived risks, privacy concerns, security concerns, and concerns about vendor lock-in, have indirect impacts. The study expands the view on cloud computing adoption among individual users with a multiplicity of factors and an integrative framework, and it also highlights the tradeoffs between benefits and risks in adoption decisions.

INTRODUCTION

Cloud computing refers to the Information Technology (IT) that enables ubiquitous, convenient, on-demand access to a shared pool of IT resources (such as storage and applications) that can be rapidly provisioned and released over the Internet with minimal management effort or service provider interaction (Mell & Grance, 2011). It represents a new trend in developing and delivering IT service to individuals and organizations (Miller, 2008; Sultan, 2010). It is estimated that worldwide spending on cloud computing will grow at an annual rate of 19% through 2015 (McAfee, 2011).

Despite its being a fast-growing "disruptive" innovation (Sultan & van de Bunt-Kokhuis, 2012), cloud computing is expected to account for less than 5% of worldwide IT spending in 2015 due to many barriers to its adoption (McAfee, 2011). For research and practice purposes, it is important to understand what factors contribute to or hinder cloud computing adoption and what roles each

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factor plays in the adoption decision. To date, most research on cloud computing adoption has focused on organization users (Demirkan et al., 2008; A. Lin & Chen, 2012; Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011; Sultan, 2011), but little is known about how individuals, such as college students, adopt cloud computing for personal use. Subsequently, empirical studies in this area only examine a handful of antecedents to individual adoption decisions, such as perceived usefulness of cloud computing, perceived ease of use, privacy concerns, and access to software (Ambrose & Chiravuri, 2010; Behrend, Wiebe, London, & Johnson, 2011). Many other factors that may influence individuals' adoption decisions have not been adequately analyzed. In fact, consumers are important stakeholders in cloud computing (Bardhan, Demirkan, Kannan, Kauffman, & Sougstad, 2010; Marston, et al., 2011), as many well-known cloud solutions such as Microsoft SkyDrive (hosting Office Web App) and Google Drive (formerly Google Docs) target not only organizations but also individuals, and the latter is a critical factor in determining the popularity and success of these solutions. Therefore, it is necessary to expand knowledge on this group of users and to understand the factors that influence their adoption decisions.

In this study, we examine factors that influence individual intentions to use cloud computing for personal needs. This distinguishes the subjects in this study from other organizational users such as managers, IT professionals, and employees. We aim at answering two research questions: 1) what factors, such as benefits and risks, may influence the adoption of cloud computing by individual users, and 2) how are these factors related? Instead of studying all types of cloud computing, we focus on Software as a Service (i.e., SaaS) in the public cloud, called public cloud applications or cloud applications (Marston, et al., 2011). Both SkyDrive and Google Drive are examples of SaaS, which provide file editing features such as word processing and electronic spreadsheets to users.

To answer the questions, we search the cloud computing and online service literature to recognize 11 antecedents to individual adoption of cloud computing. Based on the Theory of Planned Behavior (TPB; Ajzen, 1991) and the Technology Acceptance Model (TAM; Davis, Bagozzi, & Warshaw, 1989), we further categorize these antecedents into direct factors, including individual attitude toward cloud computing, subjective norm, perceived behavioral control, and perceived usefulness of cloud computing, and indirect factors, including perceived ease of use of cloud computing, transferability of computer skills, perceived risks, privacy concerns, security concerns, vendor lock-in, and vendor reputation. We conduct a survey to test the impacts of these factors on individual intentions to use cloud computing. The result confirms the distinct roles of the direct and indirect factors.

Our study extends the cloud computing literature in two substantial ways. First, it expands the view of individual adoption of cloud computing with a more integrated theoretical framework and a multiplicity of explanatory factors. Importantly, the different impacts of the direct and indirect antecedents suggest that researchers clearly specify the roles of these factors in future research. Second, the study shows the tradeoffs between benefits and risks in individual adoption of cloud computing, highlighting the importance of modeling the tradeoffs in future research. This finding also has practical meanings for vendors to promote their cloud computing solutions. As the literature on individual adoption of cloud computing is still limited, our study therefore moves forward research in this area.

The structure of the paper is as follows. First, the theoretical bases and relevant literature are studied, based on which the research model is developed. Then, the research method for testing the model is described, followed by data analysis and hypotheses testing. Finally, the contributions are discussed, and the implications for research and practice are also analyzed.