Determinants of the Use of Knowledge Sources in the Adoption of Open Source Server Software

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ABSTRACT

Previous research suggests that the adoption of open source server software (OSSS) may be subject to knowledge barriers. In order to overcome these barriers, organizations should engage in a process of organizational learning. This learning process is facilitated by exposure to external knowledge sources. Unfortunately, this leaves open the question of which factors determine which knowledge sources are used by organizations. In this study, the authors have performed an exploratory study on the determinants of the use of knowledge sources in the adoption of OSSS. The conceptual model developed in this study was based on the absorptive capacity theory. Data was gathered from 95 organizations to empirically investigate this model. Results provide a quite consistent view on how external knowledge sources are used by organizations in the adoption of OSSS. Moreover, results provide more insight into the context in which the adoption of OSSS takes place.

Keywords: Absorptive Capacity, Adoption of Innovations, Knowledge Barriers, Open Source Software, Organizational Learning

INTRODUCTION

Over the past 10 years, open source software (OSS) has become a viable solution for organizations. Although OSS used to be developed by a community of volunteer developers, an increasing number of commercial software companies have started to offer support and other OSS-related services and products (Fitzgerald, 2006). This increased commercial support has

had a positive effect on the adoption of OSS (Dedrick & West, 2003; Fitzgerald & Kenny, 2003; Morgan & Finnegan, 2007). Many OSS products have indeed already widely diffused through organizations. Recently, an increasing number of studies on the adoption of OSS have been conducted. The aim of most of these studies is to identify the factors that influence the adoption of OSS. Several of these studies have suggested that the availability of external

support is an important concern in the adoption of OSS (Dedrick & West, 2003; Fitzgerald & Kenny, 2003; Morgan & Finnegan, 2007; Ven & Verelst, 2006; Li, Tan, Teo, & Siow, 2005). A lack of external support may be a barrier to the adoption of OSS, (Morgan & Finnegan, 2007; Li et al., 2005), while the availability of external support can provide some reassurance to organizations (Fitzgerald & Kenny, 2003). These findings suggest that IT managers are rather reluctant to adopt OSS in the absence of external support, fearing that they cannot rely on the support that is offered by the OSS community or on the internal resources of the organization.

In our previous research, we have investigated the adoption of *open source server software (OSSS)*. OSSS is a term that is used to refer to OSS products that are primarily used on server-side platforms, such as operating systems, web servers and mail servers. Results indicated that the adoption of OSSS may be subject to *knowledge barriers* (Ven, 2008). Organizations can overcome knowledge barriers by engaging in a process of organizational learning (Attewell, 1992; Cohen & Levinthal, 1990). This learning process is dependent on the organization's *absorptive capacity*, namely the ability of the organization to acquire and assimilate new knowledge (Cohen & Levinthal, 1989). Exposure to external knowledge sources allows organizations to increase their absorptive capacity (Cohen & Levinthal, 1989; Cohen & Levinthal, 1990; Zahra & George, 2002).

The external support options for OSSS represent the external knowledge sources that are available to organizations to facilitate the organizational learning process. However, it has been noted that organizations differ in which types of external support are used (Morgan & Finnegan, 2007; Ven & Verelst, 2006). At the moment, it is unclear which factors influence the decision of the organization to make use of one of these external knowledge sources. Yet, this is a crucial question since organizations that face high knowledge barriers may not be aware of the best way to obtain the knowledge required

to adopt and implement an innovation. It is the aim of this study to gain more insight into this issue. To this end, we conducted an exploratory study into which knowledge sources are used by organizations in the adoption of OSSS. Our approach is grounded in the absorptive capacity theory.

THEORETICAL BACKGROUND

Previous studies have shown that the adoption of complex technologies may be subject to *knowledge barriers* (Attewell, 1992; Fichman & Kemerer, 1997). According to this view, organizations will defer adoption until sufficient knowledge about the technology has been assimilated (Attewell, 1992; Fichman & Kemerer, 1997). The adoption and diffusion of such technologies are primarily influenced by the ease with which organizations can obtain the knowledge required to adopt and implement these technologies. Therefore, organizations that can obtain this knowledge more effectively are expected to exhibit more innovative behavior (Cohen & Levinthal, 1990; Attewell, 1992). In order to overcome the knowledge barriers involved with adopting new technologies, organizations have to engage in a process of *organizational learning* (Levitt & March, 1988; Attewell, 1992).

Organizational learning is dependent on the organization's *absorptive capacity* (Kim, 1998). The concept of *absorptive capacity* was developed by Cohen and Levinthal (1989), and was defined as "*the firm's ability to identify, assimilate, and exploit knowledge from the environment*" (Cohen & Levinthal, 1989, p. 569). Organizations that have a higher absorptive capacity will be better able to learn about new technologies, or in other words, will be better able to acquire and exploit new knowledge (Cohen & Levinthal, 1989; Cohen & Levinthal, 1990). Organizations that engage in a learning process will further develop their absorptive capacity, which in turn will stimulate and facilitate future learning (Lane, Koka, & Pathak, 2006).

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