Chapter 2

Factors Affecting the Development of Absorptive Capacity in the Adoption of Open Source Software

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ABSTRACT

Previous research has shown that the knowledge that is available to an organization is an important factor influencing the adoption of open source software (OSS). Hence, it is important that organizations develop their absorptive capacity in order to successfully adopt OSS. Absorptive capacity refers to the ability of an organization to acquire, assimilate, and exploit new knowledge. However, no study has specifically investigated how organizations can develop their absorptive capacity by acquiring knowledge about OSS. This paper addresses this gap in research by investigating the organizational knowledge assimilation process within the context of the adoption of OSS. Based on a case study conducted at the Flemish government, a framework that is grounded in literature and that illustrates which contextual factors influence the development of absorptive capacity in the context of the adoption of OSS was developed.

INTRODUCTION

In the past decade, open source software (OSS) has become a viable solution for organizations. Although organizations were initially rather reluctant to adopt OSS (Goode, 2005), several commercial software companies started to offer OSS-related support, services, and products (Fitzgerald, 2006; Feller, Finnegan, & Hayes, 2008). This increased commercial support for OSS products has had a positive effect on the adoption of OSS (Dedrick & West, 2003; Fitzgerald & Kenny, 2003; Morgan & Finnegan, 2010). As a result, OSS has become widely adopted by organizations.

An increasing number of studies on the adoption of OSS have appeared in recent years (Ven &

Verelst, in press; Hauge, Ayala, & Conradi, 2010). Some of these previous studies have shown that the existence of internal knowledge in an organization is a critical factor to the successful adoption and assimilation of OSS (Fitzgerald, 2009; Ven & Verelst, 2011). This means that there are knowledge barriers involved in the adoption of OSS and that OSS can be considered a knowledge-intensive technology. To overcome these knowledge barriers, organizations must engage in a process of organizational learning (Attewell, 1992). The ease with which organizations can learn about OSS is influenced by their absorptive capacity. Absorptive capacity refers to the ability of an organization to acquire, assimilate, and exploit new knowledge (Cohen & Levinthal, 1990). Previous research has indeed suggested that organizations need to develop their absorptive capacity in order to successfully adopt OSS (Fitzgerald, 2009). Hence, a number of studies have investigated how knowledge and absorptive capacity influence the adoption of OSS (Fitzgerald, 2009; Ven & Verelst, 2010, 2011). However, to our knowledge, no study has specifically investigated how organizations can develop their absorptive capacity by acquiring knowledge about OSS in order to adopt OSS.

In this paper, we address this gap in literature by investigating how organizations can develop their absorptive capacity within the context of the adoption of OSS. To this end, we describe the results of a case study conducted at the Flemish government. The use of OSS within the Flemish government was considered to be relatively limited. From a knowledge-based perspective, it is also interesting to note that most IT tasks of the organization were outsourced to an external service provider. This means that the assimilation of new knowledge may represent a challenge to the organization. We analyzed our data using theoretical frameworks on absorptive capacity. Our focus is on how various contextual factors influence the process of acquiring, assimilating and exploiting knowledge about OSS. More specifically, we will investigate whether entities within the Flemish

government that have a higher absorptive capacity concerning OSS are more likely to adopt OSS earlier and more extensively than other entities. Based on this, we propose a framework of how organizations develop their absorptive capacity within the context of the adoption of OSS.

The remainder of this paper is structured as follows. We start by providing the theoretical background of our study by elaborating on the concept of absorptive capacity. We subsequently describe the research methodology underlying our study. This is followed by the discussion of the main findings of our case study. Finally, we present our framework, our main conclusions, and implications for theory and practice.

THEORETICAL BACKGROUND

It has been noted in literature that an organization's ability to acquire the knowledge required to effectively use that technology may be an important consideration in the adoption process (Attewell, 1992; Fichman & Kemerer, 1997). Attewell (1992) even claimed that although a technology itself can be relatively easy to acquire, the technical knowledge associated with using the technology may be difficult to obtain. In that case, organizations are faced with *knowledge barriers*, which can limit the diffusion of the technology (Attewell, 1992). In order to overcome these knowledge barriers, organizations need to engage in a process of *organizational learning* (Attewell, 1992; Levitt & March, 1988). Organizational learning requires individual learning, during which individual members of the organization acquire skills and knowledge about a technology (Attewell, 1992; Levitt & March, 1988; Kim, 1998). Organizational learning is mainly dependent on the organization's *absorptive capacity* (Kim, 1998). Cohen and Levinthal defined absorptive capacity as "*the firm's ability to identify, assimilate, and exploit knowledge from the environment*" (Cohen & Levinthal, 1989, p. 569). The higher

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