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Adoption of open source software in organizations: A socio-cognitive perspective

Josianne Marsan [a,*], Guy Paré [b,1], Anne Beaudry [c,2]

[a] Department of Management Information Systems, Faculty of Business Administration, Université Laval, 2325, rue de la Terrasse, Quebec, Canada G1V 0A6
[b] Department of Information Technologies, HEC Montréal, 3000, chemin de la Côte-Sainte-Catherine, Montreal, Quebec, Canada H3T 2A7
[c] Department of Decision Sciences and Management Information Systems, John Molson School of Business, Concordia University, 1455 de Maisonneuve Blvd. West, Montreal, Quebec, Canada H3G 1M8

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ABSTRACT

Open source software (OSS) is an important trend in the information technology adoption landscape. It has received considerable attention in the scientific literature, but mostly in the professional press. In fact, there is much debate over its actual commercial and organizational value. Since the public discourse accompanying an IT may influence adoption decisions, it is important to consider IT specialists' perceptions of the discourse on OSS. In this study, we investigated the relationship between IT specialists' profiles, IT specialists' reception of the public discourse on OSS, and their organizations' receptivity to OSS. Drawing on the socio-cognitive perspective of IT innovation adoption and the organizing vision theory, a survey of 271 IT specialists was conducted to examine these issues. Our results indicate that a majority of IT specialists in our sample are rather neutral about the OSS concept conveyed in the public discourse. However, our sample also comprises respondents with more extreme perceptions who can be classified as either supporters or detractors. Our results indicate that detractors have more years of experience but have been less exposed to OSS than supporters, and that IT specialists' perceptions of the OSS concept are positively associated with their organizations' openness to OSS adoption and, to a lesser extent, with the existence of an organizational policy that favors OSS adoption. Altogether, our findings provide strong support for the organizing vision theory and the idea that the popularity of an IT innovation concept favors the adoption of the material IT innovation in organizations. By providing a preliminary test of a nomological network of IT specialists' perceptions of the OSS concept, our study offers insights as to why organizations may or may not take OSS into account in their software procurement decisions.

1. Introduction

Software procurement decisions are not as simple as make-or-buy anymore. Organizations now have numerous procurement options to choose from such as renting software applications from application service providers or obtaining open source software (OSS) from open source communities (Campbell-Kelly, 2008). OSS, which is the topic of this study, is a contemporary phenomenon and an important trend in the information technology (IT) adoption landscape (Fitzgerald, 2006;

* Corresponding author. Tel.: +1 418 656 2131x2606; fax: +1 418 656 2624.
E-mail addresses: josianne.marsan@sio.ulaval.ca (J. Marsan), guy.pare@hec.ca (G. Paré), abeaudry@jmsb.concordia.ca (A. Beaudry).
[1] Tel.: +1 514 340 6812; fax: +1 514 340 6132.
[2] Tel.: +1 514 848 2424x2986.

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Karahanna and Watson, 2006). Without a doubt, OSS represents a growing share of the software market and is increasingly being considered alongside traditional, commercial software (Driver, 2010).

According to many specialists (e.g., Fitzgerald, 2006; Oh and Jeon, 2007), OSS will continue to play a leading role in a wave of profound, radical change that is sweeping through the IT world. However, the rate of OSS adoption by organizations is still low in many regions, particularly in North America (Actuate, 2008). Despite the promises of this relatively new software procurement mode, many organizations have not yet developed policies and procedures for adopting OSS and a call for research on specific aspects that predispose organizations toward leading or lagging the adoption curve has been made by Niederman et al. (2006b). We thus concur that OSS represents an emerging business reality that deserves more attention from researchers (Boudreau et al., 2008; Fitzgerald, 2006; Olive, 2008).

In this paper, we define OSS as software developed in a public collaborative manner, for any application (e.g., operating system, word processor, digital imaging system), and available under a license allowing free source code accessibility, reuse, modification and redistribution by users (Fontana, 2010; Wang, 2009). OSS is often used interchangeably with other designations such as *free software* and *free open-source software* (FOSS). For clarity purposes, it is widely acknowledged that FOSS is an inclusive term that covers both free software and OSS and that despite describing comparable software development models, free software and OSS have differing underlying cultures and philosophies. Indeed, free software focuses on the philosophical freedom it gives to user communities, whereas open source software focuses on the perceived strengths of its peer-to-peer development model (Feller et al., 2005).

OSS is not like other new IT and is not just a new IT (Lee and Cole, 2003; von Hippel and von Krogh, 2003; Sawhney and Prandelli, 2000). OSS represents a phenomenon that is mind bending for many IT specialists for two main reasons, namely, the type of licensing and the type of development process that transform the rules of software procurement. First, OSS comes with a new type of license governing how the software can be used. The license associated with OSS guarantees rights to users and protects the interests of its developers who believe that their software should be freely available to all (Wybo and Bernier, 2007). In contrast, the goal of proprietary software licenses is to protect the intellectual property and financial interests of software vendors (Nelson et al., 2006; Wybo and Bernier, 2007). The main feature of the license associated with OSS is that users have the right to use the software as they wish – for example, they can access the source code and can legally copy the software –, while the main feature of a proprietary software license is that it must remain the exclusive property of its designer (de Laat, 2005). A software license describes how its author believes rights and duties should be distributed between himself and users (Douglas, 2011). IT specialists are used to the terms of proprietary software licenses and understand how rights and duties are distributed between their organization and the proprietary software authors. This is not yet the case with OSS licenses for many IT specialists, which creates uncertainty towards OSS adoption. Even lawyers struggle to understand OSS licensing and to advise organizations about its adoption (Fontana, 2010).

Second, as OSS licenses grant the right to access the source code, this has created some typical OSS development practices (von Hippel and von Krogh, 2003). In fact, OSS benefit from the collaborative effort of a large number of developers, dispersed across organizational and geographical boundaries, forming Internet-based development communities (Lee and Cole, 2003; Sawhney and Prandelli, 2000; von Hippel and von Krogh, 2003). These communities consist of freelance developers who volunteer and/or developers working in organizations that pay them to contribute to OSS projects (Lindman et al., 2011; Onetti and Verma, 2009). This type of software development changes the way organizations acquire software and related services such as training and support. This makes OSS different from any other new IT. In fact, OSS can be downloaded over the Internet and used at no charge in any organization (Lundell et al., 2011). OSS based on large development communities are usually of good quality and accompanied by professional service offerings (Lundell et al., 2011; Ven et al., 2008). However, OSS service organizations are sometimes too small to service large customers (Feller et al., 2008). Less popular OSS based on smaller and less active communities may be of poor quality and often suffer from a lack of professional service offerings (Chengalur-Smith et al., 2010; Lundell et al., 2011). In such cases, the IT department must rely on in-house IT specialists to support the OSS in their organization (Lundell et al., 2011). Most IT specialists are used to a turnkey software acquisition process that systematically involves a vendor to which the organization pays license fees for the right to use the software for which the quality is often a given. They are also used to finding professional services easily for all the software found in the organization. OSS thus requires unprecedented efforts on their part in terms of evaluation of the impacts from the OSS development and service networks (Ebart, 2008; Lundell et al., 2011).

Swanson and Ramiller (1997) coined the term "organizing vision" to encompass all information and opinions available in the environment about a new technology and its applications within organizations. The existence of an organizing vision for OSS has recently been acknowledged by researchers in the IS field (i.e., Lindman et al., 2010; Marsan and Paré, 2008; Wang, 2009; Wang and Swanson, 2008). The number of available OSS applications grows dramatically from year to year (Fitzgerald, 2006), and many researchers suggested that OSS can be of strategic value to firms by allowing faster adoption of technology, increased innovation, reduced costs, and reduced risk of vendor lock-in (Bonaccorsi and Rossi, 2006; Hedgebeth, 2007; Lundell et al., 2011; Morgan and Finnegan, 2005; Wurster et al., 2011). Despite the rising enthusiasm, such suggestions often come with doubts (Gartner Group, 2005; Ven et al., 2008). OSS covers a broad and complex domain with a wide variety of stakeholders, impacts, influences, and changing conditions (Niederman et al., 2006a; Al Marzouq et al., 2005; Fitzgerald and Feller, 2001; Ven et al., 2008). Hence, the lack of reliable information on the concept of OSS has been cited as a major barrier to its adoption in organizations (e.g., Paré et al., 2009; Ven et al., 2008).

IT specialists are an important target audience for the OSS's OV, since historically most OSSs have been used for back-end rather than front-end systems (Behlendorf, 1999; Evans, 2002). In general, OSS is seen as better suited to technical systems