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## An analysis of the interplay between organizational sustainability, knowledge management, and open innovation

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## ABSTRACT

Organizational sustainability increasingly focuses on how to manage new knowledge of ideas and practices that can expand business. Open innovation plays a key role towards effective strategic sustainable management. Through open innovation, companies can leverage knowledge management to an asset that promotes sustainable innovations that influence back organizational sustainability. This paper explores the case of a Brazilian family-owned company of rubber products, operating in the sectors of health, education, and coatings, which based on organizational sustainability uses knowledge to develop open innovation aiming to promote sustainable innovations. The methodology is an exploratory single case study research based on informal observation, semi structured interviews with key informants, and focus group discussions. The case study's results explore in depth the company's experience in adopting the strategic organizational sustainability using knowledge management and open innovation to promote sustainable innovations in accordance with the model of the Organization for Economic Cooperation and Development for eco-innovation, acting as a driver for significant changes in the organization's culture in organizational sustainability.

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### 1. Introduction

Survival is the goal any organization. Under the perspective of an environment of limited resources, competitiveness arises as well as the search for new strategies for organizational sustainability (Buys et al., 2014). The concept of sustainability refers to the triple bottom-line (TBL) of environmental, social, and economic concerns of one organization, which affect present and future generations (Elkington, 1994).

The incorporation of organizational sustainability in the business environment incurs into awareness of the environmental, social, and economic capitals of the enterprise (Kucukvar et al., 2014). On the one hand, it may lead to increased opportunities

through governmental and consumers support. In this sense, organizational sustainability may act as a source of opportunities for companies to remain competitive (Gimenez et al., 2012). On the other hand, sustainability is still understood as an economic externality – or as a cost – infringed by effective legal enforcement (Porter and Van der Linde, 1995). In this sense, there is still lack of sufficient knowledge on how to incorporate social and environmental aspects in the organizational core business or how to overcome existing barriers and encouraging companies to fully deploy sustainability in business processes (Nidumolu et al., 2009).

For organizational sustainability company should focus its efforts on knowledge management and innovation (García-Álvarez, 2015; Gaziulusoy et al., 2013). Innovation grounded on knowledge and environmental, social, and economic criteria enables the creation of a sustainable basis for competitiveness in organizations (Buys et al., 2014). In other words, innovative skills generated by knowledge can play an essential role for organizational sustainability (Sanders and Linderman, 2014). The development of sustainable new products adds layers of complexity to the traditional

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new product development process, but is equally a potential source of gains for the economy, society, and people (Thomé and Scavarda, 2015; Thomé et al., 2016).

While innovation is recognized as a way to achieve improved performance and leadership (Schumpeter, 1934), the need for rethinking the models of closed innovation began with the changes occurred mainly after the World War II (Chesbrough, 2003). The rising costs of technology development and the reduction in the life cycle of the products changed the way of doing business and proposed a new competition format (Rogbeer et al., 2014). Concurrently, companies seek an increased ability to deal with uncertainties (Hallstedt et al., 2013) and to keep up with fast changes in the market (Buys et al., 2014), being impelled to navigate through a dynamic market driven by knowledge.

This knowledge, nevertheless, may be out of the companies' boundaries (Gaziulusoy et al., 2013). For enhancing their chance of success in that intent, companies should not depend solely on their own planning areas and internal development of new goods and services (Hallstedt et al., 2013). By creating advantage from external sources of technology and innovation, companies may boost domestic growth (Hellström et al., 2015). Open innovation assumes that knowledge that promotes innovations lies anywhere in a company's value chain (Chesbrough, 2003). Therefore, a path towards innovation consists on opening the company's doors to ideas (Kian et al., 2015), coming from the external stakeholders, like research centers, universities, suppliers, and customers (Chesbrough and Schwartz, 2007). Open innovation is a breakdown of values, in which knowledge starts to be acquired through partners, that is, together they acquire the necessary skills to generate innovation and knowledge due to their complementarity (Chesbrough, 2006). In this sense, open innovation is in line with knowledge management (Zemaitis, 2014), which involves the use of mechanisms that help companies to manage knowledge as an asset that promotes business development (Seethamraju and Marjanovic, 2009), i.e., innovation that generates learning and knowledge sharing may assist the development of companies (Cui et al., 2015).

The integration of knowledge management into business processes aims not only to protect the intangible assets of a company (Lee and Suh, 2003), but also to develop and to take advantage of the assets, stimulating the creation of more adapted goods and services to customers' needs and increasing competitiveness (Nissen, 2005). Business processes are the main linking elements between the work and skills of members of an organization and the wishes of their customers (Seethamraju and Marjanovic, 2009), becoming also instruments for the implementation and formalization of knowledge management in the company and for the accomplishment of its potential benefits (García-Álvarez, 2015). To the extent that knowledge becomes an essential and strategic asset, organizational success increasingly depends on the company's ability to produce, gather, store, and disseminate knowledge.

Despite the recognized need for sustainable organizational and its influences on knowledge management and open innovation, there is a paucity of theoretical model and case study research on the interplay of organizational sustainability, knowledge management, and open innovation (Lütkemeyer Filho et al., 2014). Within this context, this paper aims to answer two related research questions (RQ):

RQ1 – Whether organizational sustainability, knowledge management, and open innovation are intertwined?

RQ2 – Whether organizational sustainability, knowledge management, and open innovation interact in practice in a real world environment?

More specifically, the study aims at examining the interrelation processes between organizational sustainability, knowledge

management, and open innovation and their practice in a large-sized Brazilian family-owned company operating in the rubber product industry. The turn toward a less impacting production model may ensure firms important economic gains by spurring sustainable innovations aimed at reducing environmental impacts while providing economic benefits (Nidumolu et al., 2009). Green innovators fuel their innovation effort through inter-organizational relationships more intensively than other innovators (De Marchi and Grandinetti, 2013).

The next section presents organizational sustainability, knowledge management and open innovation and it offers a research model relating organizational sustainability to knowledge management and open innovation. The research methods follow. The section four present the case study description. The section five analysis of the case study. The final section contains the conclusions.

## 2. Theoretical background

This section presents some key concepts about organizational sustainability, knowledge management, and open innovation, viewed through the absorptive capacity theory and the lenses of eco-innovation, and then it presents the model.

### 2.1. Organizational sustainability

Sustainability is a recent and comprehensive issue for the economy, the companies, and the population, being considered a systemic concept (Buys et al., 2014) related to the continuity of economic, social (including cultural), and environmental issues (Ribeiro et al., 2015). The United Nations' Brundtland Report defined sustainable development as “[...] the one that meets present needs without compromising the ability of future generations to meet their own needs” (Longoni et al., 2014). Sustainability is a manner of driving civilization in order to the society and its members (companies included) preserve biodiversity (Faisal, 2010) and natural ecosystems, planning and acting to achieve the indefinite maintenance that can fill their needs and express their greatest potential in the present (Lee and Saen, 2012).

In the economic perspective, the circular economic term has emerged as an alternative to replace the linear business model of innovation. It is a movement that strives for sustainably restructuring economic systems, based on the replacement of disposals and on the removal of the system “take, make, and dispose” (Lieder and Rashid, 2016). In the circular economic processes, the optimization of products takes place in multiple cycles of disassembly and reuse, elimination of waste throughout the various life cycles, and use of products and their components. The discovery of new ways to ensure the quality of life for current and future generations, eliminating the negative impacts caused by the different effects of technology, motivates companies to adhere to the circular economy (Ghisellini et al., 2016).

In business terms, organizational sustainability basis is not only the economic pillar, but also the social and environmental pillars. These three pillars should be transverse to the company (Infante et al., 2013). Therefore, there seems to be a reasonable degree of consensus on the effectiveness of the triple bottom line concept as the guide of sustainable organizational management (Heikkurinen and Bonnedahl, 2013). Adopting a critical perspective, Faisal (2010) showed that in the organizational level, the concept has received different meanings, but, if carried to its last consequences, its adoption may even question the very own business objectives of companies.

The criteria to evaluate and access the interrelated concepts of economic, social, and environmental sustainability are borrowed

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