Information culture and its influences in knowledge creation: Evidence from university teams engaged in collaborative innovation projects

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ARTICLE INFO

ABSTRACT

This paper empirically analyzes the typology of information cultures (TICs) developed by Choo ((2013). *International Journal of Information Management*, *33*, 775). The primary objective is to identify information behaviors and values that could describe the information culture in the context of project team work while knowledge creation occurs, resulting in technological innovation. The secondary aim is to find resulting relationships between the TICs and the modes of knowledge conversion. Twelve university project teams were selected to participate in the study. The teams are part of the Partnership for Technological Innovation Research Program (PITE) from the São Paulo Research Foundation (FAPESP), Brazil. The qualitative technique of categorical content analysis was used. The data analysis is based on a set of five attributes: (i) the primary goal of information management; (ii) information values and norms; (iii) information behaviors in terms of information needs, (iv) information seeking, and (v) information use. The main results are twofold. First, we confirmed the existence of two dominant culture profiles, as hypothesized by Choo ((2013). *International Journal of Information Management*, *33*, 775). Second, results also showed plausible relationships between the risk-taking culture and externalization of knowledge; the rule-following culture and the combination of knowledge; result-oriented culture and internalization of knowledge; and the relationship-based culture and socialization of knowledge.

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1. Introduction

Information processes represent a change both quantitatively and qualitatively in the cognitive structure that transforms the knowledge of people. From this premise, it is possible to admit that information is the input that makes, creates, and innovates the conceptual foundations of individuals and organizations in a social process of assigning meanings, which promotes and encourages individual and organizational knowledge.

The knowledge produced by individuals is a result of the interactions of individuals with the environment. It is necessary to point attention at the environment or the culture where this knowledge production and social interaction take place. It is, therefore, essential to consider information culture, which deals with specific issues related to organizational information.

This paper addresses the typology of information cultures (TICs) developed by Choo (2013) in order to investigate its influences in knowledge generation by university teams in cooperation with companies, and attempts to explore determinants for policy and practice. The basis of our empirical analysis is the development of innovation projects, which requires new ideas that are formed through a deep interaction among people in environments that have the conditions to enable knowledge creation (Popadiuk & Choo, 2006). It is important to highlight that, to the best of our knowledge, TICs are not considered empirically in the context of collaborative innovation projects in earlier research.

Aiming to explore how the TICs influence knowledge creation, this study also addresses the four modes of knowledge conversion conceived by Nonaka and Takeuchi (1995).

Two research objectives guide our work:

- to identify information behaviors and values that could describe the information culture in the context of innovative project team-work, while knowledge creation occurs;

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Table 1
Summary of early research on information culture.

Analysis	Scope	Main contributions	Authors
The concept of information culture	Definition of information culture	Transformation of intellectual resources where the input are varying kinds of knowledge and information, and the output achieved is a processed intellectual product	Ginman (1988)
	Indicators of information culture	Values, utility of information in achieving operational and strategic success, attitudes towards it, norms, and practices that together define the information culture	Curry and Moore (2003), Choo, Bergeron, Detlor, and Heaton (2008) and Oliver (2011)
Components of information culture	Elements considered important for the evaluation of information culture	Information and communication flows that are horizontal and vertical; effective internal information sharing and environment; leadership; IT; information management; cross-organizational partnerships; processes and procedures	Curry and Moore (2003), Choo et al. (2008)
Types of information culture	Distinguishing the types of information culture	Open or closed; factually oriented or rumor and intuition-based; internally or externally focused; controlling or empowering; information channels or media	Davenport (1997)
		Functional culture; sharing culture; inquiring culture and discovery culture	Marchand, Kettinger, and Rollins (2001)
		Relationship-based; risk-taking; rule-following and result-oriented	Choo (2013)
Framework for information culture	Proposed stages to analyse and understand information culture	The information environment; information as a resource; work processes; innovation; and business performance.	Widén-Wulff (2000)

- to find resulting relationships between the TICs and the modes of knowledge conversion.

We use the case of university teams engaged in innovation projects, which are developed in collaboration with companies and supported by Brazilian government funds, as the empirical context to meet the aforementioned objectives and develop theoretical insights. Knowledge institutions in emerging economies such as Brazil reflect their enhanced capacities in innovation, and these changes are unfolding on a scale of global significance (Etzkowitz, Carvalho de Mello, & Almeida, 2005). Brazil has a strong public research sector, comprising most of the national system of innovation. Fostering university–industry (U–I) links has become the key areas of contemporary Brazilian innovation policy (Etzkowitz et al., 2005; Ponomariov & Toivanen, 2014).

2. Theoretical framing

Our study focuses on a central place of knowledge creation, namely academia. The University is a relevant case because it is a site of knowledge creation (Hautala & Jauhiainen, 2014). The current policy context makes it even more noteworthy, since universities are becoming more entrepreneurial (Etzkowitz & Viale, 2010), aiming at innovations and distinguished knowledge. Therefore, knowledge is created in U–I increasingly in teams with multiple views and skills that promote the novelty aspects of knowledge (Intemann, 2009).

As we mentioned above, one of this work's emphases resides in finding relationships between the TICs and the modes of knowledge conversion. One of the most important and widespread theories about organizational knowledge creation is defended by Nonaka and Takeuchi (1995). In their view, the organization creates knowledge through interaction and conversion between tacit and explicit dimensions. Knowledge conversion occurs in four modes: from tacit knowledge to tacit—mode of socialization; from tacit knowledge to explicit—mode of externalization; from explicit to explicit knowledge—mode of combination; and from explicit knowledge to tacit—mode of internalization. The SECI model is considered one of the rationales of this work.

The pillar of this discussion is information culture (IC). Table 1 summarizes the few studies that have attempted to explore the IC topic over the last two decades:

Based on a widely applied construct from Cameron and Quinn (2011) that has been used to differentiate organizational culture types and their relationships to organizational effectiveness, Choo (2013) neatly developed a typology of information cultures. He emphasizes elements from information behavior research. According to Choo, the information culture typologies are characterized by a set of five attributes: (1) the primary goal of information management; (2) information values and norms; (3) information behaviors in terms of information needs, (4) information seeking, and (5) information use. These five attributes serve as a guide to our empirical analysis. In addition, Choo (2013) classifies information culture into four categories: relationship-based culture, risk-taking culture, result-oriented culture, and rule-following culture:

Relationship-based culture: information management supports communication, participation, and a sense of identity. Information values and norms emphasize sharing and the proactive use of information. These values promote collaboration and cooperation. The focus is on internal information. Individuals seek information about social groups, as well as information for self and group-development. The main sources include well-connected individuals and human resource data.

Risk-taking culture: innovation, creativity, and the exploration of new ideas are encouraged while information is managed. Information values and norms emphasize sharing and the proactive use of information. These values promote innovation, development of new products or capabilities, and the boldness to take the initiative. The focus is on external information. The organization seeks ideas for new products, new markets, and information about trends and changes in its environment. The main sources include creative individuals, technology experts, and industry and government sources. Information is used to identify and evaluate opportunities, and promote entrepreneurial risk-taking.

Result-oriented culture: information management enables the organization to compete and succeed in its market or sector. Information values and norms call attention to control and integrity: accurate information is valued in order to assess performance and goal attainment. There is a focus on external information. The organization seeks information about customers, competitors, markets, as well as data to assess its performance. Information is used to understand clients and competitors, and to evaluate results.