
Editorial

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This special issue presents a collection of papers related to the literature on knowledge management, flexibility and innovation. Its aim is to contribute to consolidating the links between these lines of management research. Although close from the theoretical perspective, these areas have remained relatively separate to date, as very few papers have treated them together. In this introduction, we present an outline of the main contributions to the special issue.

The importance of knowledge management, flexibility and innovation in the research agendas of the main business schools and universities has continued to grow in recent years. Firms also dedicate a large quantity of resources to improving knowledge

management in the organisation, increasing flexibility and stimulating innovation activities. Thus, it is not surprising that researchers have been interested in studying the relationship between these areas. Our special issue includes some contributions to this line of research.

If we begin with knowledge management, a large number of the studies are developed within the framework of a resource-based vision. Some authors have even commented that a vision based on resources leads directly to a knowledge-based vision (Conner and Prahalad, 1996). Within this line of research, we find two large camps. The first, grounded in theory of the firm, provides a knowledge-based vision as the basis for understanding the behaviour of organisations (Grant, 1996). The main proposition of these studies is that firms obtain their advantage with respect to other forms of economic organisation by being better able to perform the processes related to knowledge. Studies in this line thus work from the idea that, since firms' advantage lies in knowledge processes, firms that are able to manage knowledge better will have a greater competitive advantage over the markets and other firms.

A second line starts from the relevance of knowledge in the firm and studies the processes of knowledge management. Analysing different kinds of knowledge, they propose models for managing knowledge and analyse these models' appropriateness for the creation, transfer, transformation or integration of knowledge.

Flexibility can be defined as, 'an organisation's ability to adapt to substantial and uncertain changes in the environment that requires quick reactions and which has a significant impact on performance' (Verdú et al., 2005). The management literature has a long tradition of studying flexibility, usually under the idea that there is a dichotomy between flexibility and efficiency (Gómez and Verdú, 2005; Newell et al., 2003). Part of the literature on knowledge management starts from the idea that it is necessary to break with this dichotomy between efficiency and flexibility, since the organisation must be capable of achieving both at once (Hedlund, 1994). Likewise, the union between the processes of knowledge management and flexibility has focused on the explanation of flexibility in the organisation through the appropriate use of the processes of learning and transfer (Huber, 1991; Lant and Mezias, 1992).

As to the relation between knowledge management and innovation, we need only recall a quotation from Drucker (1993, p.173): 'innovation, that is the application of knowledge to produce new knowledge.' Understanding the relationship between both issues has followed different paths. The most developed view tries to explain the innovative capacity of the firm based on the activities of knowledge management and learning in the firm (Arias and Molina, 2002; Coombs and Hull, 1998). The contrary relation has also been analysed. Cohen and Levinthal (1990) consider that absorption capacity affects innovative capacity, but that the former will be in part determined by the firm's R&D activities. R&D activity has also been considered 'a knowledge process, because it transforms information on technological advancements' (Park and Kim, 2006, p.595). Finally, we cannot forget the studies that believe innovation theory can be grounded in a knowledge-based vision and see this vision as valid for explaining its efficiency (Abou-Zeid and Cheng, 2004; Johannessen et al., 1999).

Papers that seek to relate flexibility and innovation tend to consider the relation between the two by relating both concepts to change and adaptation (Georgsdottir and Ges, 2004). The general proposition is that the firm should possess the flexibility necessary to support the level of innovation needed. However, this relation is

under-investigated, from the theoretical perspective and especially through empirical contrasting of this proposition. One of the few studies in this line is that of Verdú et al. (2005), which concludes that the level of fit between the flexibility required and real flexibility influences positively the firm's innovativeness and innovative capacity.

All of these relationships between knowledge management, flexibility and innovation require more research. It is the goal of this special issue to advance our understanding of these relations. We believe that the academy is very interested in these topics, as became clear from the large number of papers we received for this special issue (38 manuscripts). We think that the selection of papers chosen for this volume forms a relevant grouping with implications for knowledge management, flexibility and innovation and for the relationship between the three.

Peltokorpi ('Synthesising the paradox of organisational routine flexibility and stability: a processual view') confronts the problem of the dichotomy between stability and change in the firm. From a processual perspective, the author analyses flexibility and learning as sources of knowledge, focusing on routines as the unit of analysis. The paper builds on previous studies in which routines are presented as sources of both stability and flexibility – stability, fundamentally from the perspective of macro-analysis and flexibility when considering human agents. This general framework is used in studying real situations: product development routines at Honda and production routines at Toyota. The fundamental contribution of this paper is the consideration in the same framework of the macro- and micro-aspects relative to routines.

Following the central subject of routines, the paper by Levin and Barnard ('Technology management routines that matter to technology managers') uses a different vision of routines. Whereas Peltokorpi's outline is based on previous literature, the outline developed by Levin and Barnard starts from the technology managers themselves and their perception of the routines really performed in their organisations to develop an outline of technological routines. These two papers thus complement each other and help to provide a more comprehensive vision of organisational routines and their importance in flexibility, innovation and knowledge management. Levin and Barnard have developed a framework of technological routines based on the identification of 27 general routines that they found in this qualitative study. The routines identified have subsequently been grouped according to the schema developed by Pavitt (2002), with the addition of the category *providing organisational support*. The main contribution of this article is to present an outline of technological routines useful for both academics and managers, one that helps to decrease the gap between both groups when they discuss technological routines.

Given the importance of learning in determining what kind of government is best to support an activity, studying the variables that affect interorganisational learning becomes an unavoidable question. The article by Verwaal, Verdú and Recter ('Transaction costs and organisational learning in strategic outsourcing relationships') analyses this question. This article is different from previous studies in the field. The great majority of prior articles that study the determination of organisational boundaries show a dichotomy between explanations based in the theory of transaction costs and a resource-based vision. In contrast, this paper presents an integrated vision of both perspectives. The traditional variables of transaction costs, as well as assets specificity or the frequency of transactions, affect both the variables of learning and knowledge and their antecedents. This integration is undoubtedly one of the most important aspects of the article.

The main contribution of the paper by Chang and Gotcher ('Relational learning and dyadic knowledge creation in international subcontracting relationships: the supplier's perspective') is its clarification of the antecedents of *dyadic knowledge creation*. To achieve this, the authors ground their work in construct relationship learning, which they divide into the phases of information exchange, joint interpretation and relational memory. Chang and Gotcher also study the antecedents of relationship learning, focusing on the role of the use of IT, relational capital and relational commitment. Thus, this paper analyses the transfer of knowledge in a relationship and its influence on knowledge creation, the joint consideration of both processes of knowledge being one of the article's most significant contributions.

The main conclusion of the paper by Ma, Lombardo and Sciaba ('Learning mechanisms in technology based organisation change programme: an exploratory study between Chinese and Norwegian corporations') is to show how national culture, external environment and market status leave their mark when programme managers choose learning mechanisms. The authors use a framework based on a differentiation between learning to reduce uncertainty and learning to reduce ambiguity. These two kinds of learning, together with their specific mechanisms, are studied in four projects carried out by Chinese and Norwegian firms. The article thus makes a good contribution to the study of differences in learning mechanisms deployed between the firms and the reasons for these differences.

The article by Riu, Yang and Hutchinson ('Managing knowledge for new product performance in high technology industry') analyses the performance of the development of new products (NPD), focusing on two key variables: the processes of knowledge innovation and knowledge integration. Because the relationship between the processes of knowledge management and the performance of new products does not occur directly, but is moderated by the variables of creativity and new product timeliness, this article is not only relevant for the NPD literature but also contributes to strengthening the importance of proper knowledge management in the firm for improving organisational performance.

The tension in firms between exploitation and exploration is the main subject of the article by Harryson, Kliknaitė and Dudkowski ('Flexibility in innovation through external learning: exploring two models for enhanced industry–university collaboration'). This article starts from the idea that the social networks that facilitate the firm's exploration and exploitation of knowledge have opposing properties. In the face of this apparent trade-off, the authors present two cases that focus on the collaboration between industry and the university as exemplary models. They believe these collaborations can help firms to resolve the apparent impossibility of achieving both processes and thus to improve the firm's flexibility.

The article by Martín, López and Navas ('Organisational learning dynamics in the software publishing industry') presents a general frame for understanding the dynamic of knowledge in firms. This frame starts from a double classification of knowledge:

- the differentiation between tacit and explicit knowledge
- the ontological differentiation of knowledge, into individual, group, organisational and interorganisational levels. This general framework is applied to the real case of the software publishing industry.

A conceptual frame based on the same differentiation is presented in the article by Bueno, Rodríguez and Salmador ('Knowledge creation as a dynamic capability: implications for innovation management and organisational design'), although in this case the ontological differentiation is performed only between individual and social knowledge. Here, in function of the kind of knowledge, propositions and implications are developed both for better organisational design to manage knowledge and for different tools available to innovation managers depending on the environment of knowledge in which they find themselves.

The work of Professor Liao ('Impact of manager's social power on R&D employees' knowledge sharing behaviour') is interesting fundamentally for its introduction of a different focus in the study of the antecedents of internal knowledge transfers. Although prior studies have considered questions related to contextual factors as moderators of the degree to which the workers become involved in knowledge sharing activity (Szulanski, 1996), Liao has incorporated the same factors as they relate to managers. This work thus shows how the kind of management power influences employee behaviour in the case of knowledge sharing. This work helps to complete the prior frameworks of antecedents of knowledge sharing.

The study of how the firm's absorptive capacity affects the mode of government in the search for technologies outside the firm is the main subject of the paper by Ouyang ('Resources, absorptive capability, and technology sourcing in China'). This article starts from the idea that the resource-based vision, specifically the knowledge-based vision, is a solid base for studying organisational boundaries. By analysing the use of licences, non-equity alliances, joint ventures and acquisition in Chinese firms, Ouyang arrives at the main conclusion that the firm's absorptive capacity is a good indicator of the firm's behaviour in the use of these alternate mechanisms of government. He shows that the greater the absorptive capacity, the more mechanisms will be used that involve greater interaction between the partners to transfer more knowledge between them.

The article by Steen, Liesch, Matthews and Thorburn ('Balancing flexibility and control: international technology and market development in Australian biotechnology firms') has a similar starting point. This article starts from the idea that the importance of learning, on the one hand, and the protection of the firm's resources and capacities, on the other, lead the firm to adopt different structures of government in internationalisation. The article's results confirm the importance of questions related to stock and knowledge flow in determining organisational boundaries. They conclude that the greater the perceived need to learn and the greater the complementarity in the partner's capacities, the greater the propensity to use alliances in the market. This result complements those of Ouyang's article. The use of alliances will increase, due both to the greater internal capacities for learning and the greater perceived need to learn.

The relation between innovation, strategic flexibility and entrepreneurial orientation is the starting point of the article by Professors Li, Liu, Duan and Li ('Entrepreneurial orientation, strategic flexibility and indigenous firm innovation in transitional China'). Their study begins by differentiating between flexibility in resources and capability flexibility, considering the different influence each has on the firm's innovation. The results of their analysis of a sample of 585 Chinese firms are important in that they sustain the differentiated influence of both kinds of flexibility. Also relevant are their conclusions concerning entrepreneurial orientation. The results of the study allow them to conclude that entrepreneurial orientation affects positively both kinds of flexibility and thus also the firm's innovation.

As can be seen, the great variety of papers, the different theoretical perspectives and the theoretical and empirical developments of the papers presented here are very diverse. They not only provide a sample of the wealth in the literature on knowledge management, flexibility and innovation, but also show the significance of the different perspectives and proposals concerning the relationships between the three.

Finally, we will not finish this introduction without acknowledging the Editor of the *International Journal of Technology Management* for his support and the reviewers of this special issue.

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