

The Impact of Organizational Structure and Social Structure on Organizational Knowledge Creation: A Conceptual Framework

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Abstract

In the era of New Economy, knowledge creation has been regarded as the main source of organization's competitive advantage. Based on the assumption that knowledge is originally generated and constructed from organizational members, this paper aims to explore how knowledge is constructed and created in organizations with the existence of organizational structure and social structure. On the "hard" side, organizational structure stands for the strategy for innovation adopted by the organizations. On the "soft" side, social structure depicts mostly the interaction between organizational members. We expect that organizational structure would affect organizational capabilities of exploitation or exploration and, in turn, different organizational structure would have influence on how knowledge is socially constructed. Since under today's dynamic environment, organizations are more interested in becoming ambidextrous at the same time in the same unit, this paper tries to explore the paths from organizational structure and social structure to exploitative or exploratory innovation. We propose that both the "hard" and "soft" side of the organization should not be overlooked if we are to shed more light on the theory of organizational knowledge creation.

Introduction

The importance of knowledge creation capability for the organizations can not be overemphasized in the era of New Economy. More and more organizations recognize that knowledge creation is critical source of competitive advantages to differentiate themselves from competitors (Conner & Prahalad, 1996; Grant, 1996; Kogut & Zander, 1992; 1996 Leonard-Barton, 1992; Spender, 1996; Tsoukas, 1996) However, how knowledge is created and constructed within the organizations still remains much to be explored (Eisenhardt & Santos, 2002). Scholars speculate the background resides in that the studies on knowledge are mostly not empirically validated (Un & Cuervo-Cazurra, 2004). Based on the assumption that knowledge is originally generated and constructed from organizational members, this paper aims to explore how knowledge is constructed and created in organizations with the existence of organizational structure and social structure. These two elements though have been recognized as critical for successful knowledge management initiative (Santoro & Gopalakrishnan, 2000), there seems much to be explored regarding their impact on organizational knowledge creation (Walczak, 2005).

Although literature has noticed that the factors in social context may lead to firm's capability of alignment and adaptability, the respective path from social context to either alignment or adaptability has not been explored. We posit that owing to the different nature of ambidexterity (alignment and adaptability), the respective path leads to them may be different. Moreover, since organizational structure is usually established before organization's social context, it also interests us to explore the path from organization's structure to its social structure. In summary, we argue that social context may play as an important mediator to link organizational structure and organization's ambidexterity.

Organizational Knowledge Creation

Organizational Knowledge Creation as a Social Process

Leading organizational scholars have asserted that knowledge assets are essential to achieve organizational competitiveness (Drucker et al., 1997; Nonaka, 1994; Prahalad & Hamel, 1990; von Krogh, 1998). Nonaka and colleagues (2000) define knowledge assets as "firm-specific resources that are indispensable to create values for the firm." Since knowledge assets are crucial for organizations' value creation, it can not be denied that knowledge creation plays a critical role to organizations' competence building. Therefore, organizations' knowledge creation has always been top priority for top management team (von Krogh, 1998).

Having recognized the importance of organizational knowledge creation, scholars have tried to find out the exact mechanisms for it. Among all, Nonaka and colleagues (1995) have developed a theory of organizational knowledge creation and gradually gained its significance in the last decade. They propose that knowledge creation is the result of the interaction and conversion between two kinds of knowledge, i.e. tacit and explicit knowledge. There are four modes of conversion mechanisms in the process of knowledge creation: socialization (from tacit knowledge to tacit knowledge), externalization (from tacit knowledge to explicit knowledge), combination (from explicit knowledge to explicit knowledge), and internalization (from explicit knowledge to tacit knowledge). For them, the conversion of tacit and explicit knowledge is a social process between individuals (Popadiuk & Choo, 2006; von Krogh, 1998). Based on a constructionist perspective (von Krogh, 1998), Nonaka and Takeuchi treat knowledge as “justified true belief” instead of what cognitivists called “representation” meaning that knowledge is universal. In this paper, we adopt the constructionist view of knowledge creation in that individuals have to justify the truthfulness of his beliefs through personal sensemaking and individual experience under the interaction between themselves and the social context which they are embedded in (von Krogh, 1998; King and Zeithaml, 2003; Murray & Blackman, 2006). However, since the process of organizational knowledge creation is viewed as a “public justification process”, individuals would find it difficult to justify their own beliefs within organizational context. Therefore, scholars have asserted that some enabling conditions must be in place either in the form of system or structure to help the conversion process of organizational knowledge creation (Nonaka & Takeuchi, 1994; von Krogh, 1998).

Though Nonaka and colleagues’ theory on knowledge creation gives us a clear picture of how knowledge is converted and socialized within organizational context, we also find some issues remains to be further investigated. Nonaka et al. do not categorize different type of knowledge creation. The underlying premise seems that there is no difference between incremental knowledge creation or radical knowledge creation, which has gained increasing attention in the innovation literature. To shed more light on the knowledge creation process, we posit that it is necessary to first differentiate between different types of knowledge creation since different types of knowledge creation may need different kinds of coordination mechanisms.

Exploitation and Exploration as Organizational Knowledge Creation

According to innovation literature, there are two modes that new knowledge can be created within organizations. On one hand, organizations could exploit their existing knowledge; on the other hand, organizations have alternative to more distant search for new capabilities (Christensen, 1997; March & Simon, 1958; Rosenkopf & Nerkar, 2001; Weick, 1979). Since innovation requires new knowledge (Davison & Blackman, 2005; Leonard-Barton, 1995; Nonaka & Takeuchi, 1995; Senge et al., 1999), in this paper, we follow the innovation literature to categorize organizational knowledge creation into two distinct modes: exploitation and exploration of organizational knowledge creation for the purpose of analysis.

Since March (1991) first differentiates between exploitation and exploration, these two modes of knowledge creation (or innovation) has become the underlying premise of the research in innovation (Danneels, 2002; Lee et al., 2003; Rothaermel & Deeds, 2004) and organizational learning and strategy (Levinthal & March, 1993; Vera & Crossan, 2004). Before we search into the determinants of organizational knowledge creation, it would be clearer if we first well define what kind of organizational knowledge creation is studied (Downs & Mohr, 1976; Knight, 1967; Rowe & Boise, 1974), which seems to be ignored in Nonaka's knowledge creation theory. We assert that different modes of knowledge creation would need different coordination mechanisms.

From a knowledge-based view, organizations build up their competitive advantage by enlarging and enhancing their knowledge repository (Kogut & Zander, 1992). Therefore, seeking ways to create new knowledge has become top priority of top management team. New knowledge could be created in several ways, however, two modes receive most attention, namely, exploratory and exploitative innovation. Organizations could develop new knowledge based on existing knowledge or they could spend more on experimentation and search for knowledge which may depart from their existing one (Benner & Tushman, 2003). Though the importance of developing both capabilities of knowledge creation has been highlighted, the mechanisms that lead to and coordinate exploratory and exploitative innovation remain much more to be investigated (Jansen, Frans, Bosch, & Volberda, 2006). Jansen and colleagues assert that although some empirical studies do examine the impact of different coordination mechanisms on exploratory and exploitative innovation (e.g., Benner & Tushman, 2003; Hill & Rothaermel, 2003), findings are mixed and therefore needs further exploration. They also notice that prior research mostly focuses on formal organizational structure and does not pay too much attention on the influence of informal social relations on the development of exploratory and exploitative innovation (Subramaniam & Youndt, 2005). In the same vein, we posit

that either formal organizational arrangement or informal social context within organizations would have importance influence on determining the paths to either exploratory or exploitative innovation. But unlike Jansen et al.'s (2006) study, we further explore the possibility of the mediating role of the social context between organizations' formal structure and the paths to exploratory and exploitative innovation. We presume that social context in a strong sense would be able to play an important role to mediate the relationship between formal structure and modes of innovation since knowledge is socially constructed.

Before we go on to examine respective organizational determinants of different modes of knowledge creation, we would like to clarify the notion on "organizational ambidexterity" first. The term "ambidexterity" is initially used by Duncan (1976) to describe organization's need to develop "dual structures" to cope with the tension between alignment (similar to exploitative innovation) and adaptation (similar to exploratory innovation). At first, organizational scholars treat this contradictory tension as a trade-off in the organization's development, but now more and more attention has shifted to paradoxical thinking (Gibson & Birkinshaw, 2004). That is, under more and more dynamic and competitive environment nowadays, organizations have no choice but to develop both capabilities at the same time within same organizational unit. We follow Gibson & Birkinshaw's (2004) notion of "contextual ambidexterity" that organizations are able to and have to simultaneously develop alignment and adaptability under the same organizational context. They differentiate "contextual ambidexterity" from "structural ambidexterity" in that organizational features are more than formal structure. Moreover, Organizational ambidexterity would be best achieved not by establishing dual structure, rather, by arranging an organizational context which may encourage and enable organizational members to develop skills at coping with the tension between adjustment and adaptation by their own judgment (Gibson & Birkinshaw's, 2004). Based on the notion of "contextual ambidexterity", we are interested in searching for the exact paths among formal structure, social context and two distinct modes of organizational knowledge creation.

Antecedents of Organizational Knowledge Creation

The Impact of Organizational Structure on Knowledge Creation

The relationship between organizational technology and its structure has received a lot of attention since Woodward's (1965) study of the manufacturing process in firms. In the contingency literature, scholars treat technology as a contingency variable to define organizational structure (Thompson 1967; Woodward, 1965; Birkinshaw et al., 2002). Though this body of research emphasizes

“technology”, we recognize its impact on organizational structure since technology and knowledge are related constructs (Birkinshaw et al., 2002). Gold and his colleagues (2001) argue that knowledge activities could be leveraged by means of organizational structure to facilitate the flow of organizational knowledge. It is generally accepted that managerial structure supports knowledge management initiatives which in turn results in perceived benefits (Goh, 2003; Goh and Richards, 1997; Nahm et al., 2004; Swan et al., 2000; Zammuto, Gifford, & Goodman, 2000; Zammuto and O’Connor, 1992). Other scholars deem organizational structure as one of the forms of control (Blau & Scott, 1962; Lebas & Weigenstein, 1986) which aims to encourage organizational members to behave towards organizational goals (Cardinal, 2001). Structural control, therefore, is often executed through rules and procedures to regulate organizational members’ activities and behaviors (Cardinal, 2001).

How could formal structure facilitate organizational knowledge activities? Through means of authority and chain-of-command, formal organizational structure could direct vertical knowledge activities to accomplish organizational tasks (Walczak, 2005). Among the components of a unit’s hierarchical structure, we conceptualize centralization and formalization as three main elements (Jansen et al., 2006). *Centralization* refers to the empowerment of decision making (Damanpour, 1991). When the degree of centralization is high, communication channels are narrowed (Cardinal, 2001) and it decreases organizational members’ possibilities to explore innovative ideas (Atuahene-Gima, 2003; Damanpour, 1991). *Formalization* depicts the degree that organizational rules, procedures, instructions, etc. are formalized or written down (Khandwalla, 1977). When organizational members rely mostly on organizational routines or procedures to complete organizational tasks, it hampers organizational members’ willingness of experimentation (March & Simon, 1958). Formalization serves as a frame of reference that shapes organizational members behavior (Weick, 1979).

Proposition 1-1. The higher the degree of formalization, the higher the level of exploitative innovation.

Proposition 1-2. The higher the degree of centralization, the higher the level of exploitative innovation.

The Impact of Social Structure on Knowledge Organization

Literature on sociology of technology suggests that technological issues can not be fully understood if we do not analyze the social context which they are embedded in (Bijker et al., 1987; Knorr-Cetina, 1981; Latour, 1987; MacKenzie,

1995). This view is consistent with constructionists view of knowledge, who emphasize the social aspects in the process of knowledge creation. To be specific, the organizational knowledge is a function of the social system in which it is embedded in (Birkinshaw et al., 2002). Within organizational context, individuals would act and learn under the influence of both organizational hierarchy and the social context. Among the four transformation mechanisms in Nonaka and colleagues' knowledge creation theory, "socialization" has been considered one of the most important mechanisms which helps convert tacit knowledge to tacit knowledge (Walczak, 2005) since knowledge is essentially grounded in practice (Murray & Blackman, 2006). Social relationships are the outcome of the social processes and interaction between organizational members (Newell et al., 2002) and new knowledge could be created through the interaction of organizational information (Ortony, 1993). Since the establishment of social structure is based on informal interactions between organizational members, it is essential in horizontally coordinating personal relationships which supplements organizational hierarchical coordination mechanisms (Bartlett & Ghoshal, 1998). To make comparison, structural context refers to the establishment of tangible administrative mechanisms while social context is more intangible in nature in coordinating organizational members.

In this paper, we follow Gibson & Birkinshaw's (2004) notion of contextual ambidexterity. Gibson & Birkinshaw (2004) argue that four attributes of organization context, i.e. stretch, discipline, support and trust, would affect organizational ambidexterity, which in turn leads to better performance. Their argument is that organizational ambidexterity mediates the relationship between organizational attributes and performance. However, what interests us in this paper is the exact conditions that may lead to either organizational exploitation or exploration. We also differentiate between structural context and social context which Gibson and Birkinshaw (2004) put them together under the term of "organization context" though they recognize structural context is of tangible attribute and "cultural context" is of intangible kind. Moreover, their empirical analysis also shows that the four constructs generated by Ghoshal & Bartlett (1994) were merged into two factors only, namely, performance management context and social context. Therefore we adopt the notion that structural and social contexts should be differentiated. We deem structural context are given aspects of organizations which might directly influence organization's social context, e.g. the interaction among organization members or units, which then leads to organization's capability of exploitation or exploration. Another possible path is that if the strength of social context is weak, the capability of organizations' ambidexterity might directly come from how organizations are structured. Therefore, we propose that:

Proposition 2-1: A strong social context mediates the relationship between structural context and organization's ambidexterity.

Proposition 2-2: Structural context directly leads to organization's ambidexterity when the strength of social context is weak.

Conclusions

In this study, we try to conceptualize the relationship among organizational structure, social structure and the modes of knowledge creation. To be more specific, we aim to understand the exact paths among these constructs. Prior research on innovation often take the exploitative and exploratory innovation as a mediator between organizational context and its performance, in this paper we put more emphasis on finding the exact paths that lead to either exploitative or exploratory organizational knowledge creation. The influential work on knowledge creation theory of Nonaka and colleagues provide us a starting point to examine how organizations could be ambidextrous at the same time in the same unit. We argue that, though organizational formal structure is a good predictor of organizational innovative capability, the impact of social structure on organizational knowledge creation can not be ignored either. In the innovation literature, most of the research treats social context as a moderator. But we posit that social context may play as a mediator between formal structure and organizations' innovative modes if this social context is in a strong sense. If this is possible, then the managerial implication for top management teams would be that: "never ignore the power of the social community within organizations". Though social context mainly is constructed and generated by the organizational members within it, it is still possible that top management team could arrange some "soft" dimensions to facilitate the organizational knowledge creation. For future study, we would like to empirically test the possibility of social context as a mediator and examine the exact paths among these constructs. Moreover, we would also put another important constructs into the analysis, namely, knowledge characteristics. We are interested in that how knowledge characteristics would affect the paths of organizational knowledge creation. On what conditions knowledge characteristics would predict different modes of organizational knowledge creation.

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