An ability-based view of the organization

Strategic-resource and contingency domains

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Abstract
Purpose – This paper extends the corporation-based metaphor of the tree by proposing that cognition is the core ability that nourishes the development of core competencies. From such an extension, this paper aims to take a step forward to answer the question: what is the role of cognition in the organization that is in pursuit of core competencies and sustainable competitive advantage?

Design/methodology/approach – The paper answers this problem by presenting two complementary perspectives, which contribute to introduce the field of organizational cognition into the strategic-resource and contingency domains. First, it proposes precepts of an ability-based view of the organization through analogies that are most associated to concepts of the resource-based view and dynamic capabilities of the firm. Second, it introduces a contingency-based view of organizational cognition which is most developed through causal relations, and also deductive and inductive reasoning.

Findings – Conclusions reinforce the thesis that cognition is the core ability which supports individuals, groups and organizations with other complementary abilities such as intelligence, autonomy, learning, and knowledge management; whereas these abilities, all together, are sources of reduction of environmental uncertainty, and, complementarily, they nourish the development of the organization’s core competencies and competitive advantage.

Originality/value – The uniqueness and distinction of this research lies in the authors’ efforts to explain the strategic dynamic behavior of the organization in the pursuit of high degrees of cognition in order to manage high levels of environmental uncertainty, to nourish the development of core competencies, and to sustain the organization’s competitive advantage.

Keywords Cognitive mapping, Corporate strategy, Contingency planning, Uncertainty management, Competencies, Competitive advantage

Paper type Research paper

Introduction
Hamel and Prahalad (1996) use the tree metaphor to explain the corporation, whereas from a short button-up view the root system is equivalent to the set of core competencies; and the leaves, flowers and fruits are associated to end products. From such a view, this paper raises the question: - What are the sources of creation and sustenance of core competencies? Well, for a tree it can be attributed to the natural system that provides the substances necessary for the growth and sustenance of the root system which, in turn, feeds the tree upper-levels. What about the corporation? What is the main source of collective knowledge in the organization? In this paper, the answer is cognition, which is proposed as the core ability of the organization.
Research on cognition in organizations has been grounded in multidisciplinary fields, which have mainly developed over the last 50 years. However, the field of organizational cognition first received major contributions from the perspective of organizations proposed in (Simon, 1947) and (March and Simon, 1958). Later, this perspective was further developed through computational and interpretive domains (Lant and Shapira, 2001) which contributed to explain the integration of processes of sense making, knowledge creation and decision making in the organization (Choo, 2005). Organizations in the pursuit of cognition are complex information processing and collective knowledge management systems. In such a view, organizations process hard and soft information (Iandoli and Zollo, 2007), and they manage uncertainties which involve incompleteness, vagueness, confusion, and dissonance of information (Nobre et al., 2009a, b, c). Especially from the 1980s, the field of managerial and organizational cognition has been most associated with research methods of cognitive maps at individual, group and organizational levels (Brown, 1992; Eden, 1992; Eden and Spender, 1998; Nicolini, 1999; Tyler and Gnyawali, 2009; Walsh, 1995); whereas cognitive maps or representations have demonstrated to be useful to understand the behaviors and decisions of individuals and groups in the organization as well as to formulate and to implement strategies (Porac and Thomas, 2002). A vast contemporary survey on major developments from 2000 to early 2007 in the psychological analysis of cognition in organizations shows theoretical, empirical, and methodological advances across ten substantive domains of application (Hodgkinson and Healey, 2008). Among the Hodgkinson and Healey’s domains is Organizational Change and Development, which is the application domain in this paper. Most recently, Nobre et al. (2010) proposed a new contingency view of the organization, whereas the authors emphasized the organization in the pursuit of high degrees of organizational cognition[1] in order to manage high levels of environmental complexity and uncertainty. In such a new perspective, cognition was introduced as the mediator between the organization and the environment, and also as the main source of development of other important organizational abilities such as intelligence, autonomy, learning and knowledge management.

This paper supports all these results and it contributes by giving a step forward to answer to the question: - What is the role of cognition in the organization which is in the pursuit of core competencies and sustainable competitive advantage? This research answers this problem by presenting two complementary perspectives, which contribute to introduce cognition into the strategic-resource and contingency domains. First, it proposes an ability-based view of the organization through analogies that are most associated to the concepts of the resource-based view and dynamic capabilities of the firm. To illustrate this view, this paper proposes a dynamic strategic model, which explains the dynamic behavior of the organization in the continuous pursuit of sustainable competitive advantage. Second, it proposes a contingency-based view of organizational cognition which is most developed through causal relations, and also deductive and inductive reasoning. Grounded in these perspectives, this research sustains the thesis that cognition is a source of reduction of environmental uncertainty, and, complementarily, cognition contributes to create and to sustain the organization’s competitive advantage. In this research, major emphasis is given to the organizational level of study.

The development of this paper is based on the steps that introduce:
• the context of strategic abilities;
• the strategic dynamic model;
• the relation between cognition and the organization’s competitive advantage; and
• presentation of conclusions.

Organizational abilities
Ability is a general term concerning the capacity to act mentally, physically, financially, legally, or in some other ways. Cognitive ability refers specifically to mental capacity (Ree et al., 2002). In the context of this paper, cognitive ability is the main source of intelligence, autonomy, learning and knowledge management in the organization. Therefore, organizational abilities involve concepts of cognition, intelligence, autonomy, learning and knowledge management (Nobre et al., 2010, 2009a, pp. 39-45).

Strategic context of an ability-based view
In the resource-based view of the firm (Drejer, 2002; Hamel and Prahalad, 1996; Prahalad and Hamel, 1990; Wernerfelt, 1984, 1995), the organization’s competitive advantage depends on the creation, sustenance and continuous improvement of the core competencies which are developed through the effective and efficient employment of the organization’s strategic resources (Hitt et al., 1999; Lei et al., 1996). This paper supports and borrows this picture in order to introduce cognition and ability into the strategic-recourse context.

Strategic resources
Resources can be associated with tangible and intangible assets which contribute to the production system in the organization (Hitt et al., 2008). This paper supports this definition and expands it to the perspective that resources are the set of organization’s elements, which involve social structure, goals, technology and participants (Scott, 1998, pp. 17-22). These resources can be employed at the technical, managerial, institutional and worldwide levels (Nobre et al., 2009a, pp. 47-49) by the organization through the use of the organizational abilities for the development of the core competencies, and, consequently, for the creation and sustenance of the organization’s competitive advantage. In such a perspective, the organization manages its resources with basis on its strategy. Moreover, the organization interacts with the environment for the acquisition, processing, creation, distribution, employment and management of new strategic resources.

Strategic abilities
In the proposal of this paper, cognition, intelligence, autonomy, learning and knowledge management represent the set of organizational abilities. These abilities have an important role in the deployment and management of the organization’s strategic resources and they also represent sources of development of the organization’s core competencies; whereas this perspective is based on the strategic context of the resource-based view (Wernerfelt, 1984, 1995) along with dynamic...
capabilities of the firm (Helfat and Peteraf, 2003; Pettus et al., 2009; Teece, 2007; Teece et al., 1997).

Helfat and Peteraf (2003, p. 999) define organizational capability as the “ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result”. Teece et al. (1997, p. 516) explains that dynamic capabilities represent the “firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments”. Pettus et al. (2009, p. 188) mention that “dynamic capabilities involve the organizational processes by which resources are utilized to create growth and adaptation within changing environments”. All these three references distinguished the concepts of dynamic and operational capabilities. In synthesis, the first concept represents the firm ability of development, integration, coordination and deployment of operational capabilities, and it is associated to the ability of the organization to learn, change and adapt to turbulent and complex environments. The second concept has the meaning of ordinary competencies, processes and routines of standardized and repetitive patterns. Examples of operational capabilities involve activities such as manufacturing a product, procedures of inspection and quality assurance norms. In these views, capabilities and competencies seem to have the same meaning. Tracing back to the prominent and seminal book on organization of March and Simon (1958), this paper also advocates that ordinary and dynamic capabilities are also, in some measure, associated to the concepts of programmed and non-programmed decisions in organizations[2].

Therefore, this paper adopts the same view of capability as similar to competence. However, what are the foundations or sources of creation of capabilities or competencies in the organization?

In this paper, the set of organizational abilities are distinct from the concepts of capabilities and competencies. This paper supports the premises that cognition, intelligence, autonomy, learning and knowledge management are the abilities that provide the foundations for the creation and sustenance of capabilities and competencies in the organizations; and that cognition is the core ability of individuals and groups in organizations that pursue the creation of capabilities and competencies. These premises are also grounded in literature findings and empirical evidences which explain the role of managerial cognition in capability development (Laamanen and Wallin, 2009; Tripsas and Gavetti, 2000).

Additionally, when viewed as dynamic processes for the creation, integration and management of new resources in the organization, the abilities of cognition, intelligence, autonomy, learning and knowledge management can be associated with sources of development of the dynamic core competencies in the organization.

**Core competencies**

Core competencies are capabilities that are valuable and unique from a customer’s point-of-view, and also inimitable and non-substitutable from a competitor’s point-of-view (Hitt et al., 2008). Core competencies can represent a set of tacit and collective knowledge which is developed through learning processes and which provides the organization with particular strengths and superior value relative to other organizations. They are sources of innovation, customer benefits and sustainable competitive advantage (Lei et al., 1996). Therefore, core competencies are special
classes of dynamic and ordinary capabilities. This paper supports these concepts and proposes some extensions which are based on three new aspects:

1. It considers that core competencies is a set of tacit and explicit knowledge, and that there exist conversions between tacit and explicit knowledge according to the SECI (Socialization, Externalization, Combination and Internalization) model presented in (Takeuchi and Nonaka, 2004).

2. It assumes that knowledge is primarily created in the individuals’ mind and afterwards the knowledge is socialized, expanded and crystallized to the collective levels of groups, organization and inter-organization, following the spiral cycle processes of knowledge creation presented in (Takeuchi and Nonaka, 2004).

3. It defines that the organizational abilities are the sources of development of the organization’s core competencies, and thus, the sources of creation of collective knowledge in the organization.

The inclusion of explicit knowledge in the definition of core competencies is necessary because the expansion of the knowledge from the individual to the collective levels in the organization essentially depends on the four conversion modes between the two types of knowledge. These conversions subsume: Socialization (from tacit to tacit); Externalization (from tacit to explicit); Combination (from explicit to explicit); and Internalization (from explicit to tacit) of knowledge (Takeuchi and Nonaka, 2004). Additionally, this paper considers that some sets of explicit knowledge can become almost inimitable when their effective use in other organizations depends, for instance, on cultural factors along with their combination with other sets of tacit knowledge.

Therefore, grounded in the dynamic strategic context presented in Lei et al. (1996), the next section proposes a strategic dynamic model, which describes the role of organizational abilities in the enhancement of the organization’s competitive advantage.

**Strategic dynamic model**

Figure 1 illustrates a strategic dynamic model, which is proposed to describe the dynamic behavior of the organization in the continuous pursuit of sustainable competitive advantage. In this figure, the lines that connect the elements of the model indicate that the changing or evolving of one element affects the others.

The model’s functional processes can be summarized by:

1. The organization interacts with the environment through its strategic abilities for the acquisition, exchange, processing, creation, storage, distribution and employment of new resources for its own benefits. In such a process, the organization evolves and improves its own abilities of cognition, intelligence, autonomy, learning and knowledge management.

2. The organizational abilities are employed to the management of the strategic resources in the organization, and, consequently, to the development of the organization’s core competencies which form the basis for the creation of the organization’s sustainable competitive advantage. Improvements in the strategic resources, as well as in the core competencies, can feed back and
provide improvements in the organizational abilities which evolve strategically, dynamically and coupled to the other elements of the model.

(3) Internal and external stimuli can affect the organization’s competitive advantage, and, consequently, changes in the organization’s competitive advantage will activate the organizational abilities in order to restart new cycles of development of core competencies and creation of sustainable competitive advantage for the organization.

(4) Processes (1) to (3) repeat continuously in order to reduce the level of environmental uncertainty, and to improve the organization’s abilities, strategic resources, core competencies and competitive advantage.

Cognition, uncertainty and competitive advantage
The definitions and propositions introduced in this section are most grounded in the contingency theories (Burns and Stalker, 1994; Donaldson, 2001; Galbraith, 1977; Lawrence, 2000), along with strategic management and resource-based views (Hitt et al., 1999; Prahalad and Hamel, 1990; Wernerfelt, 1984, 1995). However, this paper differs from, and extends, these works by introducing cognition as the main strategic ability in the service of the organization. It proposes that uncertainty can be influenced, controlled, governed and reduced in some extent by the cognitive abilities in the organization. Consequently, by reducing uncertainty, this work reinforces the thesis that cognition contributes to create and to sustain the organization’s competitive advantage.

Environmental uncertainty and complexity
Environmental uncertainty can be associated with the level of uncertainty that the organization, groups and participants perceive or sense from the environment (Ducan, 1972). Moreover, contingency theorists (Galbraith, 1973, 1974, 1977) have defined uncertainty as the variable which makes the organization contingent upon the environment. Hence, organization design (Galbraith, 1977, 2002), and the choice of the
organization elements (Scott, 1998), depends on the concept of uncertainty which can be associated with propositions of bounded rationality (Simon, 1982a, b, 1997a, b). In such a view, uncertainty is associated with lack of information and insufficiency of cognition for general information processing and interpretation (Nobre et al., 2009a, b). Complementarily to this view, this paper defines that the complexity of the environment is contingent upon the level of uncertainty that it represents to the organization. Similarly, the complexity of a task environment is contingent upon the level of uncertainty that it represents to the organization during task execution and completion. Therefore, it can be asserted that the greater the level of environmental uncertainty, the greater is the level of environmental complexity that the organization faces and needs to manage (Nobre et al., 2009a, b).

**Relations on cognition and uncertainty**

This section introduces relations between degree of organizational cognition and level of environmental uncertainty, which are derived from the proposed concepts of relative level of environmental uncertainty and relative degree of organizational cognition.

**Relative level of environmental uncertainty definition (1):** The relative level of environmental uncertainty (RU) is defined by the proportional ratio between level of environmental uncertainty (EU) and degree of organizational cognition (OC), i.e. \( RU = \frac{EU}{OC} \).

Definition (1) indicates that the relative level of environmental uncertainty (RU) varies according to four distinct circumstances or causalities:

1. RU reduces when there is a growth in OC, for a given EU.
2. RU reduces when there is a reduction in EU, for a given OC.
3. RU grows when there is a reduction in OC, for a given EU.
4. RU grows when there is a growth in EU, for a given OC.

**Relative degree of organizational cognition definition (2):** The relative degree of organizational cognition (RC) is defined by the proportional ratio between degree of organizational cognition (OC) and level of environmental uncertainty (EU), i.e. \( RC = \frac{OC}{EU} \).

Similarly, definition (2) indicates that the relative degree of organizational cognition (RC) varies according to four distinct circumstances or causalities:

5. RC grows when there is a growth in OC, for a given EU.
6. RC grows when there is a reduction in EU, for a given OC.
7. RC reduces when there is a reduction in OC, for a given EU.
8. RC reduces when there is a growth in EU, for a given OC.

**Analyses of the relations.** Definitions (1) and (2), and more specifically, their respective causalities (1) to (4) in definition (1), and (5) to (8) in definition (2), suggest a total of eight alternatives of strategy which can lead to four possible goals: the reduction or the growth in the relative level of environmental uncertainty (RU), and the reduction or the growth in the relative degree of organizational cognition (RC). As this paper focuses on organizations in the pursuit of cognition, it selects the strategies (1) and (5). Both
strategies increase the degree of organizational cognition (O$_C$) in order to reduce the relative level of environmental uncertainty (R$_U$) and to increase the relative degree of organizational cognition (R$_C$).

From these concepts, this paper proposes that:

P1. The higher the degree of organizational cognition (O$_C$), the lower is the relative level of environmental uncertainty (R$_U$), and the higher is the relative degree of organizational cognition (R$_C$).

P1 suggests that, while the environment influences the organization through information and uncertainty, to some extent, the organization can control the environment through its cognitive abilities along with intelligence, autonomy, learning and knowledge management.

Another important result that can be derived from P1 is the relation between organizational cognition and the organization’s competitive advantage.

Relation on cognition and competitive advantage
Hitt et al. (2008) concluded that the reduction of environmental uncertainty could contribute to the creation of the organization’s competitive advantage. Additionally, Venkatraman and Subramaniam (2002) explained that the creation of the organization’s competitive advantage is a function of the organization’s ability to continually navigate its way into realms of the unknown and concurrently develop new expertise; which means that the organization’s abilities can contribute to the management of environmental uncertainty and also to the creation of the organization’s competitive advantage.

This paper supports these perspectives, and, therefore, it proposes that:

P2. The higher the degree of organizational cognition, the lower is the relative level of environmental uncertainty, and the higher is the organization’s competitive advantage.

Therefore, P2 indicates that cognition reduces the level of uncertainty, and, consequently, it contributes to create and to sustain the organization’s competitive advantage.

Conclusions
This paper introduced the field of organizational cognition and ability into the strategic-resource and contingency contexts. In such a development, this work proposed a strategic dynamic model, which contributed to explain the dynamic behavior of the organization in the continuous pursuit of sustainable competitive advantage. It described the processes and the dynamic interactions among the model’s variables, including among the organization’s strategic resources, abilities, core competencies and competitive advantage, and also between the organization and the environment. In such a view, cognition and the other organizational abilities were introduced into the strategic-resource context, and, therefore, this research suggested the basis of an ability-based view of the organization. Moreover, this paper presented relations between degree of organizational cognition and level of environmental uncertainty, and it derived a new relation between these variables and the organization’s competitive advantage. From such a view, this work emphasized the organization in the pursuit of high degrees
of organizational cognition in order to develop core competencies and to create and sustain the organization’s competitive advantage.

Practical implications
In the search of empirical results which can contribute to test P1 and P2, Nobre et al. (2009a, pp. 122-32) presented a case study about an international telecommunications and software business corporation, where they associated degree of cognition in the organization with measures of organizational process improvement such as organizational process maturity and performance, along with organizational learning. Qualitative analyses and quantitative measurements of the case study indicated that improvements in the degree of organizational cognition contributed to improve the levels of organization process maturity and performance along with organizational learning. Based on the results, Nobre et al. (2009a) suggested that improvements in the degree of cognition contribute to control the level of uncertainty, and, consequently, to create the organization’s competitive advantage. Additionally, they contributed by providing important directions to assess and to measure the degree of organizational cognition with basis on appraisal methods of organization process improvement models.

Final remarks
Cognition in organizations is the core ability that supports individuals, groups and organizations with intelligence, autonomy, learning, and knowledge management. In such a principle, cognitions such as perception, attention, interpretation, sense making, categorization, memory, and knowledge creation are processes that nourish individuals, groups and organizations respectively, with the necessary sources of development of intelligence, autonomy, learning, and knowledge management abilities. These abilities, all together, are necessary sources for the development of core competencies and collective knowledge in the organization. Nevertheless, despite being necessary, cognition is not by itself a sufficient ability that guarantees, for instance, the organization’s capability of learning and knowledge management. Organizational learning and knowledge management is also contingent upon the organization’s capability to promote strategies, autonomy, creative chaos, redundancy and requisite variety (Takeuchi and Nonaka, 2004).

At the individual level, humans achieve the capabilities of intelligent behavior, autonomy of action, learning and knowledge creation through perception, attention, interpretation, sense making, categorization, memory and other cognitive processes. At the group and organizational levels, social cognition (Bless et al., 2004; Weick, 1979, 1995) contributes with processes for knowledge creation, sharing and expansion through ontological levels (Takeuchi and Nonaka, 2004); and hence social cognition provides groups and organizations with intelligent behavior, autonomy and learning abilities. These remarks reinforce the thesis that cognition is the core ability that supports individuals, groups and organizations with intelligence, autonomy, learning, and knowledge management; whereas these abilities are sources of reduction of environmental uncertainty, and, complementarily, they nourish the development of the organization’s core competencies and competitive advantage.
Notes

1. The concept of degree of organizational cognition was first introduced in Nobre et al. (2009a) and further defined in Nobre et al. (2010). In a first perspective, researchers in the field of organizational cognition have associated the concept of cognitive complexity with the degree or level of elaboration in which people, groups and organizations perceive their environment and construct their cognitive maps. In such a case, the degree or level of cognitive complexity can be attributed to the number of hierarchical or vertical levels (or deepness) and the number of horizontal constructs that are integrated into a cognitive map (Calori et al., 1994; Nasser-Carvalho, 2004). In a second perspective, cognitive complexity can also be associated with the concept of degree of cognition in the organization or degree of organizational cognition; whereas degree of cognition can be symbolically associated with tangible and intangible measures of processes and representations (Nobre et al., 2010). Therefore, in this paper, the concept of degree of organizational cognition can be understood as synonymous with cognitive complexity at the organizational level of analysis. In such a case, degree of organizational cognition involves a whole picture about the cognitive processes and representations at the organizational level, and this macro picture is greater than the sum of the individual cognitions.

2. March and Simon (1958) provided the literature with the perspective of the organization as a set of cognitive programs which can be evoked due to an individual, organizational or environmental stimulus (Nobre et al., 2009a, pp. 245-8). These programs are classified into programmed and non-programmed decisions (Simon, 1977).

References


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Further reading


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