Dynamic fractal organizations for promoting knowledge-based transformation — A new paradigm for organizational theory

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Summary   How can a company become sustainably innovative? We propose that the company needs to have organizational forms that achieve a dynamic synthesis of knowledge exploration and exploitation. In this paper, we present the ''dynamic fractal organization'' as a new organizational model. This model departs from the conventional information processing paradigm. Instead, we present a new frontier in organizational theory: the ''dynamic fractal organization based on dynamic 'ba'.'' Dynamic fractal organizations build and utilize a triad relationship of knowledge that integrates and synthesizes tacit and explicit knowledge and creates a third type of knowledge, phronesis. The triad relationship is an upward spiraling process of converting tacit and explicit knowledge, and propels sustainable knowledge transformation across the diverse boundaries within and between organizations, and their environments.
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The Way gave birth to unity,
Unity gave birth to duality,
Duality gave birth to trinity,
Trinity gave birth to the myriad creatures.
Lao Tzu, Tao Te Ching

The need for a new organizational theory

In order to achieve and maintain competitiveness and sustainable growth, companies have to constantly create new knowledge and pursue practical wisdom (Nonaka, 1991; Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka, Toyama, & Hirata, 2008; von Krogh, Nonaka, & Rechsteiner, 2012). At the same time, the resulting continuous innovation activities need to embrace new values grounded in reality and on a society-wide scale (Nonaka & Takeuchi, 2011). In essence, the source of real innovation stems from the creation and exploitation of knowledge, with this relationship between the creation and exploitation of knowledge being

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socially dynamic. Specifically, the creation and utilization of knowledge occur simultaneously and cannot be separated (Osono, Kodama, Yachi, & Nonaka, 2006).

This relationship of creating new knowledge and exploiting extant knowledge has been the subject of academic research in organizational studies and strategic management for a long time. The investigation of ''exploration'' and ''exploitation'' of information and knowledge has become an important stream of research (March, 1991). Given that the simultaneous pursuit of exploration and exploitation is contradictory and sometimes even paradoxical, research has started to focus on the way in which the two processes can be reconciled (e.g., Tushman & O'Reilly, 1997). Recent studies have shown that in order to construct and motivate ideas for maintaining innovation in the company, managers and organizations have to face and solve this paradox (e.g., Graetz & Smith, 2007; Lewis, 2000). Indeed, maintaining an appropriate balance between exploration and exploitation, (e.g., Ahn, Lee, & Lee, 2006; Gibson & Birkinshaw, 2004; Kodama, 2003) and promoting synergies between exploration and exploitation (He & Wong, 2004) can help improve corporate performance. However, the coexistence and simultaneous application of these two different archetypes (exploration and exploitation) in a company calls for the skillful management of ''strategic contradiction'' (Smith and Tushman, 2005), ''creative abrasion'' (Leonard-Barton, 1995), and ''productive conflicts'' (Hagel III and Brown, 2005) in order to leverage potential synergies. There are also studies suggesting that the role of management to use and integrate these two different processes of exploration and exploitation is to form a so-called 'ambidextrous organization'[1], (e.g., O'Reilley and Tushman, 2004). However, direct empirical evidence is still lacking on how managers implement the theoretical principles to actually create ambidextrous organizations (Durisin & Todorova, 2012).

From our previous research in the realm of knowledge creating theory (Nonaka & Takeuchi, 1995; Nonaka et al., 2008; von Krogh, Ichijo, & Nonaka, 2000; von Krogh et al., 2012), we can show how to implement ambidexterity in organizations and even how to go beyond this mere dichotomy of exploration and exploitation. Knowledge creation theory sets the premise that the process of knowledge creation and usage forms a continuum and occurs simultaneously. This also leads to diversity as a consequence of multiple levels of involvements of individuals, teams and organizations. In order to foster innovation it is important for corporations to possess the ''synthesizing capabilities'' which is needed to integrate diverse pieces of knowledge

and increase the quality of knowledge (Nonaka & Toyama, 2002)[2].

In sum, the fundamental question we face today is ''How can a company become sustainably innovative?'' This paper intends to answer this question by asking the following research question:''What form should an organization that aims for the 'dynamic synthesis of exploration and exploitation' take?'' In answering this question, we depart from the dualistic and structuralist organizational theory, and present a new conceptual framework of the organization. We call this new concept ''fractal organization[3] based on dynamic 'ba'[4] formation'' to achieve ''the dynamic synthesis of exploration and exploitation.''

Limitations of the dualistic ''exploration—exploitation'' model

We propose that innovative corporations that maintain growth through knowledge creation and utilization have organizational structures that dynamically synthesize exploration and exploitation. To examine this proposition, we first highlight the problems and limitations with the information processing model that forms the basis of most of the extant research on exploration and exploitation. Finally we will propose a new organizational model. The concept of ''exploration and exploitation'' is grounded in the information processing model proposed by the Carnegie School of Thought in the 1950s and 1960s.

According to the School, organizations are required in order to raise the level of rationality and exceed the limited and bounded level of the individual as well as increase the effectiveness in economic activity. Organizations are able to address circumstantial uncertainties through the process of gathering and transferring information and decision-making processes (Simon, 1969).

The Carnegie School considers the environment as a given condition in which individuals or organizations exist passively. It does not consider environmental creation in which individuals or organizations exert influence on the environment, actively work the environment with their own beliefs and commitments for creating something new. Similarly, the Carnegie School assumes that information already exists in the external world, and people are merely processors of this extant information. This means that there is no notion

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[1] A number of issues have also been raised about the ambidextrous organization concept and how is can support the generation of innovations. One challenge of driving innovation businesses through ambidexterity is related to fusing and harmonizing new and old organizational cultures in the long run (Markides, 1998, 1999). Even if the culture is completely revamped in the new organization and an innovation business established, the task of transforming traditional organizations with old values may remain for the company overall. In disagreement with the ambidextrous organization concept, Govindarajan and Trimble (2005) also argue that exchange at the general manager level (senior management) should be minimized in favor of a resource exchange at the operational level (middle management and below).

[2] Synthesizing capability is the process of dialectic solution — the result of the interaction of thesis and antithesis — of diverse knowledge dispersed inside and outside of a company through the process of affirming, negating and integrating; it is the ability to dynamically create consistent knowledge systems and synthesize a wide range of contradictory factors through the structure of the knowledge creation firm model (Nonaka and Toyama, 2005). At the foundations of achieving innovation with synthesizing capability is the ''phronetic knowledge leadership'' demonstrated by leaders with practical wisdom (Nonaka, et al., 2008; Nonaka & Toyama, 2007), which is a requisite for acquiring collective knowledge through organized practical training.

[3] Note that by organization we refer not only to companies but also to smaller organizational units such as groups and teams, as well as larger ones such as communities, i.e. to any kind of system. We are grateful to an anonymous reviewer for pointing this out.

[4] Ba is a shared context in motion (see also Nonaka & Konno, 1998).