

Realizing reticulation: A comparative study of capability dynamics in two international professional service firms over 10 years

ABSTRACT

This study addresses the role of individuals when organizations balance flexibility and stability to achieve evolutionary fitness. Evolutionary fitness is suggested as the performance outcome of dynamic capabilities. A longitudinal cross-case comparison - of two similar firms that differ significantly in performance - identifies social networks as a possible explanation for their performance differences. A natural experiment confirms this. The study contributes with the two concepts of articulation (facilitating knowledge explication) and reticulation (facilitating social network formation); four propositions explicate the effect of these two on evolutionary fitness and offers a potential solution to the intentional management of dynamic capabilities.

BACKGROUND

The dissertation was submitted as a monograph consisting of 260 pages divided into nine parts and 25 chapters, and was submitted the 30th of June, 2013 for the degree of PhD with specialization in strategic management at BI Norwegian Business School. The dissertation was successfully defended at the 19th of November, 2013.

The evaluation committee consisted of:

- Professor Andre Pettigrew, Said Business School, Oxford University
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INTRODUCTION

This study presents a theoretically sampled comparative case study that examines how two international professional service firms (IPSFs) balance stability and flexibility in order to achieve evolutionary fitness and identify how the agency level contributes to achieving this balance in these two firms. Evolutionary fitness - a firm's ability to re-align its resource base with continuously changing external requirements - is in literature suggested as the performance outcome of dynamic capabilities (Helfat et al. 2007). The concept of dynamic capabilities is defined as the “*capacity to renew competences so as to achieve congruence with the changing business environment*” (Teece et al. 1997, 516). It refers to a pervasive framework in strategic management that attempts to explain sustained competitive advantage. The motivation behind the dynamic capabilities perspective was to integrate previous approaches such as competitive forces (Porter 1980), strategic conflict (Shapiro 1989), and the resource base view of the firm (RBV) (Barney 1991; Penrose 1959; Wernerfelt 1984).

Subsequently, the dynamic capabilities perspective (Eisenhardt and Martin, 2000, Teece et al., 1997, Helfat et al., 2007) has received a lot of attention and is one of the most successful streams

of research within the field of strategic management. A recent search in the Business Source Complete Database revealed that in the period from 1997-2011 there were 5982 articles that referred to dynamic capabilities. However, despite its popularity, the dynamic capability concept remains conceptually ambiguous (Arend and Bromiley, 2009, Easterby-Smith et al., 2009, Barreto, 2010, Di Stefano et al., 2010), empirical studies are limited (e.g. Ambrosini and Bowman, 2009, Newbert, 2007, Pablo et al., 2007), and the concept has received little attention outside the academic community as it is considered too abstract to be of managerial relevance.

The research question for this study is derived from a review of literature that reveals three unresolved issues in the conceptualizations of dynamic capabilities related to; its link with performance, how the balance between stability and flexibility is achieved, and the role of agency in achieving this balance. By empirically exploring the research question, this study contributes with new insight on how the sampled case firms maintain evolutionary fitness to reach a high performance level, how they balance flexibility and stability in order to create, extend and modify their resource base and the role that agency plays in obtaining this balance to achieve evolutionary fitness. The contribution of the study is the introduction of the two sensitizing concepts (Blumer, 1954) of articulation and reticulation to explain how firms maintain consistency when adapting to changes in their external environment.

THEORY

The key implication of dynamic capabilities is that firms are not only competing on their ability to activate and exploit their existing resources and organizational capabilities, but are also competing on their ability to renew and develop these resources and capabilities. The fascination with the dynamic capabilities perspective can be attributed to the perspective's aspiration to explain the "*Holy Grail of strategic questions: How to sustain a capability-based advantage in the context of environmental change*" (Helfat and Peteraf, 2009). While the RBV (Barney, 1991; Penrose, 1959; Wernerfelt, 1984) focuses on the selection of appropriate resources, dynamic capabilities focus on resource development and change. According to the RBV *stability* is needed for resources to yield value for the firm because exploitation of the resource base implies that the firm can successfully deploy their resources over time without competitors being able to copy the causally ambiguous relations between the resources that constitute their offerings. The RBV is thus concerned with how resources are heterogeneous in their distribution across firms and persist over time (Amit and Schoemaker, 1993, Mahoney and Pandian, 1992, Penrose, 1959, Wernerfelt, 1984). This internal perspective on organization of firms acts as a corollary to the external industry structure and positioning view of strategy as a key determinant of competitive advantage (Porter, 1980, Porter, 1985). According to RBV it is the creation, ownership, management and deployment of intangibles, especially knowledge and relationships, that explain variations in the performance of firms, especially those that are heterogeneously distributed by being valuable, rare, inimitable and non-substitutable (or VRIN as defined by Barney, 1991). The challenge however is that the VRIN criteria do not explain the dynamics of how the resource base is created, extended or modified for the firm to be innovative and responsive to external changes.

Hence, the dynamic capabilities perspective is not simply inward-looking in relation to the organization and its strategy. The central aim of this perspective is to explain how organizations achieve evolutionary fitness. Evolutionary fitness is defined as "*how well a dynamic capability enables an organization to make a living by creating, extending, or modifying its resource base*" (Helfat et al., 2007). The resource-base of the firm consists of "*tangible, intangible and human assets as well as capabilities which the organization owns, controls or has access to on a*

preferential basis.” (Helfat et al., 2007). The central idea of the dynamic capabilities perspective is thus the explanation of how sustained performance is achieved by aligning the organization with shifting external environmental demands. Consequently the dynamic capability research includes the question of how firms also demonstrate *flexibility*. Flexibility is defined in terms of the “*opportunity to change*” (Bateson, 1972). Hatum and Pettigrew (2006) suggest that organizational flexibility is a determinant for capability building, and that the degree of formalization and centralization will negatively affect flexibility (Volberda, 1999). Flexibility is essential because successful firms need to display timely responsiveness to effectively coordinate and redeploy internal and external competences to address environmental changes (Teece and Pisano, 1994). Hence, research suggest that dynamic capabilities cannot be bought and must thus be developed through learning that has a tendency to be local and close to ongoing activities (Teece et al., 1997) and that experience accumulation, articulation and codification is central to this learning process (Zollo and Winter, 2002) and that codification had a positive impact on performance (Zollo and Singh, 1998).

Despite the scholarly interest for dynamic capabilities, four recent review articles have concluded that the perspective lacks a rigorous construct and clear assumptions about its constituent parts and the relations between them (Arend and Bromiley, 2009, Easterby-Smith et al., 2009, Barreto, 2010, Di Stefano et al., 2010). One of the most emphasized causes of the fragmented concept of dynamic capabilities is attributed to the relatively low number of empirical studies that have taken place (e.g. Ambrosini and Bowman, 2009, Newbert, 2007, Pablo et al., 2007). Indeed, there is debate about what type of empirical studies are needed. Some researchers call for more quantitative studies (e.g. Wang and Ahmed, 2007), whilst others call for more qualitative research (e.g. Ambrosini and Bowman 2009). Adding to this ambiguity, is the existence of more than 16 definitions (identified in my literature review) of dynamic capabilities, all of which are frequently cited. The low number of empirical studies can be attributed to this very lack of a unifying definition (Ambrosini and Bowman, 2009). In particular the review of literature identified three important limitations to the knowledge of dynamic capabilities:

First, the lack of evidence that dynamic capabilities affect performance due to the lack of a unifying definition of dynamic capabilities and the resulting limited empirical research. Extant research holds that dynamic capabilities are the antecedents of performance, but does neither explain how dynamic capabilities work to achieve evolutionary fitness and high performance, nor empirically demonstrate this relationship (Ambrosini and Bowman 2009).

Second, how a balance between stability and flexibility can be achieved is unresolved. There exists in the literature a consensus of understanding that the ability to continuously change, in replicable and reliable patterns, is necessary for effective performance. It is suggested that these two logics (of simultaneous change and replication) do not mix and that extant conceptualizations of dynamic capabilities thus encompass a rigidity paradox (Schreyögg and Kliesch-Eberl 2007).

Third, the limited knowledge of the role that agency plays in capability dynamics. Several authors have addressed the lack of empirical studies exploring the duality between organization and individuals as well as called for improved understanding of the micro-foundations of dynamic capabilities (Eisenhardt and Martin 2000; Felin and Foss 2005). Agency is defined as the ‘capacity of an agent to act in the world’, and the micro-foundations view of strategic organization (e.g. Felin and Foss, 2005, Abell et al., 2008, Felin et al., 2012) point out the need

for improved understanding of the role of agency in capability dynamics (Felin and Foss, 2005, Schreyögg and Kliesch-Eberl, 2007, Abell et al., 2008).

To extend theory on dynamic capabilities so that it addresses these issues, this study observes how the interaction between different organizational levels occurs and how the interactions contribute to or hinder the balance between flexibility and stability. In order to accomplish this I need to examine how resource units are orchestrated and the interaction that takes place, and observe how dynamic capabilities they are deployed and re-aligned to create, extend or modify the resource base.

METHOD

The research design draws on a comparative and longitudinal case study (Eisenhardt, 1989, Eisenhardt and Graebner, 2007, Graebner et al., 2012, Flyvbjerg, 2006, Flyvbjerg, 2011, Yin, 1994) of two international professional service firms (IPSFs) (von Nordenflycht, 2010, Greenwood and Lachman, 1996, Maister, 1993, Løwendahl, 1997). Professional Service Firms that operate internationally provides an exemplar multileveled context to empirically observe how this balance is achieved. The two firms were chosen for the study because they are very similar, but perform significantly different (table 1): one is high performing and is assumed to have high evolutionary fitness (Verico, code name) and one is low performing with assumed low evolutionary fitness (Servco, code name).

Please insert table 1 here

I do not find that exogenous factors can explain the observed performance difference. This suggests that the performance difference between the two firms can be explained by endogenous factors leading to different degrees of evolutionary fitness. This study seeks to identify these internal factors by observing in-depth and over time how the two firms create, extend and modify their resource bases in order to maintain evolutionary fitness. I have followed two IPSFs over a period of 10 years (figure 1).

Please insert figure 1 here

In the data gathering process I employed a mixed-methods approach. Data was collected through storytelling workshops, participant observation in top management meetings, document study, and regular contact with key informants. In total, 255 individual semi-structured and several group interviews have been conducted, in real time, over the period 2000-2010.

FINDINGS

The empirical investigation revealed that the two firms face similar challenges. Both firms need balancing stability and flexibility in a way where they respond to changes in the external environment without causing damage to the capabilities that they make their living of. Both firms are dependent on their ability to attract and utilize good professionals. Professional service firms are defined as knowledge intensive with high individual autonomy. However, operating in international dynamic markets also require these firms to integrate and standardize to achieve scale advantages and to utilize a shared geographically dispersed resource base.

In both firms, I have identified changes in strategy over the 10-year period. Changes in strategy are management's active pursuit of improved evolutionary fitness. The analysis show how strategies were implemented and practices in the studied organizations to establish how they affected capabilities at the organizational, project, and individual levels over time. The analysis shows that capabilities for stability is located at the organizational level, capabilities for interaction with the external environment is located at the project level, and capabilities for flexibility is located at the individual level. The identified capabilities are present in both firms, but the effect of strategy changes in the utilization of these capabilities vary between the two firms.

Despite the particular historic context of the two firms, the empirical investigation reveals that the two firms organize very similarly and they both extensively utilize new information technology to identify and leverage knowledge within their globally distributed units. The major factor that differed between the two firms was that the firm with high evolutionary fitness actively promoted and utilized social networks while the firms with low evolutionary fitness actively inhibited people-to-people interaction.

To verify the effect of social networking on performance I performed a natural experiment. Social networking was introduced in a unit of the low performing firm. The opportunity for the natural experiment was the Flow Project; explicitly aiming at improving people-to-people interaction through the facilitation of interaction between the different individuals both within and across several units and different organizational roles; consequently, a redesigned workflow was suggested. The inspiration for the project came from Toyota's Lean management ideas on the flow of activities with a focus on work-groups and a problem-solving orientation. The Flow project was a response to the previous reductionist value-chain design, which did not sufficiently handle the needs for coordination and reciprocal interdependencies to solve problems that emerged in testing projects. The most important change observed with the Flow-project is that the automatic pass over of works tasks is replaced by the notice-board meetings with people-to-people interaction. By bringing the test engineers and sales personnel together in the discussions, the services offered became bundled and priced differently, with a larger part of tasks needed to perform a safety test now being billed. Moreover, by gaining insight in the actual work process of performing the test, sales personnel could describe the services in more detail to clients, acquiring more trust and improved prices. By coordinating more face-to-face, the process of issuing quotes and writing tenders was simplified.

Please insert figure 2 here

The effect of this natural experiment was an astonishing performance increase of 90% over the first year, surpassing the performance of the high performing firm. The unit also sustained this high performance level for the next two consecutive years (figure 2). I have also controlled for other explanations for the observed performance difference with data collected from the two firm's competitors.

COCEPTUALISATION

The study suggests two constitutive dimensions of dynamic capabilities; articulation and reticulation, that interact in a generative process and that respectively enhance the organization's ability to balance stability and flexibility. Articulation of knowledge, addressed in extant dynamic capability literature (Zollo and Winter, 2002, Boisot, 1998, Prencipe and Tell, 2001, Romme et al., 2010), is present in both firms; enabling them to produce and reproduce the resource base. (Hedlund, 1994) defines articulation as tacit knowledge being made explicit and made available at an organizational level, referring to “corporations as articulation machines” (p. 76). The meta-capability of articulation contributes to organizational stability.

The second dimension of dynamic capabilities identified, I have chosen to label reticulation – this is a new term in the context of management sciences. Reticulation - a term commonly used in natural science - literary meaning to build a network. In this context, it refers to the organization's ability to build and utilize social networks for the mobilization of tacit knowledge from the organizational periphery. The meta-capability of reticulation contributes to organizational flexibility by enabling different organizational levels to interact, mobilize tacit knowledge gained in interaction with the external environment, and find novel and pragmatic solutions to emerging challenges. Consequently, the concept of reticulation directly relates to the notion of the N-Shaped corporation with its Hetrarchy and lateral knowledge exchange dynamics (Hedlund, 1994).

I submit four propositions to explain how articulation and reticulation is related to evolutionary fitness (figure 3).

Please insert figure 3 here

CONCLUSSION

The conclusion from this study is that high evolutionary fitness cannot be achieved by articulation alone. Although knowledge articulation is recognized and described in previous contributions to the dynamic capabilities concept, reticulation is entirely new. To achieve high evolutionary fitness, both articulation and reticulation is required.

This study extends the dynamic capabilities perspective in three ways: First, it creates a link between dynamic capabilities and performance, and conceptualizes dynamic capabilities as a generative process of articulation and reticulation. Second, by explaining how both flexibility and stability is achieved, this study attempts to overcome the rigidity paradox. Third, the study demonstrates the prominent role of the agency level in the achievement of evolutionary fitness. Thus, showing how the process of creating, extending, and modifying the firm's resource base

involves multiple organizational levels that interact in a generative process between articulation and reticulation. In particular, the natural experiment demonstrated the effect of social networking on performance by addressing how individuals contribute to the organization's adaptation to environmental changes, how they contribute to creating, extending and modifying the resource base, and consequently contribute to the achievement of the firm's evolutionary fitness. Moreover, the concept of reticulation is of relevance to strategic management as it addresses the effect of social networking on ability to adapt to external changes.

An broader theoretical implication of this study is that dynamic capabilities probably are not idiosyncratic but might share similarities across firms. There exists a consensus that capabilities have to be built locally and can therefore not be bought in a market. However, there are opposing views on whether dynamic capabilities are firm-specific or heuristics that share similarities across firms. The notion of heuristics is advocated by Eisenhardt and Martin (2000) and by Eisenhardt et al. (2010), suggesting that dynamic capabilities can be understood as simple rules of thumb that guide complex strategic decisions. Hence, given the evidence in this study, it is possible to infer that the meta-capabilities of articulation and reticulation are generic and can exist in several firms.

In addition, previously dynamic capability perspective has been criticized for being too abstract and consequently of little relevance to management. I show in this study that it is possible to invest in, facilitate and manage both articulation and reticulation, and I therefore make dynamic capabilities susceptible to intentional and purposeful managerial intervention. Extending knowledge on dynamic capabilities with articulation and reticulation entails a move toward addressing how dynamic capabilities work. I also attempt to offer increased practical relevance, as both articulation and reticulation can be intentionality managed. The introduction of systems that standardize work tasks, establish efficient routines and procedures, as well as design central databases and work support tools to ensure scale advantages and the development of core competencies, are on the managerial agenda of most firms. More surprising from this study is how firms can realize their value creation potential by being better at connecting people, thus expanding managerial attention and investments to include reticulation activities.

There are however some important limitations to this study. The study is positioned in the contestable area of dynamic capabilities, it could be claimed that the thesis is about the relationship between change, learning and organizational performance, and hence there are other associated literatures that have dealt with the role of social networks for enhanced knowledge mobilization and their impact on firm performance. Future research could thus aim at juxtaposing the concept of reticulation with related concepts such as social capital and boundary spanners to further develop the conceptual contribution. In addition, future research should confirm these findings beyond the two cases of this study. Moreover, future research could explore the effect of utilization of social technology on reticulation and organizations ability to achieve evolutionary fitness through balancing flexibility and stability.

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Tables and figures

Main similarities and differences between the two case firms		
Comparison between	Verico	Servco
Ownership model	Independent foundation	Independent foundation
Home base	Norway	Norway
Main resource	Professional Engineers	Professional Engineers
Core offering	Third party engineering services	Third party engineering services
International presence	Global firm with integrated presence in all three globalization zones	Global firm with integrated presence in all three globalization zones
History and proven ability to adapt	High adaptability. Due to a long history of being global in a shifting maritime industry and later ability to diversify into other industries. Dominant position in its market with an international history from 1864	High adaptability. Despite a short history of being global, it operates in a market with very rapid change and has successfully survived transition from former government body 3 rd largest provider of global CB certificates
Performance (difference of 42,2%)	6683 MNOK/6095 employees= 1,096 MNOK per head*	357 MNOK/463 employees= 0,771 MNOK per head**

* Verico Annual report 2006

** Servco Directors Report 2006

Table 1: Main similarities and differences between the two case firms

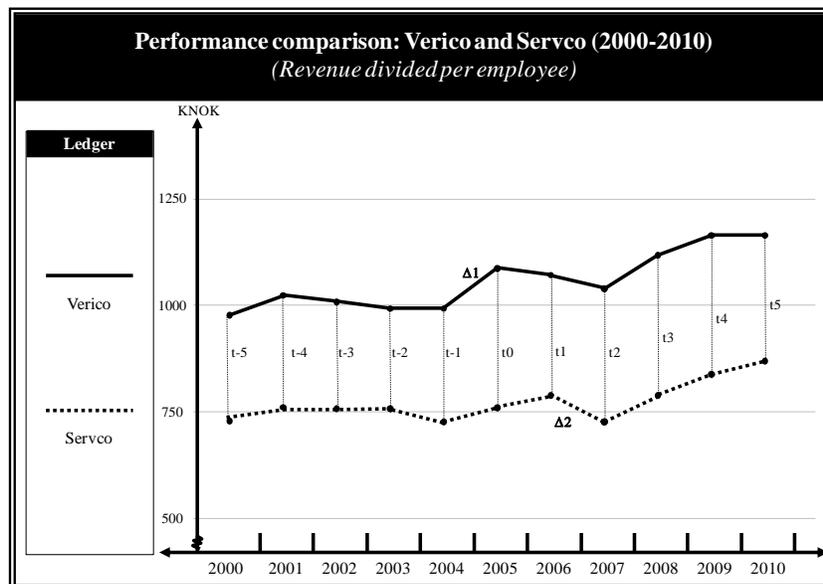


figure 1: Performance comparison: Verico and Servco (2000-2010)

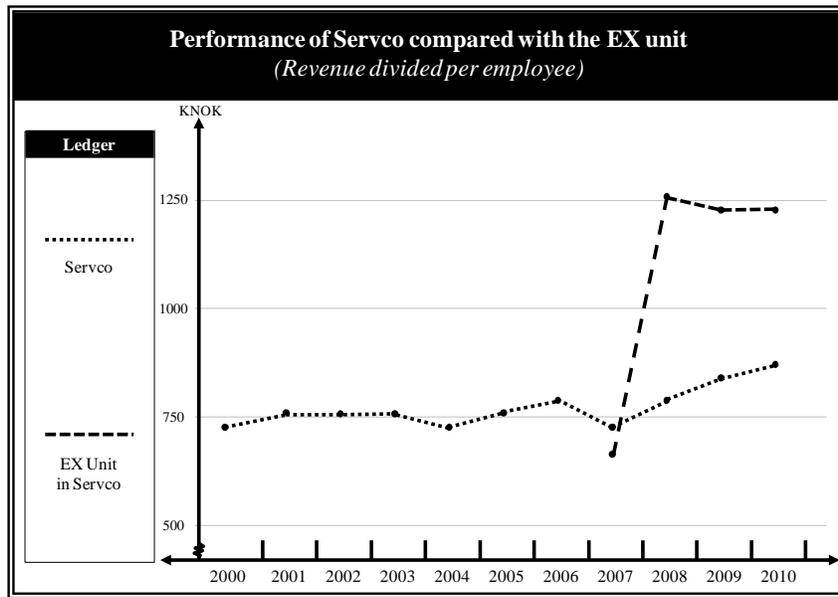


Figure 2: Performance of Servco compared with the EX unit

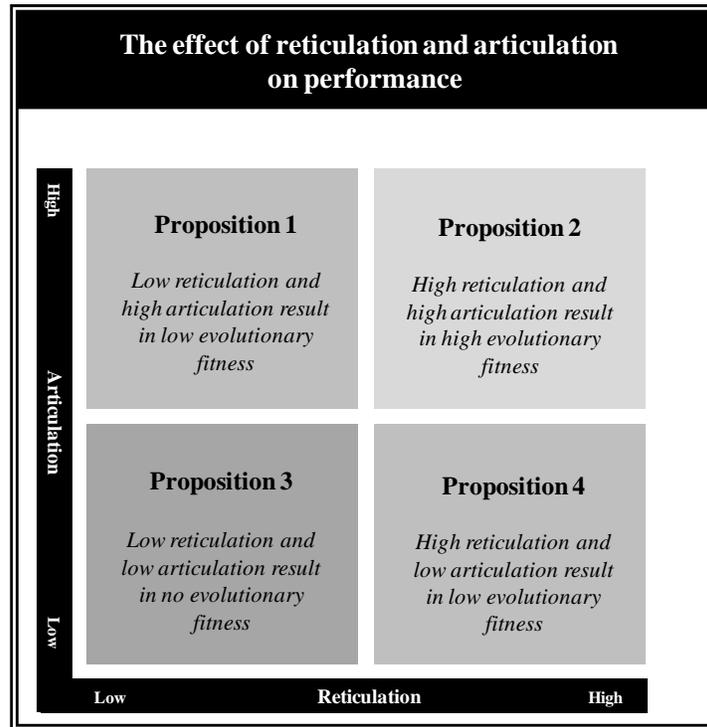


Figure 3: The effect of reticulation and articulation on performance