

The Role of Contextual Ambidexterity in Innovation in International Markets

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Abstract

The ubiquity of innovation drives the intriguing feature of exploration and exploitation for technological developments whilst firms aim to achieve competitive positions in the international markets. The trade-off consequences, on the other hand, bring about challenge to the structure term of ambidexterity and thus the gap in the extant literature, which shows that studies have drawn insufficient attention to contextual ambidexterity. Although context crucially matters for how innovation design and innovation processes can be more effective or realized, research remains in silence under these crucial issues. To address the gap, we develop an exploratory study. From our analysis, we identify that whilst innovation enacts exploration and exploitation in context with organizational environments, contextual ambidexterity entails firms to oscillate between adaptation and adjustment, and change. Given it is such contextual mechanisms drive structure effect to be accomplished our findings suggest that prior studies explain ambidexterity mainly in structure term is incomplete. Whilst our exploratory studies focus on two large international technological communication companies, our findings also explain why knowledge and innovation ‘trickle-down’ has also ‘trickle-up’ implications, and the insight indeed, suggests that contextual ambidexterity entail the succession of innovation.

Introduction

Increasingly, research has focused on the intriguing feature of structural ambidexterity (e.g., Benner and Tushman, 2003; O’Reilly and Tushman, 2004; O’Reilly and Tushman, 2008) for understanding and creating a competitive, sustainable growth firm. For this crucial concept, subsequent studies have devoted a range of ideas such as low cost and a differentiation position (Ghemawat and Costa, 1993; Porter, 1996), combining manufacturing efficiency and flexibility (Tushman and O’Reilly, 1996), resource renewal and reconfiguration, coincident of incremental and discontinuous innovation (Levinthal and March, 1993; Tushman and O’Reilly, 1997). Scholars have also raised the arguments of network structural effects (e.g., Cowan and Jonard, 2009; Gulati, Nohria, and Zaheer, 2000), and resource competency derives from network architectures (Burt, 2007; Kogut and Walker, 2001; Nahapiet and Ghoshal, 1998). Within the ideas of structure effect, studies further suggest that due to complexity pace of change faced by many organizations and the time needed to develop new products and services,

exploitation and exploration also has to be pursued simultaneously (Tushman and O'Reilly, 1997). As achieving simultaneity of exploration and exploitation is either highly difficult or simply impossible (Cyert and March, 1963; Duncan, 1976; O'Reilly and Tushman, 1997, 2004), studies continue to argue for separation or balance. To adapt to market and environmental challenges crucially brought about contextual ambidexterity, the term firstly studies by Gibson and Birkenshaw (2004).

Following from the above, an essential issue arisen is that innovation processes and knowledge development has context. Context albeit with exploration and exploitation in innovation processes and systems involves a set of trade-off issues. Trade-offs concern how the structure effect will be realized, and hence challenge the structural term of ambidexterity (Duncan 1979; O'Reilly and Tushman, 2004; O'Reilly and Tushman, 2007). We argue that contextual matters also affect actions and process in innovation, and how they can be more effective, and importantly, how they can be accomplished, in part, are determined by context, in that the complex relationship between exploration and exploitation and organizational environments. In this sense, contextual ambidexterity forgoes the conception that is favour of a firm exploits tight coupling with simultaneous loose coupling in exploration of business units or systems. Although there is more than structure term that research needs to explain, the extant literature remains in silence under these critical issues. Simply, studies have drawn insufficient attention to contextual ambidexterity in relation to structure ambidexterity. To address the gap brings about this exploratory study.

Given there is little literature to substantiate theory to address the above issues, we establish the framework by providing some strong argumentations, followed by the conceptual analysis. The essential question undertaken is, why is contextual ambidexterity necessarily functioning, and how can it indeed, complement structural ambidexterity in innovation and technology development in international markets? We conceptualize the propositions through inductive-deductive studies. In so doing, we advance the literature by offering a set of contextual mechanisms and examine them in empirical work. This means, we let the framework grounded on a set of explorations and examinations, and the empirical focus is on the complex technology and communication system in relation to innovation and technology developments, which in our analysis is presented by the case studies of the international companies of Vodafone and Huawei, respectively. Whilst Vodafone lead the case of innovation 'trickle-down' in its exploration and exploitation of emerging economies, Huawei, on the other hand, rather presents a case of 'trickle-up' or reverse innovation in exploring and exploiting external markets. Essentially, we seek to show how innovation and knowledge development at both companies demonstrate effect of contextual ambidexterity.

Examinations and Propositions

Building upon the prior study, we clarify that the context of the any innovation or knowledge development refers to actions or activities perform in a dynamic organizational environment, which encompasses internal forms of knowledge as well as the externals, market demand, and event and circumstances. We hence define contextual ambidexterity as behavioral capacity and capabilities, which entail how firm oscillate and mediate internal knowledge with external knowledge or changing markets in order to create effect of the actions. Such contextual ambidexterity crucially enacts successions of innovation and knowledge development. Essentially, contextual ambidexterity

complements structure ambidexterity in complex, challenging environments for firms to achieve high performance. For examining the assumptions, we draw together a set of mechanisms, by which we explore how these mechanisms play a role such as how a firm oscillates between adaptation and adjustment, innovation and knowledge development in the context of organizational environments in order to achieve more effective performance. By examining the insight, we also seek to advance the current observations that indicate there is reverse innovation (e.g., Govindarajan and Ramamurti, 2011). Whereas, we bring about the 'inside-out' explanations, which is we show why and how contextual ambidexterity, in effect, drives innovation and knowledge development to 'trickle-up' whilst also creating 'trickling-down' effect.

Context of Exploitation and Exploration

Prior literature describes that innovation by involving simultaneous exploration and exploitation (e.g., Brown and Eisenhardt 1997; Tushman and O'Reilly, 1997) create efficiency and firm competitive position. Yet balance these actions without undermining respective parts of the activities brings out great challenge for how such effect can be accomplished.

For resolving the problems, we, thus far, have proposed that for generating and sustaining high levels of performance, firm innovation involves contextual ambidexterity. Contextual ambidexterity entails managerial abilities in achieving structure effect by a set of contextual mechanisms. Such mechanisms drive the firm to adjust and permeate the actions demanded organizations in the trade-off considerations. Contextual ambidexterity complements structure ambidexterity, in that contextual ambidexterity with innovation consequently leads firm to pursuit action and knowledge development with consideration both internal and external circumstances, including environmental conditions. Formally, the discussion informs the first proposition,

Proposition 1. A firm develops structural ambidexterity with contextual ambidexterity will lead to a positive performance result of innovation exploration and exploitation.

Innovation and Adaptation

Adaptation drives the organizational process to engage with innovation, and knowledge development whereby contextual mechanisms drive firms to address the changing conditions in the organizational environments by refinement of choice sets in an evolving process of phase transitions. The combination of uncertainty and commitment-intensity suggests the pay-off is likely to lie with developing resources and capabilities that afford the firm with the ability to revise initial choices (Ghemawat, 1991). Contextual ambidexterity therefore prepares for an uncertain future by exploring revision possibilities, either by revisiting the initial choice decisions, or by developing the organizational capacity to respond more flexibly to events that cannot be fully anticipated.

The discussions bring about the essence that contextual ambidexterity crucially is dynamic adaptive behavior that adjusts and permeates exploration and exploitation in the context with the organizational environments to ensure the structure effects to be realized. Formally, the second proposition is

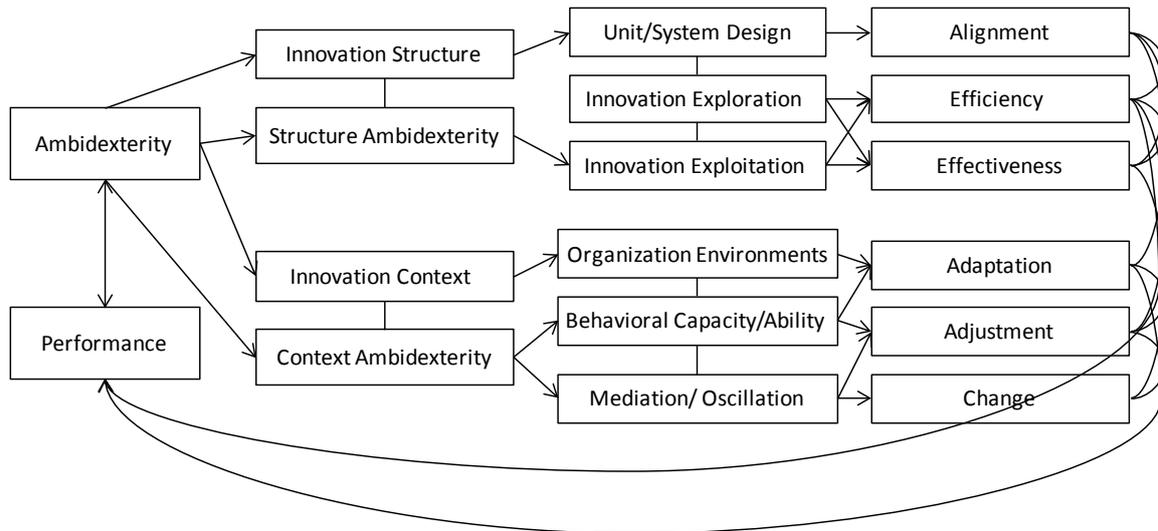
Proposition 2. The more innovation activities develop contextual, the more that behavior capacity entails the structure ambidexterity.

Methods

Assumption Model and Design

We, thus far, have drawn out the assumption model based on the argumentations. In this section, we explain how our expected results through our observation are attained, and hence we build new theory.

Figure 1 Innovation structural ambidexterity and contextual ambidexterity



We thus draw on elements from our framework for the purpose of focused examination through case studies. Figure 1 depicts our framework as we have proposed in the earlier section, which sums up the possible causal relationships between ambidexterity and firm high performance in innovation as embedded in multiple structural, as well as contextual mechanisms. The joint effect and coherence by considering a set of alignment and adaption to organizational environments results in high performance of the innovation undertaken by the firms. Our unique design process is we treat managerial actions as influencing performance and reflect behavior capacity, and other known mediators.

Case Studies and Interviews

We let the case studies capture the circumstances and conditions or commonplace situation, in which performance in relation to organizational decision and management. With an appropriate design, the studies can test a well-formulated theory by empirically identifying whether a theory's propositioned are correct or whether some alternative set of explanations might be more relevant. The use of embedded cases represents a significant contribution to knowledge and theory building on its ability to use multiple units of analysis. We develop several interview questions for the data collection through senior management team at both companies. We present the questions as the follow.

1. In past ten year, what types of structure have been developed for knowledge development and innovation by Vodafone and Huawei, illustrate each?

2. What are important factors in entry (e.g. to UK or US or China) in term of innovation and knowledge development for Vodafone and Huawei?

3. *Within the structures, how important is knowledge context or knowledge development system context for Vodafone and Huawei, give examples?*

4. *How do environmental changes value each of the below got Vodafone and Huawei, adoption, adaptation, knowledge decomposition, integration, differentiation, and specializations?*

5. *When there are change or challenges (e.g., market demand, or other situations) either from internal and external, how has the company (Vodafone and Huawei) responded to that situation or demand?, and*

6. *What changes have Vodafone and Huawei made? What adjustment have they made, and which is more effectively, change or adjustment?*

7. *Which of the above more explain sustainable development of knowledge and innovation for Vodafone and Huawei (or which are top three most important factors), and why?*

In the interviews, attention is given to design of a subunits, subsystems, as well as events that concern the organisations, and the analysis considered different outcomes about the people, products or performance. We design to interview 30 senior managers at both companies. The interviews also stress cross-sectional data, given it observe a 10-years period of organizational performance. Such observations match up with research questions that implicitly or explicitly deal with causality or change, given strong tests require either measurement more than once, or manipulation of one projected reason that may be subsequently linked to another (Bono and McNamara, 2011), such as change may be related to structure of innovation or maybe not.

Results

Structure Effect of Innovation

This part of the results shows structure effect in innovation of the two companies. The findings mainly answer the questions about the types of structures that the companies of Vodafone and Huawei have developed for knowledge development and innovation. And how they are important for strategic entry (e.g. to UK or US or China) in order to achieve collaborative efforts of innovation and knowledge development whilst Vodafone and Huawei aimed to attain more competitive positions in the international markets.

One of the important characteristics of ICT industry is rapid development of technologies and quick growth of market. Vodafone and Huawei almost grasped every opportunity of information technology revolutions and every chance of market expansion. Specially, Huawei has become a leader of industry from the follower. Their organizational structures strongly support their strategies.

In order to meet the market demands and the company strategy, Vodafone correspondingly adjusts the organizational structure to enhance the innovation to capture new businesses, reduce operational cost, as well as increase market share. In April 2006, Vodafone unveiled a new organizational structure that organized its business into three distinct units: a division targeting “new business and innovation”, a European division, and a division containing its assets in emerging markets and other affiliates (Ang, 2011). This new organizational structure devolves the activities of the New Businesses and Innovation Unit into parts of the organization closer to the customer, which enables Vodafone to exploit existing competencies and explore new innovation capabilities.

A key change of Vodafone in innovation is to strengthen open innovation and joint innovation. Collaborative Innovation Network helps Vodafone to master future

challenges. Much of the work of Vodafone Group R&D is done in collaboration with others, both within the Group and externally, with the traditional suppliers and with other emerging companies and academic partners in the communications, media and internet industries. In addition, by collaborating with professional vendors and partners, Vodafone sets up collaborative Labs such as Voxstar Labs, Vodafone xone lab, etc. , which minimises risk in deployment planning, strengthens vendor/operator relationships, ensures the technical feasibility and gets early experience.

With the fastest growth and volume of telecommunication subscribers seen in emerging markets like China, India and Africa, Vodafone is steadily increasing its exposure to emerging markets, strengthening the joint innovation and setting up innovation centers. Take China as an example, since 2000, Vodafone and China Mobile have had a strategic alliance that allows them to leverage strengths and knowledge of the partnership to improve their own business. The partnership initially focused on roaming and development, so despite Vodafone selling their 3.2% stake in China Mobile in 2010, the partnership has apparently been very successful as indicated by the growing list of partnership purposes. In Feb.2011, Vodafone and China Mobile sign Strategic Co-operation Framework Agreement .The areas of interest are actually pretty extensive, including joint innovation and R&D, promotion of converged LTE technology , value chain and industry by partnership in management, technology and operation.

The growth of Huawei strongly depends on the improvement of its dynamic capabilities and continuous innovation, which include both incremental innovation and radical one.

Huawei establishes R&D centers around the world to carry out high level innovation and trickle-up the developed market. With the development, Huawei shortens the technological gap with the international advanced level, not only becomes the direct competitor of the multinational companies gradually in the market, but also becomes their target which is blocked and put down. Huawei insists on high starting points in the technological research and development, always aims at the highly-sophisticated, leading-edge and the most promising products within the industry, and tries hard to stand on the same starting line with the international multinational companies. Take Huawei 3G product as an example, Huawei 3G products started to carry out the design and R& D of the prototype in 1995 and entered into development stage in 1998; and then entered into the testing phase in 2000; at the end of 2004, Huawei deployed six WCDMvii commercial networks finally, and broke through the western European markets. Now, Huawei established the 2012 Laboratories to carry out basic research. It has set up 23 research centers in Germany, Sweden, the UK, France, Italy, Russia, India, China, and other countries. In addition, it has established 34 joint innovation centers with top carriers to transform leading technologies into competitive advantages and business success for customers. For example, in 2011, Huawei together with TELUS and Carleton University, established a joint research lab dedicated to enterprise cloud services to focus on customer-centric innovation in support of Canada's thriving Digital Economic Strategy. By this way, Huawei devotes itself to a long-term commitment to the developed market and gain competitive advantages.

Context Effect of Innovation

This part of the results illustrate, within the structures how context with organization environments influence innovation and knowledge development, and how the set of mechanisms strengthen performance whiles the organizations mediate with

environment and oscillation between adoption and adaptation, adjustment and change. How such as knowledge decomposition integration, differentiation have effectively enhanced performance of innovation of Vodafone and Huawei. The result further show how environmental changes value these actions and in turn, these action explain structure effect cannot be separated from contextual matters and it is contextual ambidexterity complement structural ambidexterity for a successful innovation.

Here is a case of Vodafone Research and Development Germany (VF R&D.DE), which promotes a climate that fosters innovation and calculated risk taking to develop new services and ways of working (Stüer et al., 2008).

In contrast to the exploiting focus of Vodafone, VF R&D.DE has an exploratory focus and three major objectives: firstly, it intends to identify and drive radical innovation; secondly, to shape technology development and accept new business opportunities; and thirdly, to build and motivate ecosystems. Instead of doing basic research, VF R&D.DE lays more stress on applied research, new business models and innovation ecosystems. Within the structure of VF R&D.DE, the knowledge development system context plays an important role. This R&D center strengthens the cooperation with external knowledge pools, such as established companies and start-ups, research and development, service providers and universities to manage existing knowledge. VF R&D.DE scans the markets, searching actively for new discoveries, monitoring trends, and evaluating start ups. Accordingly, an inspiring network of innovative minds is established. The resulting network is continually being expanded, thanks to special events centred on future technologies, think tanks on services and business models of the future, and close links to Vodafone Research & Development. With years of expertise, ideas and the highest possible level of technical creativity, its employees develop innovative solutions, working trans-disciplinary with internal and external thought leaders and subject matter experts.

In order to speed up the radical innovation, when a business opportunity is recognised, motivation is nurtured within the network to create commitment for a joint innovation process. By means of prototyping, VF R&D.DE generates tangible and comprehensible objects, which partners can relate to. Finally, the transition process from VF R&D.DE to operators and business partners is supported by central operations. Once the idea has been developed into a draft, the project is presented to the mainstream organization to receive funding. The incubation phase is driven by interfunctional coordination, existing networks are accessed and subject matter experts are included to identify a suitable business model. Hence, the innovation ecosystem is improved and new markets are created (Stüer et al., 2008).

Ambidexterity

Finally, the result shows that when there are change or challenges (e.g., market demand, or other situations) either from internal and external, both Vodafone and Huawei choose to change their organizational structures to respond them. Here make Huawei as the case.

Since Huawei goes to global markets, it faces highly indefinite external environment. Due to the different demand of consumers, the differences in government policy and economic environment, the non-discriminatory look at the global market will ignore the opportunities for the development of the local market and miss the opportunities. In order to meet the strategic adjustment, Huawei changes its organization structure from original vertical linear structure into matrix structure.

Huawei's matrix structure is kind of structural ambidexterity with contextual ambidexterity, which help Huawei to realize the perfect unification of flexibility and professional and hence make Huawei respond to the changes of environment quickly and complete combination strategy of differentiation and low cost effectively. The horizontal regional organizations established in accordance with the principle of functional specialization, can provide support, services and supervision for the business units, and make the business operation centers carry out their respective customer-centric business activities in the regional platform. The vertical four business operation centers, which have the operating management team (EMT) respectively to determine the appropriate target, assessment and management operation mechanism according to their corresponding customer demand rule, are set up in accordance with the principles of business specialization.

Huawei gradually pushes its horizontal regional organization to the front line, which help strengthen the organization and management of the local market, to get the local market information timely, and respond quickly to the demand of the local market. Flat organizational structure make Huawei perceive changes of various environmental factors quickly. Huawei can make timely response to the changes in the external environment through the shorten decision-making chain, and solve the problems in operations management quickly. Hence, this kind of structure reduces the threat of environmental uncertainty posed to Huawei. From the perspective of promoting the product differentiation, Huawei's organizational structure is designed with a strong sense of market orientation to subdivide the business department according to the customer segments. The four business operations centers for different market segments develop new products according to the demands of their respective customers, and thus promote the development of product diversification. The matrix structure is prospective and has good expansibility. Huawei can add a new profit center needed when it enters into new products or areas of competition.

In fact, Huawei's organization structural transition began with the product line change. Huawei builds up product development team (PDT) to respond local market demand quickly. Once the opportunity knocks, the corresponding departments will seize the opportunity to take rapid action, not the entire company takes action. Each PDT is consisted of the transferred representatives from R&D department, marketing department, financial department, purchasing department, customer service department and production department, etc. It just likes a small enterprise, takes full responsibility for the whole process from research and development, market, profit and product life cycle. PDT structure endows the team members with the collective responsibility to achieve the team objective. The whole organization has higher information transparency, and all the members have the information division which conforms to the tasks, so as to form the information change networks which extend to the inside and outside of the enterprise with a clear purpose, and improve the efficiency of technological innovation accordingly.

Following the product line change, Huawei takes the corporate executive management team (EMT) and strategy & customer standing committee as the leading organizations to achieve the market-driven process, and strengthens the decision supporting ability of marketing system on the understanding of the customer demands, the control of strategic direction and the business planning. Meanwhile, Huawei exploits the effective cooperation among investment review board (IRB), marketing management team, and production system management team, operation and delivery management

team and the supportive team, to ensure the customer demands as driving power of the general strategy and its implementation.

Huawei make the structure flat down to improve the efficiency of technological innovation and promote the differentiation of product. Huawei divides the business units in accordance with the products , different business units not only have their own products and markets, but also can adapt to the new market situations flexibly and independently. On the one hand, due to the comparison and competition among the business units, each business unit will pay close attention to the new market demands, and will make innovation continuously; on the other hand, the way of business units being divided according to the products can make the individual technology and professional knowledge be given into full play, and therefore, to improve the efficiency of technological innovation.

Discussion and Implications

Prior studies identify that internationalization is viewed as a process of learning and knowledge accumulation and knowledge and learning play a central role in the internationalization processes of the firm in a different number of ways. To advance this line of research, in this paper we argue that the process essentially is innovation and knowledge crucially contextualized. Given the logic that in the process, international firms integrate external knowledge and launch attractive new products to the potential international markets, as Pla-Barber and Alegre, (2007) argue, international firms develop an outstanding innovative capability whilst they exploit in several markets. This process suggests international firms have to deal with knowledge context with both their internal production process and knowledge implications for external markets and firms while learning alters the manner in which firms see and interpret the world and identify knowledge gaps in foreign markets. Consequently, as Kafouros et al., (2008) argue, it involves product adaptation for achieving product innovation successfully.

To that end, the further challenge is the changing environment and incompleteness of knowledge. For these issues our results highlight that innovation and knowledge production essentially, is a dynamic adaptive approach, and that rather, reflects more on firm dynamic capabilities. To an extent, this paper also explains why there is reverse innovation such that the recent phenomenon of knowledge flows inversely from emerging economies to developed economies though traditionally advanced technology and innovation mostly originate in developed countries. Combined with case studies, interviews and further empirical analysis we find support to the argument.

Indeed, knowledge acquisition is one of the key factors behind a firm's international behaviour. To create a market leadership or resource competencies raise further challenges for international firms where knowledge development importantly contextualized. And it is such approach significantly contributes to the progression of internationalization. The causal explain the insight of knowledge flows is fungible but there is no uniform and equifinal distribution in the internationalization process.

Together, the findings motivate future research. It will not just fill in a literature gap in our understanding of 'trickle-up' and 'trickle down' but also creating a set of entrepreneurial opportunities for Vodafone and Haiwai, as well as other businesses. Essentially, it serves policy schemes of UK and Chinese governments for businesses and enterprises to develop international profiles. It also critically influence the realization of

knowledge exchange through the consequence that this project, in effect, creates a large customer base for both businesses through their consultations on implementations of operation systems and supply of related knowledge, products, and services for those related businesses in international markets and international ventures.

References

1. Ang, Rachel, 2011. Vodafone Global Telecommunications: Optimizing Operations. <http://ssrn.com/abstract=1861415> or <http://dx.doi.org/10.2139/ssrn.1861415>
2. Brown, S.L., & Eisenhardt K.M. 1997. The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1): 1–34.
3. Gibson, C.B., & Birkinshaw, J. 2004. The antecedents, consequences, and mediating role of organizational ambidexterity. *Acad. Management Journal*, 47:209–2006.
4. Ghemawat, P. & Costa, J. E.R. 1993. The organizational tension between static and dynamic efficiency, *Strategic Management Journal*, Special Issue 14(2): 59–73.
5. Jansen, J.P, Tempelaar, M.P, Van den Bosch, F.A., & Volberda, H.W. 2009. Structural Differentiation and Ambidexterity: The Mediating Role of Integration Mechanisms *Organization Science*, 1-15.
6. Joyce E. Bono Gerry McNamara 2011. Research Design, *Academy of Management Journal* 2011, Vol. 54, No. 4, 657–660.
7. Kerlinger, F. N., & Lee, H. B. 2000. *Foundations of behavioural research*. Forth Worth, TX: Harcourt
8. Levinthal, D.A. 1997. Adaptation on rugged landscapes. *Management Science*, 43(7): 934–950.
9. Levinthal, D.A. 2011. A behavioral approach to strategy- what’s the alternative? *Strategic Management Journal*, special issue 32(13): 1517-1523.
10. Locke, K. 2002. The grounded theory approach to qualitative research. In F. Drasgow & N. Schmitt (Eds.), *Measuring and analyzing behavior in organizations*: 17–43. San Francisco: Jossey-Bass.
11. Mulaik, S.A. 1972. *The foundations of factor analysis*. New York: McGraw-Hill.
12. Nahapiet, J., & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Acad. Management Review*, 23:242–266.
13. O’Reilly, C.A., & Tushman, M.L. 2007. Ambidexterity as a dynamic capability: Resolving the innovator’s dilemma. *Research of Organizational Behavior*, 28: 1–60.
14. Porter, M.E. 1996. What is strategy? *Harvard Business Review*, 74(6): 61-78.
15. Stüer, C., Hüsig, S. & Biala, S. 2008. How to Create and Sustain an Open and Radical Innovation Capability? An Empirical Case Study Analysing Ongoing Radical Innovation Projects at Vodafone R&D. PICMET 2008 Proceedings, 27-31 July, Cape Town, South Africa (c) 2008 PICMET.
16. Tushman, M. L., & O’Reilly, C.A. 1996. Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4): 8–30.

17. Walker, G., Kogut, B., & Shan, W. 1997. Social capital, structural holes and the formation of an industry network. *Organization Science*, 8: 109-125.