Working paper

Exploring the dynamic capabilities of boundary spanning actors: a sensemaking perspective

ABSTRACT

This article explores the dynamic capabilities of boundary spanning actors from a sensemaking perspective. In adopting a sensemaking approach we attempt to provide a more nuanced understanding of the dynamic capabilities of boundary spanning actors. We develop a conceptual framework for building innovative capabilities in science-based SMEs. Our sensemaking framework aids our understanding of the behaviours and attitudes of key stakeholders that build social capital and enhance dynamic capabilities. The central contribution of the article is to demonstrate that the behavior and/or attitudes of individual actors, in relation to boundary spanning activities and network building, acted as socio-contextual enablers that help build social capital, through boundary spanning and networking activities, leading to enhanced innovative capabilities.

Key words: Dynamic capabilities, boundary spanning, sensemaking, processual

INTRODUCTION

In this paper we explore the dynamic capabilities of boundary spanning actors from a sensemaking perspective. The relationship between dynamic capabilities, innovation and competitiveness has received some attention in *Industrial Marketing Management* (see, for example, Gebauer, 2011; Salunke, Weerawardena, & McColl-Kennedy, 2011; Weerawardena & Mavondo, 2011; Zhang & Wu, 2016) and has been the subject of a recent special issue (Mitrega, Henneberg, & Forkmann, 2018). In this paper we address a gap in existing research on dynamic capabilities, specifically regarding the role individual actors play in influencing firms' innovative capabilities. Our paper contributes to the field of dynamic capabilities by developing a new conceptual framework for building innovative capabilities in science-based SMEs. Our framework demonstrates that the behavior and/or attitudes of individual actors, in relation to boundary spanning activities and network building, was a socio-contextual enabler that help build social capital, through boundary spanning and networking activities, leading to enhanced innovative capabilities.

THEORETICAL FRAMEWORK

Dynamic and Innovative Capabilities

Organizations that can find innovative ways to manage dynamic capabilities gain competitive advantages (Gebauer, 2011). In discussing the nature of innovation and capabilities it is important to distinguish between 'innovation', i.e. the outcomes in, "new product introductions, technology patents, sales generated from new products" (Subramaniam & Youndt, 2005, p. 453) and 'innovative capabilities', i.e. the process of building relationships, dynamic learning capabilities (Salunke et al., 2011) and expertise in the creation of new ideas that support the development of new processes and products (Hagedoorn & Duysters, 2002). It has been suggested that innovative capabilities, "refer to the activities around innovation processes that reinforce and encourage the generation of new and useful knowledge based on previous knowledge" (Pattinson, Preece, & Dawson, 2016, p. 2). The development of innovative capabilities is closely linked to the concept of absorptive capacity (Cohen & Levinthal, 1990), which refers to an organization's ability to recognize the value of new, external knowledge, assimilate it, and apply it to commercial advantage (See also, Tzokas, Kim, Akbar, & Al-Dajani, 2015; Winkelbach & Walter, 2015, in this journal). Absorptive capacity is, "an important construct because it shifts our attention to how well firms are equipped to search out, select and implement knowledge" (Tidd & Bessant, 2011, p. 257) . This suggests that the dynamic capabilities of individual boundary spanners might play an important role in building networks that support the development of innovative capabilities by supporting the transfer and sharing of tacit knowledge.

Boundary Spanning

The term 'boundary spanning' was originally used by Tushman (1977) when discussing the role of individuals within an 'innovation system' who linked a firm's internal networks with external information sources. Boundary spanning actors have a substantial impact on organisational performance through the relationships they build with external stakeholders (Korschun, 2015), as well as influencing strategic renewal in organisations (Glaser, Fourné, & Elfring, 2015). Boundary spanning activities can differ, depending on the type of knowledge sought (Andersen, Kragh, & Lettl, 2013) and by encouraging the activities of individual boundary spanners, "external knowledge and expertise can be drawn into organizations for the purpose of enhancing their absorptive capacity" (Pattinson et al., 2016, p. 13). Boundary spanning actors act as 'network champions' (Gupta, Cadeaux, & Woodside, 2005) or 'innovation champions' (Coakes & Smith, 2007), transcending organizational boundaries and

supporting networking and collaboration *across* organizations, and also *in* other organizations (Pattinson & Preece, 2014). The behaviors and/or attitudes of individual actors was a socio-contextual enablers (Pattinson et al., 2016) that help build social capital, through boundary spanning and networking activities, leading to enhanced innovative capabilities.

Social Capital

The importance of social capital as a contributor to innovation has been the focus of much theoretical discussion (see, Carmona-Lavado, Cuevas-Rodríguez, & Cabello-Medina, 2010; Eklinder-Frick, Eriksson, & Hallén, 2014; Hsieh & Tsai, 2007; Partanen, Möller, Westerlund, Rajala, & Rajala, 2008). Indeed, supporters of social capital theory argue that it provides capabilities for creating and sharing knowledge that improves innovation capability. However, for science-based SMEs in particular, issues related to the appropriability of their innovations, for example, enforcing intellectual property rights, suggests that such fear, rather than resources, presents the most likely barrier to successful innovation through collaborating in networks. In this paper we argue that it is necessary to explore the relationship between individual salience and social capital in order to understand how individual actors adopt sensemaking to build relationships and develop networks rich in social capital that enhance their innovative capabilities. The next section outlines the methodological approach of the study.

METHODOLOGY

A qualitative case study methodology was appropriate because it supports study of complex phenomena within a specific context (Eisenhardt, 1989), in this case science-based SMEs. The study draws upon a qualitative case study of 6 science-based SMEs. We conducted 20 in-depth interviews with a range of individuals in these firms (see Table 1).

Table 1 Participant Companies

Company	Established	Employees	Turnover	Sector	Participants
Company A	1992	80	£5 million	Chemical processing	Operations Director Purchasing Manager Commercial Director Finance Director
Company B	2002	14	£1.2 million	Biotechnology	Managing Director Technical Manager R&D Manager R&D Scientist
Company C	2009	2	Not available	Waste water treatment	Managing Director Technical Director
Company D	2008	2	Not available	Nanotechnology	Managing Director Technical Director
Company E	2003	60	£2.4 million	Radiation detection equipment	Materials Manager New Technology Manager Chief Technical Officer Technical Manager
Company F	1981		£6 million	Gas sensor/analyser equipment	Managing Director Design Engineer R&D Manager Service Manager

Thematic analysis was considered a suitable method for analyzing our interview data for a number of reasons. Thematic analysis is useful in identifying, analyzing and reporting patterns (or themes) within a data set (Clarke, 2016). We were able to unearth relevant themes within the text at different levels, and this also facilitated the structuring and representation of our themes (Attride-Sterling, 2001).

FINDINGS

The findings suggest that the salience of individual actors acted as a socio-contextual enabler for building social capital through boundary spanning and networking building, and was a significant factor in the SMEs building enhanced innovative capabilities. In exploring our findings we developed our conceptual framework (Figure 1) to guide our analysis of the narrative data.

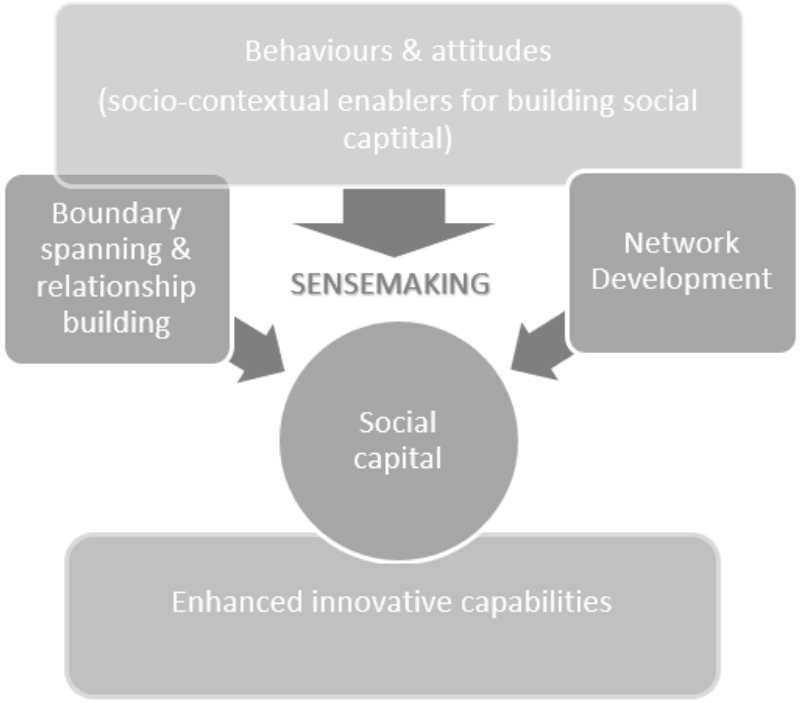

Figure 1. Conceptual framework

Boundary Spanning and Relationship Building

The behavior and attitude of boundary spanning actors was a significant factor in successful relationship building. One interviewee in Company E, considered the company's success to be a result of strong boundary spanning activities of the company's Chief Executive Officer (CEO) in promoting their unique expertise, as one interviewee explained: "I think [the CEO] helps a huge amount with [promoting the company], he has far more involvement… speaking to the right people and being responsive. It's the rapport thing isn't it?" (Materials Manager, Company E). Although originally an academic with a PhD in Physics, the CEO of Company E was viewed by fellow board members as a credible business person with extensive scientific knowledge that made him an effective boundary spanner, particularly between the company's customers and sales staff, as one interviewee observed:

> "He understands the technology and that's really what gives him his unique levels of focus. You've got to be able to help the customer and, because… the technology's quite difficult [to understand for], most of the sales people, they can help the customer a little, but they can't really help them as much as maybe [the CEO] can" (Chief Technical Officer, Company E).

In contrast, some of the smaller start-up SMEs such as Company D, based at the [W] Innovation Centre, relied on support from the Innovation Centre Manager who, acting as a boundary spanner, brought companies together to engage in innovation activities:

> "... [the Manager] is looking at… we had our first sort of get-together of water treatments… water monitoring company conference rather, where… he contacted a few companies in the area, mostly companies that didn't directly compete with each other. And we all gave a little presentation on our own companies and had a network event after that. And we have some meetings with some of those companies next week, actually" (Technical Director, Company D).

The boundary spanning activity of the Innovation Centre Manager compensated, to some extent, for the lack of salience of Company D's founders, enabling them, ex post facto, to engage with competitors in an innovation forum where they could participate in knowledge sharing activities, exchange ideas and build relationships.

Network Development

The success of Company B can be linked to the high level of salience by the Managing Director, whose ability to communicate effectively and build strong social relationships, was instrumental in providing the basis for thriving networks to form. Individual salience is often associated with successful network building and the Managing Director was able to build on the initial impromptu meeting, drawing together individuals, in essence, cultivating a network, "I have extremely good relationships with everyone I work with that's why we're successful. And I'm carrying over that good relationship to everybody in here". The Managing Director also recognized the importance of involving all his staff in building network relationships, creating the conditions for such networks to emerge: "Now when people come and visit us it's not just 'you and me'. I make sure they meet everybody; more people are involved in the meetings. They start to build their own relationship with them" (Managing Director, Company B). In contrast, Company A, relied on their networks rather than any one individual's salience, and showcased their collective expertise – technical, commercial and managerial – in order to leverage the absorptive capacity (Cohen & Levinthal, 1990) of the firm:

> We've got the commercial expertise, we have the technical expertise, we have… support services, like the laboratory, the compliance side and… a very strong management team. And because of the time… the experience, I think this is something people doing innovation value. (Operations Director, Company A).

There was much evidence of sharing of expertise in sustained, medium to-long term collaborative relationships through the building of networks across the science-based SME organizations. Through the construction of such networks, social capital was accumulated and leveraged between SMEs and the organizations they worked with which enhanced their innovative capabilities.

Social Capital for Enhanced Innovative Capabilities

Effective boundary spanners were able to build individual relationships and networks that supported the development of social capital, as one interviewee observed: "The most successful ideas are those that start from the individual and then they successfully persuade others to share that motivation, that idea, that concept, and then get some momentum behind it" (Managing Director, Company F). Such boundary spanners brought together customers, suppliers and competitors, helping build cohesive networks for the development of social capital (Partanen, Möller, Westerlund, Rajala, & Rajala, 2008). For example, the Managing Director of Company B was able to build on initial impromptu meetings, drawing together individuals, in essence, cultivating a network. By leveraging his existing personal contacts, he brought together

‘Company T' and [C] University in order to solve a problem the university were having in scaling up on one of its innovations:

> “[Company T] produce novel research entities for pharmaceutical research based on peptides. It’s a very good business. I just didn’t know it was in [this town] that’s all. We now keep very much in touch. I mean, I have a link with [C] University Department of Biochemistry and a researcher down there is struggling to scale up his peptide synthesis, so we arranged a meeting with [Company T] because they can do it” (Managing Director, Company B).

Through his boundary spanning activities, the Managing Director of Company B was able to build social capital that improved the absorptive capacity (Cohen & Levinthal, 1990) and absorptive capability (Unal & Donthu, 2014) through the exchange of network resources for new product innovation (Mu, Thomas, Peng, & Di Benedetto, 2016). On the other hand, most of Company C’s innovations had been generated through collaborations with customers. For example, a sun screen manufacturer had asked for help to improve the distribution of their product. As part of the innovation process, the sunscreen manufacturer shared its test data about the product with Company C. Through a process of mutual engagement both parties were able to enhance the innovation process by sharing their knowledge:

> Most of the work we do…we do one or two pieces internally, but pretty much all of what we do is in collaboration with an… end-user. Whether that’s right down to basically testing the technology, we’ve developed this technology but what we don’t have, as a small company, is the ability to test various applications. So we’ve done some work with some [sun] screen manufacturers to… well we did a very small piece of work to show we could improve, or should improve, the distribution of particles for [their] sunscreen. (Technical Director, Company C).

In one case, advice was backed up with other ‘free’ services such as testing, validation and reporting services, in the hope that sharing the company’s expertise would build up a shared repertoire and strengthen its chances of gaining paid contracts in the future:

> “… in certain cases what we might do is offer a kind of validation that our system might work by a sort of a… my co-founder hates this word, but a ‘free test’. She doesn’t like the word free complimentary test. But it’s just to prove that the system at least has some effect on their particular effluence stream. And then after that I would probably go with a brief report presentation and then meet them at that point. That seems to work quite well” (Technical Director, Company D).

Not surprisingly, then, in the SMEs with a stronger R&D focus there was a stronger sense of shared repertoire, developed through interactions centred around their particular domain of knowledge, i.e. an area of scientific and/or technical expertise. As one of these scientists observed: “I think everyone has a physics PhD. So yeah… if you want to put it in those terms [that they were all scientists]” (Senior Scientist, Company E). The SMEs were seen to work in partnership with their customers on an informal basis, sharing expertise, where they developed solutions to their customer’s problems.

DISCUSSION

In applying our conceptual framework to our findings, we have highlighted how the behaviours and attitudes of boundary spanning actors act as socio-contextual enablers for building social capital. The findings of the research demonstrate that a variety of networks emerged that supported a range of collaborative activities between the science-based SMEs and their diverse innovation partners, including customers, suppliers and competitors. Innovation occurred, for example, through the outsourcing or sharing of R&D activities by larger firms, or from larger firms’ as well as with (unusually) competitors, and by adopting collaborative approaches to innovation activities. The findings further demonstrate that individual actors displaying high

levels of salience played a significantly more influential role in initiating and promoting network activity. These boundary spanners were able to transcend organizational boundaries, thus supporting, innovation and collaboration both within and across organizations. These 'innovation champions' were able to promote the innovative capabilities of their organizations because of their relative salience within their personal networks. By accessing their personal networks first when seeking external knowledge these individuals and were better equipped to build stronger, longer-lasting relationships.

CONCLUSION AND CONTRIBUTIONS

First, our findings contribute to both the social capital and network literature, highlighting how individual salience improves networking capability, enabling organizations to build social capital, an essential element for successful collaborative innovation. Second, our findings demonstrate that individuals exhibiting high levels of salience not only recognise the value of networks, but are able to build successful networks that support the generation of social capital. Third, our paper contributes to the field of dynamic capabilities through the development of a new conceptual framework for building innovative capabilities. Our framework demonstrates that the behavior and/or attitudes of individual actors, in relation to boundary spanning activities and network building, was a socio-contextual enabler that help build social capital, through boundary spanning and networking activities, leading to enhanced innovative capabilities.

REFERENCES

Andersen, P. H., Kragh, H., & Lettl, C. (2013). Spanning organizational boundaries to manage creative processes: The case of the LEGO Group. *Industrial Marketing Management, 42*(1), 125-134. Retrieved from http://www.sciencedirect.com/science/article/pii/S0019850112001940. doi:http://dx.doi.org/10.1016/j.indmarman.2012.11.011

Beijerse, R. P. (2000). Knowledge management in small and medium-sized companies: knowledge management for entrepreneurs. *Journal of knowledge management, 4*(2), 162-179.

Carmona-Lavado, A., Cuevas-Rodríguez, G., & Cabello-Medina, C. (2010). Social and organizational capital: Building the context for innovation. *Industrial Marketing Management, 39*(4), 681-690.

Clarke, D. a. G., Graham. R. (2016). Professor Nigel King on Template Analysis. Retrieved from http://onlineqda.hud.ac.uk/_REQUALLO/FR/Template_Analysis/Index.php

Coakes, E., & Smith, P. A. C. (2007). Developing communities of innovation by identifying innovation champions. *Learning Organization, 14*(1), 74-85.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128-152.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review, 14*(4), 532-550.

Eklinder-Frick, J., Eriksson, L. T., & Hallén, L. (2014). Multidimensional social capital as a boost or a bar to innovativeness. *Industrial Marketing Management, 43*(3), 460-472.

Gebauer, H. (2011). Exploring the contribution of management innovation to the evolution of dynamic capabilities. *Industrial Marketing Management, 40*(8), 1238-1250.

Glaser, L., Fourné, S. P. L., & Elfring, T. (2015). Achieving strategic renewal: The multi-level influences of top and middle managers' boundary-spanning. *Small Business Economics, 45*(2), 305-327.

Gupta, S., Cadeaux, J., & Woodside, A. (2005). Mapping network champion behavior in B2B electronic venturing. *Industrial Marketing Management, 34*(5), 495-503.
Hagedoorn, J., & Duysters, G. (2002). External sources of innovative capabilities: the preferences for strategic alliances or mergers and acquisitions. *Journal of management studies, 39*(2), 167-188.
Hsieh, M.-H., & Tsai, K.-H. (2007). Technological capability, social capital and the launch strategy for innovative products. *Industrial Marketing Management, 36*(4), 493-502.
Korschun, D. (2015). Boundary-spanning employees and relationships with external stakeholders: A social identity approach. *Academy of Management Review, 40*(4), 611-629.
Mitrega, M., Henneberg, S. C., & Forkmann, S. (2018). Capabilities in business relationships and networks: An introduction to the special issue. *Industrial Marketing Management*.
Partanen, J., Möller, K., Westerlund, M., Rajala, R., & Rajala, A. (2008). Social capital in the growth of science-and-technology-based SMEs. *Industrial Marketing Management, 37*(5), 513-522.
Pattinson, S., & Preece, D. (2014). Communities of practice, knowledge acquisition and innovation: a case study of science-based SMEs. *Journal of Knowledge Management, 18*(1), 107-120.
Pattinson, S., Preece, D., & Dawson, P. (2016a). In search of innovative capabilities of communities of practice: A systematic review and typology for future research. *Management Learning*. Retrieved from http://mlq.sagepub.com/content/early/2016/06/01/1350507616646698.abstract.
Salunke, S., Weerawardena, J., & McColl-Kennedy, J. R. (2011). Towards a model of dynamic capabilities in innovation-based competitive strategy: Insights from project-oriented service firms. *Industrial Marketing Management, 40*(8), 1251-1263.
Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal, 48*(3), 450-463.
Tidd, J., & Bessant, J. (2011). *Managing Innovation: Integrating Technological, Market and Organizational Change, 4th Edition*.
Tushman, M. L. (1977). Special boundary roles in the innovation process. *Administrative science quarterly*, 587-605.
Tzokas, N., Kim, Y. A., Akbar, H., & Al-Dajani, H. (2015). Absorptive capacity and performance: The role of customer relationship and technological capabilities in high-tech SMEs. *Industrial Marketing Management, 47*, 134-142.
Weerawardena, J., & Mavondo, F. T. (2011). Capabilities, innovation and competitive advantage. *Industrial Marketing Management, 40*(8), 1220-1223.
Winkelbach, A., & Walter, A. (2015). Complex technological knowledge and value creation in science-to-industry technology transfer projects: The moderating effect of absorptive capacity. *Industrial Marketing Management, 47*, 98-108.
Zhang, J., & Wu, W.-p. (2016). Leveraging internal resources and external business networks for new product success: A dynamic capabilities perspective. *Industrial Marketing Management*.