

# THE EVOLUTION OF NETWORK CAPABILITY IN AN SME CONTEXT

## ABSTRACT

This paper charts the evolution of network capability among small-to-medium-sized enterprise (SME) through the application of an SME pre-network capability construct. The theoretical conceptualization accommodates the inherent characteristics of SMEs and recognizes that SMEs can lack the techniques essential for gaining advantages through network action. Attaining pre-network capability translates into SMEs having awareness and knowledge of their networks and being able to act within them to progress from a dyadic level to enable network action and the emergence of network capabilities.

This empirical research entailed interviews and participatory action research over 8 months, which allowed for the analysis of the evolutionary nature of SME network capability throughout the study. Interventions and measures were devised around each dimension of SME pre-network capability prior to the field research to enhance replicability through modeling how the effect can be reproduced. The three interventions necessitated six 3-hour group participatory action learning sessions. The sessions entailed an in-depth group discussion of pre-network capability and the description of an intervention that necessitated individual SME activity over the following month. At the follow-up action learning session, the participants discussed, shared, and reflected on each individual intervention action experience. Post-intervention interviews with each SME allowed for a more in-depth discussion of knowledge of issues mentioned in the sessions and clarification of those issues.

Based on the network pictures literature (Ford, Gadde, Håkansson, and Snehota, 2003; Ford and Redwood, 2005), the *awareness* intervention involved network mapping. This was used to allow the SMEs discuss their networks in terms of connections within and around the value chain. The rationale for the use of network mapping was to enhance the SMEs' awareness of networks in an industrial sense exclusive of connections based purely on friendship and kinship ties. Key qualitative measures focused on the composition of the SMEs' networks, the average length of relationships, the diversity of relationships, and the SMEs' perceptions of networks.

Findings show that by implementing the SME pre-network capability framework and the three interventions, the SMEs started to use their networks as a means to enhance their activities. Attaining the foundation dimension of the construct, awareness, facilitated this enhanced activity. Throughout the course of the study, the SMEs' perception of networks changed, and their focus shifted from a social view of networks as comprising predominantly family and friends to an industrial view of networks comprising academic institutes, government agencies, suppliers, distributors, customers, competitors, and other actors. Upon completing the study, the SMEs acknowledged that they could now focus strategically on their networks of relationships and strive to fit actors within their strategy. Initially, the participants perceived their networks as having a supporting, background role. However, 8 months later their view had shifted to more closely mirror the market-as-network approach, and SMEs could clearly see the benefits of decisively utilizing networks in their strategic activity.

Given that SMEs must acquire firm-specific capabilities prior to network capabilities, this paper contributes to the literature by developing a framework to conceptualize and explore in action pre-network capability as a prerequisite to network capability. The SME pre-network

capability framework focuses on content and process, or the how of SME pre-network capability evolution.

**Keywords:** SME, Networks, Pre-network capability, Network Pictures, Action Research.

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## Introduction

*Capabilities* are the core competitive strengths of a firm (Winter, 2003; Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and Winter, 2007), and their importance stems from the combination of resources into patterns that can differentiate the firm. Amit and Schoemaker (1993) argue that firms generate capabilities by manipulating resource configurations through value-creating strategic processes. These processes represent a series of actions that produce a change or development. *Network capability* comprises a firm's ability to develop and utilize interorganizational relationships to gain access to various resources held by other actors (Walter, Auer, and Ritter, 2006). This process enables access to and sharing of expertise and more tangible assets (Adamides and Voutsina, 2006).

Network capabilities emerge from the interaction of firms in a network but are not reducible to the capabilities of the individual firms (Foss, 1999). Because firms must build rather than buy capabilities (Teece, Pisano, and Shuen, 1997), network capability is not inherent but rather is evolutionary in nature. Firms build these capabilities by jointly integrating their resources in a network setting to create identifiable advantage. Such capacity building is a major challenge for a firm, particularly in the small-to-medium-sized enterprise (SME) context (Hill, 2001; Carson, Cromie, McGowan, and Hill, 1995). Therefore, it seems prudent to address the capability-building process essential to gaining advantage through network action. This process is termed *pre-network capability*, and research on it in the current network literature is lacking. "The small firm is not a 'scaled-down' version of a large firm" (Westhead and Storey, 1996: 18) but is differentiated by its small scale, limited resources, diverse functional responsibilities, and lack of specialist expertise (Carson, 1985). Thus, SMEs can lack the techniques essential for gaining advantage through network action. For SMEs, pre-network capability involves an owner/manager having awareness and knowledge of networks and being able to act within them to progress from a dyadic level to enable network action to the emergence of network capabilities. Therefore, given that SMEs must acquire firm-specific capabilities prior to network capabilities, this paper contributes to the literature by developing a framework to conceptualize and explore in action pre-network capability as a prerequisite to network capability. The SME pre-network capability framework focuses on content and process, or the how of SME pre-network capability evolution.

## SME Network Capability

Capabilities develop through a series of transformations by which standard resources are employed and integrated within a firm context, thus differentiating the company strategically and delivering a competitive advantage (Leonard-Barton, 1992). The strategy literature, which has evolved from a single-firm perspective, recognizes that firms are becoming increasingly dependent on external resources and capabilities as they pursue their goals. Access to internal and external resources and knowledge of their integration and use is essential if firms are to gain the advantages of capabilities embedded in relationships with network actors. This idea is particularly relevant for SMEs given the specific contextual challenges they face.

According to the small-firm literature, SME capabilities vary from firm to firm and are embedded in the owner/manager, who represents the focal point of the business. Capabilities such as social and communication skills, product knowledge (Hill, 2001), innovation,

responsiveness to change (Wynarczyk, Watson, Storey, Short, and Keasey, 1993), and flexibility (Van Gils, 2000) are useful for network action. Yet the scale of the small firm and its preference for independence (Nooteboom, 1994) tend to mitigate participation in networks. Therefore, it is unclear the degree to which SMEs are aware of their networks or the means through which SMEs access and action external resources to create network capability. This knowledge gap is important given that SMEs have much to gain from network action. Because small firms differ considerably from their larger counterparts, and because SMEs account for a considerable portion of firms, it seems sensible to address the SME network capability gap by examining the capabilities that SMEs need to action their networks to attain advantage. “Networks do not emerge without considerable endeavour” (Birley, Cromie, and Myers, 1991: 58); hence, this paper identifies and examines in action SME network-enabling capabilities, or *SME pre-network capability*. The concept of SME pre-network capability, identified by analyzing the strategic management and network literature, implies that SMEs have an *awareness* of their networks, an ability to extract external *knowledge* from network members, and an ability to achieve adaptation/innovation through network *action*. Section 3 describes a conceptual framework for SME pre-network capability and its three dimensions: awareness, knowledge, and action.

### **Conceptualization of SME Pre-Network Capability**

As shown in Fig. 1, pre-network capability encompasses an awareness and knowledge of networks in addition to the ability to act within these networks at a dyadic level to enable network action and the emergence of network capability. Awareness, the bedrock dimension of the pre-network capability construct, means that firms can visualize their interconnected organizational embedded systems as comprising suppliers, customers, competitors, and other relevant network actors. *Networks*, loosely defined as coupled systems with blurred boundaries (Johannisson, 1986), can lack clarity, constraining SMEs in their ability to appreciate the web of industrial relationships in which they are engaged. Awareness is an essential dimension of the pre-network capability construct, because although networks can enhance and add quality to SME activities (Webster, 1992; Hill and McGowan, 1996), one critical barrier in potentializing networks is the owner/manager’s limited worldview of the multiplexity and density (Dahlstron and Ingram, 2003) of relationship ties to which the firm is or could be connected. Without *awareness*, defined in Fig. 1 as the ability of SMEs to recognize and visualize the interorganizational embedded systems of which they are a part, networks are without context. That is, a full appreciation of the benefits of utilizing networks strategically necessitates the manifestation of networks from the invisible to the visible. This idea is important because the small-firm network literature tends to focus on ties based primarily on friendship and kinship lacking connection with the market-as-networks approach. One can attribute potential lack of SME awareness of networks to the fact that the concept of network itself has become overused and tends to be ill defined (Nohria, 1992; Grandori and Soda, 1996; Araujo and Easton, 1996), potentially encompassing a multitude of network connections including ties with family and friends, more formal ties with academic institutes and banks, and connections within the value chain. Driven by an independence mentality characteristic of smaller entities, SMEs may focus on personal contact networks only and not on the bigger, more complex market-as-networks picture.

[Fig. 1 here.]

With an awareness of network connections, firms are poised to access useful *knowledge* through their network connections. Participation in relationships and networks can be

instrumental in providing actors with access to timely information, thus keeping them up to date on relevant issues and referrals to other actors in the network (Burt, 1992; Cromie, 1994; Joyce, Woods, and Black, 1995). These benefits are particularly relevant in the small-firm context, given that owners/managers usually have limited time and resources. The knowledge dimension of the construct refers to the ability of firms to extract network knowledge pertinent to their core business and internalize it by integrating it with their own specialized knowledge. For SMEs, the knowledge dimension translates to generating enhanced knowledge-absorbing capacities and routines that facilitate the sharing of information (Dyer and Singh, 1998) to create opportunity.

Driven primarily by the pursuit of opportunity, yet faced with scarce resources, SMEs require and utilize many resources outside their direct control. Therefore, SMEs require the ability to action knowledge through attaining external resources to actualize network opportunity. For example, firms can action adaptation and innovation through networks (Lorenzoni and Lipparini, 1999; Han, Kim, and Srivastava, 1998; Hallén, Johanson, and Seyed-Mohamed, 1991, 1993; Turnbull and Valla, 1986). Hence, the final dimension of the pre-network capability construct, *action*, is defined in Fig. 1 as the ability to tap into pools of technologies and human resources in SME networks to adapt/innovate. SMEs have a limited impact on the marketplace and lack the financial capacity to realize opportunities by themselves. Yet close relationships with other actors in a network setting can provide owners/managers with the additional resources essential to actioning knowledge, thus facilitating the adaptation/innovation process.

The awareness, knowledge, and action dimensions are pre-relational, as they represent capabilities embedded in the individual firm as opposed to the network as a whole. Despite the fact that the knowledge and action dimensions are based on a firm acquiring resources from network actors, they are reducible to capabilities of particular firms. Nonetheless, by attaining pre-network capability, firms would be better able to attain network capability (i.e., a willingness to invest in and commit to relationships; see Gundlach, Achrol, and Mentzler, 1995) and to make short-term sacrifices (see Anderson and Weitz, 1992) for a long-term orientation. In this way, firms could expose and combine capabilities in a network to generate competitive advantages.

## **Method**

To fit the SME pre-network capability theory to practice, the authors used a participatory action research approach. Many international development agencies, including academic institutes and local businesses, use participatory action research to study intervention, development, and change within networks. PAR as a research methodology has the dual aim to embed learning into practice to enact change and improve a situation while formulating public knowledge contributing to theories of action. PAR as a process methodology is useful for capability development as capabilities are built rather than bought (Teece, Pisano, and Shuen, 1997) and are 'context dependent' (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and Winter, 2007: 7). Hence, the method was employed to understand and develop pre-network capability in SMEs due to its contextual and processual nature, capable of capturing the embeddedness and interconnectedness of SME actors within networks. Because it is collaborative in nature, the authors used participatory action research (Revans, 1983, 1998; Perry and Gummesson, 2004) to analyze the evolutionary nature of SME pre-network capability throughout the study as each SME learned from and shared experiences with one another. The authors analyzed eight Irish SMEs that met the following key criteria: less than 20 employees, past participants in an entrepreneurship program, non-competitors,

and in operation for more than 1 year. Each company had a knowledge-based, innovative component and operated within the business-to-business sector in Information and Communications Technology, electronics, consumer goods, or internationally traded services.

As shown in Table 1, the authors devised interventions and measures around each dimension of SME pre-network capability prior to the field research to enhance replicability through modeling how the effect can be reproduced. This research used multiple investigators and various methods of collecting qualitative data to ensure validity and objectivity. The three interventions necessitated six 3-h group participatory action learning sessions. The sessions entailed an in-depth group discussion of pre-network capability and the description of an intervention that necessitated individual SME activity over the following month. At the follow-up action learning session, the participants discussed, shared, and reflected on each individual intervention action experience. Post-intervention interviews (averaging 2 h apiece) with each SME allowed for a more in-depth discussion of knowledge of issues mentioned in the sessions and clarification of those issues (Fig. 2). The authors used semi-structured interviews to familiarize the SMEs with the authors and with one another, to discuss the nature of the study in more detail, and to discover the SMEs' perceptions of networks and their current level of pre-network capability.

[Fig. 2 here.]  
[Table 1 here.]

Based on the network pictures literature (Ford, Gadde, Håkansson, and Snehota, 2003; Ford and Redwood, 2005), the *awareness* intervention involved network mapping, whereby the SMEs discussed their networks in terms of connections within and around the value chain and depicted these connections graphically. The rationale was to enhance the SMEs' awareness of networks in an industrial sense exclusive of connections based purely on friendship and kinship ties. Key qualitative measures focused on the composition of the SMEs' networks, the average length of relationships, the diversity of relationships, and the SMEs' perceptions of networks.

The SMEs described the means through which they had acquired and integrated knowledge through networks in the past and provided a plan for doing the same in the future. They listed at least one information need pertaining to their business and looked to their network maps in a bid to access the knowledge. The *knowledge* intervention thus introduced the notion of looking at other actors' networks as potential knowledge sources. Key measures of the knowledge dimension were the ability of the SMEs to integrate and use network knowledge, their willingness to share information, and the type of knowledge the SMEs required and accessed (which in turn determined the extent to which strong, embedded ties were necessary).

At the *action* level, the SMEs outlined how they had realized opportunities for adaptation and innovation in the past. This intervention enabled the authors to gauge the type of adaptation/innovation in which the SMEs engaged: natural adaptation/innovation that arose because of the continual interaction of parties in a relationship (Brennan and Turnbull, 1999; Ford and McDowell, 1999; Ritter, 1999); formal, planned change through strategic alliances; or interactive action more closely related to network capability. Key indicators and measures were the SMEs' willingness to invest in adaptation/innovation, the network actors involved in the process, and the level of network resources employed and actioned in the process.

Documents attained included company and product brochures, presentation materials, business plans, newspaper articles, and company information on websites. In addition, the authors used NVivo to facilitate the organization and analysis of documentation, interview data, and action learning session data. NVivo acted as a support system to assist in managing and analyzing the large volume of complex data and rearranging the data into smaller coded groupings to facilitate insight, comparison, and theory development (Strauss and Corbin, 1990). Appendix A shows the NVivo codes.

## **Findings and Discussion**

### *Awareness*

Pre-intervention, the SMEs lacked awareness, the foundation of SME pre-network capability. Although the SMEs acknowledged that they operated within networks, they viewed these networks as comprising informal discussions with friends, family members, and business people in social settings. Reciprocity in business interactions was negligible, generally described on a once-off basis and thus not representing the embedded ties indicative of the market-as-networks approach. Strong firm boundaries were in place whereby relationships were limited by fear of competitive threats. The SMEs viewed network value in terms of an unbalanced reciprocity in their favor. They expected rewards to be high as opposed to proportionately distributed. This thinking reflects the individualistic attitude of the SMEs as being unwilling to share information or coordinate activities with nodes that either represent a competitor or could potentially have close ties with competitors; this thinking limited the network density and diversity of SMEs. Moreover, their network focus lacked embeddedness and was focused on the short term, as the SMEs expected immediate returns on their network efforts. Network connections and relationships frequently did not continue once they were no longer necessary. Networks were not integral to SMEs' strategies, and SMEs did not consider networks to be something they had to refer to, think about, or manage on a day-to-day basis. This thinking led to reactivity in relationships. Although they recognized that it might be viable to view their networks more strategically, the SMEs noted that they lacked the time to assess, manage, and attribute worth to their network ties. Rather than proactively seeking to strengthen connections and use existing network connections to create more ties, they passively operated within the framework of their existing social networks, paying little attention to their structure and function. Therefore, the SME independence mentality coupled with a view of networks as a social phenomenon posed a significant barrier to awareness. However, through sharing and discussion of network maps that detailed contacts with suppliers, customers, competitors, and other pertinent actors, SMEs enhanced their awareness.

Post-intervention, the SMEs realized the role that formal networks and distributors played in their business growth. Strong ties existed with business mentors who were intimately familiar with the running of operations and the industry and who were perceived as having "no hidden agenda." Fig. 3 shows that higher education institutes, state funding bodies, other SMEs, customers, and distributors who represented the SME to customers were also represented in network maps. However, these connections were dyadic and belied an inability to look beyond one's own networks to the relationships and networks of others. Being bound by their own network systems constrained the ability of the SMEs to reposition themselves to gain access to new networks through their existing ties. In addition, SMEs' view of networks as a social phenomenon persisted to a degree as their network activity centered on favors (as a vehicle for referrals) and self-promotion through social ties. The

SMEs agreed that “an inquiry followed by a referral from a network contact is an easy sale.” In addition, the ability to network was, in their view, dependent on their ability to use Facebook and LinkedIn to access online networks: “When I launched my software-based product, I sent a demonstration as far and wide as I could through online network software such as Facebook and LinkedIn. Results have been positive in that a large number of people have tested our product. However it is too early to gauge exact figures.” Utilizing such websites is not network activity, as these sites have a short-term focus and little two-way communication. The SME owner/manager in this example had no relationship with the majority of individuals who received the trial product and was never contacted by them again. Therefore, he could not initiate a discussion regarding the merits of the product, nor could he trust feedback, as he was unsure of its source. Age (“The older you are, the more connections you have”) and communication skills (“The more sociable you are, the better you operate within networks”) also played a large role in networking ability in the eyes of the SMEs surveyed.

[Fig. 3 here.]

The SMEs evaluated their networks as either time or resource heavy (e.g., conferences/trade events) or as containing a degree of formality (e.g., Business Network International [BNI]). For example, one owner/manager left the BNI network, as “compared to available alternatives, it had little impact on the company performance.” In evaluating the company’s dependence on and involvement with the BNI network, this participant felt that time could be better used increasing interdependencies with current relationships with a view to network expansion. He noted, “The BNI network places pressure on each member to make successful referrals and to consider solutions to other business dilemmas. Although beneficial, its value is dependent on the other members who often have little knowledge of each other’s industrial area.”

Although SMEs increased their awareness as a result of the intervention, gradually viewing awareness from a market-as-networks lens, their focus remained blurred to an extent by their connections with friends, family, and peers, as depicted in Fig. 3. Realizing the complexity of operationalizing other dimensions without clear network awareness, the authors asked the SMEs to map their connections excluding friendship and kinship ties and concentrating primarily on ties within the value chain, within academia, and to competitors. This exercise increased SMEs’ level of awareness of the market-as-networks approach and highlighted both their previous preoccupation with dyadic ties and the potential of using existing ties as conduits to other relationships. Appendix B shows the evolution of SMEs’ network maps.

### *Knowledge*

SMEs were adept at scanning their networks in search of relevant knowledge. Their entrepreneurial drive, coupled with their communication skills (i.e., their ability to interact) facilitated their ability to acquire and integrate knowledge. The owners/managers acknowledged the merit of networks in knowledge creation and the fact that knowledge had to be integrated into their processes to be of worth. One owner/manager noted, “Networks are all about information transfer. Information comes from talking to different people; however, it is up to me to digest and collate the information in terms of relevance to my business.” The owners/managers stated that the first place they looked for knowledge was within their networks, as this route was the most cost and time effective. They also suggested that

knowledge emanating from their networks was more likely to be accurate and trustworthy, as it stemmed from relationships consolidated over time: “I have come across challenges that are difficult to see a way through. One of the added benefits of building trusted relationships within a network of people with similar challenges is being able to share your issues, to have a sounding board for ideas and problems.” They felt that as they moved outward from their immediate networks, the information gleaned would or could be less reliable, hence favoring strong ties over weak ties. Although this fact suggests that SMEs’ level of the knowledge dimension of the pre-network capability construct was extensive, the knowledge acquired and integrated was explicit knowledge; stemmed from their limited worldview of networks; and was bounded by the immediate space of trusted family, friends, and peers (Fig. 3).

Post-intervention, the SMEs felt positioned to attain future knowledge through both their direct and indirect networks. The SMEs became aware of the merit of looking beyond their immediate networks (Fig. 3) to the connections held by others as trajectories to additional knowledge. For example, one SME owner/manager noted that he was struggling with the innovation process and required external specialized expertise. As shown in Fig. 4, this owner/manager approached a supplier to access information, as he was aware that “even if the suppliers did not themselves hold the knowledge, that they would have access to it through their own networks” (depicted as red dots). As the SME and the supplier had close ties as a result of years of interaction, the supplier searched its networks and put the SME in contact with a known specialist in the area in a bid to provide the additional knowledge required. The SME integrated its own internal knowledge with the external, tacit knowledge from the expert to develop the product. The SME internalized the specialist’s external, tacit knowledge through close coordination, communication, and joint learning between the two companies.

[Fig. 4 here.]

Therefore, although several authors have discussed the difficulties of transferring tacit knowledge (Levinthal and March, 1993; Szulanski, 2003), the present findings reveal that post-intervention, core expertise was transferred between the SMEs and their network actors, leading to the creation of new knowledge. This complex process involved the integration of the SMEs’ internal expertise with network actors’ external knowledge and required repeated interactions over significant periods of time. SMEs’ specialized expertise in their core area facilitated this recombination of knowledge through networks. Owners/managers were capable of converting general or abstract knowledge into knowledge that was directly useful for them and were able to coordinate very specialized and technical knowledge that emanated from network contacts. They recognized the value of network information, and, as managing directors of their own enterprises, they constantly strived to use it to its maximum potential. For example, recognizing the value of distributors in terms of knowledge, particularly in foreign markets, one owner/manager noted, “Distributors know the lay of the land. They know the local key players, including customers, competitors, and suppliers. They keep me informed of changes in the market and introduce me to new customers on each visit.”

However, the SMEs had a tendency to approach network actors on a need-to-know basis rather than viewing knowledge integration as an asset with emphasis on constant learning and interaction. This tendency limited that potential benefits of the emergence of unexpected, evolutionary knowledge that were dependent on close mutual bonds developed over time: “I have been in the situation on many occasions whereby I need to make a connection with somebody who is known by a close customer. However, by the time I get in contact with

them, it is often too late and the particular opportunity has passed me by.” In addition, although the SMEs acknowledged that knowledge was an important dimension of the pre-network capability construct, they were inhibited to a degree in applying this knowledge because of their individualistic mentality. Although the SMEs used networks to learn about competitors’ movements, prices, and offerings in a bid to adapt their own activities, gain information, and combine resources within a changing marketplace (similar to Gilmore, Carson, and Rocks, 2006), they were aware that their competitors could engage in the same strategy.

### *Action*

Pre-intervention, the SMEs described the action dimension of the construct, which encompassed adaptation and innovation, as necessitating and utilizing varying levels of network resources and relationship strength. For example, although influenced by the relationships within a network, adapting product price was not dependent on close embedded ties. In contrast, adapting products for foreign markets was greatly facilitated by strong ties and the resources of distributors, customers, and their respective networks.

Because they had fewer large customers and suppliers, the SMEs viewed adaptation at this stage as necessary and expected to cope with environmental changes and serve customers effectively (Brennan and Turnbull, 1999; Ford and McDowell, 1999; Ritter, 1999). The SMEs engaged in predominantly dyadic adaptations with their customers, altering their products and services as needed by customers. In line with Ford (1980), although reactive, these adaptations played an important role in demonstrating commitment and were made to ensure continued supply. However, the dyadic adaptations were often transactional in that they did not always stem from long-term embedded relationships, and there was not always a commitment of financial or human resources. Frequently customers assisted with the redesign and/or redevelopment of the product or service, but once this process was complete, the relationship was put on hold or ended entirely. Relationships with customers were managed predominantly on a transactional basis, and for the majority of the SMEs, no relational marketing strategy existed. Similarly, when members of the value chain assisted in terms of innovation, they ensued from a series of dyadic relationships as opposed to within a network context. This was because the participants did not want to make their operational processes transparent to the network as a whole because of a lack of trust and a recurring fear of competitor knowledge.

In terms of both adaptation and innovation, the most prevalent network from which external resources were attained comprised customers from whom the majority of SMEs realized through communication and careful listening that a change was necessary. SMEs remarked that building and maintaining strong relationships with their customers, together with keeping in regular communication, exposed the gaps in adaptation and innovation that required attention. One owner/manager stated, “To a certain degree we rely on our customers to either tell us or imply what innovations they would like to see. Through frequent meetings with them we increase our chances of discovering their needs and innovating to meet them. On occasion this has been merely a passing comment by a customer which has sparked an idea for us.” Distributors and suppliers were important when the SMEs rarely dealt directly with the end user. The main value derived from distributors during the innovation process was information regarding customer needs, competitor products currently on the market, and emerging products for which they could potentially supply a component. Therefore, adaptation/innovation related to the SMEs’ local product market and was usually reactive and incremental and dependent on action within SMEs’ immediate networks. The SMEs obtained

no physical resources in the pursuit of their innovation/adaptation through networks. The SMEs recognized that they were faced with scarce resources and low R&D budgets, and they realized that by working together with various types of partners through the adaptation/innovation process, they could potentially share and thus reduce the costs associated with the process. However, little evidence emerged to suggest that the SMEs were willing to make short-term sacrifices for long-term results, a precondition of adaptation and innovation more typical for the strategically oriented firm. In addition, although they were in search of financial resources to assist with their innovation/adaptation, the SMEs sought funds from venture capitalists and government agencies instead of partners who could potentially assist them through the process.

Post-intervention the SMEs discussed utilizing network ties to facilitate the adaptation and innovation process. They decided to discuss alterations to their adaptation and innovation strategy as opposed to changes to products or services. The SMEs recognized that they were blinded by seeking capital solely in terms of injections of cash instead of looking to the embedded value chain network, which could potentially offer human resources, complementary specialist expertise, risk sharing, and distribution routes. However, cooperation was, in some cases, still accompanied by the risk of losing crucial information and competence to business partners. This finding was evident in the SMEs being very proactive in identifying organizations with which they could potentially collaborate but being reluctant to take the initial step toward collaboration.

### Network Perceptions

Analyzing the current findings in relation to the key SME literature reveals the necessity for the SME pre-network capability framework. Consistent with Chetty and Campbell-Hunt (2003), each of the SMEs in this study had limited resources (both financial and human), which affected their ability to conduct a multitude of managerial activities. In general, they were leading specialists in their core areas of expertise and had attained a general business education from the academic institutes with which they were affiliated. They had a limited impact on the marketplace (Carson, 1985) and were dependent on business from a small economy (Ireland). The SMEs' strategy was not proactive but rather much like fire-fighting, constantly aimed at insulating themselves from competitors. Findings show that by implementing the SME pre-network capability framework and the three interventions, the SMEs started to use their networks as a means to enhance their activities. Attaining the foundation dimension of the construct, awareness, facilitated this enhanced activity. Throughout the course of the study, the SMEs' perception of networks changed, and their focus shifted from a social view of networks as comprising predominantly family and friends to an industrial view of networks comprising academic institutes, government agencies, suppliers, distributors, customers, competitors, and other actors. Upon completing the study, the SMEs acknowledged that they could now focus strategically on their networks of relationships and strive to fit actors within their strategy. Initially, the participants perceived their networks as having a supporting, background role. However, 8 months later their view had shifted to more closely mirror the market-as-network approach, and SMEs could clearly see the benefits of decisively utilizing networks in their strategic activity.

### Managerial Implications

In practice the pre-network capability construct is invaluable for SMEs, as it has the potential to relieve some of the resource/time pressure on SME owners/managers by providing them

with strategic routes through their existing and potential network ties. With awareness, knowledge, and action, SMEs are poised to access, share, and jointly integrate network expertise and more tangible assets to create network capabilities not reducible to those of individual firms. This finding is particularly important in an SME context, in which such activities are often restrained because of a lack of funding and/or expertise. However, acquiring pre-network capability is a time-consuming learning process that cannot be underestimated. Academics and consultants must act as network brokers to reduce or eliminate network constraints, in particular SMEs' preference for independence, while SMEs simultaneously hone skills such as responsiveness to change, flexibility, and communication skills.

In terms of policy, the SME sector is the focal point of European Union industrial policy and funding because of the belief that the sector contains the rejuvenation potential necessary to revitalize the industrial and services sectors in stagnating economies (Organisation for Economic Co-Operation and Development, 2006). To stimulate growth, governments promote the development of information-sharing networks among SMEs to overcome their skills and knowledge gaps. For small firms, networks play a central role in learning, knowledge creation, and innovation processes (Tell, 2000), and SMEs participating in networks learn on higher levels to a greater extent than other firms (Chaston and Mangels, 2000; Bessant and Francis, 1999; Hanssen-Bauer and Snow, 1996). However, participation in SME networks remains low (Gibb, 2000) despite 20 years of substantial government funding. In an ongoing era of accountability, policymakers must defend and validate their actions by applying structure to effectively gauge the effectiveness of network-centered programs operating internationally. The SME pre-relational capability construct and its three dimensions could present an important opportunity to reorient and restructure enterprise policy to more closely meet the needs and wants—and enhance the core capabilities of—small firms.

## **Conclusion**

The contribution of this paper is to provide a structured trajectory for the acquisition of SME network capability through the application of a SME pre-network capability construct. This theoretical conceptualization accommodates the inherent and ingrained characteristics of SMEs and explicitly recognizes that SMEs can lack the repertoire of techniques essential to gaining advantages through joint network action. This paper adds to the strategic management literature by broadening the definition of capability, explicitly recognizing that SMEs must build confidence in networks prior to taking joint action within them. The strategy literature highlights the fact that firms must draw upon external sources of capabilities to facilitate the development of competitive capabilities (McEvily and Zaheer, 1999) to drive management strategy forward, generate new lines of business, solve problems faster, and transfer best practices (Wegner and Snyder, 2000). However, within an SME context, in which owners/managers are tasked with diverse responsibilities, pre-network capability represents a take-off capability that ensures that SMEs have an awareness and knowledge of their networks in addition to the ability to act within them prior to actioning resources and capabilities in a network context. Therefore, given that SMEs must acquire firm-specific capabilities prior to network capabilities, the contribution of this paper is the development of a framework to conceptualize pre-network capability as a prerequisite to network capability.

This paper also provides direction for academics to teach SMEs to operate strategically within their networks. Participatory action learning is invaluable for the creation of pre-network capability through the iterative process of problem diagnosis, action intervention, and shared reflective learning. This path could potentially be more relevant to the learning needs of SMEs than the traditional classroom approach. SMEs must learn through experience and interaction the value of collaboration, as the implementation challenges and key lessons from this research relate to the barriers that the individualistic attitude of SME owners/managers creates. SMEs' limited worldview of networks stems from a lack of awareness and appreciation of the multifaceted nature of networks.

Extensive empirical testing of the pre-network capability conceptualization should be the next step in advancing knowledge in this underresearched area. Researchers could conduct empirical studies randomly with SMEs that have not previously had close connections with the academic sector. Similarly, replicating this study with participant actors from the same core network would lend new perspectives on conceptualization and reveal how actors within the same value chain perceive and relate to one another.

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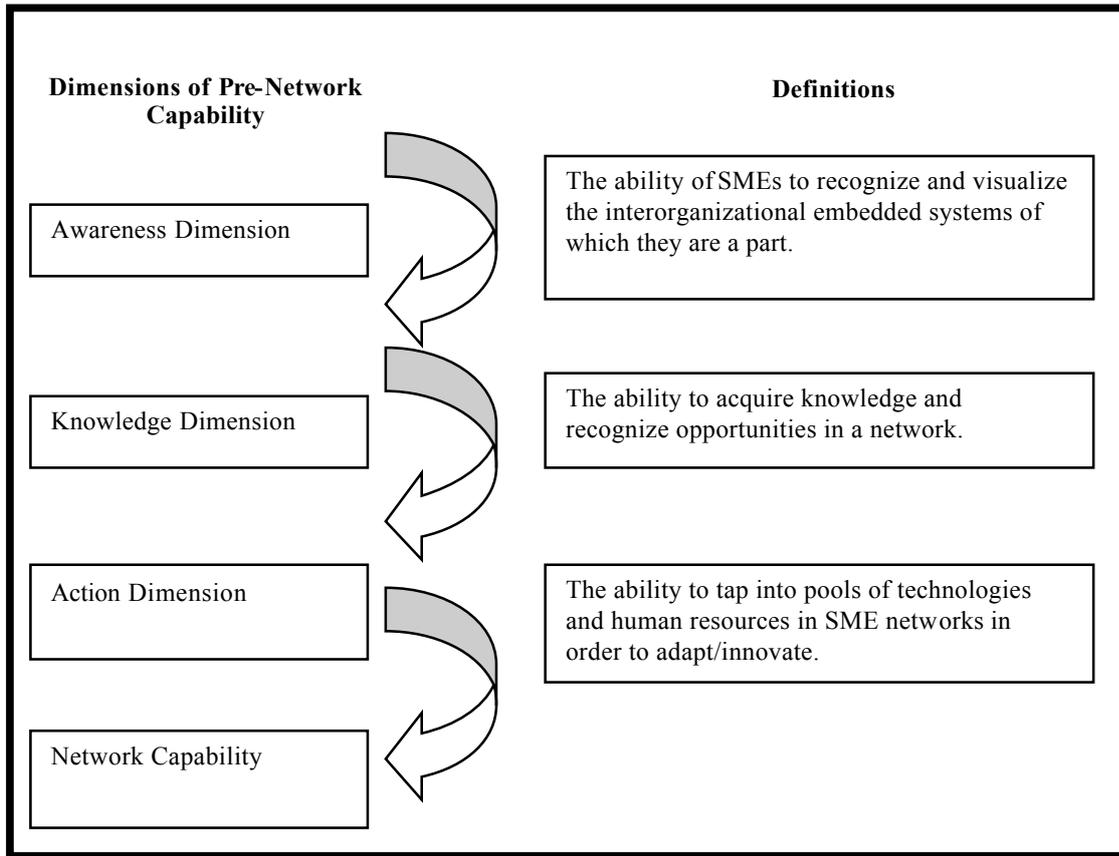
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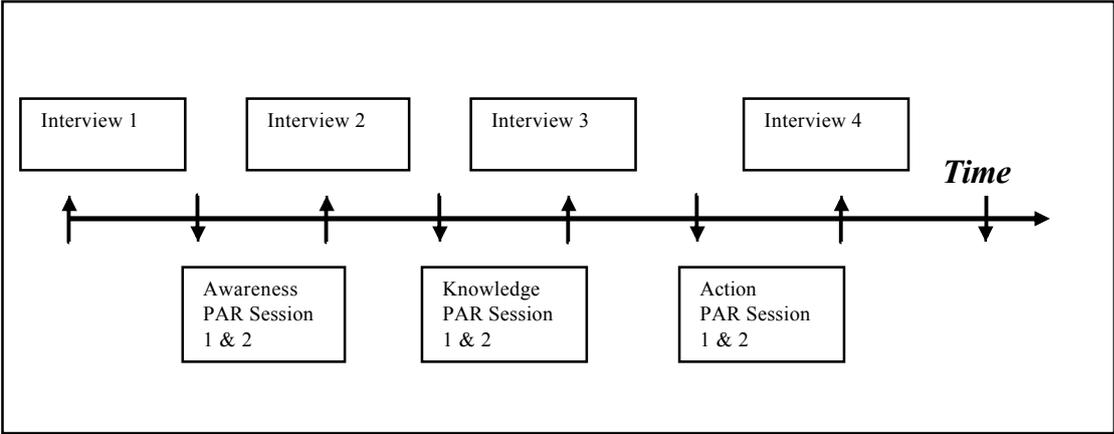
**Table 1**

Key interventions and measures of the dimensions of the SME pre-network capability construct.

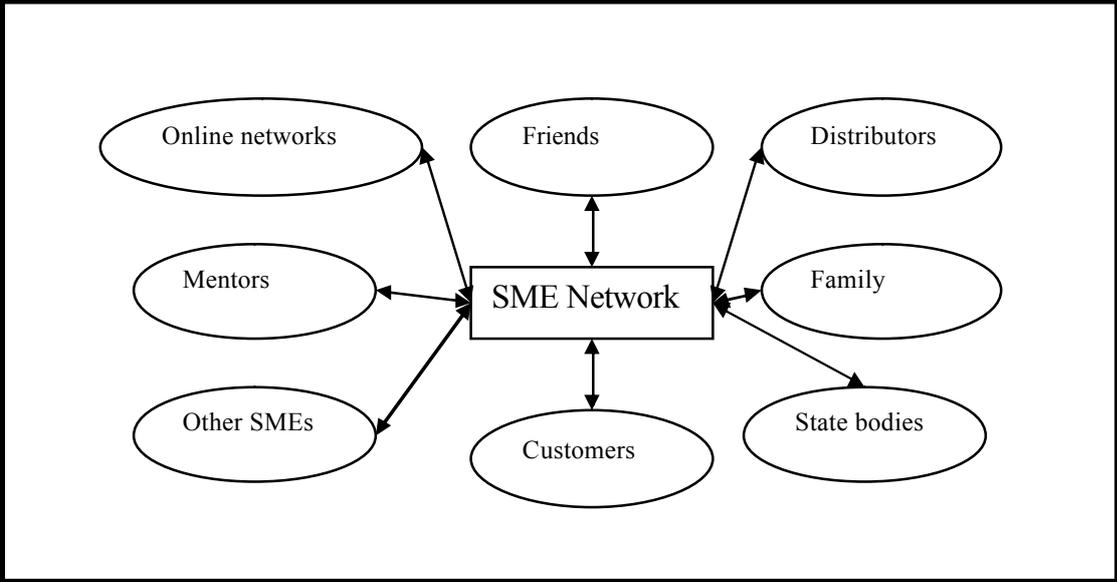
|               | Awareness   | Knowledge  | Action   |
|---------------|---|--|--|
| Interventions | Network mapping   | Past knowledge acquisition and integration; future knowledge plans   | Past adaptation/innovation processes   |
| Measures      | Density (Granovetter, 1976),<br>Diversity (Granovetter, 1982; Dubini and Aldrich, 1991),<br>Embeddedness (Uzzi, 1997),<br>Reciprocity (Gouldner, 1960; Harrison, 2004),<br>Network composition (Gilmore et al., 2006) | Type of knowledge required (Hansen 1999 )<br>Real and perceived reward/risk from participating in knowledge exchange (Hansen 1999)<br>Type of external knowledge accessed (Jarillo, 1989, 1988a, 1988b)<br>Willingness to share information (Ciborra and Patriotta, 1998 ; Empson, 2001) | Key network actors involved in adaptation/innovation<br>Degree of proactive, reactive, or interactive adaptation/innovation (Brennan and Turnbull, 1999; Hallén et al., 1991)<br>Level and type of external resources employed |



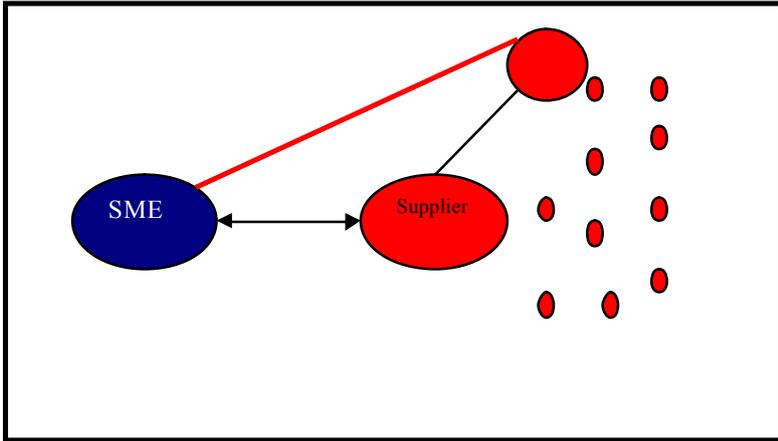
**Fig. 1.** Dimensions of the pre-network capability construct. SME = small-to-medium-sized enterprise.



**Fig. 2.** Research schedule. PAR = participatory action research.



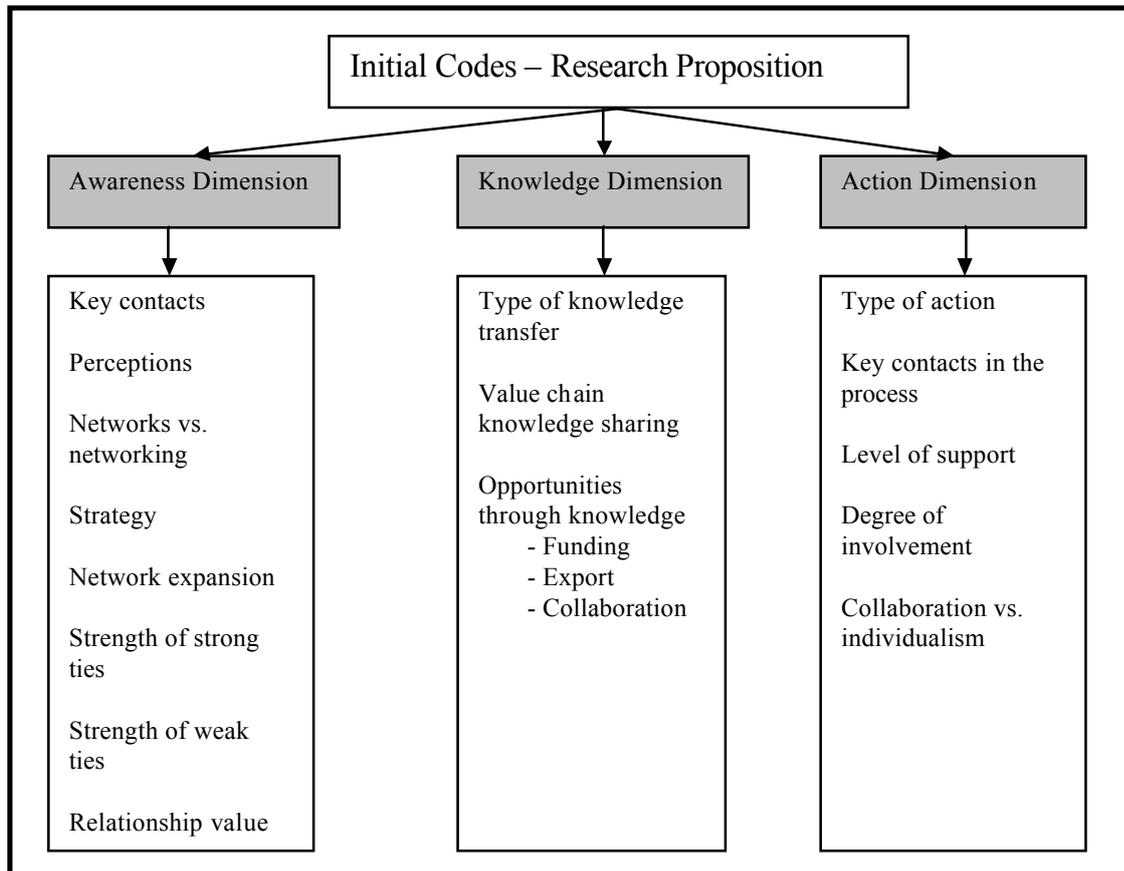
**Fig. 3.** Small-to-medium-sized enterprise (SME) network map.



**Fig. 4.** Example of knowledge acquisition through a supplier network. SME = small-to-medium-sized enterprise.

## Appendix A. Coding

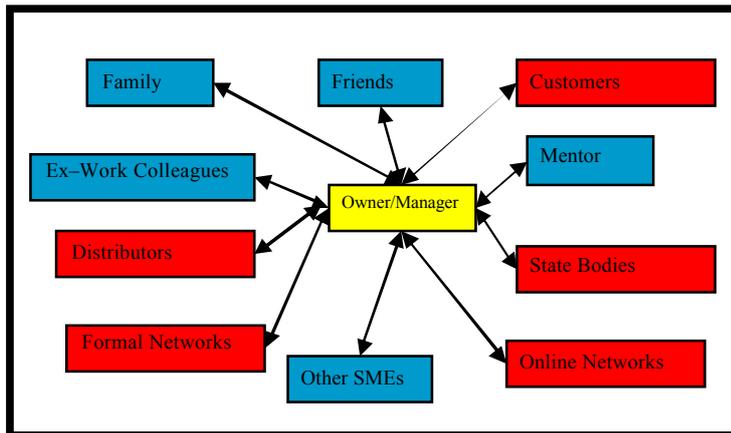
Fig. A1 shows the category system used to determine the relationship between the data collected and the dimensions of the pre-network capability construct. The three dimensions themselves represented the initial codes, and key themes emerged under each dimension as a result of continued data collection and analysis.



**Fig. A1.** Analysis using NVivo.

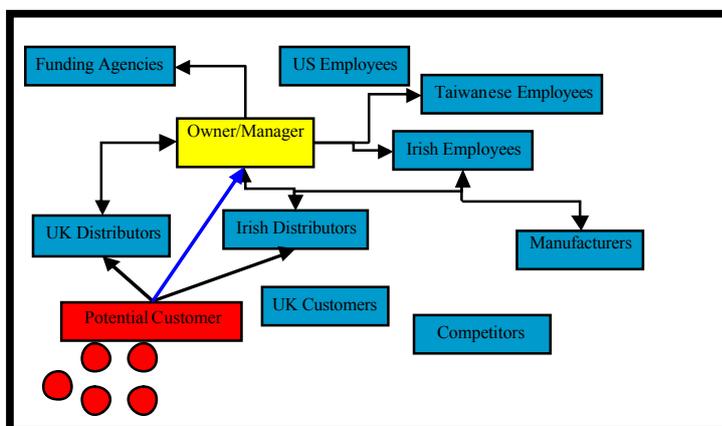
## Appendix B. Evolution of Network Maps

Pre-intervention, the SMEs viewed their networks as social concepts. The blue boxes in Fig. B1 show that the SMEs' networks comprised friends, family, mentors, ex-work colleagues, and other SMEs. Post-intervention (red boxes), awareness increased to include ties with customers, distributors, state funding agencies, online networks, and formal networks. However, all ties were dyadic, based on the advantages that the SMEs could gain through connections, and were depicted in general terms, hence not allowing for the visibility of others' networks.



**Fig. B1.** Pre-intervention network map. SME = small-to-medium-sized enterprise.

Following the second awareness participatory action learning session, SME owners/managers recognized the value of detailing networks from a market-as-networks approach, an interactive perspective that includes customers, manufacturers, distributors, and employees (see Fig. B2). The SMEs no longer focused merely on dyadic ties and could, to a certain extent, detail the threads that bound various actors together. They started moving from the general (employees) to the specific (US employees) in terms of their connections, which enabled them to look beyond their own networks to the relationships held by others. This change facilitated the mapping of others' networks as potential trajectories for useful network expansion. However, although competitors appeared in networks maps, SMEs viewed them from a distance with no evident interaction.



**Fig. B2.** Post-intervention network map.