ROLE OF PARTNERSHIPS AND NETWORKS IN SME INNOVATION AND GROWTH

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Abstract

Growth is traditionally seen as one of the main indications of a company's success. The economic antecedents of SME growth have been studied widely in the areas of entrepreneurship, marketing, management and economics. However, the means of growth, including cooperative forms and networks, have not received sufficient attention in the literature. The purpose of this study is to increase understanding on the ways how science and technology-based SMEs can facilitate and enhance their ability to grow by collaborating and networking with different actors in their business environment. On the basis of our research framework drawn on the literatures of entrepreneurial and industrial networks, we examine the growth process of SMEs through four interlinked phases: (1) innovation assessment, (2) offering development, (3) commercialization, and (4) achieving rapid growth.

Keywords: SME growth, entrepreneurial networks, industrial networks, cooperative forms, innovations, capabilities

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Introduction

Growth orientation is appreciated as an indispensable character of most small and medium-sized enterprises (SMEs) in emerging industry sectors and business areas. In rapidly developing sectors, growth is a necessary prerequisite for company survival since it can be regarded as an indication of a company's ability to innovate and fulfill customers changing needs, thus, giving positive signals to its stakeholders – not least to venture capitalists and other shareholders (Birley, 1985) In addition, growth demands resources and increases risks, although it can also provide higher revenue.

From the SME management point of view, growth is a complex and challenging issue. There are several factors, which impede the growth potential of a single SME. First, the increasing importance of knowledge, technological complexity, and global competition has transformed linear value chains into complex, overlapping business networks suggesting that an SME has to be able to become a valuable member of the network in order to be accepted by other firms (Möller & Svahn, 2003; Parolini 1999; Wikström et al. 1994; Ritter et al., 2004). Traditional products and services are also becoming more systemic offerings in nature often involving, besides the core product/service, installation, user education, maintenance and upgrading. This development calls for inter-firm cooperation (Ford et al. 2003; Parolini, 1999). Furthermore, the rapid pace of technology development and consumption cycles drive R&D investments, whereas increased customer power and competitive pressure shorten the product-life cycles and emphasize the proportion of service components in the total offering (Ford et al. 2003). These factors increase the investments needs of SMEs and demand fast adaptation capability. Taken together, all the trends identified enhance the needs of SMEs to establish different types of business relationships.

In this study we focus on the requirements that networking sets for science and technology-based SMEs targeting at rapid growth. Special attention to this kind of SMEs is warranted as they can potentially play a strong role in the emergence of new business fields, wherefore their growth is essential even for the economic development and national welfare (Möller & Svahn, 2005; Penrose, 1959). Furthermore, most SMEs need networks to get their innovations and special competence commercialized, and to achieve rapid growth. We see that SMEs can compensate their limited resources with a careful utilization of networks. Network relationships are not "free", however, they require specific managerial capabilities. Although there exists a well developed tradition of industrial network research addressing also capabilities (see the recent review by Möller & Svahn, 2003) it has primarily centered on large-scale firms. Relatively scant research-based knowledge is available on the proactive utilization of networks by SMEs.

Three interrelated research questions are posed to guide our research of partnerships and networks related to SME growth:

1. What kinds of partnerships and networks enable science and technology-based SMEs to develop and commercialize their innovations and achieve rapid growth?
2. How these partnerships and networks can be accessed and mobilized?
3. What are the key managerial capabilities needed in the early phases of SME growth?

This paper is divided into following sections. After the introduction we carry out a brief literature review. Then we propose a conceptual framework for describing and analyzing the early growth phases of a science and technology-based SME. Thereafter, we present the empirical research design, and finally we discuss our preliminary findings.

Role of partnerships and networks in SME growth

The following review of the relevant literature is organized in the line of our research questions. First, we concentrate on the extant studies providing information on the types of partnerships and networks that have been identified to facilitate SME growth. Second, available knowledge on how SMEs get access to business partners is reported. Third, information on the capabilities involved in achieving growth and utilizing networks is discussed.

Partnerships and networks facilitating growth

To respond to the challenges in their business environment, growth-oriented SMEs are increasingly establishing different kinds of collaborative arrangements with other companies and organizations (Jarillo, 1989). Thus, they aim at sharing business risks, getting access to resources they urgently need, and managing their innovation and market growth processes (Castells, 1996). In a small growth-oriented company, however, the entrepreneur is the most important resource; his or her visions and expectations are crucial to the company's strategic direction. On the other hand, it has been recognized that companies founded by a team of individuals are more likely to achieve better success than companies managed by individual entrepreneurs (Brush, Greene & Hart, 2001). We see that the more complex the technological base of the new firm, the more probable is the emergence of a management team solution compared to a traditional single entrepreneur mode.

In the early stages of growth, SMEs need to establish relationships with companies and opinion leaders who have high visibility in the field (Larson 1991; Liao & Welsch 2002). According to Lechner and Dowling (2003), these relationships form a reputation network, which helps an SME to overcome the liability of newness (Elfring & Hulsink 2003). Moreover, distribution and marketing networks (e.g advertising agencies, marketing consultancies, various distribution channel members) play an important role in facilitating growth. This is due to the fact, that they enable access to new or current markets, and provide new market information (Lechner & Dowling 2003; Larson 1991) and expertise in commercializing a product-service offering. Reputation and marketing-related networks are generally highly overlapping, but, it is useful to make a distinction between the different functions served by different network connections.

There are some partnerships and networks, which are critical in several stages of the life cycle. For technology driven firms it is also important to participate in the so-called knowledge, innovation and technology (KIT) networks (Lechner & Dowling, 2003; Nonaka & Teece, 2001). These networks provide the company new knowledge or access to the new knowledge creation process (Lechner & Dowling, 2003; Cohen and Levinthal, 1990). It has also been found, that external business advice from lawyers and accountants correlates strongly with rapid growth (Robson & Bennet, 2000).

Access and mobilization of networks

A number of researchers have documented, that the social and personal networks of the entrepreneur are the basis for the SME collaboration (Lechner & Dowling, 2003; Brüderl & Preisendörfer 1998; Vanhaverbeke 2001; Hite & Hesterly, 2001). In addition, business associations and other institutions can play an important role stimulating SME networking (Vanhaverbeke 2001). It has been argued that, as the company grows, networks become more calculative and intentionally managed (Hite & Hesterly, 2001). However, not all social ties and networks evolve into these calculative and commercial networks. While this is maybe true for the supplier relationships, the downstream contacts (sales relationships) seem to become more social in nature (Schutjens & Stam 2003). Successful firms also seem to seek a sole or a few strategic suppliers and focus on making these relationships work to their own advantage (Beekman & Robinson, 2004). Furthermore, it is important to note that growth-oriented companies must seek partners that are also capable (and willing) to grow with them (Beekman & Robinson, 2004).

Network mobilization requires an organization-wide network-player orientation, with key personnel sharing and supporting the achievement of joint goals. The mobilizer must be able to create an organizational forum for sharing the work and responsibilities between actors, to establish coordination mechanisms for cooperation, and to instill a network identity (Dyer & Nobeoka 2000; Gadde & Håkansson 2001). As most joint development work is carried out through multi-actor/multi-functional teams, team management and bridging capabilities are at the heart of the process. The role played by boundary personnel is crucial in this process. Their knowledge base and their understanding of the cultures involved should enable them to bridge communities of practice. In brief, net mobilization requires the ability to organize multi-level and multi-functional contacts and teams in general, involves several actors and must be supported by an integrated information system.

Capabilities in SME growth

The previous discussion focused on different kinds of collaborative forms, and access and mobilization into them. A different aspect, and more fundamental one, is the issue of capabilities. In the development stage, the critical capabilities of an SME relate to new product and technology development (Beekman & Robinson, 2004). Furthermore, firms targeting at rapid growth need to integrate the knowledge and preferences of customers into their R&D processes as early as possible (von Hippel 1988). As the growth continues, sales and marketing capabilities become important (Lichtenstein & Brush, 2001; Beekman & Robinson, 2004).

There are some capabilities, however, which are important in several stages of the life cycle. Organizational coordination, for example, is an important capability both in the initial stage and in the rapid growth stage (Beekman & Robinson, 2004). An important aspect in the growth of an SME is to be able to establish both strong and weak ties (Granovetter, 1973). Uzzi (1997), based on his studies, contends, that in order to facilitate rapid growth, SMEs should actively utilize both strong and weak ties in their relationships as well as in the sense making of business opportunities. Weak ties with multiple actors form an important source of information about ideas that originate outside an actor's more-immediate network environment.

It has been suggested that any firm trying to mobilize a network targeting at commercialization of a new innovation should carefully attempt to assess what kind of key value-activities are required. This analysis would then guide the identification of the potential partners to be accessed and mobilized (Möller and Svahn, 2005).

Conceptual Framework

In this study we examine the growth of an SME and its network relationships through a framework of four interlinked growth phases. The proposed phases (depicted in Figure 1) are: (1) innovation assessment, (2) offering development, (3) commercialization, and (4) achieving rapid growth. The framework is based on a synthesis of several studies related to SME networks and growth (Beekman and Robinson 2004; Gabrielsson and Kirpalani 2004; Lechner and Dowling 2003; Chetty and Campbell-Hunt 2003; Hite and Hesterly 2001; Jolly 1997; Churchill & Lewis 1983; Havnes and Senneseth 2001; Greiner 1998; Robson and Bennett 2000; Madsen and Servais 1997).

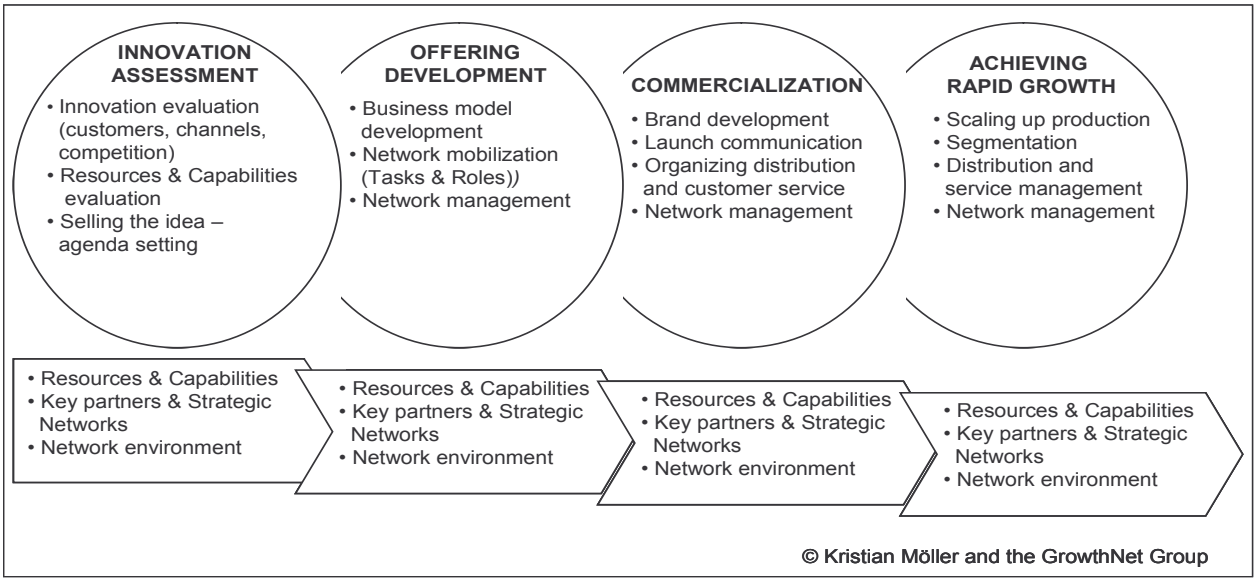

Figure 1. Framework for SME Innovation and Growth

The first phase in our framework, innovation assessment, refers to the evaluation of the innovation and its commercial potential and selling the "idea" to the potential stakeholders. The second phase, offering development, includes the development of the initial business model, and accessing and mobilizing necessary relationships and networks concerning pre-launch activities. This is followed by the third phase, commercialization, which, in turn, includes issues related to establishing brands, marketing communication, as well as distribution and customer service. Finally, the fourth phase, achieving rapid growth, refers to scaling up the production systems, distribution, and segmentation of customers.

The fundamental idea in our framework is that SMEs need to develop and access different types of capabilities and resources in order to be able to achieve rapid growth. In other words, an SME needs functionally differentiated capabilities in order to be able to carry out the value activities required in each postulated phase. Because of the inherent resource scarcity of SMEs, we argue further that a major share of these resources are accessed and developed with different partners and business networks along the four identified phases of early growth. The four arrows paralleling the growth phases in Figure 1 illustrate the idea. It should be noted, however, that we do not imply that each phase involves different sets of partners or network relationships. On the contrary, we argue that the role and functions of partners and network relationships change according to the postulated resource and capability requirements. In addition, we believe that the accessed and developed resources are primarily cumulative. This suggests that one should expect an SME, which has achieved rapid growth, to have a more extensive portfolio of network relationships compared to the previous phases.

It should be noted, that the early innovation development phase has been intentionally left out of this study as it has been intensively studied and well documented in innovation development literature, (e.g. Gruber 1989; Rothwell 1992; Cooper 1993; Biemans 1995; Powell et al. 1996). Likewise, our framework covers the phases until achieving rapid growth, and thus, does not consider the further development of growth. This focus on the early growth has been made due to the fact that overcoming the challenges faced in the early stages of growth is crucial for the company's survival.

Finally, it is important to note that although the description of our framework resembles a typical phase-model we do not assume linear and automatic progress. In fact, firms can "merge" phases if they can develop the capacity to master the necessary value activities. Firms may also have to remain in a certain phase or even "go backwards" if they do not succeed in developing the resources and capabilities vital for high growth. In this sense progress is often not linear, but involves various development cycles and most SMEs never reach rapid growth.

Research Design

The overall research project is divided into three phases. These phases include an exploratory field study phase and two comparative field study phases. A qualitative research approach is applied in all parts of the study. The aim of the exploratory field study is to improve our understanding on the different types of collaborative arrangements and strategic nets used by technology and science-driven SMEs. This phase includes both desktop research and interviews of SME experts in associations, public organizations and companies. The exploratory field study was carried out during the spring 2004.

The main field study phase comprises a comparative study of six in-depth SME cases operating in bio/pharmaceutical, environmental, and software industries. Different industrial context were chosen to be able to examine whether there exists some unified patterns of networking. An in-depth case study approach is justifiable due to the complex character of the issues involved. The companies and their network relationships will be studied for a period of 18-24 months. This longitudinal approach is essential for capturing the expected interaction between the different challenges faced by the firms along their growth paths and their postulated differentiated use of partnerships and networks across the growth phases. Analysis of these phenomena requires good access and collaboration with the case companies. The selection of the cases was based on the following pre-set criteria: (1) companies have reported an actual and identifiable growth, or they have indicated a clear growth orientation, (2) companies are using collaborative forms, and (3) their business concept can be regarded as science or technology-based. The

selected companies are mainly between 5-10 years of age, and they represent different phases of our framework.

The qualitative field study includes 3-4 interview series with each of the case companies. The first interview run is targeted to the key individuals of the case company. The aim is to get an in-depth understanding of the case company's business concept (i.e. customers, competitors, business model, competitive advantage), current business networks (i.e. R&D collaboration, partnerships with public actors, key suppliers, distributors, etc.) and growth history especially focusing on critical events and growth barriers. The second interview series is targeted to the case company's key partners and the aim is to get a more comprehensive view of the case company's business networks. The third and the fourth series are follow-up interviews and their aim is to record and analyze (1) the case company's growth path and its barriers and challenges, (2) changes in case company's resource and capability needs, and (3) the evolution of the case company's business networks and partner "portfolio". The in-depth case study phase started in June 2004 and it will continue till December 2005.

Based on the intensive case analysis a more extensive field study covering 16 SMEs is conducted through either personnel interviews or a combination of phone interviews and informed self-report questionnaires. The themes & questionnaires are constructed on the basis of the earlier phase results. This sub-study allows the critical evaluation and verification of the in-depth case findings. Moreover, it allows the extension of the case study results by inclusion of different types of offerings (different complexity and risk levels, different final customers – business vs. consumer), and different types of SMEs (different resource and capability bases, and different growth phases). Data will be collected during the latter part of 2005. In addition to the interviews, workshops are held and secondary data is collected. The first workshop round is company-wise while the second is sector-wise. Secondary data is collected from the case companies (memos, collaborative contracts, business plans, etc.) and public sources (newspapers, statistics, business reports, etc.) during the whole research project. The project will be concluded in August 2006.

Preliminary findings

In the following sections we report our preliminary findings related to the three research questions. Findings related to the first research question refer to the types of partnerships and networks that enable our science and technology-based case companies to develop and commercialize their innovations. Findings related to our second research question indicate how companies have gained access or mobilized these networks and relationships. Finally, guided by our third research question, we identify the key managerial capabilities needed in the different phases of growth. According to our research framework, these issues are addressed in four interlinked growth phases: innovation assessment, offering development, commercialization, and achieving rapid growth.

Innovation assessment

On the basis of our preliminary findings, collaboration with the science and technology communities provides the most important networks and partnerships in the innovation assessment phase. These communities or KIT-networks often include non-profit or non-commercial institutions, such as universities, science parks and research institutes. In addition to this, our findings emphasize relationships with actors providing financial resources. Financing partners may include foundations, private investors, venture capitalists and government agencies.

Consistently with previous studies, our findings indicate that entrepreneurs' social relationships are vital in accessing and/or mobilizing these networks and partnerships. They are identified as a basis for the establishment of a company's business networks, and have a key role in accessing necessary external resources.

As to required capabilities, it is crucial that the SME managers are capable of evaluating whether the innovation has commercial potential and which of its application(s) might be the most profitable one(s).

Managers also need to be visionaries in the sense that they are able to transform the innovation into a clear and logical business concept. This ability helps managers to convince stakeholders about the credibility and growth potential of the company. Obviously, this "business vision" and its conceptualization are important throughout the entire SME life cycle, but the target audience may vary from one growth phase to another. In the innovation assessment phase, these stakeholders include financing partners, which need to be convinced about the market potential of the innovation. In addition, a critical capability in the innovation assessment phase relates to the KIT-community. In other words, the SME managers must be able to influence the KIT-community to direct their research focus according to company's preferences.

Offering development

Our findings indicate that the development of a science and technology-based market offering requires contribution from both KIT-communities and required business partners. Main partners include actors such as lead users/customers, distributors, suppliers and complementary product and service providers.

Access and mobilization of the above mentioned partnerships and networks require a clear outline of the value-creating system for the new offering. After mapping the value-creating system, the roles for ideal business partners are specified. Furthermore, potential partners are assessed with the help of all available information (e.g. www sites), and are contacted directly or through trade fairs, conferences or business associations.

In this phase it was found critical that the firm was able to get the IPR of the innovation without breaking ties with the members of the KIT-community that has contributed to the innovation process. In addition, managers must be able to conceptualize the business model and convince partners of its market potential.

Commercialization

In the commercialization and launching of the offering, establishing reputation becomes of critical importance to a small and unknown SME. Therefore, in order to convince potential customers, an SME needs to use references as assets to prove its credibility as a trustworthy company. These references can be relationships with both well-known partners in the industry (e.g. KIT, distribution, technology, R&D) and with (pilot) customers.

Our cases indicate that well-known customers can be found through the pilot projects (completed in the offering development phase) or simply through aggressive sales efforts. Reference partners, on the other hand, can be more difficult to attract, especially without a convincing track record. Attracting well-known partners usually requires that the company has something truly unique to offer.

A crucial managerial issue in the commercialization phase is the capability to mobilize and coordinate the operations of business partners, such as suppliers and distributors. Another important capability is convincing reference partners that co-operation is mutually beneficial.

Achieving rapid growth

Our empirical data demonstrates that as SMEs achieve rapid growth, distribution networks remain their vital role, and it becomes of crucial importance to build positive links to opinion leaders and gatekeepers. We identify opinion leaders as actors whose statements are highly valued by end-users, partners, media and public organizations. In our data, gatekeepers refer to those actors who possess some critical resources (e.g. venture capitalists) or have the authority to make decisions in specific areas of business (e.g. public regulators). Thus, by influencing both opinion leaders and gate keepers the company can ensure that its business environment favors the future growth. These partners are especially important if the company's innovation is radical and not supported by the current infrastructure.

Opinion leaders include professionals and academics, thus, they can be found from KIT-community where the company usually has established strong relationships. Gatekeepers, on the other hand, are often easy to pinpoint but require more sophisticated and non-commercial lobbying.

According to the findings, important capabilities in achieving rapid growth phase are related to scaling up the production and distribution networks. In KIT-networks, on the other hand, it seems necessary that the company is capable of balancing between non-commercial development communities and profit-driven business world. This is due to the fact that as the company grows and uses the KIT community's input to make profit, there is a risk that the noncommercial community ostracizes the profit-oriented company which may lead to dissolution of a relationship. Also, an important capability relates to the ability to recognize emerging market opportunities and transform them into successful business concepts.

Discussion

Our empirical findings indicate that SMEs need different partners and networks along with the growth phases due to their different resource and capability requirements. This provides clear support for our framework. As postulated earlier in this study, we found that SMEs extend and diversify their partner or network portfolios from one phase to another. It is interesting, and somewhat unexpected, however, that none of their partners and networks became totally redundant, although the roles and relative importance of different networks and partners changed between phases. These changes primarily support our expectations of the functional differences between the postulated phases.

In our current material the KIT-community provides an excellent example of multiple roles across the growth phases, as KIT-community seems to be important resource pool in the transition from one growth phase to another. In the innovation assessment phase, KIT-network is, obviously, often the primary source of innovation. When an SME proceeds to the development of its offering, KIT-network can provide the required resources and knowledge for the further improvement of innovation into a commercial application. As to the challenges confronted in the commercialization phase, KIT-network can provide references to the reputation building in the form of well known, credible and approved development and technology partners or pilot customers. Finally, when an SME achieves rapid growth, KIT-network provides continuous R&D input, which enables the company to keep its products and technology up-to date and, thus, securing the future growth. Furthermore, KIT-network often includes opinion leaders, whose statements are valued by various actors and can facilitate market demand. Especially, in the case of radical innovations that are not supported by current (technical, financial and/or political) infrastructure, the SME can try to persuade the influential and known actors from the KIT community to support its innovation.

It should be noted that our current results are based on a very limited number of cases. More research is needed to critically examine the robustness of the proposed framework in terms of the postulated phases of early SME growth and the resources and capabilities argued to be critical in each phase. Another avenue for future research would be to examine how the characteristics of innovation influence the role of partnerships and network relationships.

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