

EVOLVING GLOBAL BUSINESS: NETWORK EMBEDDED BEHAVIOURS OF BUSINESS DEVELOPMENT

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This paper examines emergence of international new ventures and their attempts for rapid evolvement of global business activities through examination of three intertwined, network based processes. Specifically we aim to find out how the business of technology-driven international new ventures evolves over the very first years of operation. We build on research of internationalisation strategies of international new ventures, opportunity discovery of entrepreneurs and innovation development in technological firms. The empirical study is a longitudinal single case study on a technology based venture in software business. The primary empirical data consists of several interviews of the entrepreneur and some actors in the networks on which the venture's early evolvement in global markets was based. As an end result of the paper we illustrate the three processes of opportunity discovery, technology development and the development of the firm in international markets as the cornerstones of evolving global business of a software firm. Moreover, we show the intertwinedness of these processes and define the main behavioural drivers of the business development.

Keywords

International business, business opportunity, high technology, interaction, networks, process

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This paper examines emergence of international new ventures and their attempts for rapid evolvement of global business activities through examination of three intertwined, network based processes. Specifically we aim to find out how the business of technology-driven international new ventures evolves over the very first years of operation. We build on research of internationalisation strategies of international new ventures, opportunity discovery of entrepreneurs and innovation development in technological firms. The empirical study is a longitudinal single case study on a technology based venture in software business. The primary empirical data consists of several interviews of the entrepreneur and some actors in the networks on which the venture's early evolvement in global markets was based. As an end result of the paper we illustrate the three processes of opportunity discovery, technology development and the development of the firm in international markets as the cornerstones of evolving global business of a software firm. Moreover, we show the intertwinedness of these processes and define the main behavioural drivers of the business development.

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Introduction

Globalisation of business, facilitated greatly by the development of information technology, has been rapid during the last decades (Andersson & Wictor, 2003; Carayannis et al., 2006; Laanti, Gabrielsson & Gabrielsson, 2007). As the economy becomes more and more global and the role of technology more crucial, the importance of small technology firms for economic productivity of nations grows. This has made researchers more and more interested in business development and internationalisation of small and medium-sized technology-based firms. International entrepreneurship, covering creation of technology driven international new ventures, opportunity discovery across borders and global networks, has become an intriguing research area (see e.g. McDougall & Oviatt, 2000; Andersson & Wictor, 2003; Laanti et al., 2007; Moen, Gavlen & Endersen, 2004; Rialp, Rialp & Knight, 2005).

International new ventures are companies that soon after their inception look for sales and purchases from international markets (Oviatt & McDougall, 1994). Networks and relationships have been noted to have an important influence on their business development (e.g. Allen, 2000; Coviello & Munro, 1995; Harris & Wheeler, 2005; Sharma and Blomstermo, 2003). Entrepreneurship, in turn, can be seen as a process, which consists of people, technology and discovering and utilising of opportunities (Park, 2005). For the small entrepreneurial companies networks are an essential source of knowledge, financing, legitimacy and assistance with opportunity discovery (Singh et al., 1999; Arenius & De Clercq, 2005). For international new ventures technological innovation is often the reason for the foundation of the company (Laanti et al., 2007). The innovation development, in turn, is again a network based process (Cantisani, 2006).

In the present paper we take part in the discussion on international entrepreneurship by combining research on internationalisation of international new ventures, entrepreneurial opportunity discovery and technological innovation processes. All these three processes are essential in evolving global business of small, new technology-based ventures but have seldom been examined in-depth in relation to each other. Since all these processes rely on networks and networking activities combining these processes provides a profound picture of evolving global business through interaction in networks. This paper focuses on software firms and the interaction-centred international development of these firms in networks. Specifically we aim to find out how the business of technology-driven international new ventures evolves as a network-based process.

To answer the above question we build on previous research on the internationalisation of international new ventures (e.g. Oviatt & McDougall, 1994; Coviello & Munro, 1997; Ellis, 2000; Andersson & Wictor, 2003; Johansson & Vahlne, 2003; Laanti, et al., 2007). Since the empirical data is concerned with technologically innovative small software firm, we utilise the research on opportunity discovery and development (e.g. Ardichvili, Cardozo & Ray, 2003; Elfring & Hulsink, 2003; Park, 2005) and on technological innovation processes (e.g. Koskinen & Vanharanta, 2002; Park, 2005; Narvekar & Jain, 2006, Pykäläinen, 2007) as well. As a result, the theoretical framework of the study consists of three interrelated processes, namely the internationalisation centred, business opportunity centred and technology centred process.

In the empirical study we analyse the evolvement of global business through a longitudinal single case. The primary empirical data consists of several interviews of the entrepreneur and interviews of some actors in the networks on which the venture's early evolvement in global markets was based. The empirical analysis builds on event sequence analysis using both the single events and the three processes as the units of analysis. As an end result we illustrate the intertwinedness of the processes of opportunity discovery, technology development and international market development in the evolving global business of a high tech firm. Moreover, we define internal problem solving, external solution creation, opportunity selling and opportunity organizing as the behaviours embedding the business in various networks.

Theoretical Framework

Internationalisation centred process

The internationalisation centred process focuses on the international market entry of a new venture. Research on international development of companies has traditionally focused on choosing entry and operation modes as well as target markets. The traditional models (e.g. Johanson and Vahlne, 1977) argue that companies start with domestic markets, then enter psychically close markets and only later on other countries and continents. The operation strategy gradually develops from less committing indirect exports to greater commitment requiring operation modes, such as own subsidiaries. Recently, the early internationalisation of small and specialised technology companies has attracted considerable research interest and noted to differ from the internationalisation of companies in more mature industries (Saarenketo et al., 2004; Sharma & Blomstermo, 2003). They seem to have strong intention to internationalize at the inception and already about third year they may operate in numerous markets, have growing international sales and dominant positions (Coviello & Munro, 1997).

Early internationalisation of high tech firms

By definition high-tech firms produce products and services with leading edge technologies (e.g. Bell, 1995). Dependence on the latest technologies is a central feature of high-tech; ending up with obsolete technologies means going out of business. The firms are highly specialised, high quality producers of products having short life cycles and specialised niche markets spread thinly across the world (Andersson & Wictor, 2003; Bell, 1995; Crick and Jones, 1998; Madsen and Servais, 1997). Thus, internationalisation is a natural step in high-tech firms' business operations.

Typically, international new ventures have limited institutional knowledge and international business experience (e.g. Laanti, et al., 2007; Sharma & Blomstermo, 2003) but often have an internationally experienced entrepreneur (Andersson & Wictor, 2003). They have an aggressive growth strategy and their needs for financing, market and management knowledge are bigger than in traditional companies (Laanti, et al., 2007). Limited financing is one of the major obstacles in global expansion

(Saarenketo et al., 2004). Thus, innovation, founders, management and financing can be seen as the main resources explaining international development and globalisation strategies (Laanti et al. 2007).

However, internationalisation is an emerging process, which evolves over time and through action. It is more than defining and acquiring required resources. During the process international new ventures increase their ability and desire to discover business opportunities as well as to do business abroad (Saarenketo et al., 2004; Eriksson et al., 1997). Rapid internationalisation requires rapid learning about foreign markets and operations (Johanson & Vahlne, 2003). Every new customer is a source of knowledge and new relationships (Sharma & Blomstermo, 2003). The increased amount of knowledge and network resources helps the company to internationalise further (Eriksson et al., 1997). The international operations and networks also evolve simultaneously. In the following we go deeper into the network embeddedness of the process.

Role of company network

Already Johanson and Mattsson (1988) noted that internationalizing firms rely on their existing relationships because these offer contacts to customers, help to develop partners and positions, provide local market knowledge and initial credibility, and provide access to distribution channels. Since then, numerous researchers have stressed the importance of inter-firm relationships for internationalisation process (see Harris & Wheeler, 2005).

Coviello and Munro (1995) note networks to both enhance internationalisation efforts and compensate the limited marketing expertise and infrastructure but also to restrict the business. To go to international markets you have to have information of the international opportunities and identify and get to know the possible exchange partners (Ellis 2000). Beyond information sharing and access, existing relationships may initiate unintentional internationalisation if a current business partner becomes an active mediator introducing the firm to foreign actors (Komulainen, Mainela and Tähtinen, 2006). Johanson and Vahlne (2003) emphasize that in networks new ventures learn, and by using what they have learned they are capable of proceeding in internationalisation. Especially, the fast and successful growth of companies is noted to be interrelated with presence in international networks (Coviello & Munro, 1997).

Successful internationalisation requires the company to take advantage of the skills and resources of other companies – especially when the customers have high demands, markets are unstable and the product is of strategic importance or it cannot be standardized (Coviello & Munro, 1997; Moen et al., 2004). Thus, internationalisation of international new ventures is learning through networking (Sharma & Blomstermo, 2003; Johanson & Vahlne, 2003). It is an outcome of knowledge development and committing taking place in interaction with existing and potential partners.

Business opportunity centred process

Opportunity is the heart of business opportunity centred process. Opportunity typically starts as a vague one and develops further through time in a cyclical, iterative, complex and interactive process (Ardichvili, Cardozo & Ray, 2003; Park, 2005). Shane and Venkataraman (2000) argue that opportunities are novel ideas of new means-ends relationships between goods, services, raw materials and organizing methods. Therefore, an opportunity consists of an idea of new combination of an offering, resources and mechanisms to realize the idea and of a value proposition to the potential customers. As a whole, business opportunity discovery is both rational and intuitive search for information and both social and cognitive interpretation of information in order to recognize market gaps and to create strategic business concepts (Puhakka, 2007).

Evolution of entrepreneurial opportunities

Entrepreneurship is “a process by which individuals pursue opportunities without regard to the resources they currently control” (Stevenson and Jarillo 1990). Elfring and Hulsink (2005) noticed that three entrepreneurial processes, discovery of opportunities, securing resources and gaining legitimacy have substantial effect on the survival and the performance of a firm. Ardichvily et al. (2003) divide the process to stages of opportunity discovery, development and evaluation. Network ties affect all these processes. On this basis, we see entrepreneurship as a network based process of creating new business, in which an opportunity is recognized and turned into a form in which it creates economic value by using own and others’ resources and personal relationships (Puhakka, 2007).

According to Ardichvily et al. (2003) core process of opportunity discovery begins when entrepreneurial alertness is high enough. This requires certain personality traits, knowledge and social networks to exist. To be able to recognize opportunities and understand the value of them, one needs cognitive abilities and a solid knowledge base. In order to survive and prosper in a rapidly changing world, companies need to continually identify new opportunities beyond their existing competencies (Shepherd & DeTienne, 2001). Opportunity discovery can be seen as an action, which takes place both prior to firm foundation and after it throughout the life of the firm (Singh et al., 1999). Individuals discover opportunities by recognizing the value of received information (Arenius & De Clercq, 2005) and entrepreneurs also take advantage of these opportunities (Andersson & Victor, 2003).

As mentioned earlier, opportunity development process is cyclical and iterative and the entrepreneur evaluates opportunities in multiple stages. These evaluations may lead to the discovery of additional opportunities or to changes in initial vision (Ardichvily, et al., 2003). Effective opportunity discovery in high-tech start-up involves understanding and combining technological diversity to market opportunities and continual development of technology according to customer needs (Park, 2005). The more connected entrepreneur is, the more opportunities she/he can recognize. This makes opportunity discovery and venture evolution strongly embedded in networks as discussed next.

Support of social network

Already Aldrich and Zimmer (1986) emphasized close personal relationships to be often the best available sources for resources in new venture establishment. Even the initial opportunities are recognized through existing social relationships (Ellis, 2000). New venture creation is, thus, embedded in entrepreneurs’ social networks and it is a collective process. Entrepreneurs who use social network to learn about new business possibilities recognise substantially more opportunities than those entrepreneurs who do not have network support (Puhakka, 2006). The networking entrepreneurs are able to exploit opportunities also from those industries in which they do not have previous experience (Singh et al., 1999) and get knowledge on foreign market possibilities through their social networks (Ellis, 2000).

In the establishment of new ventures is question about collaborative learning (Reynolds, 1991; Keeble, Lawson, Smith, Moore and Wilkinson, 1998; Keeble, Lawson, Moore and Wilkinson, 1999), in which a venture is created in cooperation with many instances. The entrepreneur is the driving force that has the capability to legitimate the use of resources in his/her own venture. As a result of collaborative learning, an innovative milieu, in which knowledge, skills, and other resources are in interaction, is created. Learning in the innovative milieu works as mental support in the vague new venture creation (Keeble et al., 1999).

However, relying on the innovative milieu of close relationships is not enough for continuous opportunity discovery. Wide social network with weak ties brings in new information and knowledge

(Carayannis et al., 2006; see also Puhakka, 2006). These friends of friends and people you meet every now and then, and who do not belong to your immediate social network, are the sources for new information to create something really new.

In addition, new venture creation is not about choosing the most efficient option but about creation of trustworthy and reciprocal relationships, in which parties want to invest in the long-term development of the new venture (Oliver and Liebeskind, 1998; Floyd and Woolridge, 1999; Starr and MacMillan, 1990; Taylor, 1999). In the end, opportunity discovery is based on social dialogue in which a common understanding is created through interaction with others (Saravathy, 2001). The sense-making and sense-giving is focused on discussions for meaning-building and reality-construction, instead of pure decision-making.

Technology centred process

Technology centred process is focused on an innovation, which is an idea, procedure or object new to a company or an individual, implemented to offer new product or service to customers (Cantisani, 2006; Narvekar & Jain, 2006). Innovation is an outcome of creation, diffusion and use of knowledge and also a key driver of economic growth (Carayannis et al., 2006). Technology by definition is not an innovation but innovation is created by combining technology and market need to create profitable opportunity (Park, 2005). Shane (2004), for example, demonstrates that just one technology can spawn multiple business opportunities to a firm. Technology can be seen to have a twofold role in the technological innovation process: it is both as input and output of innovation (Nieto, 2004).

Creation of technological innovations

Prior research has created a number of models to understand innovation processes (see e.g. Twiss, 1986, 4-5; Koskinen & Vanharanta, 2002; Cantisani, 2006; Narvekar and Jain, 2006). The models vary from simple and linear to complex ones, but no model has become a widely accepted innovation model. What we can say is that technological innovation process is a sequence of actions undertaken in order to generate new technologies and techniques by using science and scientific methods (Cantisani, 2006). Innovation process also includes a number of actors and co-operation between these actors at different phases of the process (Narvekar & Jain, 2006). As a whole, technological innovation process is continuous, path dependent, at least partially irreversible and technologically uncertain (Nieto, 2004).

Previous research (e.g. Maxwell & Westerfield, 2002; Courseault Trumbach, Payne & Kongthon, 2006) has shown that innovative technologies come mainly from entrepreneurs and small businesses. High tech companies are designed to be effective and innovative and are often wholly built around innovative products (e.g., Bell, 1995). Their knowledge and technology intensity is the basis for competitive advantage because the ability to use existing knowledge for developing new products makes their knowledge base difficult to copy and dependent on the existing relationship network (Sharma & Blomstermo, 2003).

Ability to recognise and utilise learning opportunities by combining internal technological skills to external, technology-based environment is critical in innovation (Carayannis & Alexander 2002). Thus, innovation is not limited to the internal technological development, but includes operational and commercial suitability of the new product (Twiss, 1986, 5-6; Koskinen & Vanharanta, 2002; Park, 2005; Calia, Guerrini & Moura, 2007; Pykäläinen, 2007). To be able to develop an innovation, a company needs to create both effective intra-firm and inter-firm relationships (Calia, Guerrini & Moura, 2007; Ritter & Gemünden, 2004). We go deeper into the innovation networks in the following.

Elements of innovation network

Innovation is a network based process in about all innovation models (Cantisani, 2006). According to Ritter and Gemünden (2004) innovation success is affected by technological and networking capabilities of a company. A company needs technological competence in order to increase the value in products and processes. For technological competence the firm needs to internalize and spread knowledge inside the firm in order to reduce unnecessary technological and organizational research (Weerd-Nederhof et al., 2002). Knowledge influences the creation of innovation and through that the success of a company (Narvekar & Jain, 2006).

Secondly, a company has to develop its networking capability to be able to connect with other actors in market and through this allow interaction outside organizational borders (Ritter & Gemünden, 2004). The performance of company does not depend only on customer relationships although, for example, skills to adapt according to customer demands are emphasized (Park, 2005). A range of different types of external partners can play an important role through their unique resources (see Gemünden, Ritter & Heydebreck, 1996). In addition to assisting in developing a new and competitive product, they can, for example, help to develop company's business model (Calia, Guerrini & Moura, 2007). Ritter and Gemünden (2004) use the concept of innovation network of this kind of a wide relationship base for embedded technological and business development.

Global business emergence

We see the global business emergence of an international new venture as an outcome of three different processes. Therefore our theoretical framework (see Figure 1) consists of internationalisation centred, business opportunity centred and technology centred processes, which are connected to each other in the business evolvement over time. Interesting in the previous research is that the three processes can be seen as embedded in different networks. Internationalisation research discusses primarily inter-firm networks, entrepreneurship research emphasizes inter-personal networks and the technological development is embedded in R&D focused innovation networks.

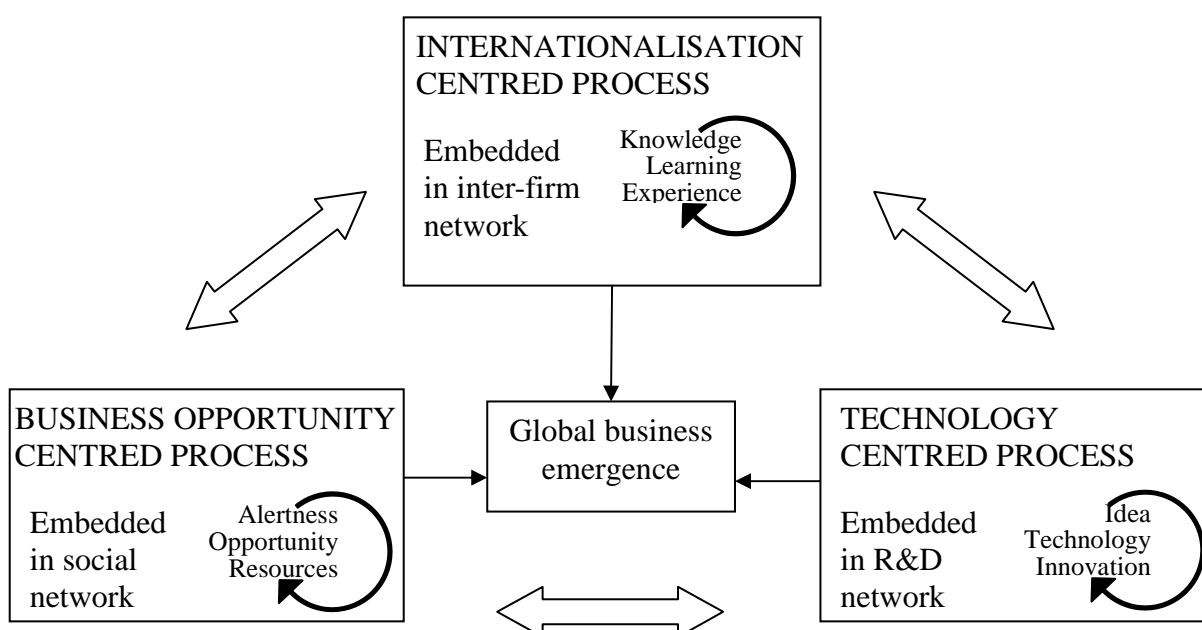


Figure 1. Three intertwined processes of global business emergence.

The connections between the processes can be proposed to emerge through various routes. Growth is

often intertwined with high innovation abilities. The knowledge intensity, which stems from innovation, creates growth and facilitates internationalisation. Opportunity development moves the internationalisation process forward, for example, from intention to internationalise to active involvement. Innovation creates the venture idea and triggers the internationalisation process. Learning creates knowledge and knowledge is the basis for both innovation and internationalisation. Experience can be seen as a consequence of knowledge and learning, but experience can also be transformed into knowledge. The experience and knowledge gained from internationalisation helps in evaluating new opportunities and developing the existing ones. These intertwined processes lead to global business emergence.

Methodology

Processual research on organisations has been expanding significantly over the last couple of decades, and this methodological tradition is also followed here. In line with Pettigrew (1997) and Van de Ven and Poole (2005) a process is defined as a sequence of individual and collective events, actions and activities unfolding in context over time. The case study method is applied, whereby qualitative and longitudinal data are used to create understanding of the phenomenon and the generative mechanisms underlying the events examined.

We produce a longitudinal single case study and utilize event sequence analysis to trace the interrelatedness of different events in the global business evolution process of the case firm. Case research represents a particularly strong method for studying change in networks (Borch & Arthur, 1995; Dubois & Gadde, 2002; Easton, 2000; Halinen & Törnroos, 2005). Here the principles of realist case research (Easton, 2000; Tsoukas, 1989) are adopted to explain the sequence of events. Instead of law-like predictions, it is the generative mechanisms that are interesting, i.e. the underlying processes that generate and explain observed associations between events (Bhaskar, 1998; Tsoukas, 1989).

Through systematically gathering and analyzing empirical data and searching for the intricate details of the case under study we aim at creating a novel understanding of the emergence of international new ventures. Learning from a case in a certain context is a significant strength of the present study because the interaction of an event and its context can be best understood through thorough case research (see Dubois & Gadde, 2002). As a result we describe the three processes of technology development, opportunity realisation and international market entry and illustrate the connectedness of these processes through network embedded behaviours.

Data collection

We examine the whole life cycle of an international new venture, which was legally established in November, 2004 and sold to another company in 2007. It operated in software business serving so-called continental system developers. The company was a spin-off from a primarily locally operating Finnish advertising agency. The company, however, had its main market in the US, practically in Silicon Valley and right from the beginning set as its target to be seen as a local Silicon Valley firm.

We made four interviews with the founder and CEO of the company, the first one in March, 2005, second in October, 2005, third in January, 2007 and the last one in August, 2007. In addition we have interviewed in October 2004 and March 2006 two representatives of a governmental programme that aims to accelerate the internationalisation of the Finnish software firms and had a significant effect on the emergence of the company as an international new venture. The six interviews lasted from one hour to two hours and were all tape-recorded. In addition, we had two short, informal discussions with a US consultant who was a crucial partner to the company and with a friend of the entrepreneur who closely followed the emergence of the firm.

To ensure as good a fit as possible between reality and the studied aspects, data were also collected from written sources (Easton, 2000). The secondary data included the web-pages of the firm, its application to the governmental program and a short analysis of a US consultant of company's US activities from its official establishment until closing two first deals in the US market. In addition 47 press releases and articles dealing with the firm were collected from newspapers, magazines and from the internet. The secondary data was an important supplement to the interview material, when it came to constructing the case study narrative and tracking the chronology of the events and their contents.

Data analysis

The aim of the analysis was to generate a well-grounded account of the process by using two sense-making strategies (Langley, 1999). We adopted a narrative strategy to construct a detailed story from the raw data and to prepare a chronology of events for further analysis. A visual mapping strategy was used to build on the narrative with a view to making the changes from one level to another visible. These two strategies for decomposition of the data allowed us to examine how events at one level were related to events at other levels and analyse the behaviours and networks behind the changes.

Altogether 134 pages of the verbatim interview transcripts and 47 media articles formed the raw data of the analysis. From this data we, firstly, constructed a detailed description of the company's development based on all the interviews and the secondary data. The resulting analytical report aided our formation of a holistic view of the international new venture development over time. The CEO of the firm was provided the possibility to read the case narrative and comment on it. He checked the correctness of it and complemented the narrative with several important details. In the subsequent analysis, we defined 55 events over about five year evolution of this international new venture (see Tables 1 & 2).

We then went back to the original, word-by-word interview data and aimed to reorganize the data by coding. The coding system had the basic categories of internationalisation, opportunity, technology and networks, which rose from the theoretical discussion. In search for the generative mechanisms driving the evolution and intertwinedness of the three processes we concentrated on the behaviours and networks that were behind the connections of at least two of the processes.

Case Study on Processes of Global Business Evolvment

The company is technologically innovative software company that develops www-based applications and their user interface. It focuses on development of AJAX-based, non-browser specific, rich internet application development platforms. The offering of the company – a rich internet application toolkit is based on two core technologies. One is virtual browser that creates a virtual document object model as an interface between the real document object model and the application. It makes it possible to effectively test browser compatibility with the application. Testing only once against the virtual browser is enough when without it the tests need to cover tens or even hundreds of different combinations. This removes problems of web browser breeds and versions. The second technology is intelligent web-application structure, one form of AJAX engine, which changes how a web-page operates. It reduces the loading times for web-pages and makes their use more effective. Together the technologies reduce the amount of code of web-pages created and maintained by the web developers to some three percents from an old technology. As a result savings are received from lower need of bandwidth, lower amount of maintenance personnel and increasing effectiveness of web-application use. Next we present the case narrative which is then summarised in Table 1 at the level of the different development processes.

Empirical events at three levels of the business development process

The idea generation behind the international new venture can be seen to date back even to some ten years in time. In 1996 a couple of students interested in web-technologies established a firm that developed to an advertising agency specialized in digital media. The advertising agency started to deal with ideas related to the company establishment already in the end of 1990's. The idea was not intentionally developed; instead, they tried to do the best possible digital media solutions to their customers. Creative solutions and work for new innovations was encouraged and this created good circumstances for developing new. The projects done to different local customers and their needs in the different projects guided the product development. The developed rich user interfaces were first used internally in the advertising agency.

The discovery of a business opportunity was based on the realisation of limitations in current technology and development of own technology to solve the problems. The created product, Virtual Browser acted as a starting point for making own tool library. A robust DreamWeaver plug-in was developed and it received Macromedia Approved Certification. The entrepreneur first communicated the opportunity to his social networks: friends and family provided the first test bed for the opportunity and encouraged him to go on with it.

In 2003 the company applied to partly government financed training programme, which aimed to aid Finnish firms' access to the US markets. The programme was lead from Finland but a core of it consisted of a six-person team of US consultants and managers. The company was about to be left out of the programme, since the business idea and the background of the opportunity in an advertising agency and the business concept were difficult to understand. Together with provision of additional information, the enthusiasm and commitment of the entrepreneur and the technological promise opened the door to the programme. First phase in the Global Software programme included strategic training and creating global readiness.

In 2004 the company had the first financing negotiations for US entry. According to the entrepreneur, the reason for internationalisation was that 60 % of its potential customers were located around 100 miles from Silicon Valley. The Finnish Technology Agency funded company's first trip to the US. Also the training programme helped to secure US as target market. The second phase in Global Software programme included more specific strategic training. The company presented the idea to US consultant and expert team. Then they participated in trainings and workshops of US consultants that made them to think the strategy and especially how to effectively communicate with the US people. This way the opportunity got some key words that made it easier to communicate to others. The training programme included a two-week press, analyst, consultant and venture capitalist meeting trip to US.

In May 2004 the company made agreements with two US consultants and got a market validation document, which concretized the existence and elements of the opportunity. In the summer they had financing negotiations in Finland. Firstly, a Finnish business angel became interested in the opportunity and committed to invest in its development. The entrepreneur also presented the opportunity in the introduction programme of a leading Finnish technology investor and to other possible financiers. Several venture capitalists expressed their interest and from the Finnish technology investor it got a conditional promise of investment.

The advertising agency (parent firm) decided not to invest in the third phase of the Global Software programme. However, the contacts to the US and the Finnish programme team were maintained. In autumn 2004, the company made market research in the US and the financing was secured when the company was officially established as a daughter company of the advertising agency in November 2004. The company filed for a patent on Virtual Browser and the first version of the product was released.

In January 2005 the company made further funding applications and in February it did its market strategy, product positioning and competitive analysis research. In February the company became an independent firm. The company received a seed financing of US\$ 1 million. Internationally experienced board was elected for the new venture. However, at this point the entrepreneur was the only one working in the company, he worked from the office of the advertising agency utilizing its infrastructure and advertising agency services and acted also as the CEO of the advertising agency. Therefore, the company was closer to a virtual organisation than a real one. But the entrepreneur acted as if it was a well established company; it had its own web-pages, office address and filed patents for the main technologies.

In April 2005 the US office was established. It was important for the company to build a local presence in the US and that is why the established office was called the head office. In reality the headquarters was a P.O. Box address creating a virtual office. In practice the company was present in the market through the business trips of the entrepreneur and some members of the board of directors and through two US consultants working for it. Utilizing the US partners' services was considered crucial since then they were also willing to open their contact networks to the company.

In summer 2005 the entrepreneur made customer appointments in the US and got one delivery agreement and one letter of intent. The company also hired product development personnel. At this stage the company had about 10 competitors. The product pricing strategy was developed during the summer and the two first customers were secured. The opportunity became a business. The first Alpha version of the product was released to one customer in August and intensive product development for two first customer orders started. In 2005 about 80 % of sales came from the US and 20 % from Finnish markets. The CEO and board members travelled to US every second month and had phone conversations with the US customers.

In summer 2006 the company received a second round of venture funding, in total 2 million euros. The company established operational U.S. Office in Silicon Valley and hired personnel in the US. In October the company joined Open Source Collaborative Eclipse Foundation and launched Open Source RIA Platform for AJAX-Based Rich Internet Applications. They also had their first beta version of open source product. In November the company recruited new CEO and in December a new Vice President of Global Sales.

In 2007 the company changed from dual license business model to Open Source business model. There was also a dramatic change in competitive landscape; the amount of competitors increased to around 200. The company had two primary customer groups: OEM-customers and e-customers. In summer 2007 the company was sold to another Finnish company.

As we see it, the business of this software company evolved simultaneously at three levels constituting different but intertwined processes. The processes are summarized in Tables 1 and 2.

<i>Events in time</i>	2001-2002
<i>Business Development Process</i>	
Internationalisation centred process	9. First ideas about commercializing internationally the technology
Business opportunity centred process	<p>1. Parent firm serving customers</p> <p>3. Understanding of an emerging trend by trial and error</p> <p>4. Customers not yet knowledgeable of Web 2.0</p> <p>8. Preliminary tests of idea with family and friends</p>
Technology centred process	<p>2. Developed Web 2.0 technologies not available</p> <p>5. New product conceived Virtual browser</p> <p>6. Dream Weaver plug-in</p> <p>7. Macromedia certification</p>

Table 1. Empirical events at three levels of

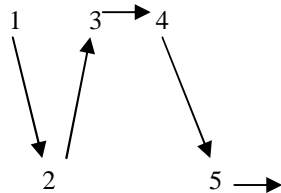
Events in time 2001-2002

Business Development Process

Internationalisation
centred process

Business
opportunity centred
process

Technology
centred process



Events in time 2005

Business Development Process

Internationalisation
centred process

Business
opportunity centred
process

Technology
centred process

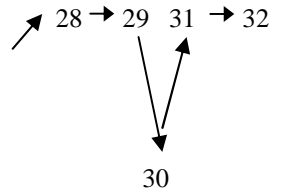


Table 2. Illustration of intertwinedness of c
process.

Network-based behaviours connecting the business development processes

Through deeper analysis of the connections between the different events we can trace a sequence of events as illustrated in Table 2. We could also identify a repertoire of behaviours that drove the evolution of the software company and embedded it in various local and international networks (see Figure 2). As a whole, we see that the global business emergence as opportunity centred. Although, Tables 1 and 2 present a few direct links between internationalisation centred and technology centred processes, this only indicates that the events are consecutive in time.

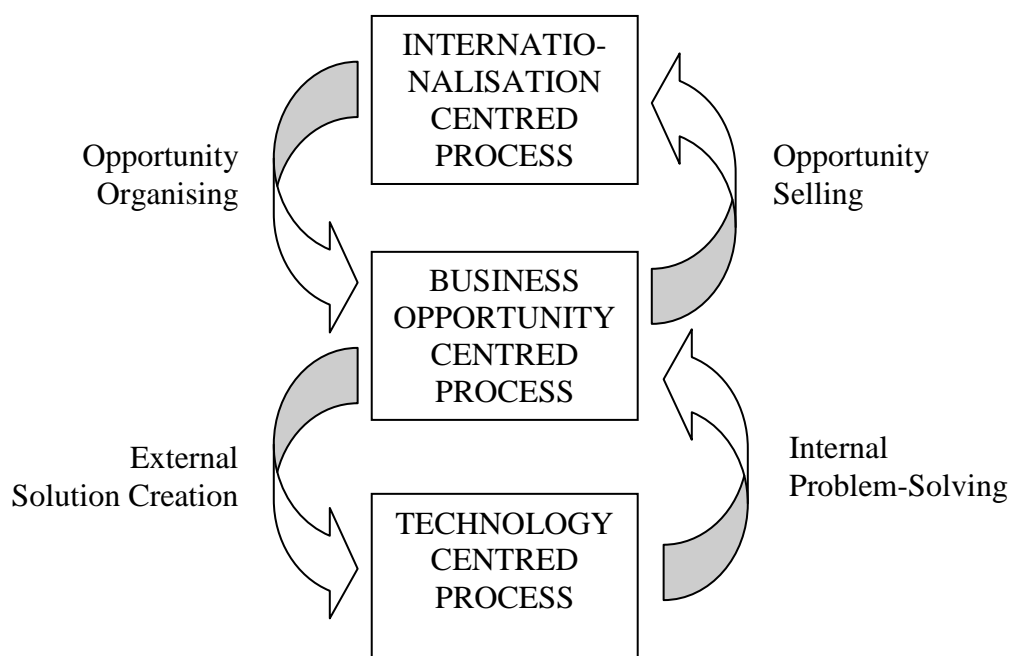


Figure 2. Behaviours behind processes of global business emergence.

The evolving of the business of the international new venture can be seen to have started as interaction between the technology development and discovery of the business opportunity. The processes are connected through behaviours named as *internal problem-solving* and *external solution creation*.

Internal problem-solving refers to behaviour connecting technological innovation to business opportunity. Internal needs or, for example, limitations in the used technology in the focal company, act as an impulse for the creation of new innovation (see for example events 2-3). Problem-solving is primarily based on company's internal technological development although customer projects are a central development platform. Thus, we see this behaviour as embedded in the closest network of co-workers. It was the desire of the technological team to develop better tools than the existing ones for their own work and better customer service as illustrated in the quotations.

"The desire to not to compromise in usability and user experience has made us invent new means to get the work successfully done."(CEO)

"We found out that it (the used product) doesn't work because of these compatibility problems. And it wasn't a great product. That's why we made the virtual browser innovation, which removed compatibility problems, and this was the starting point for creating an own library (product), which eventually solved the compatibility problem."(CEO)

The technology then received a Macromedia certification, which led the entrepreneur to wonder if there was an opportunity to develop new business. He reflected upon the idea in discussions with friends and family who saw the relevance of the technological innovation and possible international markets

External solution creation centres on the needs of the customers that guide the development of technology. In the early stages of the case venture, the customers' role in the solution creation was indirect, because they did not expect the kind of technology that was developed. Still the link to customer interface existed. In the later stages, when the company had established customer relationships for the new venture especially, the external solution creation was directly customer relationship embedded behaviour. The customer-specific implementation (events 38-39) is one example of external solution creation. Here, the realization of the business opportunity creates needs for a new technological solution. Another example of external solution creation in the case study is the specific request from the customer to switch to the open source model. The change in business concept created a need to develop the technology (events 48-49).

"Well actually the message came from few customers, in the USA I mean, that have we considered the open source model, since they are now considering switching to it and that actually would mean that they, in order to use our product, should have this opportunity." (CEO)

In the case study the early developments were driven by internal problem-solving and external solution creation behaviours. To make entry to US markets possible several stakeholders needed to be convinced about the feasibility of the opportunity exploitation. We call these behaviours as *opportunity selling*. The entrepreneur first tested the idea with his family and friends and supported by them and the peers, the entrepreneur applied to the Global Software programme (events 8-10). Interesting in the developments then was the hesitation of the Programme team of consultants (events 10-11). The hesitation was due to the exceptional background of the idea in a non-technical firm. This was overcome through later shown fascinating technological promise and possibly large markets for it.

"We and the consultants were wondering how an advertising agency can make serious software product business. [The entrepreneur] gave some additional explanation, how he sees it [the business] and better crystallised the business ... It was seen that the opportunity existed, and in a way the potential can easily be big." (Programme Manager)

The financiers and consultants needed also to be convinced, like in the events 20-21. From 2003 on the events focused for a while on the development of the opportunity in connection with the internationalisation of the business and securing resources for the new venture. These developments were strongly embedded in the US consultant network and financing networks which were the basis for business validation in the chosen markets.

Establishing a virtual organisation is also an example of *opportunity selling* behaviour. To sell the opportunity to customers, the case company needed to be actively involved in market and virtual organisation provided a way to attain this as illustrated in the quotation below.

"There is no other option than to go abroad ... Virtual office provides the same service in all the infrastructure...I have the same system, the same programmes, same communication possibilities not depending where I am." (CEO)

Opportunity organising focuses on the definition of the business concept, target market and target customers as well as the ways to realize the opportunity as a business. In the case study a crucial event, required actually by the financiers, was the official establishment of the company as a subsidiary of the advertising agency, which started to concretize it as a new venture. Simultaneously also a first product version was released and the virtual headquarters established in the US. Therefore, the virtual organization is related to both opportunity selling and opportunity organizing behaviours. Virtual organisation provided a way to create a presence in the market. This allowed the entrepreneur to act as if he had well established and organized business.

"[Software company] was closer to a virtual organization than a real one. But the entrepreneur acted as if he had a well established company." (Programme Manager)

The international image of the company was strengthened through international board of directors. These actions were followed by first customer meetings and that lead to release of financing. The internationalisation and increased experience helped the company to discover new business opportunities and to organize its business according to these.

“And then the US deal came actually through the fact that we were part of the Global Software programme and it made quite clear were the market is and how the market entry should be done.”(CEO)

When the financing and first foothold in the US market was achieved the company could focus on product development and marketing strategy especially with respect to pricing and competition. As a result the business concept was focused on technology licensing (event 38).

If we look at the latest developments in the case study, the three processes and the four behaviours are firstly strongly intertwined. The intensive efforts in R&D led to development of Alpha version of the product and on this basis the first customer deal in the US was made. The first customers, then, released the second round of financing. This made it possible to invest in establishment of a real subsidiary in the US. Now the business concept was again reconsidered and as a result of R&D work a Beta version of an Open Source product was developed and the opportunity organized as an Open Source business model. However, meanwhile the competition in the US market rose dramatically necessitating again changes in the opportunity organizing. The customers were divided to a kind of R&D partners and to e-commerce based ones. However, the conclusion from the analysis of the severe competitive situation was that to be able to grab on the opportunity and create financially valuable exit to the owners of the company, the firm was sold to a stronger and larger company in the same field of business.

As a conclusion, we notice that the business evolves at three levels as, for example, changes in the business model (from technology product to technology licensing and to service-centred open source model), development of implementation of new technologies and processes and creation of international customer, financier and other relationships across borders. The changes in the opportunity organizing change the way company manages its customer relations or sees itself as well as creates needs for technology development. Business evolution includes constant change and answering to the needs and requirements of various stakeholders.

Conclusions

The purpose of this paper was to study emergence of international new ventures and their attempts for rapid evolvement of global business activities through examination of three intertwined, network based processes. We draw our conceptual standing-point from previous research on internationalisation of international new ventures, opportunity discovery of entrepreneurs and innovation development in technological firms. Combining these three areas were seen to be essential because evolving of global business of small, young technology-based ventures have seldom been examined from this kind of a holistic viewpoint. Specifically the objective was to find out how the business of technology-driven international new ventures evolves over the first years of their operation. As an end result of the paper we illustrated the intertwinedness of the three processes of opportunity discovery, technology development and the development of the firm in international markets and defined the main behavioural drivers behind the connections.

We contributed to the existing research on emergence of international new ventures in two particular ways. Firstly, we demonstrated that emergence of international new ventures is an interactive process embedded in internationalization centred process, business opportunity centred process and technology centred process. Our main claim is that you cannot understand emergence of international new ventures if you do not understand all these three processes and especially the interaction

between them.

Secondly, we demonstrated that emergence of international new ventures is driven by four specific behaviours, namely internal problem-solving, external solution creation, opportunity selling and opportunity organising. Through this we wanted to suggest that the emergence of international new ventures could be approached by studying the behaviours as the generative mechanisms for process dynamics. It is important to notice how and why the actions of the managers pull and push firms forward in historically contingent and socially constructed processes. This way we could bring in new knowledge on how the emergence of international new ventures is actually accomplished.

The results will help researchers and practitioners to further understand the entrepreneurial behaviour, dynamic and episodic nature of emergence of international new ventures and intertwinedness of the processes of which the phenomenon consists of. Furthermore, results will offer more insight into understanding how firms learn and develop new capabilities for creating and sustaining competitiveness in rapidly changing and uncertain modern business environments.

From the managerial point of view, we argue that the complexity of building successful international new ventures is to a great extent due to the necessity of handling all these three processes at the same time and in connection to each other. When international new ventures are often based on business opportunities for which the window of opportunity is a short one and the opportunity needs to be quickly built into a real business the timeline creates further challenge. In quick realisation of the business opportunity embedding the business to various resourcing, legitimatising and otherwise assisting networks is crucial.

A challenge for any new market entrant is to position the new venture to a market and to legitimate its existence. Relationships in all the above three arenas seem to play an important role in this. Our study of a new international software venture emphasises opportunity organising, opportunity selling, external solution creation and internal problem-solving to be the behaviours for constructing the new venture, convincing others to support it and legitimating the business in the markets. These network embedded behaviours are central to recognition of prominent new innovations developed by the technology system, discovery of customer needs in markets, organisation of resources and finance and transferring new businesses to international markets with global competition. In sum, it is possible to argue that international new ventures are embedded into a specific situation and network in which the goals are woven along the way through dialogue with many instances.

Based on our results, when a new international high-tech venture is established, entrepreneurs and managers need to progress in technological development, international market creation and business opportunity discovery almost simultaneously. If any of these is missing, it is quite likely that the new venture diminishes. With respect to our case study we can consider if this was a success or a failure case of the evolvement of an international new venture and global business. The company did create customer relationships in its main markets and it made business deals there. On the other hand, the venture was sold to a bigger player only after about three years of existence as an independent venture. From the research viewpoint we consider it as a very interesting case because of the possibility to trace the various events along its life cycle and then theorize on the connections between the events and the drivers behind the business development process.

References

- Aldrich, H. and Zimmer, C. (1986), "Entrepreneurship through social networks," in Donald Sexton, D. and Smilor, R. (Eds.), **The Art and Science of Entrepreneurship**, Cambridge, MA: Ballinger Publishing Company.
- Allen, J. P. (2000) "Information systems as technological innovation", **Information Technology & People**, Vol 13 No 3, pp. 210-221.
- Andersson, S. and Wictor, I. (2003) "Innovative internationalization in new firms: born globals – the Swedish

- case”, **Journal of International Entrepreneurship**. Vol 1 No 3, pp. 249-276.
- Ardichvili, A., Cardozo, R. and Ray, S. (2003) “A theory of entrepreneurial opportunity identification and development”, **Journal of Business Venturing**, Vol 18 No 1, pp. 105-123.
- Arenius, P. and De Clercq, D. (2005) “A network-based approach on opportunity recognition”, **Small Business Economics**, Vol 24 No 3, pp. 249-265.
- Bell, J. (1995) “The internationalization of small computer software firms: a further challenge to “stage” theories”, **European Journal of Marketing**, Vol 29 No 8, pp.60-75.
- Bhaskar, R. (1998), “Philosophy and scientific realism” in R. Bhaskar, M. Archer, A. Collier, T. Lawson & A. Norrie (Eds.), **Critical Realism: Essential Readings**. London: Routledge.
- Borch, O. J. & Arthur, M.B. (1995) “Strategic networks among small firms: implications for strategy research methodology”, **Journal of Management Studies**, Vol 32 No 4, 419-441.
- Calia, R. C., Guerrini, F. M. and Moura, G. L. (2007) “Innovation networks: from technological development to business model reconfiguration”, **Technovation**, Vol 27 No 8, pp. 426-432.
- Cantisani, A. (2006) “Technological innovation process revisited”, **Technovation**, Vol 26 No 11, pp. 1294-1301.
- Carayannis, E. G. and Alexander, J. (2002) “Is technological learning a firm core competence, when, how and why? A longitudinal, multi-industry study of firm technological learning and market performance”, **Technovation**, Vol 22 No 10, pp. 625-643.
- Carayannis, E.G., Popescu, D., Sipp, C. and Stewart, M. (2006) “Technological learning for entrepreneurial development (TL4ED) in the knowledge economy (KE): case studies and lessons learned”, **Technovation**, Vol 26 No 4, pp. 419-443.
- Courseault Trumbach, C. Payne, D. & Kongthon, A. (2006) “Technology mining for small firms: knowledge prospecting for competitive advantage”, **Technological Forecasting & Social Change**, Vol 73 No 8, 937-949.
- Coviello, N. and Munro, H. (1995) “Growing the entrepreneurial firm: networking for international market development”, **European Journal of Marketing**, Vol 29 No 7, pp. 49-61.
- Coviello, N. and Munro, H. (1997) “Network relationships and the internationalisation process of small software firms”, **International Business Review**, Vol 6 No 4, pp. 361-386.
- Crick, D. and Jones, M.V. (2000), “Small high-technology firms and international high-technology markets”, **Journal of International Marketing**, Vol 8, pp. 63–85.
- Dubois, A. and Gadde, L.-E. (2002) “Systematic combining: an abductive approach to case research”, **Journal of Business Research**, Vol 55 No 7, pp. 553-560.
- Easton, G. (2000), “Case research as a methodology for industrial networks; a realist apologia” in Fleetwood, S. & S. Ackroyd, (Eds.), **Realist perspectives on management and organisations**, London: Routledge.
- Elfring, T. and Hulsink, W. (2003) “Networks in entrepreneurship: the case of high-technology firms”, **Small Business Economics**, Vol 21 No 4, pp. 409-422.
- Ellis, P. (2000) “Social ties and foreign market entry”, **Journal of International Business Studies**, Vol 31 No 3, pp. 443-469.
- Eriksson, K., Johanson, J., Majkgård, A. and Sharma, D. D. (1997). “Experiential knowledge and cost in the internationalization process”, **Journal of International Business Studies**, Vol 28 No 2, pp.337-360.
- Floyd, S. and Woolridge, B. (1999) “Knowledge creation and social networks in corporate entrepreneurship: the renewal of organizational capability”, **Entrepreneurship Theory and Practice**, Vol 23 No 3, pp. 123-143.
- Gemünden, H.G., T. Ritter & P. Heydebreck (1996). Network configuration and innovation success: An empirical analysis in German high-tech firms. **International Journal of Research in Marketing**, 13, 5, 449-462
- Halinen, Aino and Jan-Åke Törnroos (2005), “Using case methods in the study of contemporary business networks,” **Journal of Business Research**, Vol 58, pp. 1285-1297.
- Harris, S. and Wheeler, C. (2005) “Entrepreneurs’ relationships for internationalization: functions, origins and strategies”, **International Business Review**, Vol 14 No 2, pp. 187-207.
- Johanson, J. and Mattsson, L-G. (1988), “Internationalization in industrial systems,” in Hood, N. and Vahlne, J.-E. (Eds.), **Strategies in Global Competition**, New York: Croom Helm, pp. 287-331.
- Johanson, J. and Vahlne, J.-E. (1977) “The internationalization process of the firm - a model of knowledge development and increasing foreign market commitments”, **Journal of International Business Studies**, Vol 8, No 1, pp. 23-32.
- Johanson, J. and Vahlne, J. (2003) “Business relationship learning and commitment in the internationalization process”, **Journal of International Entrepreneurship**, Vol 1 No 1, pp. 83-101.

- Keeble, D., Lawson, C., Smith, H., Moore, B. and Wilkinson, F. (1998) "Internationalisation processes, networking, and local embeddedness in technology-intensive small firms", **Small Business Economics**, Vol 11 No 4, pp. 327-342.
- Keeble, D., Lawson, C., Moore, B. and Wilkinson, F. (1999) "Collective learning processes, networking, and institutional thickness in the Cambridge region", **Regional Studies**, Vol 33 No 4, pp. 319-332.
- Komulainen, H., Mainela, T. and Tähtinen, J. (2006). "Social networks in the initiation of a high tech firm's internationalisation", **International Journal of Entrepreneurship and Innovation Management**, Vol 6 No 6, pp.526-541.
- Koskinen, K. U. and Vanharanta, H. (2002) "The role of tacit knowledge in innovation processes of small technology companies", **International Journal of Production Economics**, Vol 80 No 1, pp. 57-64.
- Laanti, R., Gabrielsson, M. and Gabrielsson, P. (2007) "The globalization strategies of business-to-business born global firms in the wireless technology industry", **Industrial Marketing Management**, Vol 36 No 8, pp. 1104-1117.
- Madsen, T. and Servais, P. (1997). "The internationalization of born globals: An evolutionary process?" **International Business Review**, Vol 6, pp.561-583.
- Maxwell, J. R. and Westerfield, D. L. (2002) "Technological entrepreneurship characteristics related to the adoption of innovative technology", **S.A.M. Advanced Management Journal**, Vol 67 No 1, pp. 9-14.
- McDougall, P. and Oviatt, B. (2000) "International entrepreneurship: the intersection of two research paths", **Academy of Management Journal**, Vol 43 No 5, pp. 902-908.
- Moen, Ø., Gavlen, M. and Endersen, I. (2004) "Internationalization of small, computer software firms: entry forms and market selection", **European Journal of Marketing**, Vol 38 No 9/10, pp. 1236-1251.
- Narvekar, R. S. and Jain, K. (2006) "A new framework to understand the technological innovation process", **Journal of Intellectual Capital**, Vol 7 No 2, pp. 174-186.
- Nieto, M. (2004) "Basic propositions for the study of the technological innovation process in the firm", **European Journal of Innovation Management**, Vol 7 No 4, pp. 314-324.
- Oliver, A. and Liebeskind, J. (1998) "Three levels of networking for sourcing intellectual capital in biotechnology: implications for studying interorganizational networks", **International Studies of Management and Organization**, Vol 27 No 4, pp. 76-103.
- Oviatt, B. and McDougall, P. (1994) "Toward a theory of international new ventures", **Journal of International Business Studies**, Vol 25 No 1, pp. 45-64.
- Park, J. S. (2005) "Opportunity recognition and product innovation in entrepreneurial hi-tech start-ups: a new perspective and supporting case study", **Technovation**, Vol 25 No 7, pp. 739-752.
- Pettigrew, A. (1997) "What is processual analysis", **Scandinavian Journal of Management**, Vol 13 No 4, 337-348.
- Puhakka, V. (2006) "Effects of social capital on the opportunity recognition process", **Journal of Enterprising Culture**, Vol 14 No 2, pp. 105-124.
- Puhakka, V. (2007) "Effects of Opportunity Discovery Strategies of Entrepreneurs on Performance", **Journal of Entrepreneurship**, Vol 16, pp. 19-51
- Pykäläinen, T. (2007) "Model for profiting from software innovations in the new era in computing", **Technovation**, Vol 27 No 4, pp. 179-193.
- Reynolds, P. (1991) "Sociology and entrepreneurship: concepts and contributions", **Entrepreneurship Theory and Practice**, Vol 16 No 2, pp. 47-70.
- Rialp, A., Rialp, J. and Knight, G. (2005). "The phenomenon of early internationalizing firms: what we do know after a decade (1993-2003) of scientific inquiry," **International Business Review**, 14, 147-166.
- Ritter, T. and Gemünden, H. G. (2004) "The impact of a company's business strategy on its technological competence and innovation success", **Journal of Business Research**, Vol 57 No 5, pp. 548-556.
- Saarenketo, S., Puimalainen, K., Kuivalainen, O. and Kyläheiko, K. (2004) "Dynamic knowledge-related learning process in internationalizing high-tech SMEs", **International Journal of Production Economics**, Vol 89 No 3, pp. 363-378.
- Sarasvathy, S. (2001), "Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency", **Academy of Management Review**, Vol. 28, pp. 243-263.
- Shane, S. A. and Venkataraman, S. (2000), "The promise of entrepreneurship as a field of research", **Academy of Management Review**, Vol 25, pp. 217-226.
- Sharma, D. D. and Blomstermo, A. (2003) "The internalization process of born globals: a network view", **International Business Review**, Vol 12 No 6, pp. 739-753.
- Shepherd, D. A. and DeTienne, D.R. (2001) "Discovery of opportunities: anomalies, accumulation and alertness", **Frontiers of Entrepreneurship Research**, Babson College, Wellesley, MA.

- Singh, R. P., Hills, G. E., Hybels, R. P. and Lumpkin, G. T. (1999) "Opportunity recognition through social network characteristics of entrepreneurs", **Frontiers of Entrepreneurship Research**, Babson College, Wellesley, MA.
- Starr, J. and MacMillan, I. (1990) "Resource cooptation via social contracting: resource acquisition strategies for new ventures", **Strategic Management Journal**, Vol 11, pp. 79-93.
- Stevenson, H. and Jarillo, C. (1990), "A paradigm of entrepreneurship: entrepreneurial management", **Strategic Management Journal**, Vol 11, pp. 17-27.
- Taylor, M. (1999), "The small firm as a temporary coalition", **Entrepreneurship and Regional Development**, Vol 11 No 1, pp. 1-19.
- Tsoukas, H. (1989), "The validity of idiographic research explanations", **Academy of Management Review**, Vol 14, pp. 551-561.
- Twiss, B. (1986), **Managing Technological Innovation**, (3rd ed.), London: Pitman Publishing.
- Van de Ven, A. & Poole, M.S. (2005) "Alternative approaches for studying organizational change", **Organization Studies**, Vol 26 No 9, 1377-1404.
- Weerd-Nederhof, P. C., Pacitti, B. J., Silva Gomes, J. F. and Pearson, A. W. (2002) "Tools for the improvement of organizational learning processes in innovation", **Journal of Workplace Learning**, Vol 14 No 8, pp. 320-331.