

Emergence of a Internet Network Era Among International Entrepreneurial Firms

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ABSTRACT

This paper examines the mechanisms by which high tech entrepreneurs in international entrepreneurial firms utilize new web social media in their ventures. The study found that the network of weak ties have expanded with these new social networking tools. These expanding weak ties on the web have characteristics of strong ties as they seem to protect against opportunism and entrepreneurs, particularly those with the largest networks of weak ties, perceive weak ties as portfolios. This study indicates that the web has greatly affected bridging opportunities and the individuals with the largest networks show the greatest opportunities for bridging and they use the web to show their network strength and opportunities to connect people.

KEYWORDS:

Web

Social media,

Embeddedness,

International entrepreneurial firms

International entrepreneurship,

Networks.

Introduction

Each individual inherits imposed family relations at birth but soon after the individual begins to develop his own network of relationships. Various factors have been shown to affect the construction and development of an individual's personal relationship network. The entrepreneur's ability to construct and enhance network of relationships has been shown to be affected by various factors such as social background (Anderson & Miller, 2002), institutional development (Kiss & Danis, 2008) and social capital (Batjarga, 2007). This paper examines international entrepreneurs and their network of relationships with emphasis on new social networking tools on the web. It is important to observe the most recent trends in relationships on the web's social networks with regards to international entrepreneurship. The reason is that internationalization requires more weak relationships as foreign contact is not as likely to be or develop into a strong relationship as the domestic contact (Duque, Shrum, Barriga, & Henriquez, 2009). Researchers of internationalization have also recognized the importance of weak ties in the internationalization process of new ventures (Harris and Wheeler, 2005, Komulainen, Mainela, & Tahtinen, 2006, Sharma & Blomstermo, 2003). But most studies on ties and entrepreneurs, have focused on ties with relatively high trust level which have been named, embedded ties (Uzzi, 1997, Hite & Hesterly, 2001) or portfolios of weak and strong ties (Ozcan & Eisenhardt, 2009). This study observes the mix of weak and strong ties by interviewing international entrepreneurs but the emphasis is on their large network of weak ties on the web which most often are counted in hundreds of links and reflect the international entrepreneur's 'wide' search for solutions across borders rather than 'deep' information within local relationship in local areas. How can we assess these large networks? Are they a usable tool in venturing, often numbering hundreds or thousands of links? As they have become much larger, do they have a particular role in the venturing of the entrepreneur? Are they filling the structural holes?

The web has provided users with new tools in relationship building which opens further the opportunity for individuals to have relationships with large group of people. Scholars have long recognized the potential of web-based communication technologies for improving networks. On the other hand this field remains underexploited (Lewis, Kaufman, Gonzalez, Wimmer & Christakis, 2008). The web has transformed 'community' and social capital and made them less dependent on physical space (Wellman, 2001). Current formation of different networks on Facebook, LinkedIn, Twitter and other such web social network sites, which can easily extend all borders, is a challenging aspect to explore further. Scholars have suggested that these web-based services, allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2007). Research has been conducted on Facebook regarding issues such as social capital (Ellison, Steinfield & Lampe, 2007) and taste sharing (Lewis, Kaufman, Gonzalez, Wimmer, & Christakis, 2008). Research on LinkedIn is much more limited. In international business, Facebook or LinkedIn have not been researched specifically. This paper explores how the international entrepreneurs are using the social network of LinkedIn and Facebook and possibly other similar web based media in their activities and how these networks may be affecting relationships.

Collaboration is particularly important in small, open economies (Chetty & Campbell-Hunt, 2003). Nowhere in the world is Facebook as widely used as in Iceland and LinkedIn is also popular among business professionals. Icelandic entrepreneurs in various international enterprises in Iceland are utilizing LinkedIn and Facebook in their activities. This trend in Iceland is probably a result of the fact that firms with small domestic market have less chance of achieving economies of scale within their domestic market (Kutschker, Baurle, & Schmid, 1997). The firms are therefore forced to go global at early stages of their development but as these firms are located relatively far from markets, traditional methods of international networking, as international conferences, are costly. This provides an opportunity to use Iceland as an interesting base in the research on how these entrepreneurs use the web to build their network of relationships abroad. As similar trends of social networking on the web can be seen in most developed countries, the research can give valuable input into the effects of new web based networking tools on international entrepreneurial firms and possible research methods and modeling of these firms and the internet in most developed countries. The goal is not to model a specific outcome but to emphasize how new social networks can affect relationships in international business.

The article is divided into four sections. First is a review of the relevant literature which frames the investigation. Second is the methodology and measures used in the research. Third is a discussion of the cases being studied. And finally, the article concludes and presents limitations and implications.

A Review of Related Literature

The Resource-Based View, networks and international entrepreneurship

Entrepreneurs, acting in the role of resource coordinators and agents for their firms, often bring their personal social networks to the firm, which then become one of the firm's most valuable strategic assets for providing the resources necessary for successful development (Hite and Hesterly, 2001). In this paper the entrepreneur in the international entrepreneurial firm is viewed as a resource coordinator. The foundation of this paper lies therefore in the Resource-Based View (RBV) of the firm (Wernerfelt, 1984). The paper is also based on social network theory (Burt, 1992; Coleman, 1988; Granovetter, 1973, 1985) and international entrepreneurship (Oviatt & McDougall, 2005). The link between RBV, the entrepreneur in the international venture and social network theory lies in the argument that social networks provide the international entrepreneur with access to resources they are unable to access themselves.

Wernerfelt (1984) suggests that rather than looking to market characteristics to infer which resources are required by a firm to succeed, the focus might be on the resources the firm possesses. This has been referred to as the Resource-Based View. These resources include physical, social and financial capital. International entrepreneurship research focuses on how social networks enable the international entrepreneurial firm to acquire and mobilize resources for early internationalization. The RBV sees the firm as a unique bundle of resources which are often costly to imitate or substitute (Barney, 1991).

The RBV assumes that the resources are heterogeneously distributed within industries and are imperfectly mobile. Business actors require resources such as capital, skills and labor to start or expand their business activities. Some of these resources they hold themselves but they access other resources by utilizing their contacts which help them in their ventures. The idiosyncratic knowledge of entrepreneurs is a dynamic capability which is pertinent to the entrepreneurial processes. The outcome of successful contacts which the entrepreneurs hold, their social capital, is the key component of entrepreneurial networks (Burt, 1992). External social capital in the form of network ties has positive impact on foreign market knowledge of new ventures (Yli-Renko et al., 2002). Sharma and Blomstermo (2003) observe networks of international new ventures especially in relation to how these networks generate social capital for these firms. They demonstrate that international new ventures utilize weak ties to provide information about foreign markets. Maurer and Ebers (2006) define social capital as 'an asset available to individual or collective actors that draws on these actors' positions in a social network and/or the content of these actors' social relations' (p. 262). Arenius (2002) suggests that increased social capital includes better access to resources and international opportunities, and a means by which to overcome the liabilities of newness and foreignness. Tsai and Ghoshal (1998) suggest that 'a trustworthy actor is more likely to be a popular exchange partner' (p. 467). Coleman (1988) also emphasizes trustworthiness in relation to social capital leading to economic and/or political benefit. Trust is therefore a very important element of social capital not least when observing network relationships of international entrepreneurs.

Personal network analysis observes three factors specifically. First, the analysis focuses on the types of people in the network (are they friends, kin etc.), secondly what kinds of resources flow through the networks and finally the embeddedness of these relationships (do they contain strong or weak ties?). The embeddedness, or level of strong and weak ties in social networks, can enhance the ability of entrepreneurs to acquire resources (Batjargal, 2003). Granovetter (1973) introduced a theory on the spread of information in social networks. He emphasized that all business transactions take place in a social context and therefore a full understanding of economic phenomena is not possible without consideration of this context. Embeddedness is the degree to which individuals are enmeshed in the social network (Granovetter, 1985). This idea of embeddedness is the foundation of the role of networks in the activities of individuals and organizations. Economic relations between individuals or firms are embedded in social networks and these social networks consist of various ties. Granovetter (1973) suggests that the strength of the tie is a 'combination of the amount of time, the emotional intensity, the intimacy and the reciprocal services that characterize the tie' (p.1361). These ties are either weak or strong. Strong network ties have high levels of social relationship or personal interaction with high frequency (Granovetter, 1982). The strong network ties means that members are motivated to be of assistance and protect actors in insecure positions (Hite and Hesterly, 2001). Weak ties, on the other hand, are not as heavily based on personal interaction among members of the network but may provide strategic advantage in terms of resource availability (Granovetter, 1973). Aldrich, Elam and Reese (1996) label network ties as 'friends, acquaintances and strangers', reflecting strong, weak or market ties. Krackhardt (1992) views the weak ties as 'local bridges' to parts of

the network which would otherwise be disconnected (1992). Burt (1992) suggests that the weak ties offer opportunities. The structural holes in networks create competitive advantage for those individuals whose networks spans these holes. Uzzi (1997) describes individuals who transfer expectations and opportunities of an existing relationship over to new relationship as 'go betweeners' while Anderson et al. (1994) emphasises that unique set of connected partners of one firm increases the attractiveness of the firm as an exchange partner and makes the 'network identity' of the firm higher.

Social networks have various dimensions which have been discussed previously. The issue of weak and strong ties in social networks has been the core of the debate which is explained by the fact that these networks are not static but dynamic. The network relationships develop from few strong ties to a more complexed tie structure with a mix of weak and strong ties (Larson & Starr, 1993). Network relationships are therefore transformed from simple structures to a dense set of multidimensional relationships. With regards to entrepreneurial firms, the question is what 'drives entrepreneurs to establish and deepen some relationships and not others, and how do they manage their mix of weak and strong ties?' (Elfring & Hulsink, 2007, p. 1850). Also, are the strong ties more important than the weak ties? The tendency to form ties to similar entrepreneurs has been explored (Kim & Aldrich, 2005) which supports the view of the importance of strong ties. Ruef (2002) found that individuals positioned in heterogeneous networks, comprising both strong and weak ties, are more likely to be regarded by their peers as innovative in comparison to entrepreneurs in more homogeneous networks. Greve and Salaff (2003) mention how networks have several useful properties for entrepreneurs. One of these properties is positioning. 'Entrepreneurs position themselves within a social network to shorten the path to knowledgeable others to get what they need' (p. 3).

Hite and Hesterly (2001) argue that the entrepreneur's personal network evolves through time. To begin with the network is identity-based dominated by strong ties but develops into an intentionally managed network which is rich in weak ties. Jenssen and Koenig (2002) argue that in the process of new venture creation, the entrepreneur's personal friendship ties are crucial for the initial firm growth. Therefore, a focus on strong and more embedded ties can be more important in the start-up and early growth stage than in later stages (Starr & MacMillan, 1990). Whatever the role weak or strong ties play in the life of the emerging entrepreneurial firm, the appropriate use of personal relations can transform the entrepreneur's personal network into an effective tool for achieving a good firm performance (Bratkovic, Antoncic & Ruzzier, 2009) and be the best foundation to build an international strategy (Harris and Wheeler, 2005).

International Entrepreneurship (IE) is an important research literature at the intersection of international business theory and entrepreneurship theory (Keupp and Gassmann, 2009). Most literature on IE has focused on the internationalization of small firms, how internationalizing firms have survived and the characteristics of individual or groups of entrepreneurs in their course of internationalization (Keupp and Gassmann, 2009). International entrepreneurship theory emphasizes the dynamic and chaotic aspects of early internationalization where skills, experience, and social networks play a dominant role (Keupp & Gassmann, 2009; McDougall, Sapienza, Autio, George, & Zahra, 2006,

Shane, & Oviatt, 1994;). As far as international entrepreneurship is concerned, relatively little research has been conducted on the development of relationships of international entrepreneurs. The growing field of international entrepreneurship research has recently been adding a geographic variable into the study of the relationships of entrepreneurs in small high tech firms in international markets, within networks (Coviello, 2006. Harris and Wheeler, 2005, Komulainen et al. 2006, Laanti et al, 2007, Ojala, 2009, Sasi & Arenius, 2008; Sharma and Blomstermo, 2003) The personal relationships developed internationally by these entrepreneurs have been recognized as being essential in the process of growth of these firms. The global level is the most appropriate level at which to study the role of networks in international trade and capital movements (Casson & Della Giusta, 2007). One should keep in mind that local and global networks can compliment each other and members of a national network can also be members of international networks (Casson, 1997). Various local and national networks may play an important role in the creation of personal networks of international entrepreneurs. Kavanaugh, Reese, Carroll, & Rosson, (2005) suggest that communities with high levels of social capital have greater ability to organize and mobilize effectively for collective action. The reason, suggest the authors, is that these communities have high levels of social trust, dense social networks, and well-established norms of mutuality. Communities with "bridging" social capital (weak ties across groups) and "bonding" social capital (strong ties within groups) are the most effective in organizing for collective action. People who belong to multiple groups act as bridging ties. (Granovetter, 1973).

At the early days of new electronic communication, researchers had recognized the potential of electronic communication in potentially stimulating bridging social capital (Lin, 1999) After a short hiccup at the beginning of this century, the web 'has become a pervasive mechanism for the conduct of international trade, and this is particularly true in industrial markets' (Pitt, van der Merve, & Berthon, 2006 p.607). Researchers have also recognized how electronic communication plays a vital part in bridging emotionally distant and geographically diverse actors (Kavanaugh *et al.* 2005; Wellman, 2001). Creating an effective virtual system is suggested to lower co-ordination costs and accrue timely responses for an effective instrumental social system of exchange (Lee, 2009). Lee suggests research in communication media regarding business and management and social capital should ask the question 'How does electronic and face-to-face interaction affect bridging and bonding networks?' (p. 266). As technology changes and the potential of new web technology affecting business relationships develops, this new communication media becomes increasingly more important in international business ventures. At the same time new communication media in relation to international entrepreneurial firms has rarely been studied. Therefore, this paper addresses an important gap in the literature by considering the interdependent influences of the new social networks on the web on venture internationalization processes within a known theoretical frame of RBV, social networks and international entrepreneurship. The research may provide a starting point for additional theoretical and empirical work in this field.

Method of Research

The research was explorative in nature and rooted in Eisenhardt's (1989) interpretative methodology, which allows theory and data to interact. In line with Eisenhardt's comparative case approach this paper makes a systematic comparison between types of entrepreneurs found in the research process. The purpose in this study is to compare the phenomenon being studied in a systematic way and by that exploring different dimensions of the issue to be researched. Iceland was chosen as the country of origin due to its small and open economy with an extremely limited domestic market (population 315.000). For Icelandic high tech entrepreneurs, due to the small market, internationalization is not only a common strategy it is a necessity. All the twelve case entrepreneurs have been involved with the software business for more than 5 years, all are owners or part owners of their firms. Their firms are independent startups in software development with international exposure and they began international marketing/sales within their first three years (see Appendix 1 for list of entrepreneurs). Theoretical sampling logic (Eisenhardt, 1989) was used to identify and select cases for the study. The entrepreneurial firms were selected non randomly from the database of the Federation of Industry in Iceland. By focusing on software entrepreneurs, a good comparison can be made with studies in this field (e.g. Ojala, 2009, Sasi & Arenius, 2008, Komulainen et al., 2006, Coviello, 2006, Sharma & Blomstermo, 2003, Harris & Wheeler, 2005). However, these previous studies on international entrepreneurs and their networks have not addressed how the web has affected their relations.

Almost all network studies have been conducted by means of personal interview (Matzat & Snijders, 2009). 'The qualitative research interview attempts to understand the world from the subjects' point of view, to unfold the meaning of their experiences, to uncover their lived world prior to scientific explanations' (Kvale & Brinkman, 2009, p.1). In an open-ended interview, the respondents are asked to comment about certain events. They may participate in the process by giving extra input on solutions, providing insights into events or suggest other sources to observe. In the case of the open ended interview, the interviewer has to avoid becoming dependent on a single informant. It is important to seek the similar data from different sources to verify its authenticity. The interviewer is available for assistance and the interviewer can motivate the interviewee to continue answering. The interviewing was based on 'native category' approach (Buckley & Chapman, 1997; Harris, 2000), involving extensive conversations about beliefs and perceptions around non-directive questions rather than directed questions derived from theory. No prompts were used to pursue issues (such as relationships or exchanges) not raised by the interviewee, and limited clues were given as to the areas of interest of the interviewer (Strauss and Corbin, 1991). Nevertheless, the interviews were partly structured to direct discussion to relevant topics, such as the web, and to achieve equivalent data (Eisenhardt, 1989). To obtain a list of the most important relationships (the strong ties), each participant was asked: 'What do you think about when you consider the future of your business?', with a follow up question: 'Who do you discuss [this issue] with, or consult with?' (Harris & Wheeler, 2005).

Creswell (2007) encourages researchers designing qualitative studies to include new and creative data collection methods. Researchers have argued that online communication

technologies improve network research (Watts, 2007). Lewis, Kaufman, Gonzalez, Wimmer, & Christakis (2008) argue that open, evolving social network sites represent remarkable new research opportunities which are ideally suited for data collection and analysis. The procedure pursued in analyzing the web networks of the entrepreneurs being studied involves:

1. Open interviewing process with all the entrepreneurs regarding their social networks, weak and strong ties, and their usage of communication techniques on the web. The interviews lasted 70-90 minutes.
2. Participant observation which included establishing a Business Network Research Group on LinkedIn where all the participants in the study were members which opened the possibility for the researcher to follow their networks and actions.
3. Mapping the individual's networks in terms of number of links, strength of ties and geographic setting of links.
4. Observing how the participants used other web networking tools which included Facebook, LinkedIn, Small World, Xing, blogs and Twitter.
5. Follow up interview allowed the participants to confirm the accuracy of the researcher's rendition of the network map. At the same time, quantitative data was collected regarding links on preferred web network. The follow up interviews lasted on average 50 minutes.
6. Mapping the individual's network on the web and mapping different categories of entrepreneurs found in the research.
7. Analyzing data.

Defining ties as weak or strong is based on four criteria: the frequency of contact, the emotional intensity of the relationship, the degree of intimacy, and reciprocal commitments between the actors involved (Granovetter, 1995). Weak ties provide access to novel industry information and new business contacts. Strong ties are relationships that can be relied on in both good times and bad times.

The participant observation consists of actively following the development of the networks of the participants on LinkedIn and Facebook. LinkedIn is a professional social network on the web with 70 million members while Facebook is a more general social network on the web with over 450 million users. The researcher set up a Business Network Research Group on LinkedIn which includes all of the international entrepreneurs being studied. The following on both LinkedIn and Facebook started in April 2010 and the researcher observed the number of ties over 6 months period, geographical setting of ties and background of those linked to the individuals being studied. All the participants were aware of the research and gave their approval. In cooperation with the interviewed, the researcher also followed various links and how they affected the development of the business. All comments or discussions which are either directed at the researcher or to the all the links are studied. No formal discussion or requests for comments or ideas on the Business Network Research Group on LinkedIn was started prior to interviewing the candidates. This was done to make sure that the researcher had not inserted his ideas into the group before the qualitative interviews had been executed. Another concern regarding a social network analysis of individuals using the web is whether link on the web between two individuals implies a 'social link' or are

they hollow links which little of substance flows? Watts (2003) argues that since it is humans that create links between each other on social networks on the web, these relations have their origin in human behavior and are indeed social. This research takes this viewpoint and emphasizes the value to international entrepreneurship research to observe further these links, their origin and purpose and how they are used, without oversimplification or prejudgment? All of the participants are with their own LinkedIn sites and most have their own Facebook sites. Their firms have their own websides and many of the participants are also active on other web communication sites such as Twitter, Xing and Small World and some of them have their own blog.

Method of observing web links

In this paper we add to the counting and analysis of ties as a result of an open ended interviewing, an analysis of the context of web links of international entrepreneurs. Fischer (1982) argues that

‘most adults encounter people through their families, at work, in the neighborhood, in organizations, or through introduction by friends or relatives; they continue to know some people met in earlier settings, such as school or the army; only rarely do chance meetings, in a bar, at an auction, or such become anything other than brief encounter’ (p. 52).

The context for creating relations is of significant value when studying personal networks of international entrepreneurs. By that we can observe how people encounter people, the importance of connectors or the “go betweeners” (Uzzi, 1997 p.48) and basically where do relations come about. This information can have a significant value when assessing how international entrepreneurs create business contacts in different and often unknown territories.

Coviello (2006) assesses ties of international new ventures based on whether they are initiated by the firm (‘outward’), initiated by an external party (‘inward’), or initiated by ‘third party’ introductions. Similarly, Grossetti (2005) suggests three types of situations which are contexts for constructing relations. The first is an involvement in a collective form (which Grossetti names ‘circle’) where certain relations may last longer than the collective form which made its initial construction possible. An example of this may be a group of individual entrepreneurs who are working together on a task which then becomes obsolete. Certain relations in the group may last longer. Another example may be former class mates or colleagues.

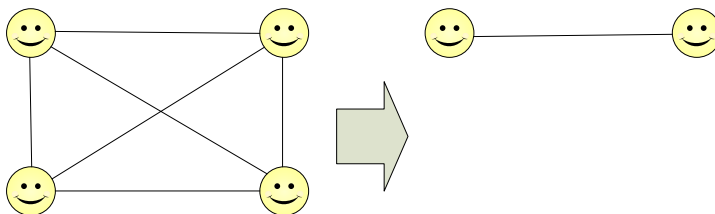


Figure 1. Relations last longer than relations in a collective group.

The second type of situation is where relations are constructed around a common concern. Two entrepreneurs can take part in a large project where they are separately working on different parts of the project. These individuals do not necessarily look at these relations as a collective form but these common concerns may then lead to relationship and a structured collective entity. In this study the common concern includes various trade shows, business conferences and other activities which the entrepreneurs perceive as forum of people with common interest.

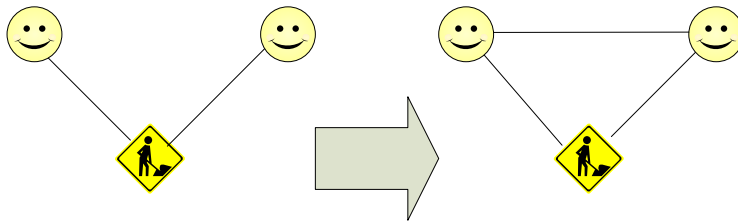


Figure 2.. Relations constructed around common concerns

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The last type which Grossetti identifies are relations derived from other relations. ‘Certain people are introduced to us by friends either directly or during recreational or purely social activities (evenings out, suppers etc.)’ (Grossetti, 2005, p. 233). Two entrepreneurs are introduced by a mutual friend or business associate. Through this introduction a new relationship develops.

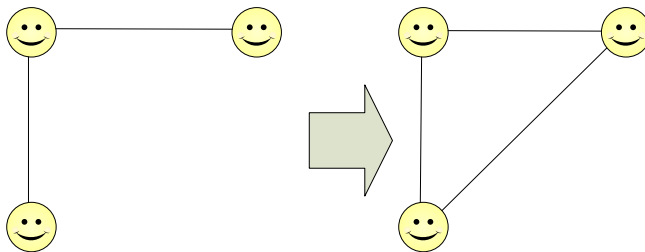


Figure 3. Relations derived from other relations.

The follow up interviews with the participants entailed a further exploring of each network, clarifying ambiguous relationships, and a collection of quantitative data regarding the context of relationships on the preferred networks of the participants on the web. These interviews lasted on average 50 minutes and were conducted 3 months after the initial interviews. To form the method of interviewing and data collection the following method was used.

1. The participants were asked what was their preferred professional networking tool on the web.
2. The researcher went over the list of on average 70 random links of the participants on the preferred network in cooperation with the participants, totaling 840 links on the preferred network. Only links which were described as both friendship and

business or business were identified. Current co-workers were also left out as in many of the firms these links were initiated by the firms so that all of the co-workers would be linked together on the professional network. Participants were asked the following questions:

- a. How did you first meet this person?
- b. Who introduced you or who initiated the contact?
- c. Any other comments on development of relations?

Discussion of research results

This study has explored ties of international entrepreneurs and how they shape their network relationships using the web. The web is of particular interest as its global diffusion is often perceived as a positive catalyst that streamlines many social, organizational and technical processes (DiMaggio, Hargittai, Neuman & Robinson, 2001). One finding observing the cases in this study is that the entrepreneurs with the largest number of links on the web tend to have few strong ties as indicated in the open interviews with these entrepreneurs (see Table 1). The entrepreneurs with the smallest number of links on the web have, on the other hand, the greatest number of strong ties as indicated in the interviews. When a participant in the study, with one of the largest number of links on the web, was asked whom he discussed the future of his firm, which was the name generating question to confirm strong ties, he responded: 'I send out my thoughts to a group of 40-50 investors and specialists on LinkedIn' The interviewed also indicated that portfolio of weak ties are playing a more vital role in the strategic decision making of the entrepreneurs than previously, partly because of new communication technology on the web. One participant said: 'I blog my thoughts about the venture and then basically try to let them vote on best solutions. It also creates more fans (followers)'. This supports Greve's (1995) suggestions that, in a loosely constrained network, the entrepreneur may be able to discuss ideas and problems without a high risk of idea appropriation. This also supports Coviello's (2006) findings that international new ventures use this strategy. The opportunities of the new web communication technology may further strengthen these activities of international entrepreneurs.

Similar to Eisenhardt and Ozcan (2009) who found that executives in firms with high-performing network portfolios visualize their portfolios in the context of an entire network, not as a series of single ties, this study showed similar network attitude among the entrepreneurs with large number of links on the web. They viewed individual links as parts of a portfolio which often linked to their specific industry or specialization. The connectors or the 'go betweeners' are important here. These individuals, revealed in the interviews, had a strong network identity and large web network. However, the network itself or portfolios of relationships within the network may also be seen as the "go betweeners", rolling over expectations from an existing relationship to a new relationship. The web network seems therefore itself to roll over expectations. The individuals meet at an event which they have some common interest in, common concern. Later, they plan to connect on the web and both use the built in referral system on the web to evaluate the quality of each other. If they see that they are both tied to

number of same individuals they receive indirect confirmation about the quality of the new tie. The portfolio of ties which connect to the two individuals becomes the 'go betweeners' and partly protects against the opportunism seen as the weakness of weak ties in former studies on social networks in business (Uzzi, 1997).

Geographic analysis and analysis of the background of the linked individuals in the studied entrepreneur's network showed a significant difference between the entrepreneurs regarding the geographical positioning of the links (i.e. domestic or foreign). On average, foreign links on LinkedIn account for about 40% of total links (see Table 1). As the number of links increased so did the proportion of foreign links. Of the 171 weak ties defined by the international entrepreneurs in the open interviews, 41 were foreign or 24%. Observing the links on LinkedIn, close to 3 thousand links, 41% were foreign. This may indicate that LinkedIn is opening further doors for foreign contacts for the entrepreneurs in this sample. Facebook, totaling over 8500 links, had fewer foreign contacts, or 23%. The interviews indicated a very mixed results regarding the use of LinkedIn and Facebook. All of the interviewed named one of the two as preferred web network.

As the interviews developed several of the interviewed in all the groups mentioned success stories of colleagues or acquaintances in business who they thought had used their relationships on the web more systematically. These instances were mostly of individuals who had obtained resources through social networking. They mentioned business people who had obtained valuable business contacts with a mix of web- and face-to-face relations, assisting family members of their new business counterparts on their travels in Iceland through the web, building strong relations on the web etc. It was not a matter of the number of ties but the management and creativity regarding current ties which they showed interest in. The participants showed enthusiasm for developing their somewhat hollow relations, created at trade shows and other such events, into links on the web, to nurture these weak links into personal relations and from there into full business relations.

Burt (1992) suggests that the larger the effective size of the network, the greater its growth of nonredundant ties and the number of structural holes increases, which opens further bridging opportunities. Even though various indicators show a sign of ever increasing web of weak ties of international entrepreneurs and this article has suggested that large amounts of weak ties seems to suit best for the strategy of exploration, the interviewed also expressed concerns regarding this development. These concerns are twofold: Serving a large portfolio of weak ties can be time consuming and many of the participants indicated that their social network on the web did not necessarily reflect their optimal business network. Secondly, there is a growing problem of 'buggers' as one participant phrased the issue of people, which they have never met but are linked up with on the internet, who are sending various requests and comments on these web sites. These hollow relations can take a lot of time and be questionably efficient. One such mail was received by one interviewed the same day as the interview: 'Hi (X), Good to connect again via LinkedIn. It has been a long long time! Hope you're well. I actually moved back to (city) last year to begin life as a Canadian again. Good fun. I'm working

on a new tech idea and if you had a minute I would be keen to hear your thoughts...' The interviewee had no previous working experience with this individual and had never met him. They were though both a part of a large social network of entrepreneurs on the web.

Observing this within the framework of the resource based view, this dynamic capability of web relationship building, can lead to an overflow of social capital for the international entrepreneurial firm. Cross, Nohria and Parker (2002) suggest one of the myth of social networks is that to build better networks, we have to communicate more. The concerns which the interviewed expressed regarding their increasing network size, is in line with this myth. Many of them have for the past 1-3 years been expanding their web network rapidly, communicating more with a larger set of links, but they are not sure whether their network and their links are the 'most effective ones'; whether more means less. Network literature cautions that size of personal network is not necessarily correlated to the business success. According to the participants, their new social networks on the web have increased their relationship network and their number of weak ties. Hollow embeddedness has increased in the cases being studied but the question is what effects it will have on the ventures of the international entrepreneurs? Even though the entrepreneurs seemed to value large number of weak ties in the interviews, the entrepreneurs valued more efficient and creative use of the personal network rather than size. One entrepreneur said: 'Time is valuable and networking can be very time consuming and more so as time goes by.' The growing tendency of large networks, increased bugging and ineffectiveness, has led to a search of these entrepreneurs for more specially tailored and closed networks on the web. At the same time, the importance of network identity in the cases being studied seems to have increased.

One of the results is the identification of three patterns or distinct types of entrepreneurs; the 'seeking' entrepreneur, the 'catalyst' entrepreneur, and the 'focused' entrepreneur. These three groups are similar in experience and there is not a significant difference in the age of their firms. However, the *seeking entrepreneurs* are on average 4 years younger than the other two groups. On the basis of interviews and secondary data, the researcher looked for an even distribution leaving out two entrepreneurs who had been interviewed as they all matched one of the three categories.

The seeking entrepreneur

The first one is the *seeking entrepreneur*, a pattern that is observed mainly among the international entrepreneurs where their entrepreneurial firms are actively seeking further opportunities abroad as they may mean the make or break of the venture. Four participants in the study were categorized as *seeking entrepreneurs*. The network of the *seeking entrepreneur* is unstructured and he perceives himself as a member of an international network of 'symmetrical' relationships between people of equal status (see Figure 1). His focus regarding the social network on the web is to establish channels which may change into business and help him gain credibility (Zain and Ng, 2006).

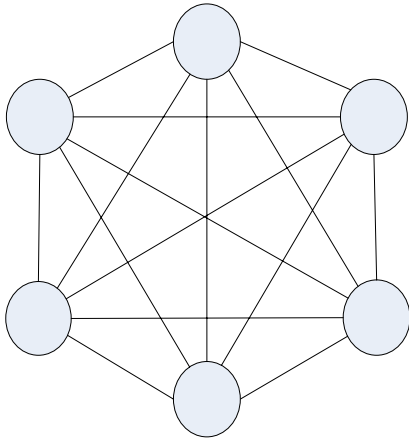


Figure 1. The Seeking entrepreneur seeks opportunities on the web from various relationships; from people of equal status.

Even though the *seeking entrepreneurs* perceive both weak and strong ties as important, the weak ties play a dominant role. They are actively seeking weak ties as they realize they have no way of establishing in a short time frame strong ties with foreign partners and they realize the important part of weak ties in the internationalization of the business. This is in line with Sharma and Blomstermo (2003) who demonstrated the importance of weak ties for international new ventures. As these international entrepreneurs have the ambition to expand into new markets, they need weak ties in their search for private information on business opportunities. This pattern of network evolution confirms the results reported by Hite and Hesterly (2001) and Jack (2005) who studied networks of domestic entrepreneurs. The web is used as a tool where the entrepreneur wonders around and opens links wherever possible. The *seeking entrepreneurs* have large number of links on the web and these links are not managed in a systematic way. These individuals are though very much aware of the opportunities these connections may bring and nurture them. The weak ties on the web are perceived as important in the search for new information concerning the development of products, business-to-business customers, finding distributors or establishing relations within a particular industry. Due to financial constraints they are not able to invest heavily in these relationships by visiting these firms abroad or attend many conferences or trade shows, which many of the interviewed see as the key to both creating new ties and strengthening or enhancing the weak ties which have been created. The *seeking entrepreneurs* were less concerned about the time spent networking on the internet than the other group. The *seeking entrepreneurs* indicated that their networks on the web have increased significantly in size in recent 12-24 months. One of these entrepreneurs moved to London in 1999 and as he did not have any ties in London, he had to establish relations with people with similar interest to build his venture. He became a member of a social network of entrepreneurs in London which became a LinkedIn network few years ago and through that network established connections with three investors from Asia and the UK when launching his firm. The entrepreneur has now a network of 80 connections of interested investors through LinkedIn who all have been introduced to his business ventures and plans and at least a part of this group continued to be the source which the entrepreneur plans to use in his ventures later.

The web relationships of the *seeking entrepreneur* were geographically dispersed and in many cases the relationships can be defined as hollow relationships which the interviewed hope to develop later into a business relationship. The *seeking entrepreneurs* seem to be the only entrepreneurs in this study which are open for links which in the beginning are mostly unknown to them but they perceive as an opportunity; a potential for common concern. This is contrary to previous research emphasizing the role of web networks as maintaining or reinforcing existing offline relationships rather than to meet new people (Lewis et al., 2008, Ellison et al., 2007). In the cases being studied in this paper, the *seeking entrepreneurs* are actively seeking new and often mostly unknown contacts through the web. Cross, Nohria, and Parker (2002) suggest that managers should overcome certain myths about how networks operate. One of these myths is that 'Everyone should be connected to everyone else'. The *seeking entrepreneur* seems to reflect this myth as they tend to be collectors of various links with undefined purpose. Even though the *seeking entrepreneur* perceives himself as being a member of a symmetrical network he also realizes there are certain connectors in his network who are more important than others. There seems to be a ranking in terms of the quality of the weak ties, the *seeking entrepreneur* seem to have a fairly good picture of who the catalysts are, individuals who are connectors and may initiate business. There is where the *catalyst entrepreneur* comes in.

The catalyst entrepreneur

The second one is the *catalyst entrepreneur*, which is associated with international entrepreneurs who have in this study shown the largest network links on the web, the strongest network identity and have high bridging ties (see Figure 2). The *catalyst entrepreneurs* are in line with results from social network analysis which have suggested that heavy web users with bridging ties have high social engagement and bridge social capital in communities (Kavanaugh et al, 2005). Four entrepreneurs were categorized as *catalyst entrepreneurs*. These individuals show a positive relationship between their perceived network strength and business venturing. In this study, the *catalyst entrepreneur* seems to be the most effective in using electronic and face-to-face interaction to bridge and bond networks. These individuals had three- to fourfold number of links on LinkedIn compared to the other participants on the web and the coding of the interviews indicated also strongly their relatively strong network identity. They have a unique and diverse set of connected partners which increases their attractiveness as network partners.

An interesting finding is that these entrepreneurs have the largest network on the web but the smallest number of strong ties indicated in the open interviewing process. The *catalyst entrepreneurs* are therefore trusted network members with bridging ability and strong network identity but in the interviewing they indicate that their list of highly trusted partners is lower compared to other entrepreneurs being studied. The web links seem to serve as a new medium and the large network represent a form of status; a strong network identity. Prior to building their network on the web they had been speakers at foreign conferences and built a network of some key foreign players in their industry. In the interviews with the *catalyst entrepreneurs* they did not see the web overtaking conferences and trade shows and the face-to-face bridging.

Similar to the *seeking entrepreneurs*, the *catalyst entrepreneurs* use the web to seek new business contacts as well as strengthening current network. One *catalyst entrepreneur* stated: 'I use the web social network to seek connections but not necessarily to enhance existing ones. After initiating relations on the web I tend to move them into more traditional territories. I use LinkedIn as I would use a conference. I send teasers to five individuals saying that I will be in London on Thursday.' One of the interviewed *catalyst entrepreneurs* said: 'I perceive that we can use the web relationship networks much more in our daily projects. You expose a part of you project into you personal network and by that you may create a group which endorses it. LinkedIn is heading in this direction. You come with a question and there is voting about the best answer. You come with good answers and you get certain points. That is how you can create a brand on LinkedIn.'

Another key finding regarding the *catalyst entrepreneurs* is that they have various ties with important individuals and firms abroad in their relevant field. Their perceived strength lies in their strong network identity; they are attractive exchange partners due to their unique set of connected relations with other individuals and their resources and ties (Anderson et al., 1994). They realize their strength in networking and go to some lengths in enhancing and preserving them. The interviewed indicated that it would be greatly oversimplifying that with the web comes 'death of distance.' (Cairncross, 1997) as they indicated that the most important relationship building came from face-to-face relations. One of the *catalyst entrepreneurs* indicated that since moving back from London, where he lived for five years, many of his key contacts had been inactive, the web had helped him preserving them as 'low hanging fruit' as he phrased it but without face-to-face relationship, these contacts would possibly dwindle.

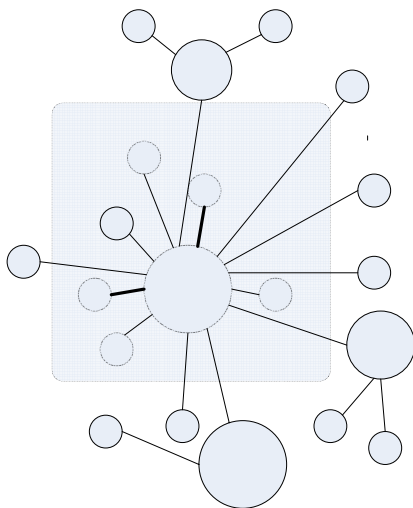


Figure 2. The Catalyst entrepreneur has the largest network of weak ties on the internet, connects to various key individuals at home and abroad and has the strongest network identity. (Shaded part represents domestic contacts)

A large number of people tend to want to link with the *catalyst entrepreneurs* as they are more likely to link them to valuable contacts. This is partly the reason why the *catalyst*

entrepreneurs have larger network on the web than other entrepreneurs in this study. The *catalyst entrepreneurs* were mentioned in the open interviews by two of the *seeking entrepreneurs* as being ‘important in our network’ and ‘connected us to an American firm’. These results are in line with Tsai and Ghoshal (1998) who suggested that trustworthy actors are more popular exchange partners. The large and dispersed network relationships of the *catalyst entrepreneur* and his strong network identity presents opportunities for these individuals but the interviews also showed that these individuals are involving themselves in more business and social issues. They keep their own blog pages, some use Twitter or actively seek to become presenters at conferences etc. to strengthen their position in the industry. Whether these growing and time consuming activities on the new social media benefits their entrepreneurial firms is to be seen, but these activities may lead to less focus on their core business.

The Focused entrepreneur

The third category of entrepreneurs identified in this research is the *focused entrepreneur*, which is associated with international entrepreneurs who have in this study shown less interest in personal web networks and have smaller networks. Four individuals were identified as *focused entrepreneurs* in this research. These individuals are on average four years older than the *catalyst entrepreneurs* and 6 years older than the *seeking entrepreneurs*. They are using more traditional methods in communicating with business partners but are interested in the web and its use (see Figure 3). The *focused entrepreneurs* have been in the same high tech niche for most of their career – have a good network around them regarding that specific area of interest, are looking for new business, but do not as actively seek or value weak relationship ties on the web or elsewhere as the other entrepreneurs. They are generally more skeptical about the idea of large relationship networks and they see large number of weak ties as a time consuming and inefficient way of doing business. “We come back from conferences with a chunk of business cards from various people – two or three may be good but little or nothing comes out of the chunk of it.”

Examining the *focused entrepreneur*, the open interviews indicated they tend to have proportionally larger network of trusted ties, strong ties, than other entrepreneurs being studied, but they have the smallest network on the web. The *focused entrepreneur* has been successful but his network identity is highest in the domestic market. A geographical analysis of LinkedIn connections did show relatively fewer foreign links of these entrepreneurs than the other groups and their network resembles them in terms of experience and training. Only one of the four *focused entrepreneurs* had a Facebook site but all of them had LinkedIn. The geographical setting of links of the *focused entrepreneur* on LinkedIn is more local but even though their web links abroad are fewer they indicate that they have been selective regarding whom to connect with. One is though with higher network identity in a specific market niche abroad but does not utilize the web to enhance these links.

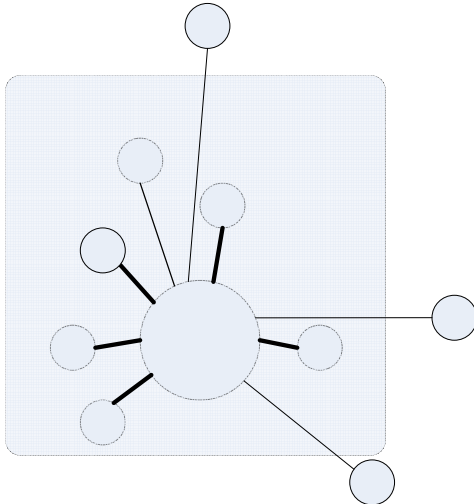


Figure 3. The Focused entrepreneur has fewer links on the web, especially abroad (shaded part represents domestic contact) , but has built more traditional links with people and has more strong ties.

One of the *focused entrepreneurs* studied and worked in Germany in the 90's: 'I am going to use Xing in Germany (similar to LinkedIn). I use it to get to people with my specific message. I use these links on the web to enhance my connections – be visible. When our clients begin to observe our validity and trust I want them to be able to see that we are real people with good background.' Another *focused entrepreneur* said: 'I am not a great connector. We have actually reached a certain stage, we have processes, and steady culture ... we are beginning to show profit.' One of the *focused entrepreneurs* commented: 'I already know what is going on in my network'. While the *focused entrepreneur* might have a good personal network in his field, things can change fast, leaving the entrepreneur evaded

When observing two degrees away on LinkedIn, i.e. friends of friends; each connected to one of your connections, the individuals linked to the *seeking-* and *catalyst entrepreneurs* have a much larger 2nd degree network than the individuals linked to the *focused entrepreneurs*, indicating that the *focused entrepreneurs* seem to be linked to other people who are themselves with relatively small networks on the web. This is in line with studies on social relations on the Facebook which have shown that people tend to link up with similar people (Lewis et al., 2008).

Table 1
Number of ties from interviews and number of links on LinkedIn and Facebook of the entrepreneurs

	Average age	Average number of strong ties defined	Average number of other ties defined	Average links on LinkedIn	Percentage of international ties on LinkedIn	Average links on Facebook
Seeking entrepreneurs	37	7	18	168	39%	650
Catalyst entrepreneurs	39	6	15	441	52%	852
Focused entrepreneurs	43	9	20	108	17%	560*

*Three of the focused entrepreneurs did not have Facebook.

Reading the interviews one of the issues drawn out as an interesting theme to observe further was general views about relationships and their importance. The international entrepreneurs showed strong signs of being both aware of their social relationships and the importance of these relationships with regards to the web. They seemed to realize how hollow many of the relations on the web sites are but realize also that new communication tools may increase the trust rating of entrepreneurs on these sites which opens new opportunities to use these sites more efficiently. The entrepreneurs also expressed interest in lowering cost of obtaining resources such as relationships by using the web, tailoring their network and building a strategy for web communication.

Analysing preferred professional network on the web

As the number of links of the participants on the preferred web network was much larger than in the open interviews and the significant majority of the relationships indicated that they were weak, the research did not focus on defining strong and weak ties but viewed all the web relations as weak, leaving out personal/friendship relations which were not related to business. Instead, the focus was on the context of creating relations and the evolution of these relationship networks.

The categories of creating relations are built on Grossetti's (2005) three forms of contexts for constructing relations, Collective form, Common concern and Relations derived from other relations. The results of the analysis of the preferred network on the web reveals both similarities and confirms Grossetti's (2005) specific formulations of network context on the web of the three groups in the study (Table 2). The Collective form includes former co-workers or current/former domestic client/supplier (lawyers, IT specialists etc.) and classmates. The Common concern includes professional conferences or trade shows and related networking activity (parties, meetings etc.) This category includes individuals who were not known to the participants but asked the participants to link up with them. According to the interviewed these links were accepted as they seemed to represent common interest or concerns. Finally, Relations through others includes contacts through a connector. These can be formal agents or brokers or individuals which are identified as connectors. On average, 8% the *seeking entrepreneurs* were not able to identify their links, 6% of the *catalyst entrepreneurs* and the *focused entrepreneurs* identified all of their links.

Table 2
Context of relationships of identified links on preferred web network

Type of entrepreneurs	Collective form	Illustrative quote	Common concern	Illustrative quote	Relations derived from other relations	Illustrative quote
Seeking entrepreneurs	37%	She worked with me on a previous IT project	61%	We met at a conference in Seattle	2%	We were introduced through mutual mail by (industry leader)

Catalyst entrepreneurs	27%	He wanted to link up on Facebook. I found out we had studied together at gymnasium	64%	I was a speaker at a conference where he was also. He began following me on Twitter.	9%	This is a guy I met skiing in France. We had a mutual friend who introduced us.
Focused entrepreneurs	63%	He is a former colleague of mine from previous job	30%	We were both at the board of New Tech Iceland	7%	I was introduced to this guy by a former classmate

Overall, the analysis indicated that the majority of the links of the *seeking- and catalyst entrepreneurs* were initiated through Common concern; trade shows and conferences, both domestic and abroad. Very few domestic or foreign contacts of the catalyst- and focused entrepreneurs were created without people having formerly met. The seeking entrepreneurs had higher proportion of these instances, ranging from 10% up to 30% while the others had less than 10%. The *seeking- and catalyst entrepreneur's* network relationships on the web seem therefore to be mainly formed through involvement in various groups with a common concern in their area of interest. The most common response when discussing each link with the *seeking- and catalyst entrepreneurs* was: 'I met him/her at a party/conference/trade show and we began to talk', while the most common response from the *focused entrepreneurs* was 'I met him/her as we worked/did business together.' This is in line with research which has suggested that the social media is primarily used to strengthen current ties rather than to create new (Lewis et al. 2008, Ellison et al. 2007).

The other most significant parts of the networks consisted of the Collective form; former co-workers and former or current business associates and former classmates. The network of the *focused entrepreneurs* is relatively more based on former classmates or colleagues than the others. This is explained by the fact that *focused entrepreneurs* have proportionally more domestic links which tend to consist of larger parts of former classmates and/or colleagues. One observable difference between the *seeking entrepreneurs* on one hand and *catalyst- and focused entrepreneurs* on the other, was regarding who initiated the first contact; who invited whom to join their network? The participants were not able to answer who had initiated the relationships in over 60% of the relations. On the other hand, they knew they met the person at a trade show in San Francisco or Berlin, at school, former workplace etc. In many cases, the question on who initiated the relations seemed irrelevant as they just replied with 'we met at a conference' or 'we studied together'. But in the cases which the participants were able to remember who initiated them, the findings revealed a significant difference in the initiation of the relationships. This study supports Coviello's (2006) findings that relationships initiated by the international new ventures are common, but this study also reveals large difference between the different types of entrepreneurs. The *catalysts* and the *focal entrepreneurs*, and particularly the *catalysts*, initiated much fewer relationships compared with the *seeking entrepreneurs*. The *seeking entrepreneurs* were more aggressive in their pursuit

of links while the others were more on the receiving end. One *focused entrepreneur* said: 'I reject many into my network', and a *catalyst* said 'they tend to contact me.' Analyzing the context of the relationships on the web and interviewing the participants about their origin, revealed partly a description of the three categories of entrepreneurs in line with the definitions of the three types of entrepreneurs. The *seeking entrepreneurs* were aggressive in seeking links, the *catalyst entrepreneurs* are sought after links and can therefore be more passive in their approach and the *focused entrepreneurs* have much smaller networks but have proportionally larger network of former colleagues and classmates indicating their smaller but tighter relationship network. The *catalyst entrepreneurs* seemed more passive in their pursuit of contacts. When asked, how did you first meet this person, they responded more frequently than the other entrepreneurs by indicating both their passive approach but also network identity: 'I came to know him first as he followed me on Twitter', and 'I tend to wait until the other asks me to connect.'

This study did not find a large number of relationships on the web being created by third party. But the recognized relations which were created through third party were in many cases highly valued by the participants. These included relationships initiated by the 'go-betweeners' or 'connectors' which had resulted in business.

In interviewing the participants regarding the evolution of their web network they seemed to agree that they started with few close friends and expanded through the friends of the close friends. In the early stages of the network development, the relationships tended to begin more oriented towards friends. This might explain the relatively larger portion of Collective form of ties among the *focused entrepreneurs* than the others as their tie on the web are much fewer than the others. Even though the participants did not suggest that number of links a contact had were any indications of the quality of the contact, some of the interviewed seemed to value contacts with large number of links. Some of the interviewed looked at the number of links which their contacts had and said: "You see, he has 350 connections...." or, "He has only 23 connections ...". The most interesting part of this observation of links on the web in close cooperation with the interviewed, is when the "turning nodes" show up, the links which somehow have made the most difference for the business. As one *catalyst entrepreneur* said when observing his links: "Oh, here is the US contact who invited me to dinner at his house with (person) from (a large US network). And a *seeking entrepreneur* said: "Here is my first foreign investor whom I met on the internet, we Skype at least monthly".

Conclusion

This study contributes to the international entrepreneurship literature by recognizing the change in the evolution of relationships of international entrepreneurs in software firms and responds to Lee's (2009) suggestion that research in business should focus on how new communication media affects bridging. Existing studies on high tech software firms networking activities indicate that the dominant networking activity of emerging, independent software firms are exploration of weak ties and weak ties pave the way for the internationalization of high tech firms (Komulainen et al., 2006, Sharma &

Blomstermo, 2003). Findings here reveal a strong focus of the international entrepreneurs on obtaining resources using weak ties. This indicates the importance and utilization of the underlying theories of RBV and social networks in this paper.

Uzzi (1997) found that strong ties (embeddedness) promoted “economies of time” (the ability to capitalize quickly on market opportunities). This promotion realised because the transactional details protected against opportunism in weak ties which Uzzi phrases as ‘arm’s length realationships’. This study reveals a portfolio of weak ties of international entrepreneurs which have some of the characteristics of strong ties. You are a part of a large network on the web. You have been accepted by numerous people who know other people who are linked up with you on the web and you are active in increasing your network identity, being one of your most important resources in web communication. All these elements within the weak tie structure of the web network establish an initial motive for trust and protects against opportunism; one of the foundations of strong ties.

This paper offers a methodological contribution to the study of web networking relationships and context of these relationships of entrepreneurs. The opportunity of counting and evaluating weak ties of entrepreneurs on the internet opens a new and exciting field in the study of the development of relationships of international entrepreneurs. New social media technology has made the list of relationships much more organized which opens doors to exploring weak ties in a more systematic manner. The findings also stress the importance of the RBV literature in the observation of changed network structure of software entrepreneurs. Entrepreneurs use contacts to access resources and the dynamic capability to actively broaden the network of contacts is an important part of the RBV.

This paper has a number of limitations. First, the focus has been at only software firms. More extensive studies in other settings are required to test the extent to which the findings can be applied more generally. However, this exploratory study contributes to existing theory, by observing an important element of social networking, the web, into the study of social networks of international entrepreneurs and generated arguments to explain why network development differs among different types of entrepreneurs. Secondly, as indicated in this paper, some users of these networks are more popular than others. Using only number of links to indicate network identity or popularity may be misleading as a growing number of web users are collecting links. One method to evaluate individuals might be to find out how many sought to link up with them rather than how many links they have. This might indicate their network strength and separate them from individuals who might be collecting hollow links from similar people for various reasons such as impressing others, interest in collecting etc. This was partly exercised in this study but a more structured study in this area could be of interest. Thirdly, with the seemingly growing importance of weak ties in the internationalisation process of firms it would be valuable to explore further weighing of weak ties similar to the work being done in social networks where ties get values according to their significance. (Opsahl, Agneessens, & Skvoretz, 2010). One is also left with questions regarding the validity of obtaining lists of weak ties from interviewees through mostly open ended interviewing. The list of connections on the web networks indicated many

weak ties which the participants had not mentioned in the interview. The open ended interview should not be to test the memory of participants regarding their large number weak ties. This does not necessarily downplay the value of observing weak ties in an open interviewing setting but emphasizes mainly the opportunities which the social networks represent in obtaining data on the number of ties, context for creating ties and the character of the ties. Lastly, the number of ties and the distinction between weak and strong ties is not always clear. Nevertheless, this exploratory study contributes to existing theory, and adds value to frameworks which have rarely been tested in an international business environment. The continued cooperation between the researcher and the entrepreneurs on the Business Network Research Group on LinkedIn opens further the opportunity to explore the development of the personal networks of the international entrepreneurs using the method of participation observation as well as longitudinal and dynamic data which network research will emphasize on in coming years (Lewis et al., 2008) . Future studies might observe, in line with Ruef (2002) whether individuals positioned in large heterogeneous networks are more likely to be regarded by their peers as innovative in comparison to entrepreneurs in more homogeneous networks.

As far as implication for international entrepreneurs in software firms is concerned, this paper emphasizes that networks on the web can provide opportunities to enlarge weak ties which are especially important in the development of international enterprises. Entrepreneurs might consider how they should form a strategy on building these networks to access a more diverse array of skill sets, how to use them to build trust and strengthen network identity which can provide new bridging for their ventures. Lee (2009) suggests that creating an effective virtual system will lower coordination cost and the web may increase effectiveness of business communication. This study indicates that the web has in the cases being studied, greatly affected bridging opportunities which the international entrepreneurial firms are continuously exploring and observing how best to utilize. The role of the *catalyst entrepreneur* is particularly interesting in that respect as he shows the greatest opportunities for bridging and the web is a valuable vehicle for showing his network strength and opportunities to connect people. In these days of the web, a global business-to-business of software firms will include global web networks of relationships, whether these are intentional or not. Social network analysis with special emphasis on various new social networking tools of international entrepreneurs on the web represent an exciting field to explore.

Appendix 1.
Overview of the selected Icelandic international entrepreneurs and their current high tech software business

Firm/ entrepreneur	Year of active initial entrepreneur- ship	Education	Firm est.	Business activity	Entrepreneur interviewed
E1	2000	Business	2000	Mobile social matching software	Founder and Managing director
E2	1998	Engineering	1997	Information Security	Founder and Managing director
E3	2001	Comp. science	2004	Web solutions for the music industry	Founder and Managing director
E4	1998	Engineering	1998	Software solutions for	Founder and

E5	2000	Comp. science	2000	online gaming Ticketing software and ticket web service	Managing director Founder and director
E6	1998	Business	2004	Mobile web technology sites	Founder and Managing director
E7	1996	Comp. science	2008	Broadcasting technology	Founder and Chairman of the Board
E8	2002	Comp. science and MBA	2002	Flight Search Engine software	Founder and Managing director
E9	2000	Technical	2007	Data Mining	Founder and Managing director
E10	2005	Comp. science	2006	Web crawler technology	Founder and Managing director
E11	2002	Comp. science	1997	Online games	Managing director
E12	2004	Engineer	2004	Telecommunication software	Managing director

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