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The Strong versus Weak Tie Effect on Entrepreneurial Processes:
ICT-Start-ups in the Netherlands

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Abstract

The value of networks as an integral part of the explanation of entrepreneurial success is widely acknowledged. It is unclear, however, in what way certain networks influence the success of start-up companies. The question of this paper is: 'in what way does the entrepreneur's network contribute to the success of his start-up.' The focus is on improving our understanding of the causal mechanisms between the strong versus weak tie effect on three core entrepreneurial processes affecting performance, i.e. the ability of the entrepreneur to discover opportunities, to get resources, and to gain legitimacy. The network benefits are not uniform, we explore two contingencies, i.e. uncertainty and time. The networks of 30 ICT start-ups in the Netherlands were (re)constructed on the basis of in-depth interviews with the founders and desk research. We draw conclusions about the benefits of a particular mix of strong and weak ties to the ability of the start-up to survive and to grow.

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INTRODUCTION

Start-up firms are usually short of a complete set of skills and resources, they typically pursue small and highly uncertain opportunities, that are unproven and require little capital (Bhide, 2000). Instead of high-powered venture capitalists and customer-friendly banks, they have to rely upon asset parsimony and creativity in serving customers, often persuade friends and family to invest in them. Some of these entrepreneurial companies even lack a business plan from the start and only later, when some innovative ideas have popped up and investors have expressed their interest, business plan are written and grand ambitions are expressed. Besides the lone and creative starters struggling to survive and searching actively for business, there are other categories of nascent entrepreneurs which are kick-started in setting up shop, due to a supportive source (or mother) organisation or a specialised incubator. Both former employers and professional start-up facilitators assist the entrepreneur(s) in his (their) early stages by providing capital, coaching, rolling contracts, referrals to new customers, suppliers, hence reducing the firm's *liability of newness* (Stinchcombe, 1965). New corporations typically lack stable relationships and sufficient resources from the beginning, but spin-offs and incubates, applying a *don't go it alone* logic have privileged access to resources and all kind of strategic partnerships, due to their affiliation with their mother or incubator organisation (Baum et al., 2000).

The lone inventor-entrepreneur acting on his/her own behalf in the search for new combinations, spotting new market opportunities and striving for profit maximisation, tells only half of the story of (innovative) entrepreneurship. Granovetter (1995), for instance, has argued that economic activities are socially situated and cannot be explained by reference to individual motives alone; instead they depend critically on the robustness of the underlying social structure. Economic action usually takes place in complex social situations, where actors are related to each other in ongoing networks of (inter)personal and interorganisational relationships. Their face-to-face interactions and economic transactions are influenced by the larger social, political and cultural context; their pursuit of economic goals, for instance, is typically accompanied by that of such non-economic (i.e. socio-political) ones such as sociability, recognition and approval, status, and power. Like any other economic actor, also entrepreneurs are embedded in social networks which provide access to critical resources (e.g. information, capital, customers). Aldrich & Zimmer (1986) have defined entrepreneurship as the situational exchange of resources and opportunities, which are embedded in ongoing social relations. Those emergent economic linkages are channeled and facilitated or constrained and inhibited by the entrepreneur's position in larger social networks.

In explaining the success of a (new) company, it is therefore not only the qualities of the entrepreneur that play a large role, but also the social network(s) in which the entrepreneur(s) and his/their company is operating. A network is one of the most powerful assets that any individual can possess: it provides access to information, opportunities, power and to other networks (Uzzi, 1996; 1997). An alternative term for this whole set of active connections among people and organisations, which seems to be *en vogue* today, is 'social capital' (Davidsson & Honig, in press). More specifically, for Cohen & Prusak (2001: 4) social capital includes the trust, the mutual understanding, shared values and behaviour that not only bind the members of interpersonal networks and communities, but also facilitate cooperative action. The link between the entrepreneur and his contact network and success is not straightforward. On the one hand, a high level of social capital (i.e. dense social networks) will generate positive results, contributing to more intensive knowledge sharing, lowering transaction costs and turnover rates and promoting greater coherence of action. On the other hand, social capital is not the key to organizational success, or more precise, it can be even be neutral or even detrimental to a firm's success. Some organisations succeed, despite the negative effects of low social capital (e.g. universities, consultancies); others collapsed because of poor market decisions and strategic errors, despite being known for their collegiality and employee commitment. Or even more to the extreme, the ties that bind can also be the ties that blind (Cohen & Prusak 2001: 14): 'cohesive and tightly integrated communities can become a problem if that makes it clannish, insular, or even corrupt.'

The core question in this research project is the following: 'In what way does the entrepreneur's network contribute to the success of the starting company.' The network seems to be important when it comes to discover opportunities, to acquiring knowledge and resources and to gain legitimacy. In the literature, however, it is unclear in what way a certain network configuration influences the success of a start-up company in terms of structure (dense/thin) and the type of relations (strong/weak). There are, for example, conflicting results: 'both strong and weak ties are argued to be positively related to performance'(Rowley et al., 2000, p. 369) and in some cases strong ties are considered a disadvantage rather than a benefit (Gargiulo and Benassi, 1999). Efforts have been made to reconcile these opposing views. For example, Burt (2000) argues that they are not necessarily conflicting, but they play different roles, which are valuable for different populations or purposes. There are contingencies and the question arises what type of network under what circumstances will contribute positively to the success of a starter. Two contingencies will be reviewed on basis of our empirical material. First, the degree of uncertainty. Higher uncertainty about the business model of the start-up increases the benefits of structural holes (Podolny, 2001) and weak ties (Hansen, 1999). Weak ties and structural holes provide access to new information and high uncertainty about a business model requires extensive search for information to discover opportunities for new ways to combine resources in order to satisfy demand. Podolny refers to this of uncertainty as egocentric uncertainty, which is different form alter-centric uncertainty. The latter deals with the uncertainty of others, such as consumers and potential alliance partners, about the start-up. This type of uncertainty is closely related to legitimacy and a start-up lacking legitimacy will benefit from strong ties to an organization with reputation. The second contingency refers to time, in particular the different network requirements between emerging start-ups and firms in their early growth stage. Hite and Hesterly (2001) argue that in the emergence phase start-ups benefit most from strong ties. In that phase they need a 'friends favor' concerning access to resources. The advantages of weak ties and structural holes only become relevant later on in the early growth stage. In that stage start-ups have to explore ways to grow in new markets or products.

It is our aim to gain insight into what the causal mechanisms from network to start-up success look like. In short, 'how exactly is that possible positive network effect brought about', and 'what are the sources of that network effect' are two core questions we will address in this research. It is difficult to relate the network benefits directly to performance, therefore we distinguish three core entrepreneurial processes from the literature as discussed above, that are directly affected by the presence of weak or strong ties. These three processes may be seen as intervening processes that regulate the key performance indicators. The three entrepreneurial processes are: to discover opportunities, to secure resources and to gain legitimacy.

In order to answer the research questions, we constructed the networks of 30 ICT start-ups in the Netherlands. Through interviews with the founders of 30 ICT/Internet-companies and through desk research we have (re)constructed the evolving networks of all the start-ups in 'mini-cases' and have analysed them in terms of their contribution to the firm's (lack of) success. A distinction was made between three types of initial network conditions. (1) *lonesome cowboys:* this category of ICT-start-ups includes companies that appear as if from nowhere and emerge without substantial support from partners in the ICT community; (2) *spin-offs/spin-outs:* this second category consists of ICT-start-ups that in some way have been given support when they were founded from their former employer(s) (e.g. in training and coaching, housing, contract research, financing, etc.); and (3) *incubator-driven companies:* the third category is created, founded and built *within* a strategic network of (potential) partners and professional service providers, created as such by a specialised *incubator.*

On basis of this research design we are able to examine the two research questions and review the contingencies. Interviews are suited to investigate the various network benefits and get detailed insights how these benefits contribute to the core entrepreneurial processes. Concerning the contingencies we have chosen start-ups with wide variations in terms of egocentric uncertainty, partly reflected in variations in the degree of innovativeness, ranging from radical to incremental. In addition, distinguishing different type of initial network conditions allows us to examine how this initial situation affects networking behavior in the initial period of existence and get detailed information whether and how particular network benefits contribute to the entrepreneurial processes.

NETWORKS AND ENTREPRENEURIAL PROCESSES

Theoretical perspectives

In the existing literature on entrepreneurship the importance of having a solid network, in addition to the personal qualities of the entrepreneur, is emphasized as being one of the factors influencing the achievement of starters. In this research we emphasize the influence of the entrepreneur’s network on the achievements of the starting company. The network is important to obtain knowledge, complementary means and legitimacy. Until the mid-1990s, most network studies established a simple causal relation between the size of the network and the success of the starter (Aldrich & Zimmer, 1986; Larson & Starr, 1993). Recently, however, more and more qualifications are being brought forward that indicate that the relation is not that simple, nor does it necessarily have to be positive. Steier & Greenwood (2000), for instance, introduced the term ‘network overload’. At a certain size the network no longer has a positive impact on the success of the starter, and may even be negative. The positive effect of a number of relations is cancelled by the amount of extra time needed to maintain new relations. To limit the danger of 'network overload' an entrepreneur may benefit from an incubator, since the incubator provides him with access to a new network. Another study (Stuart et al., 1999) suggests that it is not so much the size of the network as its quality and reputation that have a positive influence on the success of start-ups. In addition, various studies introduce contingencies, for example with regard to the branch in which the starter is operating. Research conducted by Rowley e*t alia* (2000) shows that a network with strong and close relationships has a positive effect on the achievements of starters in a stable industry, but a negative impact on the success of starters in a dynamic market. Research on 'social capital' has yielded similar results. The analysis presented by Gargiulo & Benassis (1999), ominously called *The dark side of social capital*, shows that an existing network with close ties can inhibit the search for new opportunities and therefore have a negative impact on the success of a start-up in a dynamic market.

The structure of networks may vary from a loose collection of ties to close-knit business groups, in which the focal organization is embedded. In this explorative study, a choice has been made for the effect of a particular mix of strong and weak ties in entrepreneurial networks, because this mix allows for an analysis of support networks in terms of both the depth and width of relationships. Granovetter (1995) has specified the intensity and diversity of relationships, i.e. the difference between strong and weak ties, on the basis of four criteria: namely, the frequency of contacts, the emotional intensity of the relationship, the degree of intimacy and reciprocal commitments between the actors involved. While weak ties provide access to (new) industry information and to new business contacts, strong tries are relations one can rely upon both in good times and in bad times. Strong ties tend to bind similar people in longer-term and intense relationships. Affective ties with close friends and family members may provide a shortcut to or even preclude the search for useful knowledge and access to critical resources. In other words, strong ties contribute to 'economies of time' (Uzzi, 1997: 49): the ability to capitalize quickly on market opportunities. The manifestation of strong bonds will also reduce the time spent on monitoring and bargaining over agreements: free-riding will be discouraged and transaction costs lowered. Strong ties are more likely to be useful to individuals in situations characterized by high levels of uncertainty and insecurity, e.g. amidst radical innovations. In such complex settings, individuals rely on close friends and family members for protection, uncertainty reduction and mutual learning. Krackhardt (1992: 238) has elaborated on the affective component of strong ties by arguing that commitment, loyalty and friendship within an organization will be critical to an organization's ability to deal with major crises. In short, a relational governance structure based on strong ties will promote the development of trust, the transfer of fine-grained information and tacit knowledge, and joint problem-solving (Uzzi, 1996; 1997; Hansen, 1999; Rowley et al., 2000). In situations of high uncertainty researchers found not only benefits of strong ties, but also limitations. The limitations concern the ability to discover information on opportunities to improve the business model of the start-up. In the initial stages start-ups continuously search for improvements in the way they combine resources in order to satisfy demand in a profitable way. In these situations of high egocentric uncertainty (Podolny, 2001), weak ties appear to be more beneficial than strong ties with regard to searching for new information. Essentially high egocentric uncertainty has different network benefits of the core processes of discovery of opportunities and securing of resources. The former profits most from weak ties, while the latter core entrepreneurial process benefits most from strong ties.

Strong ties have other shortcomings as well. There is the risk of *overembeddedness*, i.e. of stifling economic performance (Uzzi, 1996). Close ties within and among business communities are vulnerable to exogenous shocks and may insulate such commitments from information that exists beyond their network.
There is the danger of being blind to new developments or being 'locked-in' (Johannisson, 2000). Weak ties refer to a diverse set of persons working in different contexts with whom one has some business connection and infrequent or irregular contact. These loose and non-affective contacts increase diversity and may provide access to various sources of new information and offer opportunities to meet new people. Weak ties represent local bridges to disparate segments of the social network that are otherwise unconnected and may open the door to new options (Granovetter, 1995; Burt, 1992). In short, both strong and weak ties are useful and contribute to the emergence and growth of firms, although they are beneficial in different ways and at different stages of a company’s development (Elfring & Hulsink, 2003). Therefore, the ideal entrepreneurial network includes a particular mix of strong and weak relationships (Uzzi 1996; 1997). We have distinguished three entrepreneurial processes, the ability to discover opportunities, the ability to secure resources, and the ability to gain legitimacy, in which network ties play a role.

In order to understand the causal mechanisms between start-up activity, the relevant network structure and performance, we will focus on the mix of weak and strong ties, each of them contributing in a particular way to the entrepreneurial process. Strong ties are associated with the exchange of fine-grained information and tacit knowledge, trust-based governance, and resource cooptation (Rowley et al., 2000). Their advantages are different from the benefits generated by weak ties. Weak ties are beneficial as they provide access to novel information as they offer linkages to divergent regimes of the network (Burt, 1992). As strong and weak ties each have qualities, that are advantageous for different purposes we focus on the mix. Thereby we build on the work of Uzzi (1996) and Rowley et al. (2000) who conclude that a key issue in the determination of network benefits is the search for the optimal mix of strong and weak ties.

On basis of a review of the literature, Hite and Hesterly (2001) propose that start-ups rely in the emerging phase primarily on their strong ties. And only later in the early growth stage they expand their network to include weak ties as well. The argument for the dependence on strong ties has to do with the high level of altercentric uncertainty of the new venture (Podolny, 2001). Strong ties are willing to provide the resources despite the uncertainty, while weak ties tend not to take the risk associated with the uncertain future of the start-up. Furthermore, in the early growth phase, it is necessary to develop a more diverse network in which weak ties may appear to be crucial to discover structural holes (Burt, 1992). These structural holes are important to get access to new resource providers in order to fuel further growth. Thus they propose that network benefits develop from exploitation of strong ties to the exploration of weak ties.

Three entrepreneurial processes

In short, both strong and weak ties are useful and contribute to the emergence and growth of firms, although they are beneficial in different ways and at different stages of a company's development. Therefore, the ideal entrepreneurial network includes a particular mix of strong and weak relationships (Uzzi 1996). We have distinguished three entrepreneurial processes in which network ties play a role. (1) The ability to discover opportunities: an important source of new ideas and lucrative opportunities may be the networks, in which the entrepreneur is more or less actively participating. Hills, Lumpkin and Singh (1997) found that about 50 percent of entrepreneurs identified ideas for new ventures through their social network. In addition, in the process from idea to the actual start of a venture, prior knowledge (Shane, 2000) and information (Fiet, 1996) are important. Both variables are closely linked to networks, as network relations can be seen as ways to gain access to knowledge and information. (2) The ability to secure resources: providing access to resources is an important contribution of networks to the venturing process. Entrepreneurs rarely possess all the resources required to seize an opportunity. One of the crucial tasks in a new venture is to access, mobilize and deploy resources. This is a difficult task in the initial stages of a start-up with limited financial resources and hardly any ability to generate internal resources and revenues. Close social support networks (e.g. spouse, family ties) may provide the founder/owner with the resources (e.g. financial and human capital) he or she is lacking, and hence provide stability to the new firm in its early stages. Additionally, sparse networks facilitate the search for critical asset providers (e.g. investment and technology partners and key customers), who may offer the start-up further access to new resources. And (3) the ability to gain legitimacy: a network of a start-up may be helpful as it opens possibilities to gain legitimacy. Gaining legitimacy is imperative in starting something that is considered innovative (DiMaggio, 1992). Start-ups are confronted with the *liability of newness*, or simply stated, young organizations face higher risks of failure than old ones. Network ties may result in getting associated with respected players in the field.

Opportunities

An important source of new ideas and lucrative opportunities may be the networks, in which the entrepreneur is more or less actively participating. Hills, Lumpkin and Singh (1997) found that about 50 percent of entrepreneurs identified ideas for new ventures through their social network. In addition, in the process from idea to the actual start of a venture, prior knowledge (Shane, 2000) and information (Fiet, 1996) are important. According to Fiet (1996: 429): ‘use of network may be viewed as a way of tapping into an information channel to obtain risk-reducing signals about a venture opportunity.’ Both variables are closely linked to networks, as network relations can be seen as ways to gain access to knowledge and information. In one of the first studies on this aspect, Birley (1985) carefully documented how often entrepreneurs seek advice and feedback on the core ideas of their business plan, when they turn to friends and family for local issues, and when they use formal ties to look for financial support. The start-up was seen as an iterative process in which the number of informal and formal ties affected the success of the entrepreneur in finding a lucrative opportunity. The environment and the opportunities it contains are diverse and uncertain. The network of an entrepreneur is a source of information helping the entrepreneur to locate and evaluate opportunities.

Networks and in particular weak ties provide access regarding a diverse set of topics, ranging from potential markets for goods and services to innovations and promising new business practices. Weak ties are supposed to lead to a more varied set of information and resources than strong ties can (Bloodgood et al., 1995), and consequently weak ties enhance the ability of entrepreneurs to spot opportunities.

Resources

Providing access to resources is an important contribution of networks to the venturing process. Entrepreneurs rarely possess all the resources required to seize an opportunity. One of the crucial tasks in a new venture is to access, mobilize and deploy resources (Garnsey, 1998). This is a difficult task in the initial stages of a start-up with limited financial resources and hardly any ability to generate internal resources and revenues. Close social support networks (e.g. spouse, family ties) may provide the founder/owner with the resources (e.g. financial and human capital) he or she is lacking, and hence provide stability to the new firm in its early stages (Brüderl & Preisendörfer 1998). Additionally, sparse networks facilitate the search for critical asset providers (e.g. investment and technology partners and key customers), who may offer the start-up further access to financial resources, production know-how and complementary technology, distribution channels, etc. Furthermore, there is initial uncertainty about the growth of the venture and the resources it requires (Chrisman, Bauerschmidt & Hofer, 1998). In the case of staged investing by venture capitalists in technology start-ups, the amount of uncertainty about a venture declines as it survives and grows. One of the key survival strategies is 'asset parsimony' (Hambrick & MacMillan, 1984). The required resources need to be secured at minimum cost. Paying the market price for resources, such as labor, materials, advice and commitment is often too expensive. Social transactions through network ties play a critical role in the acquisition of venture resources. These resources can be acquired far below the market price, the entrepreneurs (as well as intrapreneurs) employ social assets such as friendship, trust, and obligation (Starr & MacMillan, 1990). In particular, network members representing strong ties are more motivated to help the entrepreneur than those with whom the entrepreneur has weak ties. Potential entrepreneurs assess their ability to get hold of the required resources at relatively low cost on the basis of their strong ties.

Legitimacy

The third contribution of a network to the success of a start-up is the way it opens possibilities to gain legitimacy. Gaining legitimacy is imperative in starting something that is considered innovative (DiMaggio, 1992). Stinchcombe (1965: 148-150) has introduced the concept of the *liability of newness*, or simply stated, young organizations face higher risks of failure than old ones. Established organizations have a set of institutionalized roles and tasks, stable customer ties, experienced constituents, a surplus of capital and creativity (slack), and a shared normative framework at their disposal, all of which contribute to an effective provision of goods and services and their ultimate survival. New firms and novel organizational forms, on the other hand, are more likely to fail just because they still have to develop and acquire those prerequisites (Baum, et al., 2000). Faced with the aforementioned 'liability of newness', a new venture has to organize institutional support and legitimacy. This appears to apply especially to (relatively) radical innovations, where young technology companies need the endorsement of (some of) the prominent players in their industry (Stuart et al., 1999). In order to enhance their visibility and gain recognition, new ventures seek to obtain a prestigious business affiliate to build up a strong link with and eventually hope that, through this key contact, they will have access to new customers and partners. Furthermore, biotechnology companies in particular establish large supervisory boards with well-know industry experts and academics (Elfring & Hulsink, 2003).

Suchman (1995: 574) has defined legitimacy in a broad sense as 'a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions.' Aldrich and Fiol (1994) draw a distinction between cognitive and socio-political legitimacy. Understanding the nature of the new venture is referred to as cognitive legitimacy. It has to do with the spread of knowledge regarding the new business concept. To overcome this legitimacy barrier, network actors, such as competitors, distributors and universities, must be mobilized to create partnerships in order to achieve a wider understanding of the new concepts. The second, and related, type of legitimacy is labeled socio-political legitimacy and refers to the extent to which key stakeholders accept the new venture as appropriate and conforming to accepted rules and standards. Achieving socio-political legitimacy is particularly difficult when the new venture is very innovative and challenges existing industry boundaries. In those cases changes in the institutional framework are often required. Organizing socio-political legitimacy requires collective action, negotiations with other industrial constituents and joint marketing and lobbying efforts.

RESEARCH DESIGN

The research project contributes to the phenomenon of the ‘networking entrepreneurs’ in our Internet- and ICT-based society and to the institutionalisation of ‘networking’ in our network economy. There are a number of processes that indicate that ‘networking’, defined as the exchange of information and contacts and the wheeling and dealing between entrepreneurs, business partners and service providers, is not only on the rise in terms of its popularity, but also in terms of quality. Statements such as ‘without a good support network innovative entrepreneurs are nowhere’ are an indication of the social and economic value attached to existing and new contacts and partners within a strategic network. In addition to the well-established technology transfer offices, large companies, universities and research establishments, and intermediary investors and service providers have set up so-called ‘incubators’ to nurture new ideas, entrepreneurs and/or dynamic firms or to speed up product and service innovation and entrepreneurial growth in a controlled environment. where resources, services and contacts are easily accessible (Smilor & Gill, 1986; Richards, 2002). However, within the community of high-technology and ICT-starters there are also new rituals and innovative institutions, aimed at bringing together new ideas and entrepreneurial professionals that not yet know one another. In addition to the afore-mentioned ‘incubators’, there are also ‘virtual incubators’, such as Garage.com and Factory Zoo, that are trying to exchange contacts and business plans and establish global companies over the Internet. Also, the regular partner evenings and *ICT-parties* (First Tuesday etc.) and the rise of special media focused on information exchange and networking (e.g. bulletin boards/websites exclusively for starters, new magazines created by and for ICT-starters such as Red Herring and Tornado Insider) can be seen as illustrations of ‘entrepreneurial networking’. A very significant question in this context is, however, whether these networking activities, facilitated in part by ICT and communicated through Internet, do contribute to the success of that new company.

This study is about nascent and actual entrepreneurship in the Dutch Information and Communication Technology (ICT) sector and especially the role that is played by the networks in which starters do or do not participate with regards to the innovativeness and success of these ICT-companies. The population of experts and professionals that are working at large companies or research institutes, recent university or polytechnic graduates, and other specialists in a particular domain (e.g ICT) produces nascent entrepreneurs (Van Gelderen et al. 2000). Nascent entrepreneurs are people that are seriously considering starting an ICT-company, whether on their own or with others. In the process of founding and building a company the social and strategic network in which the starter operates or wants to operate (with the partners and means that the company presently lacks) can play a determining role in the growth and eventual success of the company. This research is concerned with the ones that actually did so, in other words young, small and innovative ICT-companies. These we define as companies with a minimum of 2 employees that offer ICT-products or services and were founded between 1990 and 2000. Our research focuses on the entrepreneur and his/her network of various contacts and links. Furthermore, our sample of young and dynamic ICT-companies includes a 'mere' 30 start-ups and their linkages with relevant investors, business-partners, customers, other entrepreneurs etc. It is, of course, also possible that the company does not value growth and expansion that much, being relatively content with the market niche within which it is operating.

An application of the theory and practice of the 'networking entrepreneur' was found in the Dutch ICT industry. We constructed the networks of 30 ICT start-ups which were set up between 1990 and 2000. We interviewed the founders of 30 ICT/Internet-companies and through desk research we have sought to determine to what extent the presence or absence of such support networks have contributed in a positive way to the success of the start-up (e.g. survival, growth and/or profit). In that way we reconstruct the networks of all start-ups in 'mini-cases' and analyse them on the basis of development phases (conceptualisation, foundation, growth, etc.). We have divided the 30 companies into 3 groups of about 10 companies each, based on the extent to which these starting companies utilise a strategic network to start and build their ICT-company:

(i) the first category of ICT-start-ups, called the *lonesome cowboys*, includes companies that appear as if from nowhere and develop further without substantial support from a strategic network. These are ICT-starters that are being founded within a constellation similar to traditional companies: the entrepreneur or entrepreneurial team initially sets out without network partners and at a later development stage may look for additional knowledge, employees, funds and customer input (next to the conventional commercial and labour relations the company maintains with its customers and employees). Examples of *lonesome cowboys* are Annie Connect (call centre), Euronet (internet service provider), and Ring Rosa! (computer-telephony integrator).

(ii) the second category of *spin-offs* and *spin-outs* consists of ICT-start-ups that in some way have been given support when they were founded from their former employer(s) (e.g. in training and coaching, housing, contract research, financing, etc.) Whereas in the case of a spin-off company there is no longer a direct financial relation with the company the entrepreneur has worked for, in the case of a spin-out there does exist a relation with the mother company, for instance in the form of a strategic participation in and/or collaboration with the nascent company. An example of a company that keeps sending new companies into the world is the national research laboratory CWI (Centre for Mathematics and Information Science), which since the early 1990s has created around 10 spin-offs, an example is Oratrix. Universities and large companies, consciously or unconsciously, can also serve as incubator for innovative ideas and potential entrepreneurs and generate spin-offs and/or spin-outs; examples are HuQ Speech Technologies (Universityof Groningen) and Carp Technologies (University of Twente). Also established companies can churn out teams of employees that start for themselves seeking to commercialise the technologies they were working on previously. Examples of corporate spin-offs in our sample are Wellance (spin-off from KPN/Planet Internet) and Profuse (spin-off from Baan Company).

(iii) the third category, that of *incubator-driven ICT-companies,* is created, founded and built *within* a strategic network of (potential) partners and professional service providers, created as such by a specialised *incubator* (e.g. Twinning). Thanks to this closely integrated and varied network or with the help of a strategic partner creating a virtual network, the start-up can develop further. Examples of incubators in the Netherlands are Twinning, Silicon Polder Fund, Gorilla Park and Newconomy. These incubators provide the ICT-start-up (in exchange for a share in the new company) with easier access to a number of important services, such as financing, housing and equipment/infrastructure, counselling & coaching, and information exchange & networking (contacts and referrals to clients, partners, suppliers, research institutions, etc.). Examples of such incubator-driven ICT-starters are Hot Orange, Trylian, and Gopher publishers.

Each of the 3 groups will include at least 2 companies that were unsuccessful and that have faced bankruptcy. Although it is relatively hard to obtain the cooperation of entrepreneurs who did not succeed, their findings are of great importance to our research. On the basis of the variations in the structure of the network and the type of relations they rely upon and/or they develop over time, we intend to develop propositions concerning the contribution of a particular network configuration to the three entrepreneurial processes, i.e. the ability of the start-up to discover opportunities, to get resources and to gain legitimacy. Thus, our empirical material can be summarized in a three by three matrix, three types of start-ups and three entrepreneurial processes.

The research was explorative in nature and is aimed at generating hypotheses with regard to the influence of networks on the success of ICT-starters. Thirty entrepreneurs were non-randomly selected from the databases of the Business Information Centre (BIC) at Erasmus University Rotterdam, EIM, and Dutch trade magazines (Automatiserings Gids, Computable, Emerce). In total, 31 founder-entrepreneurs were interviewed (29 individually and one joint interview with the two original founders). 12 lonesome cowboys were selected for the study, 10 spin-offs and 10 incubatees (see table 1 below). The interviews were semi-structured and lasted on average between 1 and 1½ hour. The in-depth interviews were taped and transcripts were made of them. On the basis of these transcripts and publicly available company profiles (obtained through desk research), 32 'mini-cases' of the entrepreneur and their firms were made. In the final phase the mini-cases will be analysed and the findings will be discussed.

Table 1: Overview of ICT companies participating in the study

Lonesome cowboys	**Spin-offs**	**Incubatees**
Annie Connect	Bitmagic	Bibit
Co-makers	Carp Technologies	CareerFever
Euronet	HuQ Speech Technologies	FactoryZoo
Keekaboo	InterXion	Gopher
Metrixlab	Profuse	Hot Orange
Nedstat	Proloq	Information Innovation
Planet Internet	Tornado Insider	Oratrix
Rits Telecom	Tridion	Punt Edu
Ring	Wellance	Siennax
The Vision Web	Xpertbuyer	Tryllian
Vocognition		
XOIP		

RESULTS

Lonesome cowboys

Lonesome cowboys start without a particular network within the ICT industry. They are relative outsiders and they benefit from some of their strong ties linked to their background.

These strong ties are in some cases family and friendship ties, but they also profit from relationships in their previous work environments. However, these strong ties appear to be relatively unimportant. The dominant networking activity is the exploration of weak ties. Most of the founders in this category of start-ups discover opportunities through their weak ties. Experienced (e.g. Nedstat) and unexperienced (e.g. Metrixlab) founders invested substantial time in meeting new people, going to conferences and participating in novel networking type of activities. Although some spin-off starters disqualified those network events (‘those meetings are for persons without a good network’), lone starter Metrixlab, for instance, benefited from the First Tuesday meetings and valued them in their search for valuable contacts.

In most cases the business model of the start-up changed during the period of emergence. These changes were often inspired by discussion with acquaintances, such as people they recently met or persons they were referred to by relatively ‘distant’ friends. The networking could be characterized by the frantic search for people who could give information on new opportunities and the feasibility of the already spotted opportunities. The uncertainty about the tasks and strategy of these start-ups is extremely high and they were continuously looking persons who could provide information about the feasibility of their business model. The rate of new weak ties added to their network appears to be high, but at the same time these ties are dropped as soon as they realize that these persons are not able to give new insights. The rate of bridge decay (Burt, 2001) is very high. At the same time some of these weak ties developed into strong ties during the start-up phase. The role of strong ties, although limited in number, was to give ‘trusted’ feedback on the various stages of the business plan (often close friends and family relationships). These strong ties were often outsiders to the ICT community, while the weak ties consisted mostly of insiders. These weak ties appear to be used to get access to the strategic network of ICT and related firms in the Netherlands.

Some of the weak ties during the opportunity discovery process developed into trusted ties, of which some appear to play an important role in the process of securing resources. For example, at Metrixlab a tie from a First Tuesday meeting became board member and connected them capital and technology resources. Similarly, founder of Co-makers developed some strong ties in their GEM class, which connected him valuable knowledge sources. However, despite the role of these ‘new’ strong ties, the older strong ties, people they know well from their previous activities, appear to be of more importance to get hold of the required resources. Previous work experience and ties developed at university have been very important to get access to capital and human resources. On the basis of this limited number of cases we find a mix of strong and weak ties contributing to the resource acquisition process. Although the strong ties are in most cases dominant. Some weak ties developed into strong ties and simultaneously some weak ties were dropped because they did not provide sufficient value in the struggle for resources. This selection among weak ties is a process which appears to be less intense in the resource acquisition process than in the opportunity discovery process. Thus, the wild exploration of network ties in the search for opportunities evolves into a combination of exploration and exploitation of the network in the process of getting resources.

Concerning the third entrepreneurial process of gaining legitimacy, the network benefits could be characterized by a mix of strong and weak ties. Although weak ties tend to be dominant, some also used their strong ties purposefully to get connected to reputable parties. Although some of these strong ties were part of their original weak tie connections and have developed into strong ties by the time legitimacy was crucial. So only very few 'old' strong ties were involved in legitimacy building. It was interesting to see that almost all of these entrepreneurs were aware of the importance of legitimacy. However, only about half of them were actively searching for persons or organizations to be associated with in order to gain legitimacy. These founders were also very keen on their public relations and were personally involved in the management of external communications, which was also used to signal their ties to partners with reputation in the field. For the start-ups without this active management of expectations, association with a well-known player in the field was always recognized ex post as being important for the growth and survival of their start-up. In these cases this legitimacy effect may be seen as a side-effect of their search for resources and first major clients. Most of their emphasis was on finding a respectable 'launching' customer, but connections to leading venture capitalists or major ICT companies, such as KPN or IBM were valued as well for their impact on legitimacy.

Spin-off entrepreneurs

The spin-off entrepreneurs in our sample were kickstarted and headed off for a fast early growth due to the in-depth industry knowledge of the founding entrepreneurs with many years of experience and the resources provided by their former employer, varying between capital, tangible and intangible assets (easy access to patents and facilities), rolling contracts, and reputational benefits as a consequence of the association with the mother organisation. However, the status of being industry insiders and the almost direct participation in an already established strategic network (e.g. the Baan network with Proloq and Profuse) or an international research community (e.g, in the case of the academic spin-offs Carp and HuQ) piggybacking on the contacts and resources of the mother organisation, proved to be in a number of cases we investigated a blessing in disguise: while the spin-off firm had a number of ongoing commitments (contracts, patents/licenses) and strong ties (with a clear industry affiliation), it was relatively weak to develop new weak ties, and as a consequence, unable to break out from the complacent networks, it already has established. Just by this trained incapacity to pursue weak ties aggressively and cultivate a diverse network, spin-offs lack the drive of the lone starters to take major risks (e.g. experiment with new technologies) and to spot unseen opportunities (work with new customers and partners) and they may lose some of their initial advantages at a latter stage. This could be seen as a lock-in effect, or a path-dependent development.

Concerning the discovery of opportunities, clearly fall back on their source organization and their previous skills and colleagues for their pet ideas and projects they want to pursue. For some spin-off entrepreneurs, their venture is a hobby, a research experiment or a joint endeavour, driven by their interest, curiosity or simply, to work with their peers and colleagues (e.g. Planet Internet, HuQ, Carp). For others, their venture is a market niche or a technical application yet unserved by their mother organization (e.g. Profuse, Proloq, Tridion); there is also a category of start-ups attempting to exploit a newly emerging market (with some support), such as Tornado Insider, InterXion and Wellance.

After the initial stages of discovering opportunities, the subsequent stages of establishing surviving and seeking growth, the spin-off entrepreneurs fall back on self-financing and self-activation, next to (some) support from their mother organization. While most spin-offs remain close with their parent (as a kind of subcontractor or specialized supplier), hereby expressing a modest attitude towards growth (and as such do not have a major demand for additional resources and assets), the more ambitious spin-offs with venture capital involvement go for more (e.g. Tornado Insider, InterXion, Wellance and Tridion). Through a substantial investment and professional commitment, new skills are required, such as a more experienced CEO, professionalisation of the advisory board, and more money, and higherpowered customers and new regional markets are sought. While the former category still enjoys the coziness of a happy family life with the parent, the latter category of firms break away from their source organisaton and seek to diversify their networks with new and more heterogeneous contacts.

In the final stage of establishing themselves in the market place, spin-off start-ups fall back on a number of tactics, such as a stepping-stone approach qualifying for one round of financing or subsidy scheme, or participating in business plan competitions and actively seeking publicity or joining all kind of professional and/or regional associations and affiliating themselves with VIPs. The dominant logic of these spin-offs seems to vary between simply functionalist reasoning stressing survival and cautiously preserving the partnership with the mother organization (e.g, the two university and the two Baan spin-offs), or focusing on operational achievements, such as quality, project execution and certification, or straightforwardly stressing their corporate successes (several rounds of financing, established strategic partners, large international customers, big events etc.).

Table 2 Summary of results

	Discovery of opportunities	Securing resources	Gaining legitimacy
Lonesome cowboys	- Weak ties dominant, i.e. through previous jobs, conferences, first teusday meeting. - Limited number of strong ties	- Mix with emphasis on strong ties. - Strong ties such as friends dominant. - Regularly these strong ties have grown from weak ties in the opportunity discovery phase.	- limited number of strong ties. - in half of the cases active to get launching customers (with reputation) through weak ties. - also the side-effect of marketing or alliancebuilding activities.
Spin-offs	- Strong ties dominant, usually friends or former colleagues. - Ambitious firms use weak ties later on to search for information on opportunities.	- Mix of strong and weak ties, in which the ambitious and growth oriented start-ups use weak ties to find not only opportunities but also financial resources and human resources.	- Some fall back on their strong ties with the parent. - Growth oriented start-ups use weak ties with for example clients.
incubators	- Family and friends as strong ties more important than incubator. Only intow cases, Oratrix with CWI and Hot Orange with Gorilla Park incubator plays key role as strong tie. - Usually first mix of weak and strong ties to discover opportunity and then go to incubator.	- Remarcable that weak ties are dominant, also when when contacts through incubator. - In some cases (Factory Zoo, Bibit, Career Fever, Punt Edu, Tryllian) through strong ties (friends) and not through incubator.	- Very limited role for incubator, who has limited legitimity itself (Oratrix with CWI is the exception). - Mix of strong and weak.

Incubatee entrepreneurs

The category of incubatees and their networking behaviour is more difficult to put into perspective. First of all, the incubator organisations with whom our incubatees were affiliated with, were all young and inexperienced (e.g. Twinning was established in 1998; Gorilla Park, Small Business Link and Newconomy in 1999), and busy with establishing themselves. The category of incubatees is the least homogeneous of the groups of networking entrepreneurs we distinguish, diverging in terms of opportunity recognition, mobilising resources and gaining legitimacy. While some have a clearly worked out business idea right from the start (e.g. Bibit, Information Innovation, Punt Edu, Tryllian), others develop in close collaboration with their incubators more than one option or actively experiment with new organizational forms (Career Fever, Siennax and Hot Orange). There is also a difference between start-up entrepreneurs which desperately needed the resources and referrals offered by the incubators (such as the case for foreign entrepreneurs in the Netherlands or student entrepreneurs) and incubatees who considered the assets and support network as something extra which was welcome but not desperately needed (e.g. Punt Edu, Bibit, Factory Zoo, Oratrix). One could say the same for the involvement of the incubates in gaining legitimacy:

In a number of cases the incubator and the incubatee evolved together, helping each other wherever and when ever possible (Gorilla Park and Hot Orange); in a number of other cases, where resources, services and facilities were offered to the surprise of future 'incubatees' (e.g. Tryllian, Information Innovation) and opportunistically accepted (Oratrix), one could rightly question the added value of the incubator. Instead of offering their incubatees a Rolodex of business contacts instantly, the incubators had to roll out their network of services first, finding business partners and searching for capital and political legitimation, before they could actually help their start-ups. Already during the built-up of their infrastructure, they ambitiously and randomly started to select a large number of start-ups as incubatees, and promised them services, resources and contacts they could not yet fully materialise and deliver. Like their incubatees, the incubators themselves also lacked a track record and all kind of standard procedures. The supply of services, resources, facilities and contacts not only varied between incubators, but also within the portfolio of investments of one incubator: for instance, one Twinning company only marginally benefited from an early investment, and another firm agreed on office space, a whole set of specialised services, and two major co-investments.

Some of the incubatees with proven entrepreneurial skills and an extensive industry network were not desperately in need of support by the incubator to seize business opportunities. Others, that were clearly less experienced, could find a shelter and some seed money from the incubator to promote their ideas and consider some market opportunities; in this case the incubator could not really help, since there were not any clear ties (neither weak neither strong) with established companies that could act as a partner or customer for the start-up. In the case of securing resources, most of the incubatees benefited from the services and facilities offered by and through the incubator, and eventually from the new weak ties they now had access to (although they disagreed whether the new contrats with law firms, consultancies, accountancies and investors were worth the money). The relatively unknown incubatees also could benefit from the reputation and the brand name of their well-known incubator, giving them quicker access to banks, investors and other service providers. When the incubators ended up in stormy weather in 2001-2002, the legitimacy benefits offered by incubators evaporated and some incubatees went bust or had to distance themselves from the struggling incubator.

DISCUSSION AND CONCLUDING REMARKS

Comparing the contribution of the mix of strong and weak ties for the lonesome cowboys and the other two types of ICT start-ups is revealing for our understanding of the egocentric uncertainty contingency. Egocentric uncertainty is relatively high for lonesome cowboys. They do not build on previous experiences in the parent company as is the case for spin-offs and they cannot profit from the incubators' experiences about their business model. Thus, access to new information about other ways to build the business model is crucial. In the cases, we observed a frantic search for opportunities given by weak ties. As soon as the opportunity appeared to be less promising than originally thought, the weak tie was dropped and new leads were explored. The dominance of weak ties can be explained by the high level of egocentric uncertainty. The benefits of weak ties are much higher in this uncertain context than they would be in a situation of a stable and agreed on business model. In the latter case the emphasis would be on implementation and not so much on search for alternative opportunities. Spin-offs staying close to the parent benefit from their experience and are more focused on transferring and combining resources to build their start-up. The benefits of strong ties are much higher in such a context of limited uncertainty than the weak tie advantages. Only in the cases that spin-offs want to break away from their parent the level of egocentric uncertainty grows and the benefits of weak ties increase as well.

Concerning the contingency of time the results of the use and development of network ties of the lonesome cowboys category is significantly different from the network benefits to entrepreneurs as suggested by Hite and Hesterly (2001). In our sample of start-ups weak ties appeared to be very important in the emergence. There may be two reasons for this different finding. First, in our cases the emergence phase is dominated by the search for the most lucrative opportunity and not primarily focused on securing resources, while the focus of Hite and Hesterly seems to be on the resource acquisition process. Secondly, our cases of high-tech start-ups differ in the sense that they indeed take much more time to search for the best business concept (see also Roberts, 1991) and thus there is more focus on opportunity discovery and that process benefits more from weak ties than strong ties. In that process ties are also less committed to the start-up and therefore the uncertainty and the associated risk is not that important as in the situation of being a resource provider.

The argument of Hite and Hesterly (2001) for the growing importance of weak ties as the venture evolves from emergence to early growth is the need to find structural holes. Structural holes and the role of weak ties are related to the discovery of new information about new growth areas. This information and thus weak ties may be of importance to spot new opportunities. Of course this search process will benefit from weak ties, however, we observe that the weak tie benefit is much larger in the emergence phase and the related high level of uncertainty about the development of a business model that works. The difference may be the result of the degree of uncertainty at the emergence phase. Our cases of high-tech start-ups may be different from the average start-up.

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