# Networks effects on Entrepreneurial Processes: Start-ups in the Dutch ICT Industry 1990-2000

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# *Networks effects on Entrepreneurial Processes:*
## *Start-ups in the Dutch ICT Industry 1990-2000*

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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 network is important because it may contribute to three entrepreneurial processes, i.e. the ability of the entrepreneur to discover opportunities, to get resources, and to gain legitimacy. 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. A distinction was made between three types of initial network conditions. First, the more or less independent start-ups; secondly, spin-offs from established companies and lastly, start-ups in incubators. On the basis of the variations in the structure of the network and the type of relations we draw conclusions concerning the contribution of a particular network configuration to the ability of the start-up to survive and to grow.

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## INTRODUCTION

The formation and early growth of new firms is less spectacular, visionary and heroic than often thought. The field of entrepreneurship is beset with several myths (Bhidé, 2000; NCOE, 2001), such as the delusions of risk-taking (entrepreneurs take wild risks in starting their companies), high-technology innovation (start-ups begin with breakthrough inventions), and the entrepreneur as an expert (with a strong track records and years of experience in his/her industry). Furthermore, one could also add the myth of the grand strategy (successful entrepreneurs have a well-considered business plan and have clearly developed their visionary ideas before taking action) and the venture capital myth (most companies are backed by venture capitalists providing them with millions to develop their ideas and build a business.

While often the case with myths offering an inspiring account of events and stories and how and why they have happened (or will take place), they are not true and can easily be debunked (Bhidé, 2001). Most successful entrepreneurs start as relative amateurs with little background experience and only later, with some of the entrepreneurial and managerial lessons learned, they team up with (more) experienced executives. Also, initially, they are far from successful, often beginning with some product or service that put them on a path to something else which eventually will bring them success. Instead of having this grand vision and pursuing those radical innovations, these successful entrepreneurs all have a Master's degree in the Bloody Obvious: they slightly modify someone else's (often ordinary) ideas, execute it very well and take only calculated steps towards improving the product or the service in the next stage of their early growth. Last but not least, only a very small minority of all new firms is backed by venture capital (approximately one percent of them).

In short, start-up firms, short of a complete set of skills and resources, typically pursue small and highly uncertain opportunities, that are highly new and unproven and require little capital. 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. These 'bootstrapped entrepreneurs' with modest funds basically help incubate new disruptive technologies that at first cannot compete in niche markets and produce revenue streams too small to attract the interest of bigger companies. Some of these entrepreneurial growth 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 less spectacular 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).

So 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 acquiring knowledge, complementary means and 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). The network contribution to a starter’s success can, however, be negative as well (e.g. network overload). There are contingencies and the question arises what type of network under what circumstances will contribute positively to the success of a starter. In addition, it is important to gain an insight into what the causal chain from network to start-up success looks 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. In order to answer this question, 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 the basis of the variations in the structure of the network and the type of relations we intend to develop propositions concerning the contribution of a particular network configuration to the ability of the start-up to survive and to grow. This study is intended to clarify the contingencies of the network contribution to the success of the start-up entrepreneur.

## 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; Rowley et al., 2000).

Strong ties have shortcomings too. 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, in press). 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.

## 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, in press).

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.

## Networks and corporate evolution

In order to understand the causal mechanisms between the 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 (Krackhardt, 1992; 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 (Granovetter, 1995; 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; 1997), Hite & Hesterly (2001) and Rowley et alia (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. A number of researchers have utilized a contingency approach to reconcile the different network benefits. For example, the industry context has been introduced as a contingency factor by Rowley et alia (2000) and Hite & Hesterly (2001), show that as ventures progress from emergence to growth the evolving resource needs require a shift in network structure.

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 uncertainty of the new venture. 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, while we find evidence that it is exactly the reverse; from exploration of weak ties in the search for opportunities to exploitation of emerging strong ties.

## 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 (see also table 2). 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.

*Table 2: Mix of weak and strong ties of lonesome cowboys to discover opportunities*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Annie Connect | Diverse contacts through previous job in media sector | In medical insurance related to WAO | Weak ties dominant and substantial change in business plan |
| Co-makers | Diverse contacts through previous jobs and via internet | Two family ties | Weak ties dominant and one turned into strong one |
| Euronet | Diverse contacts through education and old jobs and crucial accidental tie | One family member and old friend | Weak ties dominant and accidental meeting turned into strong tie |
| Keekaboo | Contacts through friend and accidental encounter | Co-founder introduced by friend | Co-founder has quitted soon |
| Metrixlab | Many trial-and-error contacts, i.e. through first Tuesday meetings and friends of friends | Trusted feedback by niece | Frantic search for ideas and feedback of this student start-up, person met at first Tuesday meeting turned into strong tie |
| Nedstat | Contacts through internet, searching for complementary information | - | Change of business plan and name |
| Planet Internet | Different people at university, professors and guestspeakers in class | - | Relatively early on heavily influenced by KPN as financier |
| Ring | Professor AI important for research | IT friend at Nortel and friend in Basel | Strong ties appear to be dominant of this serial entrepreneur in related field |
| Rits Telecom | Contacts through study project at Telecom Association and work on business plan writer at investment company | - | Early on weak tie turned into strong one |
| Vocognition | Outsiders who contacted them and appeared to be important for idea building | - | Substantial change in business plan |
| Xoip | Contacts at conferences | - | Frantic search for ideas and feedback, they wrote 20 business plans |

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.

*Table 3: Mix of weak and strong ties of lonesome cowboys to secure resources*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Annie Connect | Search for technology | Accountant linked to vc. Member of board. First client from old media network | Mix with emphasis on strong |
| Co-makers | Project student through professor at TUE | Family for money and students from GEM class for employees and expert team | Mix with emphasis on strong. |
| Euronet | Bankmanager approved second round of capital | First round of capital by landlord | Mix |
| Keekaboo | Connection to person who had access to cheap programmers in Budapest | For venture capital two 'dispuutsgenoten' played role | Mix with emphasis on strong |
| Metrixlab | Advisor to make business plan. Trial-and-error to get vc. | Employees through ties at university. Role of board member | Mix with emphasis on weak |
| Nedstat | First client and Informal investor. Time for associations and network meetings | Family and friends for first employees. Informal investor links to technology and vc's. | |
| Planet Internet | Some employees through consultancies | Capital, technology and some employees at kpn | |
| Ring | Technology through people met at conferences. Employees. | Venture capital through previous colleagues | Mix with emphasis on weak |
| Rits Telecom | Diverse contacts for search for more capital. | Hennie (investment group) for technology and employees. Student friends for employees | Mix with emphasis on strong, not much uncertainty on direction and needs |
| Vocognition | Links to voice technology | Friends from Nijenrode important for capital and suppliers. Board member. | Mix with emphasis on strong |
| Xoip | Supplier met at dedicated conference | Venture capital and first ten employees through friends | Strong ties appear to be dominant, stressed importance of building relations over time |

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 (see table 4). 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.

*Table 4: Mix of weak and strong ties of lonesome cowboys to gain legitimacy*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Annie Connect | Paid journalists to get access to policy makers, with whom to be associated | Connections to insurance people used to be associated with well-known politicians | Actively using ties to gain legitimacy |
| Co-makers | Recognized that tie to Metaalunie (employer association) was important | - | No purposeful search to be associated with ‘legitimate’ partners, part of search for clients and capital |

| | | | |
|---|---|---|---|
| Euronet | Partnering with Wegener (large publishing company) and populair radio dj used their name | - | No active strategy for gaining legitimacy, was more side-effect of doing business |
| Keekaboo | Free publicity by being active marketer with limited budget | - | Legitimacy was side-effect of marketing efforts. |
| Metrixlab | Being associated with professor at university and well known marketing company | Board member well known in internet circles | Actively looking for well-known people to be associated with |
| Nedstat | First client (ABN-AMRO) was important | | Actively involved in giving presentations in order to be connected to trusted parties |
| Planet Internet | | KPN as financier and technology provider | Benefited from tie to KPN for getting employees and media coverage |
| Ring | Pieper asked as board member and other board member well known in internet circles | Friend introced them to first major client, vc dealing with IPO | Actively managing people to be associated with |
| Rits Telecom | ABN-AMRO as first client and Radio 538 as partnership | - | Actively managing legitimacy because concept is unknown |
| Vocognition | Trial and error to get first major client (C&A) | - | This first major client turned into strong tie |
| Xoip | Deals with well-known players in the field, such as Microsoft and KPN | - | Legitimacy as side effect of working with reputable players for their knowledge |

## 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 (see table 4). 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.

*Table 5: Mix of weak and strong ties of spin-off entrepreneurs to discover opportunities*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Bitmagic | Not applicable | One worked for Planet Internet and Volkskrant;<br>Erwin, Alex, Dick, all from Planet Internet | started as a hobby project, technical experimentation;<br>2nd start-up after Planet Internet for Frackers |
| Carp Technologies | Assignment at Medialab (as engineering student) | Hobby projects with fellow students;<br>Study/career advisor promotes starting up | already close ties with their informatics professor |
| HuQ Speech technologies | | Curiosity and strong research interest with university professor (PhD projects) | |
| InterXion | Assignment for marketing course (liberalisation telecom);<br>Through customer shift from telephony to Internet/data exchange | Telecoms interconnection (previous job at Enertel);<br>Telephone exchange | |
| Profuse | | Idea for user interface was developed at Baan | |
| Proloq | shift from consultancy to product development (through customer) | business development by 5 Baan renegades (opportunity in growth market) | love/hate relationship with mother organisation Baan |
| Tornado Insider | Red Herring (events & magazine) | Prolin previous start-up & employer for two founders;<br>International experience with investment rounds | |
| Tridion | Agency.com caused a strategic reorientation and demerger (separation of product & services)<br>Key customers KLM, Wolters Kluwer (also used as referrals)<br>External members of Product Advisory Board | Website builder Twinspark as mother organisation | |
| Wellance | International ISP clients for KPN/Unisource<br>Acquisition plan by Datatech (promoting various corporate projects for potential clients)<br>ING Bank | Technical group Planet Internet holding (KPN and Unisource)<br>Development of subscriber management system<br>No acquisition but MBO | |
| Xpertbuyer | | Idea developed in previous position, actively supported by colleague who became co-founder; employers wants to exploit it within the firm; support from father and husband | Founder is very experienced in purchasing & procurement |

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 (see table 6). 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 higher-powered 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.

*Table 6: Mix of weak and strong ties of spin-off entrepreneurs to secure resources*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Bitmagic | Business angels Pieper and Vredegoor<br>Funds from Ministry of Economic Affairs for development (Kredo) | Pieper turned into strong tie<br>Trusted feedback Dick as software engineer | |
| Carp technologies | referral to mentor (through TOP scheme);<br>through university staff contact with distributors;<br>through former Medialab manager in contact with Hoojit (major account); | Temporary entrepreneurial position (TOP scheme);<br>Contract research for university & professor;<br>Recruiting staff through university<br>Facilities & office on campus | |
| HuQ Speech technologies | Informal investors (through new faculty director)<br>Regional development & investment companies (through university) | University for staffing<br>University holding (patent, know how) | |
| InterXion | Person who set up InterXion in Germany (DICICS tender);<br>Extending services (storage & maintenance) for customers;<br>Cold calls for business plan support (PWC), Siemens (leasing equipment);<br>Closeness to international hub (Amsterdam)<br>informal investors (though former Enertel colleague)<br>then other investors (Residex, Fleet equity, Morgan Stanley etc.<br>collaboration with Jones & Lang | Hiring former Enertel colleagues (director, spokesman, support people);<br>Uncles for recruitment and financial assistance | |
| Profuse | Additional banking support<br>Recruiting staff from local technical schools<br>Advertisement in orthodox protestant newspaper | Self-financing; COO (friend of the founder) | Official spin-off of Baan (still close ties with Jan Baan) |
| Proloq | | Customers and revenues through Baan network<br>Joining of Herman vd Weerd (referral through co-founder Theo van Ieperen | |
| Tornado insider | Financing from business angels, Rabobank & Cheerlab;<br>Managing editor from Oracle (previous job contact);<br>Inviting journalists from all over Europe for a weekend, | Support people from Prolin/HP (graphical designer, technical support) | |

| | | | |
|---|---|---|---|
| | Printing/publishing expert<br>Large international banks as customers/sponsors (previous financial network) | | |
| Tridion | Van der Boom Groep (financing) | Ronald Slot (co-founder Twinspark) in Advisory Board and networker/recruiter for Tridion | |
| Wellance | Investors (P3, Pythagoras) through ING and Planet Internet Belgium<br>From Dutrch-Belgium VCs to 3i (IK)<br>ING and AEX as key accounts | Unisource (mother): cash, technology and contracts (no liability) | |
| Xpertbuyer | Positive attitude venture capitalist<br>Further financial support from Ministry Economic Affairs (Kredo); location through Yellow Pages; recruitment through local university and polytechnic<br>Partnership with Extair and In ventures | Self-financing, also through friends & family network | |

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 (see table 7). 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 7: Mix of weak and strong ties of spin-off entrepreneurs to gain legitimacy*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Bitmagic | A number of VIPs (positive for wider recognition, negative for VCs: no control) | Secretive activity leads to all kind of speculations | Frackers is serial entrepreneur |
| Carp technologies | Membership of Technology circle Twente<br>Syntens (SME support) | Part of the Twente University spin-off scheme (TOP)<br>Mentor (has become strong tie) | Survival is also seen as a way of gaining legitimacy |
| HuQ Speech technologies | Business plan competition & prize<br>Recognition by industry peers (Aurora test) | Ongoing partnership with university professor (PhD and publications)<br>Close tie with the two regional investors and one informal | |
| InterXion | Qualification for Kredo creditscheme (Ministry Economic Affairs)<br>Legal support from acquaintance (ghostwriter of Telecoms Act | Several financing rounds (220m Euro)<br>Experienced international CEO (IBM) | |
| Profuse | KPN Telecom as customer | Baan network + customers; quality | |
| Proloq | | Baan network (no official spin-off, but benefits) | Major Baan customer insists on reintegrating Proloq by Baan |

| | | | |
|---|---|---|---|
| Tornado Insider | Publicity and support in international banking community | Hiring media people;<br>Eurodisney Eship-VC event | |
| Tridion | Large visible customers (KLM, Ericsssson)<br>Contacts with business analysts (Medigroup, Gartner) | Project commitment and execution make difference | |
| Wellance | Certification (ISO, security standards, best practices)<br>Publicity as result of 3i investment | KPN as a learning environment (some key people) | |
| Xpertbuyer | Schiphol Airport as customer | Former employer (now customer and advisor) | Reputation in the business, NEVI-platform |

## 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) (see table 8). 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) (see table 9). One could say the same for the involvement of the incubates in gaining legitimacy:

*Table 8: Mix of weak and strong ties of incubatee entrepreneur to discover opportunities*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Bibit | Many diverse contacts as interim manager | Two partners in start-up are family | |
| Career fever | Continuous change in business plan, travel project cancelled, friend of friend had idea about business games | Trusted feedback by family and Wouter as incubator manager | |
| Factory Zoo | Customers (having worked with Burda, Luxembourg/Astra | Business development for former employers (DEC, AT&T, IBM) | ongoing links with former colleagues |
| Gopher | Frank Zappa (role model in independent publishing) | Idea arose in the dynamic interaction between consultant and print entrepreneur - printing company of co-founder | No role for the incubator Twinning |

| | | | |
|---|---|---|---|
| Hot Orange | Searching for role models in the American Internet industry: Dell, Monsterboard, finally e-commerce; Then choice for shopping portal and after that Amazon model (BtoC) | Two founders have background at Prolin/HP; Friendship with investor/entrepreneur Jeroen Mol (Prolin & Gorilla Park) | Hot Orange existed before incubator Gorilla Park was set up |
| Information Innovation | Friend in Deutsche Bank organised a testing of the product Location in Twinning centre through contacting Amsterdam Science Park | Previous jobs and positions in business consultancy and in finance/banking | |
| Oratrix | Involvement in EU and WWW research networks Participation in McKinsey's New venture business plan competition | Research lab CWI as source organisation | - academic/research spin-off (focus on exploration) |
| Punt Edu | ING as lighthouse account | - presentations for Euronet as starting ground<br>- start-up team with life partner and friend | |
| Siennax | First ICT consultancy, then Il Campo (Intranet/ASP application); Association with Twinningv and lead to Twinning company as first user | Core of BSO-Origin sales and business development managers; Internal experimentation; Two informal investors and mentors (BSO-Origin) | Early contact with Twinning |
| Tryllian | Professional background in digital electronics and ICT consultancy (BSO-Origin) | Working at the technological frontier in ITC; Early employee furthers technical breakthrough in mobile agents; | Idea existed before |

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.

*Table 9: Mix of weak and strong ties of incubatee entrepreneurs to secure resources*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Factory Zoo | Marketing (local hockey club) staffing (MBA-ers and legal expertise) financing (Twinning) co-financing (Alan Wilde) | Co-founders (IBM colleagues) RABObank as strategic investor and leading edge customer (through DEC connection) | Relationship with Twinning became sour (opportunism) |

| | | | |
|---|---|---|---|
| Gopher | Additional financial means through prize (Silicon Polder Fund), then Twinning Seed & Growth fund & Paribas<br>Recruitment: Temporary agencies Hexspoor | Self-financing (consultancy & printing) | |
| Bibit | First clients through cold calls, employees through diverse contacts | Friend introduced founder to Paribas VC | |
| Career fever | Students as employees, Student's dean, meeting psychological testing expert;<br>First Tuesday meetings | Friends from student house on board, cheap housing through board member;<br>Legal advice from board member | |
| Hot Orange | Informal investors;<br>Nesbic & Gorilla Park as investors (?)<br>Retail and US Internet knowledge;<br>Accountants are hired;<br>Additional staff through temporar gencies | Self-financing and location starting from home;<br>Staff recruited out of Prolin/HP network;<br>All kind of support from Gorilla Park (finance, location, managers, advisory board) | Two start-ups learning from each other; |
| Information Innovation | Office and seed money from Twinning; hiring Twining investment manager;<br>Then Twinning growth + BNP-Paribas;<br>Accountant andf Patent lawyer (through Twinning) | After growth financing Twinning became a strong tie | |
| Oratrix | Additional financial means by informal investors, Dutch government (credit schemes) recruiting staff through international research network<br>Professional contacts with competitors Real & Microsoft, customers (BBC and US Ministry of Defence) | Self-financing (by founders)<br>CWI: intellectual property, financial backing | |
| Punt Edu | Newconomy (investment company)<br>Intercollege The Hague (former school) for accommodation | Falling back on some alumni of Intercollege for staffing | Self financing |
| Siennax | Pilot customers such as KPN, ADZ, ABN Amro;<br>Twinning with Prime as leading investors<br>Arthur Anderson as accountant (through Twinning); | | |
| Tryllian | Attending investment events (NEBIB)<br>Two informal investors (TIFAN)<br>Twinning (seed + growth) and NPM<br>Housing and facilities (Twinning, but also self-activation) | First employee found through life partner (programmer) | Resources mobilised and acquired despite/thanks to Twinning |

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.

*Table 10: Mix of weak and strong ties of incubatee entrepreneurs to gain legitimacy*

| | Weak ties | Strong ties | Comments |
|---|---|---|---|
| Factory Zoo | - active publicity seeking plenty of business plans received | Lighthouse accounts: ATOS Origin, Educational institutions Through Rabobank access to SMEs | The founder's professional network of DEC & IBM alumni may have proved more decisive for the start and early growth than incubator Twinning |
| Gopher | Broos van Erp prize, Gang of 8 advising Prime Minister (both through Vincent Evers) | Twinning (Michiel Westermann) | Acquired by Quote publisher |
| Bibit | Some large clients acted as references, professional public relations | Venture capitalist became a strong tie | |
| Career fever | Mobilising people and getting to know them through book project | Affialiation with EUR Small Business Link (Wouter & Felix) | |
| Hot Orange | Third-Wednesday/Network event Entrepreneurs as role models (Stelios, Branson); After Bertelsmann On-line, biggest on-line store; | Active publicity strategy (seminars, workshops) | No synergy with Gorilla Park: one BtoC, the other BtoB; |
| Information Innovation | After turnaround into Vizigence, product is now ready to market | Through Twinning (especially useful for foreigners) | |
| Oratrix | Prize in New Venture competition international recognition in the field of standardisation and international specialised users | Official CWI spin-off | Relationship with Twinning never flourished (with the exception of seed money): no accommodation, no network, no coaching |
| Punt Edu | Relationship with ailing Newconomy turned sour (negative network effect) | Relationship with Kennisnet (education) became close link | - turnaround as a consequence of the ailing investment company (buy-back) |
| Siennax | Peer group of ASP-providers (US Internet Working, Telestore, Telecomputer etc.); Access to business analysts; Higher education (Network academy Acadoo); Public relations; | Business model based on recurrent revenues | |
| Tryllian | Presence in Silicon Valley | Creativity (serial entrepreneur: first start-up failed) | |

## CONCLUDING REMARKS

While the lonesome cowboys in their early growth stages move from exploration to exploitation, the other two categories predominantly focus on exploitation, in the case of spin-offs, and on exploration, in the case of incubatees. Also the development path differs between spin-offs and incubatees: while the first is still very close and dependent upon its source (or 'mother') organisation, i.e. a strong tie, the latter's use of contacts is less outspoken, sometimes referrals and references provided by the incubators, and/or alternatively developed by the in-house entrepreneurs themselves.

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 phase and some of them appeared not to have any difficulties concerning the uncertain future of the start-up. 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. This use of the structural hole argument is a bit odd. Structural holes and the role of weak ties are related to the discovery of new information. Information which was unknown and not expected to be known. This information and thus weak ties may be of importance to spot new opportunities or more specifically for these start-ups to change the business concept on basis of this new information. This process plays in particular a role in the emergence phase. Once the start-up has evolved to early growth, they know what they need in terms of resources. Thus there is no reason to discover new information through structural holes, the search for resources and also legitimacy is straightforward.

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