STARTING GLOBAL

An Entrepreneurship-in-networks approach

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STARTING GLOBAL,
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Dit proefschrift is goedgekeurd door de promotor:

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Preface

So there it is: my thesis is finally finished. All there is to do is to come up with ten interesting and teasing propositions and to write this preface.

Four and a half years ago I began working on this book, more or less by chance. While working on my master thesis, I was advised to contact Rosalinde Klein Woolthuis, who was then just about to defend her Doctoral Dissertation, as she might give me some useful advise and comments on networks and co-operations. She invited me to come to the seminar about her thesis and listen to the results of her work. Little could I know that I would pursue a Ph.D. myself. In fact it was the last thing on my mind. However, during the seminar and during a meeting some weeks later with Aard Groen he and Wim During somehow convinced me to consider the possibility. I guess their remarks about traveling internationally and working in an international environment must have something to do with it.

It took me several months to come up with a topic for this research. Originally, the very broad proposal had included the topics "entrepreneurship and networks", but not much focus. In the end, the topic of this thesis the global startup process, studied from an entrepreneurship in networks approach proved to fit perfectly my previous knowledge on international business and the core of our research at NIKOS.

In the first year I regretted my choice on many occasions. Not achieving immediate results but working towards something that would only be finished after four years was very frustrating for someone that is as impatient as me. A three-week trip to Mexico, supervising a Stress Study trip, during which I could take a step back and think things over, finally saved my career as a Ph.D. student. Today, I am glad for it and in fact I could not think of any work I would enjoy more than being a researcher!

Yet that did not mean finishing up this thesis was not hard. The last months have been a struggle, filled with doubts and insecurities, as they are supposed to be. But now the work is done.

This brings me to the words of gratitude that are always expressed in prefaces like this. I want to keep the list short and only mention those who have contributed directly to my research and this thesis. Colleagues, friends and family who supported me and whom I had a good time with will not be mentioned in person, which does not mean they're not appreciated.

Clearly, Wim During and Aard Groen my Promotor and Assistant Promotor have been the most influential. Wim your intuitive and personal approach to doing research and supervising your Ph.D. students have been very inspirational and truly are an example to me. Also, your rebellious nature has made working with you interesting and show that as a researcher you do not have to comply with conventions. I will remember this well. Aard, with your precise and accurate way of working you have taught me to be more detailed and precise in my work as well and thereby working with you has been an excellent quality guarantee and improved the quality of a my thesis a great deal.

Marijke, besides colleagues we have become good friends over the years. Working with you on 'Understanding Entrepreneurship', discussing both the content of our theses and the process around it, and traveling together to conferences and London, have made the process less lonely and a lot more fun. When you're done as well we'll book a flight to Spain!

Paula, I have learned a lot from you about writing papers and generally enjoyed working with you. We have shown ourselves how communication technology enables people to work and co-operate around the world, -from the start. Also your enthusiasm and support have been a great help and stimulant. I hope we will continue

to co-operate over the years in many projects and publish many papers together. Peter van der Sijde, you have been a great colleague. You make doing research and writing papers seem easy. Setting up Global Start has felt as a confirmation that studying Global Startups has been a good choice. Paul, thanks for our discussions, having someone else work on the same topic is such a bonus. Good luck with your own thesis. Let me know if I can help you as well. I would also like to thank Peter Geurts, with helping me along with NVIVO and the qualitative data analysis

Next, of course there are the entrepreneurs who have shared with me their experienced and told me their stories and let me write about them. With some of you I have only met once or twice, with others I met or talked on many more occasions. I owe this thesis to all of you. A special word of thanks for the founders of Sound Inc.! You have given me access to such an amazing set of data and provided me with a great opportunity to do this research. I hope can do something in return some day. Finally, a special word for Jeroen: thank you for putting up with all of this, and me, as well as for the practical support, and love!

Nederlandse Samenvatting

Wereldwijd opereren is lang beschouwd als iets wat alleen is weggelegd voor grote, al lange tijd bestaande bedrijven. Echter in de laatste twee decennia is gebleken dat een groot aantal MKB bedrijven en starters internationaal of zelfs wereldwijd actief kunnen zijn. Over dit laatste soort bedrijven gaat dit proefschrift.

In het proefschrift zoek ik antwoord op de volgende onderzoeksvragen:

1. Wat is een global startup?
2. Hoe kunnen we het global startup proces beschrijven in termen van de inhoud, de context en het verloop (content, context and course)?
3. Met wie en met welk soort organisaties heeft het ondernemende team contact tijdens het global startup proces?

3b. Wat is de inhoud van de interactie tussen het ondernemende team en haar contacten gedurende het global startup process?

3c. Met betrekking tot de methode van interactie tussen het ondernemende team en haar contacten

- wat is de oorsprong van deze contacten?
- hoe vaak vindt de interactie plaats?
- welke communicatie kanalen worden er gebruikt voor de interactie?

4a. In hoeverre is mijn model, gebaseerd op ondernemershap-in-netwerken geschikt voor het beschrijven van, het verkrijgen van inzicht in, en begrip van het global startup proces?

4b. In hoeverre biedt mijn model aanknopingspunten voor vervolgonderzoek over het fenomeen 'global startup'

4c. In hoeverre biedt mijn model aanwijzingen voor professionals die betrokken zijn bij de ondersteuning van global startups?

Ter beantwoording van de eerste onderzoeksvraag heb ik bestaande literatuur op het gebied van internationalisering van jonge en startende bedrijven geanalyseerd met betrekking tot de daarin voorkomende beschrijvingen en definities. De belangrijkste conclusies van dit literatuuronderzoek is het feit dat de meest gebruikte termen zoals born global, international new venture, global startup ten onrechte als synoniem zijn beschouwd en dat zij niet de complexe realiteit van dit soort bedrijven weergeven. Wel biedt de literatuur enkele goede aanknopingspunten voor de opzet van de gevalsstudie.Voor de exploratieve, meervoudige gevalsstudie werden 5 gevalsstudies uit de literatuur aangevuld met nieuw materiaal (oa. jaarverslagen en websites); tevens werden 4 nieuwe gevalsstudies uitgevoerd. Door deze opzet was het mogelijk inzichten van anderen mee te nemen, een grote geografische diversiteit in de gevalstudies te creëren. Gelijkertijd door zelf met ondernemers te praten een gevoel ontwikkeld voor wat het daadwerkelijk betekent om een global startup te zijn. Op basis van de gevalstudies werd een 12-tal stellingen ontwikkeld, welke zijn samengevat in Tabel 1.

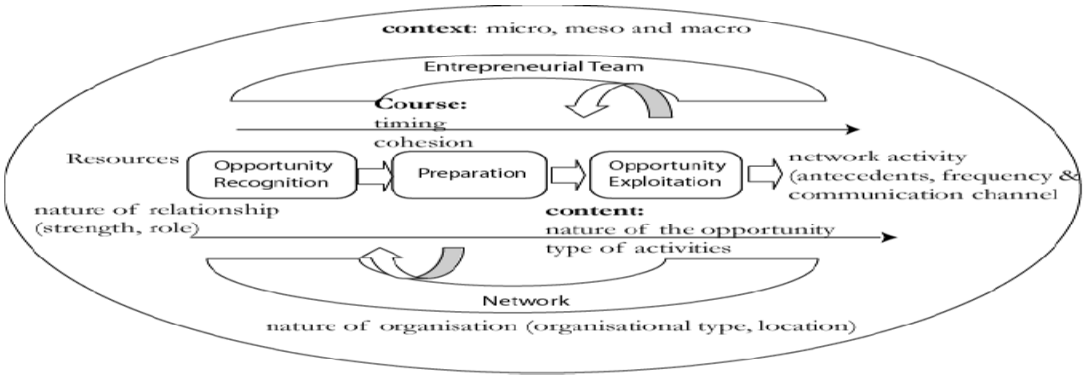
#	Stellingen
1	Het startproces en het internationalisatieproces van een global startup zijn in hoge mate geïntegreerd en kunnen niet afzonderlijk van elkaar begrepen worden.
2	Global Startups beginnen vaak met internationale activiteiten voordat zij daadwerkelijk gestart zijn
3	Global Startups starten internationale activiteiten om wereldwijd kansen na te jagen, in plaats van om direct een concurrentievoordeel te behalen.
4	Global Startups zijn betrokken bij een grote verscheidenheid aan formele en informele activiteiten met buitenlandse contacten
5	Global Startups maken gebruik van een groot aantal methodes om het netwerk te ontwikkelen
6	Global Startups zijn wereldwijd actief in meerdere regio's
7	Het proces van internationalisatie van global startups volgt de aanwezigheid van kansen in plaats van een patroon van toenmende geografische en culture afstand ('phychic distance')
8	Global Startups zijn niet noodzakelijk snelle groeiers in termen van het aantal medewerkers
9	Global Startups worden gekenmerkt door een hoog niveau van ondernemendheid (entrepreneurial orientation)
10	Global startups worden opgericht door ondernemers met vertrouwen in hun internationale vaardigheden
11	Global startups verlaten zich op de relatie met een sterke partner, dit is vaak een onderzoeksinstituut of commerciële partij
12	Global startups zijn vanaf de start ingebed in een internationaal netwerk

Tabel 1. Stellingen met betrekking tot het global startup concept

Door deze stellingen te combineren werd de volgende beschrijving van een global startup geformuleerd: "Een global startup is een ondernemende starter die wereldwijd betrokken is in een verscheidenheid aan internationale activiteiten. Dit gebeurt omdat dit soort bedrijven kansen najaagt daar waar deze in de wereld ontstaan, omdat middelen, partners en/ of klanten zich daar bevinden. Global startups lijken in staat technologie en innovatie te combineren met een duidelijk begrip van behoeftes in de markt. Terwijl veel technostarters gericht zijn op onderzoek, worden global startups ook gedreven door een verkoop-oriëntatie. Omdat zij vaak opereren in radicaal innovatieve sectoren is het creëren van zichtbaarheid en acceptatie van hun technologie, producten en toepassingen van veel groter belang dan het verkrijgen van een direct concurrentievoordeel. Zelfs als de oprichters geen formele internationale ervaring hebben hebben zij wel de vaardigheden en het vertrouwen ontwikkeld om te werken in een internationale omgeving. Vaak verlaten global startups zich op samenwerking met bestaande organisaties zoals onderzoeksinstituten. Dit soort relaties kan gevaar opleveren voor de ontwikkeling van het bedrijf. Echter zij helpen wel met het overwinnen van belangrijke problemen zoals gebrek aan middelen, reputatie en organisatie tijdens de start en de internationalisering. Global startups zijn al vroeg in hun ontwikkeling ingebed in een internationaal netwerk."

Ter beantwoording van de tweede en derde vraag, maak ik opnieuw gebruik van literatuur studie en een longitudinale enkelvoudige gevalsstudie. Op basis van de literatuur over ondernemerschap, ondernemerschap-in-netwerken en "international new ventures" ontwikkel ik een model. Het ontwikkelde model bestaat uit twee delen: het global startup proces-gedeelte en het interactie-gedeelte. Uitgangspunt voor het global startup proces gedeelte is het ondernemerschapsproces. Volgens dit proces bestaat ondernemerschap uit drie fases: (1) opportunity recognition, (2) preparation, (3) opportunity exploitation. Voor elk van deze drie fases worden vervolgens drie dimensies bestudeerd: (a) de inhoud, (b) de context, en (c) het verloop. De *inhoud* betreft enerzijds de aard van de kans en anderzijds de activiteiten die worden

ondernomen om de kans na te jagen. Onder de *context* verstaan we de organisatie-, industriële, technologische en geografische omgeving waarin het proces plaatsvindt. *Het verloop* heeft betrekking op de timing van de activiteiten en hun onderlinge samenhang. Met betrekking tot de interactie werd besloten de aard van de externe contacten (type organisatie, locatie van de contacten), de aard van de relatie (aard relatie, "tie strength") en de aard van de communicatie (oorsprong, communicatie kanaal, frequentie) op te nemen in de analyse. Het gehele model is weergegeven in het onderstaande figuur.



Deze figuur vormt samen met de door mij beschreven en gedeeltelijk ontwikkelde methode de basis voor het bestuderen van de longitudinale gevalsstudie.
Met betrekking tot die methode beschrijf ik het complete proces van het selecteren van de gevalstudie, het verzamelen van de data, het voorbereiden van de data , tot de analyse van de data en de rapportage van de bevindingen alsmede welke methoden ik heb gebruikt om de kwaliteit van het empirische onderzoek te waarborgen en welke soorten bronnen ik heb gebruikt in mijn onderzoek. Specifieke aandacht wordt gegeven aan het gebruik van bedrijfse-mails als een data bron in kwalitatief onderzoek. De reden hiervoor is dat enerzijds deze bron nog erg onbekend is, en nog niet eerder door anderen expliciet is beschreven en dat anderzijds het gebruik van deze bron een aantal uitdagingen met zich meebrengt.

Eerst presenteer ik een chronologisch overzicht van alle relevante gebeurtenissen (de ontdekking van de technologie, de ontwikkeling van toepassingen en het introduceren van de producten op de markt, en de professionalisering van het bedrijf aan het einde van het global startup proces). Daarna beschrijf ik de bevindingen van mijn analyse van het global startup process en het interactieproces tijdens dit proces, in termen van het onderzoeksmodel wat hierboven is gepresenteerd. Deze analyse leidt tot de formulering van een groot aantal stellingen met betrekking tot het global startup proces en het interactieproces. Deze stellingen zijn weergegeven in de onderstaande tabellen.

#	Stelling
13a	Het opportunity recognition proces van een high tech global startup vindt plaats in een internationale context
13b	Het opportunity recognition proces van een high tech global startup brengt informele en/of formele grensoverschrijdende uitwisselingsprocessen met zich mee
13c	In high-tech global startups, is het verkrijgen van kennis over technologische zaken en mogelijke applicaties via informele uitwisselingsprocessen vaak de eerste internationale stap.
13d	Voor veel high-tech global startups, begint internationalisatie nog veel het eigenlijke begin van de bedrijfsactiviteiten.
14a	Door het internationale karakter van technologie moeten global startups bekendheid en acceptatie van hun technologie, producten en services realiseren onder gebruikers en opinieleiders overal ter wereld.
14b	Het creëren van bekendheid en acceptatie vindt vroeg in het global startup process plaats, ofwel in de preparion pfase, of nog beter in de opportunity recognition fase.
15	(Global) startups moeten vaak een zijstap maken, en een alternatieve opportunity najagen om zo de middelen te vergaren die het najagen van de daadwerkelijke opportunitie mogelijk maken.
16a	Zoals elke starter heeft een global startup gebrek aan middelen
16b	De benodigde middelen van een global startup moeten naast nationaal vaak ook internationaal worden gevonden
16c	Global startups moeten zich toegang verschaffen (ipv eigendomscontrole te bewerkstelligen) tot middelen en daarvoor creatieve ondernemende methodes gebruiken.
17a	Een high-tech global startup moet trachten een marktgedreven bedrijf te worden om zo een ontvankelijke positie in de markt te creëen.
17b	Tijdelijke afwezigheid van de belangrijkste onderzoeker kan een voordelige strategie zijn om een marktgedreven bedrijf te ontwikkelen.
18a	De (internationale en technologische) aard van de opportunity bepaalt in hoge mate het verloop en de context van het global startup proces.
18b	Het global startup proces heeft veel kenmerken die gelijk zijn aan de activiteiten van een binnenlandse startproces
18c	Het global startup proces verschilt van een binnenlands startproces in termen van de locatie waar deze activiteiten plaats vinden en de macro-context waarin deze plaats vinden.
19a	De internationale aard van het startproces wordt niet als problematisch ervaren door het ondernemende team.
19b	De oprichters van global startups zien de internationale aard van hun startproces als het logisch gevolg van de door hen nagejaagde opportunity

Tabel 2 Stellingen met betrekking tot het global startup proces

#	Stelling
20a	Strategische allianties tussen global startups en grote buitenlandse bedrijven ondervinden vergelijkbare problemen als binnenlandse allianties
20b	Verschil in middelen, ervaring en macht zijn belangrijkere factoren bij het ontstaan van conflicten binnen internationale allianties dan verschillen in nationaliteit (cultuur, taal, wetgeving)
21a	Global startups moeten interacteren met een grote verscheidenheid aan organisaties gedurende het gehele startproces.
21b	Voor een global startup proces is het niet noodzakelijk om reeds voorafgaand aan de ontdekking van een opportunity een internationaal netwerk te hebben.
21c	Een global startup moet (wel) vroeg in het startproces een wereldwijd netwerk opbouwen
21d	Zowel binnenlandse als internationale contacten zijn belangrijk bij het opzetten van internationale activiteiten
22a	Tijdens het opportunity recognition proces zullen global startups bestaande contacten gebruiken om nieuwe internationale en binnenlandse contacten te indentificeren en op te zetten.
22b	Tijdens latere fases in het global startup process is proactiviteit van het team belanrijker in de ontwikkeling van het netwerk dan het gebruik van intermediairen of makelaars.
23a	Het gebruik van e-mail en Internet tijdens het global startup process vermindert de behoefte aan internationale reizen (wat leidt tot besparingen in tijd en geld)
23b	Het gebruik van e-mail en Internet tijdens het global startup proces maakt het mogelijk voor bedrijven om verschillen in tijdzones te overbruggen in de communicatie met internationale contacten
24a	Het gebruik van internationale beurzen en conferenties is zeer waardevol voor global startups
24b	Het gebruik van internationale beurzen en conferenties biedt global startups de mogelijkheid om zich te presenteren aan nieuwe en bestaande wereldwijde contacten
24c	Het gebruik van internationale beurzen en conferenties biedt global startups de mogelijkheid om snel een wereldwijd netwerk op te bouwen.

Tabel 3 Stellingen met betrekking tot het interactie proces

Deze stellingen vormen zowel een deel van het antwoord op vraag 2 en 3 als een inleiding op de beantwoording van de vierde en laatste vraag van dit proefschrift en op de formulering van de algemene conclusies. De eerste conclusie is dat het global startup proces in feite niet heel anders is dan een ander start proces in een high-tech context. Ondernemers lijken niet onder de indruk te zijn van het opereren in een wereldwijde markt. Hieruit concludeer ik dat ondernemerschapstheorieën daadwerkelijk beter aansluiten bij de werkelijkheid van global startups dan internationalisatie of strategisch-management theorieën. Ten tweede, met betrekking tot het netwerk, concludeer ik dat het proactief opbouwen van het netwerk belangrijker is dan het gebruik maken van reeds bestaande contacten als makelaars en referenties naar nieuwe contacten. Met name het creatief gebruik van Internet, e-mail en beurzen blijkt een gunstig effect te hebben op de globalisering en daarmee op de algemene ontwikkeling van global startups. Dit stelt het team in staat efficiënt en effectief netwerken op te bouwen en te ontwikkelen in diverse tijdzones en regio's. Tot slot bespreek ik de beperkingen en de bijdragen van mijn onderzoek in termen van theorievorming, methodologie, praktijk en onderwijs. De belangrijkste aanbeveling m.b.t. de methode betreft het gebruik van bedrijfs e-mails als bron van kwalitatieve data in longitudinaal onderzoek. Hoewel het voorbereiden van de data veel tijd kost en veel software nog niet geschikt is voor de grote hoeveelheid 'documenten', raad ik onderzoekers vanwege de rijkheid van deze databron zeker aan deze te overwegen en in indien mogelijk te gebruiken in combinatie met meer traditionele databronnen zoals interviews en archiefmateriaal.

PART 1. SETTING THE STAGE

1. Introduction

1.1 Prologue

By May 2003, Sound Inc. offered a wide range of sound measurement sensors and services to customers in over 30 countries on five different continents, using both direct sales and an extensive network of local distributors. A considerable part of the company's time and resources are spent on creating awareness and acceptance of their Sensor-technology and applications. Therefore, the company's officials travel abroad frequently to present scientific publications at conferences and to display and show the products and applications at international conferences Also, researchers at various laboratories around the world are testing and working with Sensors and thereby help the firm to create awareness and acceptance of the technology on the one hand and to gain new ideas for sensors and applications of these sensors on the other hand. Finally, all though the permanent staff is all-Dutch, the company is now also hiring foreign trainees or Ph.D. researchers to expand the team on a temporary basis. The global activities are displayed in Figure 1

These global activities may suggest that Sound Inc. is a large and established company. Yet, only seven people are involved in the venture, mostly part-time. Perhaps even more surprisingly, the firm was only launched in 1998. Even before the actual start, "Sound Inc.'s founders, Mr. Wide and Mr. Path, realised that the firm would have to operate across the globe from day one, because essential resources like technological information and feedback had to be obtained from the global community, and because the domestic market was simply too small to support a sustainable venture. As the entrepreneurs explained: "the Sensor offered an opportunity that was and is truly global in nature. In order to capture this opportunity we have to be innovative and creative with our limited resources and display proactive behaviour towards the market or else they will not even know the Sensor exists".

In this study, I examine the apparent paradox of being small and new yet global. Or in other words this dissertation centres on the following broad question: How can a firm of such a small size and young age be active on such a global scale?

1.2. Background of the study

Despite the obvious complexity of conducting business activities on a global scale from such an early stage, today many firms, like Sound Inc. B.V., are indeed globally active from inception. Although such 'born global firms', or 'global startups' have probably always existed (Knight, Bell and McNaughton, 2001)[1], it seems that their number and importance have increased rapidly since the mid-eighties.

The earliest reports on the existence of such ventures appeared in the late nineteen-eighties and early nineteen-nineties in popular journals such as the Wallstreet Journal (Gupta, 1989), the McKinsey Quarterly (Rennie, 1993) and Inc (Mamis, 1989, Bianchi, 1993). For instance, Gupta (1989) introduces a number of companies that seek to build an international market position early on, by leveraging technology and financial capital. They seek international growth through co-operation as well as international acquisition. Building on a study performed by McKinsey and Co (1993), Rennie describes born globals as firms that begin exporting on average two years after their foundation and achieved 76% of their total sales through exports (Rennie, 1993). Despite their small size, these firms seem to be able to compete and win against larger established firms by competing on quality and value. Characteristic for these firms is that they view the world as their marketplace from the outset and the domestic market as a support for their international business. Around the same time researchers involved in the research of entrepreneurship also became interested in the phenomenon (e.g. Ray, 1989, McDougall, 1989, Brush, 1992). For instance, in one of the first scientific reports Ray (1989) found that global startups were highly entrepreneurial firms that internationalise their activities to pursue opportunities wherever they arise. Yet, it took until the late nineteen-nineties for the number of studies to increase rapidly.

In my perspective, the young nature of the field makes the phenomenon an interesting subject for a doctoral research. In particular, there are several reasons for studying global startups. First, these firms defy traditional notions of international business. Most theories on international business were formulated in the context of large, well-established firms, and clearly they do not describe, explain and predict the behaviour of new ventures in an accurate manner (McDougall, Shane and Oviatt, 1994, Madsen and Servais, 1997, Autio & Sapienza, 2000).

Notwithstanding considerable attention for this phenomenon in recent years, most studies conducted to date reflect the immature status of the field. For instance, many studies lack a solid theoretical foundation or use poorly defined concepts and measures for the factors under investigation (Coombs and Sadrieh, 1996, Harveston, 2000). Also, many 'obvious' research questions have so far remained unexplored. For example, "how do global startups come into existence?" or "how do founders of global startups overcome distance and time differences in establishing global networks?" are only two of the questions that have yet to be examined.

Therefore, a scientific need exists to develop theories that do describe and explain this phenomenon adequately. In my view two weaknesses are most important. The first weakness relates the fact that most studies have focused on young yet, established firms rather than on nascent ventures in their startup process. As a result the antecedents and processes leading to a global startup are not yet analysed in a

[1] For instance the Dutch East Indies Company offers a historical example of a global startup.

systematic way. The second problem in my perspective related to the narrow focus of most studies. With a few exceptions (e.g. Coviello & Munro, 1995; Jones, 2001) all studies have focused on sales activities in international contexts and neglected other types of cross-border activities. Although the focus on sales is not surprising considering the general interest in venture performance, other forms of international activities need to be included in my view, in order to create a complete picture and a deeper understanding of company behaviour. Second, entrepreneurial ventures like these are often considered the engine of the economy because they generate jobs and offer new and often innovative products and services (Harveston, 2000, EZ, 1998, 2001). Therefore, understanding how successful global startups operate, may offer a starting point for the support of other potential global startups. For (nascent) entrepreneurs the topic is interesting because the (exciting) stories of global startup firms may act as stimulants to pursue similar ventures. Finally, there is a personal interest and fascination with these companies and their founders. Their boldness is a reminder that everything is possible and that we need not feel limited to a single country regardless of our experience and age.

1.3 Problem statement

When this research project was just initiated, the number of studies that focused on firms that were internationally active early on in their existence was less than 50. From this it can be concluded that not much was known about such companies. In addition, most of these works used different names and labels to describe such companies. The most popular of these labels is without doubt 'born global' (for instance, Rennie, 1993, Cavusgil & Knight 1996, Madsen and Servais, 1997, Harveston, 2000). The names International New Venture (Oviatt & McDougall, 1994, Servais and Rasmussen, 2000) and Global Startups (Mamis, 1989, Ray, 1989, 1995, 2003, Bianchi, 1993 McDougall, Shane and Oviatt, 1994, Oviatt and McDougall, 1995) are also used relatively frequently. Further 'Infant Multinationals' (Lindqvist, 1991), 'Instant Multinationals' (Fillies, 2001), 'Instant Internationals' (Hordes, et.al, 1998) and even 'global high-tech firms' (Jolly, et al., 1992, Burgel and Murray, 2000), 'high-technology startups' (Roberts and Senturia, 1996) or early-stage technology-based firms (Preece et al., 1999) are associated with the phenomenon as well.

Not surprisingly, the question: 'What is a global startup?' frequently came up when mentioning that my doctoral thesis focused on this type of company. Because of the 'confusion', which seems inherent to the state of the research, 'simply' adopting one of the existing definitions without further analysis or discussion would not be sufficient. Therefore, answering the question:

1. What is a global startup?

is the first task in and an important contribution of this research. This question is dealt with in Chapters 2 and 3 of this dissertation in an exploratory nature that allows for setting the stage of this research.

Early research into global startups (and similar firms) has focused mainly on identifying global startups (e.g. Rennie, 1993, Brush, 1992; Lindqvist, 1991), providing rationale for their existence (see for example McDougall, Shane and Oviatt, 1994) and identifying factors differentiating global startups from gradual globalisers (for example Harveston, 2000). These early works have contributed to our preliminary understanding of global startups. However, from a first review of the literature it seems that very few studies have examined *how* such firms come into existence and are

able to pursue opportunities on a worldwide scale from inception[2]. In order to gain insight in how this is done we need to examine what happens between the time an entrepreneur has an initial idea and the moment where the startup process ends and a global firm has been established. This leads to the question "What does the global startup process look like?" Or in other terms "How can we model the process conceptually?"

According to Van de Ven and Poole (1995) there are several ways to look at processes. In this research I adopt a teleological perspective on processes. According to this perspective the purpose or goal is the final cause for organisational development (in this case the creation of a viable global startup firm). According to Van De Ven & Poole (1995: 516), the perspective builds on the notion that entities (entrepreneurs, firms) are purposeful and adaptive in their behaviour. By itself or in interaction with others, the entity constructs an envisioned end state, takes action to reach it, and monitors the progress, while at the same time being constrained by their environment (Commons, 1950; Gibson, 1988 in Van der Ven & Poole, 1995). The modification in this research would be that, I consider that all construction and action takes place in interaction with others and never by the entity in isolation (Groen, 2003, forthcoming). In accordance with the teleology perspective I maintain that in analysing processes we need not prescribe a necessary sequence of events or specify which trajectory development of the organisational entity will follow. The reason for this is that entrepreneurs undergo changes in their ideas and come back from previous decisions and plans on the basis of their experiences and learning process.

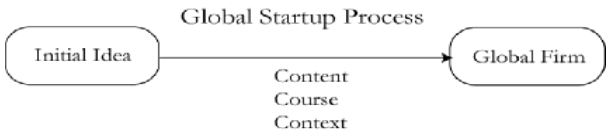
The empirical process under investigation here is, clearly, the global startup process: The global startup process, as the name suggests is the process by which a nascent venture (startup) comes into existence and which takes place in a global context starting with an initial idea and ending either when the venture is terminated or, if this does not happen before, when the company has overcome its liabilities of newness. According to several authors such as Stinchcombe (1965), this takes approximately six years from the time the (preparatory) activities begin. With the teleological perspective in mind, the global startup process needs to be described in terms of its content, context, course and the actors that are involved in it. Consequently, the second research question can be formulated as:

2. How can we describe the process by which a global startup firm comes into existence with respect to
   - Its content
   - Its context
   - Its course

In answering these questions, which are graphically represented in Figure 2, I will keep in mind that multiple constellations of content, context and courses are likely to exist. Therefore, argumentations will be offered for why specific constellations are observed and when these constellations are likely to be observed.

[2] As will be shown in the discussion of the literature, this does however not mean that the literature does not provide interesting starting points

Figure 2 The Global Startup Process: from initial Idea to established Global Firm



A basic assumption in this research is that we can understand the global startup process in terms of the entrepreneurship-in-networks perspective. From this perspective, entrepreneurship involves economic actions between actors and does not occur in a vacuum but is conditioned by ongoing structures of social relationships (e.g. Granovetter, 1973; Birley, 1985, Groen, 2002). In other words, the entrepreneur is embedded in a social context and needs to interact with other actors to exchange information and resources to exploit the opportunity and create value. As the global startup process is most of all an entrepreneurship process it follows that networks play an important role in this global startup process. Specifically, I will examine to relational aspects of entrepreneurial networking rather than positional elements of the network. In order to examine what the role of networking is, the interaction between the entrepreneurial team and the network will be described in more detail. Interaction refers to the engaging in activities and exchange of resources (e.g. Brush et al., 2001) and /or capitals (e.g. Groen, 1994, 2002) between the parties (the entrepreneurial team and the network).

In this research I examine three elements of the interaction process. First, I describe with whom entrepreneurs interact during the global startup process (e.g. friends and family members, other companies, governmental agencies). Second, I will explain what the content of the interaction is (the type of resources exchanged). Finally, how the interaction takes place is also relevant and will therefore be described as a third element of the interaction process.

Regarding this third element, some additional remarks have to be made. There are many ways to describe how interaction takes place. In this study three dimensions will be examined. First, to determine how the interaction between the entrepreneurial team and the network affects the global startup process it is necessary to determine how the network comes to being and how it is being used. As suggested by Lorenzoni and Lipparini (1999: 318) firms (and entrepreneurs) may be assumed to be able to shape and deliberately design their networks to a certain extent. For that reason it will be examined what the antecedents of the network interaction are. Second, it will be examined how frequently the interaction between the entrepreneurial team and the members of the network takes place. Finally, how the members of the entrepreneurial team communicate with the external contacts is particularly interesting, considering that the network contacts are expected to be located in different places around the world and time and distance has to be overcome[3].

From the research on the entrepreneurial process it is clear that at different stages of the process, different parts of the network are developed and activated for different

[3] In Chapter 5 it will be discussed in more detail why it was decided to focus on these dimensions of the interaction rather than on other (positional) dimensions such as network size or density or frequency of interaction.

purposes (e.g. De Koning, 1999, Birley, 1985) in different ways. Consequently, the following research questions can be formulated:

3a. with what type of contacts does the entrepreneurial team interact throughout the global startup process?
3b. what is the content of the interaction process between the entrepreneurial team and the different network contacts throughout the global startup process?
3c. regarding the method of the interaction between the entrepreneurial team and the network contacts throughout the global startup process
- What is the Origin of the network contacts?
- What is the Frequency of interaction between the entrepreneurial team and its contacts?
- What Communication channels are being used between the entrepreneurial Ttam and its contacts?

Whereas the previous research questions were more descriptive in nature, the final question is more evaluative in nature. I expect that the network plays an important role in the global startup process and that in fact we might be able to understand how the global startup process actually 'works' by looking at it from a network perspective. Therefore, it is evaluated to what extent this expectation was correct and thus to what extent the entrepreneurship-in-network perspective is suitable to understand the global startup process. The final research question can now be formulated as

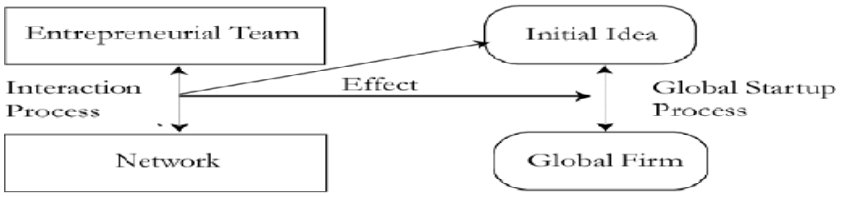
4. To what extent is this model based on entrepreneurship in networks
- suitable for describing, gaining insight and understanding the global startup process,
- provide points of reference for further research into the global startup phenomenon
- provide guidelines for practitioners involved in supporting global startups[4]

The research questions are visually represented in Figure 3. In this Figure the basic building blocks and the relationship between these building blocks for the research model are shown. In this Research Model the three core elements (the entrepreneur or -as many ventures are started in tams- the entrepreneurial team, the network, and the global startup process) are central. In addition the research questions included in the model represent the relationships that need to be examined. The global startup firm is not included in this model as this firm can be regarded as the end product of the global startup process.

To summarise, the purpose of this research is twofold. First, the study will contribute to the development of a better understanding of the concept Global Startup. Second, the study will contribute to the development of a better understanding of the Global Startup process. In order to answer the research questions an entrepreneurship-in-network perspective is adopted throughout this investigation. In chapters 4 and 5 an extensive discussion of this perspective is provided.

[4] In this study the entrepreneurship-in-network perspective will not be compared to other perspectives. This would be a topic for further research.

Figure 3 Preliminary Research Framework



1.4 Research Context

Even though previous research (e.g. Aspelund and Moen, 2001, Moen, 2002, Simoěs and Dominguinhos, 2001) has shown that new venture internationalisation is not limited to high-technology ventures, it was decided to focus this research on high-tech startups. Many different definitions are used to describe high-tech startups. High-tech firms are those firms that develop and market new products and services that are based upon a proprietary technology or skills (Roberts, 1990, Shane, 2001). For such firms technology is at the same time at the heart of their business opportunity and the more important input in the production process. We can however not speak of *the* high-tech startup. According to Hellman & Puri (2000) high-tech startups may differ in three dimensions: First, high-tech startup may not be in the same stage of product development at founding. Entrepreneurs may develop a technology / product while working at a previous employer and transfer this product / technology to the startup or alternatively develop the products or technology from scratch after founding the new venture. Second, the firms may differ in the scope of their product-technology. Entrepreneurs may develop one specific product while others develop broad platforms. Third, high-tech startups differ considerably with respect to the newness or innovativeness of their core technology; some may be true innovators while others can better be described as imitators (Hellman & Puri, 2000). Other authors have used the distinction between competence-enhancing versus competence-destroying innovations (Anderson & Tushman 1991, Aldrich, 1999).

In this study we focus on those high-tech firms that exploit innovative rather than imitative technologies as these are the most radical manifestations of high-tech ventures, regardless the state of development at time of foundation or the scope of the product-technology. The reason for focusing on high-tech ventures is that the phenomenon is most widespread in high-tech industries. Also, the pressure to start global is much stronger in such industries as high R&D investments and small domestic (niche) markets force companies to venture across borders (e.g. Coombs & Sadrieh, 1996). Therefore, explaining the underlying mechanisms of the global startup process in high-tech firms is more relevant than explaining the mechanisms of a global startup in sectors where it is 'only' a strategic option rather than the sole means of survival. Further it should be noted that this study takes place in the context of university spin-offs. Many university spin-offs are highly knowledge intensive and often potential global startups. Thus this type of firms forms interesting candidates for the research. Further, at the University of Twente where this research was conducted significant efforts in the field of commercialising R&D and stimulating entrepreneurship have resulted in a relatively large pool of (potential) global startups. Using the connection of these firms to the University facilitated access to the cases included in this study.

1.5 Research approach

The scientific purpose of this research is to contribute to the understanding of the global startup phenomenon by developing descriptive and explanatory knowledge of the global startup process and the role of the network in this process. Thus, in this dissertation theory is developed rather than tested. The research questions are exploratory in nature and address contemporary complex systems of variables that cannot be controlled or manipulated. The processes under investigation are for a large part studied in real time. The reason for this is that we want to avoid sense-making and rose coloured perceptions in hindsight from the side of the entrepreneur to influence our findings. Consequently, following Yin's suggestions, I considered the case study approach to be the most applicable research method for this study.

Eisenhardt (1989) suggests there is a lack of clarity regarding the role of inductive processes and the role of literature in building theory from case studies. She suggests that if possible the research should be based on specific research questions and a priori specifications of important constructs. If these constructs prove important as the study progresses, then researchers have a firmer empirical grounding for the emerging theory (Eisenhardt, 1989: 536). Yet, she also states that researchers should avoid thinking about specific relationships between variables and theories as much as possible, especially at the outset of the process. Alternatively, Yin (1984, 1994) states that cases studies should always be preceded with the development of some theory that can then be adapted or modified on the basis of the empirical findings. This approach is much more appealing in the context of this research. Even though the global startup phenomenon is rather new, and fairly little theory has been developed in the field, some of the constructs, variables and relationships relevant for this field can be found in other fields. Also, if we want to advance a specific field, we need to build on earlier research, even if it is only to prevent from making the same mistakes or discovering factors or effects that are already known from other researchers.

In this research the empirical cycle (De Groot, 1975; Swanborn, 1993) is gone through twice. First I examine the concept global startup based on a literature review and a series of exploratory case studies. Multiple case studies were deemed necessary because of the exploratory nature of the question. Information from several companies would be necessary to find the common characteristics of a global startup. After that it is examined *how* entrepreneurs interact with their network during the business creation process to fulfil the global potential of their new venture. To this end a more extensive literature review in the field of global startups is conducted first. The insights resulted from this review are combined with insights from theories on 'knowledge-intensive entrepreneurship in networks' that are reviewed as well, to develop the research framework to guide the empirical research. For the empirical research a qualitative approach based on a single longitudinal case study is adopted.

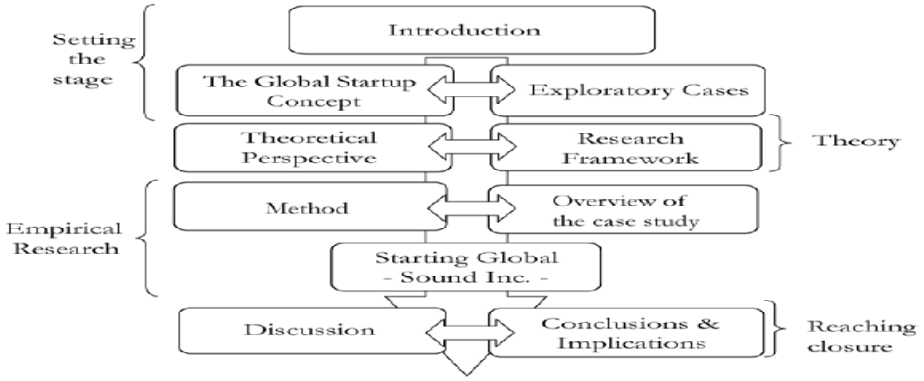
Single cases are mainly used to confirm or challenge a theory, or to represent a unique or extreme case (Yin, 1994). They are ideal for revelatory cases where observers have access to a phenomenon that was previously inaccessible. As suggested by Dyer and Wilkins (1991) single case studies enable researchers to develop a much richer and more structured understanding of the phenomenon under investigation than can be achieved on the basis of several case studies, as time and resource constraints will result in more shallow descriptions.

The company under investigation provided us with access to a wide variety and large amount of data that was often very sensitive and that would not be obtainable from other companies. By comparing and contrasting the findings from this case study to the findings from the theory a series of propositions is formulated that form the basis of a new theory on global startup firms which focuses specifically on how global startups come into existence and progress through their startup process.

1.6 Layout of the dissertation

This dissertation consists of four parts.
Part One, **Setting the Stage,** consists of this introductory chapter and the exploration of the first research question "What is a Global Startup?" This question is explored on the basis of a discussion of the literature (Chapter Two) and of a series of exploratory case studies (Chapter Three). Part Two, **Theory,** presents the theoretical core of this research and elaborates the research questions. Specifically, in Chapter Four I discuss the literature on global startups in more detail, focusing on the relevant insights and theoretical contributions regarding the global startup process and the role of the network in this process. From this, implications and directions will be derived to guide the remainder research. In Chapter Five a research framework is developed on the basis of theoretical insights from (knowledge intensive) entrepreneurship, and networks. Part Three of this dissertation, **Empirical Research,** presents the empirical study. First, in Chapter Six I describe and discuss the method I used in the empirical investigation. Chapter Seven presents an overview of the global startup process of Sound Inc. Next in Chapter Eight the case study findings are analysed and results are presented. In Part Four **Reaching Closure** the findings are used to answer the research questions. The findings from this case study are discussed in Chapter Nine. The Conclusions and Implications of the research are presented in Chapter Ten.

Figure 4 Layout of the Dissertation



2. The Global Startup Concept in the Literature

2.1 Introduction

In this chapter, an overview is presented of the literature in which the concept 'Global Startup' and concepts that are closely related to or associated with the Global Startup are discussed. After introducing these briefly, I compare and contrast the different concepts and argue why the concept global startup is most suitable in this research[5]. In addition, a working definition of this concept is presented. This working definition will then be further examined and elaborated in Chapter 3 on the basis of a series of exploratory case studies. Chapters 2 and 3 are devoted to answering the first research question: What is a global startup? [6]

2.2 New Venture Internationalisation in the literature

Although the phenomenon of young venture's internationalisation is nothing new, the concept 'global startup' is of recent origin: the first reference to the Global Startup firm in the (popular) literature appeared only in 1989[7]. Yet in the decade leading up to that first reference, several authors started to discuss the rapid internationalisation pattern of new ventures that contrasted the traditional 'stage-models' (Johansson & Wiedersheim Paul, 1975; Bilkey & Tesar, 1977; Johansson & Vahlne, 1977) of firm internationalisation. Terms such as '*leapfrogging*', (see e.g. Hedlund & Kverneland, 1985), '*innate exporters*' (Ganitsky, 1989) or '*infant multinationals*' (Lindqvist, 1991) were used to describe the situation when a firm jumps over stages in the classical stages model and internationalised right from its birth. Around the same time, studies on **'***High-technology Startups'* (Jolly, et al., 1992) also identified rapid internationalisation patterns in such firms. However only since the nineteen nineties such firms started to receive more explicit attention under a variety of names.

2.2.1 Global Startups

The concept Global Startup is first mentioned in a practitioner's paper by Mamis (1989). He uses this in relation to the case of the French firm 'Technomed'. Technomed went international before it even had a product and by the age of three was conducting business in 28 countries (Mamis, 1989). Technomed's international activities included utilising international human resources at the headquarters and foreign subsidiaries from the very start.

Around the same time, Ray (1989) conducted a series of four cases in which he used the term global startup; later he revised and expanded these case studies but like Mamis, he does not give a formal definition of the concept 'global startups'. Instead he simply describes these firms as ventures that from the start pursue opportunities wherever in the world they arise. The Global Startup is defined more formally by

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[5] The actual findings of relevant studies in this area will be presented in chapter 4.

[6] An earlier version of Chapter 2 and 3 has been rewritten as a conferences paper (Wakkee, Kirwan and Van der Sijde, 2004) and has been presented at the Academy of Management Meeting, 2004 in New Orleans. The author wants to acknowledge the help and support of Peter van der Sijde and Paul Kirwan in describing the global startup concept

[7] This was the earliest reference I could find in the literature both from conducting a search in several academic search engines and from a broader search on the Internet using Google and Altavista search engines. As pointed out by Dr. Oviatt in his comments on an draft version of this dissertation, the concept global startup was a common term of trade in 1990, which suggests that several articles might have already been produced by that time. However, Dr. Oviatt too had not been able to identify such works either.

Oviatt and McDougall (1994) as one that *seeks to derive significant competitive advantage from extensive co-ordination along multiple organizational activities, the location of which is geographically unlimited***.** Such firms not only respond to globalising market conditions, but also proactively act upon opportunities, to acquire resources and sell outputs wherever in the world they have the greatest value. This description indicates that global startups are highly entrepreneurial firms: they seem to pursue opportunities wherever they arise. Further, Oviatt and McDougall (1994, 1995) suggest that such global startups are typically founded by strong entrepreneurs with international experience and skills.

Besides by Oviatt and McDougall (1994, 1995) the name global startup has seldom been used (for an exception see Hordes, Clancy & Baddelay, 1995, Yeoh, 2000). The most important reason for this may be the qualitative nature of the definition and the lack of an operational measure, which make it difficult to use in large-scale quantitative research. Several authors (e.g. Blomstermo & Sharma Deo, 2002, Harveston, 2000, Moen, 2002) have referred to global startup in their literature review; however they typically treat the concept as being (almost) synonymous with the born global firm.

2.2.2 Born Global Firms

McKinsey & Co (1993) and Rennie (1993) introduced the concept 'born global' in 1993. On the basis of studies about Australian exporters, they describe a born global as a firm that from inception views the world as its market and acts accordingly. He further states that these firms are typically young and sell more than 75% of their produce abroad. From this description Knight derived a more operational measure of born globals (Cavusgil & Knight, 1996, Knight, 1997): firms are classified as born global firms when they begin international activities and reach an export sales level of at least 25% within three years. This level of international sales seems to be quite arbitrarily, but it is chosen because it suggests that international sales activities are significant for the company (Knight, 1997). Also it suggests that the international activities are the result of proactive behaviour from the part of the company and not merely the result of an unsolicited order from abroad. While the born global concept has been most widely adopted in the literature (e.g. Autio & Sapienza, 2000, Harveston, 2000, Moen, 2002, Rasmussen et. al, 2001, Rialph-Criado, Rialph-Criado & Salas, 2002, Saarenketo, 2002, Servais & Rasmussen, 1999), many researchers who have claimed to utilise this definition have made changes to the operational measures without explicitly stating this, or explaining why this was necessary (Wakkee & Harveston, 2003). For example, Kandasaami and Huang (2000) increased the number of countries to five and the percentage of international sales to 40%, and decreased the number of years to two. Similarly, Harveston (2000) defines a born global as one that reaches an international sales level above 25% and that has activities in at least three countries within three years of inception. Recently Moen (2002) classified firms founded after 1990 with international sales levels over 25% as 'born globals'.

The concept born global seems to have gained considerable foothold in the literature. Over 40 publications and working papers examining firms called born globals were identified. However, reviewing the literature I identified four problems in relation to this concept and its definitions:

1. Although the definitions of born globals identified in the literature are similar, the use of different 'operational' dimensions or measures may lead to considerable confusion and even to the comparison of apples and oranges across different studies.
2. The focus on international sales leads to a less than complete picture of the (international) development of such companies, as they may be involved in a wide range of international activities from the start.
3. Both the lack of - (e.g. Knight, 1997, Cavusgil & Knight, 1996, Knight et al., 2000, Moen, 2002) or using a minimum number of countries (e.g. Harveston, 2000, Kandasaami & Huang, 2000) as a measure of global diversity, may result in studying firms that are international, e.g. European or Asian firms rather than global firms (e.g. Knight et.al2000). This suggests that the name 'born *global*' does not reflect the actual nature of the companies under investigation
4. The lack of a measure of company age or stage of development may lead to the study of firms that begin international activities early but only expand these activities at a much later stage.

From this I conclude that the concept born global is typically used in relation to export marketing issues in young but established ventures, while the concept global startup is used more often in connection to entrepreneurial processes in startups. I will come back to this issue in the discussion of this chapter.

2.2.3 International New Ventures

In 1994, Oviatt and McDougall (1994) introduced the concept International New Venture. They defined the 'International New Venture' as a firm that from inception seek to derive a significant competitive advantage from the combination of resources and sale of outputs around the world. This definition implies that a decision has to be made concerning the time of inception. According to Oviatt and McDougall (1994, 1995), inception is a gradual process. Therefore, to determine whether a new venture will be an International New Venture, researchers should determine if there is a demonstrated resource commitment to sell the outputs in multiple countries upon completion of the development. They distinguish between different types of International New Ventures based on two dimensions: the number of countries in which the firm is active and the number of activities along the value chain that are co-ordinated internationally:

- The *international market makers* are firms that are mainly involved in export or import activities either focusing on
  (a) Few countries (the *export / import startup*) or
  (b) Serving a wide array of countries (*multinational traders*).
- The *geographically focused startup* derives advantages by serving well the specialised needs of a specific region through the use of foreign resources and by combining multiple value chain activities.
- The *global startup,* finally, is the most radical manifestation of the INV because it derives significant competitive advantage from extensive co-ordination along multiple organisational activities, the location of which is geographically unlimited. Such firms do not only respond to globalising market but also proactively act upon opportunities to acquire resources and sell outputs wherever in the world they have the greatest value.

In my perspective, the concept International New Venture has two main benefits over the concept Born Global. First, the theoretical basis for the concept and the definition are much stronger, as the authors provide sufficient explanation for the major elements of their definition. For instance, rather than choosing a rather arbitrary period of three years in which international activities should begin, Oviatt and McDougall refer to observable commitment to engage in international activities. Also, they refer to the motive for international activities: creating a competitive advantage. The second benefit is that their framework allows us to recognise that *the* International New Venture does not exist, but that they can take several shapes.

A potential problem in relation to the definition of an international new venture concerns the more qualitative nature; the definition does not offer exact or quantifiable criteria regarding for instance the scale of the international activities. Although the definition of the international new venture can easily be used in case study research, the qualitative nature makes the definition more difficult to apply to large-scale quantitative research. This might explain why the authors in their later work (Oviatt & McDougall, 1998) have used the definition of a born global as defined by Knight (1997) for their empirical work. Interestingly, this problem has received hardly any attention and therefore no adequate solution is offered.

Notwithstanding the benefit of the international new venture concept, very few authors have used this name and definition in their research. However, recently several researchers have combined Oviatt and McDougall's (1994) definition of the International New Venture and Knight's (1997) definition of the Born Global. For instance, Hurmelinna et al. (2002) and Dominguinhos (2002) define born globals as firms that reach 25% foreign sales, after starting export activities within 3 years and from inception seek to derive competitive advantage from use of resources and sale in multiple countries. Further, only two publications that also used the label International New Venture were found in the literature.

The first publication is from Jones and Tagg (2001). Based on a sample 213 firms, they identify different types of 'internationalisation startup patterns' and 'further internationalisation patterns' based on the time to entry, scope of the activities (marketing, R&D and production), direction of the activities (inward, outward) and the intensity (number of links). One group of companies following a distinct pattern of further internationalisation is called the International New Ventures. Interestingly, the authors indicate that the similarity between their 'International New Venture' and the 'global startup' of Oviatt and McDougall (1994), as ventures with significant involvement and commitment at early stages of their development is striking. In my opinion it would have made more sense to adopt this existing label instead of adding to the confusion by using similar labels for different types of firms and different labels for similar firms.

Knudsen and Madsen (2003) have recognised the value of Oviatt and McDougall's framework but they suggest that it should allow for more narrowly defined subcategories. Their approach resulted in a nine-cell framework displayed in Table 1.

	No foreign sales after 3 years	*<25% foreign sales outside own continent after 3 years*	*>25% foreign sales outside own continent after 3 years*
No foreign sourcing after 3 years	Born local firm	Born international seller	Born global seller
<25% foreign sourcing outside own continent after 3 years	Born international firm	Born international firm	Born global firm
>25% foreign sourcing outside own continent after 3 years	Born global sourcer	Born international firm	Born global firm

Table 1 Proposed classification of New Ventures (Knudsen & Madsen, 2003: 25)

Starting from Oviatt and McDougall's original framework, Knudsen and Madsen suggest using international sales and international sourcing as main dimensions in categorising international new ventures. Although this distinction is a considerable improvement over the born global definitions that only include sales, international sales and sourcing, it still does not capture the full range of value-added activities that were originally included by Oviatt and McDougall (1994). For instance it does not recognise co-operative agreements between foreign partners. On the other hand, because they do include more precise criteria of global diversity (no activities, less than 25% activities outside the home continents and more than 25% activities outside the home continent), their categorisation is more suitable for large-scale empirical research.

Interestingly, Knudsen and Madsen consider international sales to be more important than international sourcing when it comes to classifying international new ventures. A firm with more than 25% sales outside the home continent and less than 25% sourcing is considered a born global while a firm that sells less than 25% but sources over 25% is considered a born international. They argue that the proportion of obtaining significant foreign sales is much more difficult than sourcing foreign inputs and that therefore the probability of finding new organisation forms is higher amongst active global sellers than among global sourcers. However, in high-tech sectors resources are often extremely specialised and complex and offered only by a small number of potential suppliers. Therefore, obtaining such resources may be at least as difficult and as important as selling end products abroad. Consequently, I do not completely agree with their classification of firms. Their way of classifying firms can however be explained from the fact that in their research (e.g. Madsen & Servais, 1997, Rasmussen, Madsen & Evangelista, 2001) they approach the phenomenon from an export marketing perspective rather than from a more holistic business startup or entrepreneurship perspective.

2.2.4 Related Concepts

Besides the concepts discussed above, a large number of studies were identified in which similar or related phenomena were discussed. Over the years, terms like '*Global High-technology Firms'* (Roberts & Senturia, 1996) and '*Early-Stage Technology Firms'* (Preece et al., 1999) have been associated with the phenomenon. These firms are typically described as being active in a high-tech industry or engaging in R&D activities and selling part of their produce internationally. Although research suggests that new venture internationalisation is most widespread in high-tech sectors, other studies have shown that it is not limited to such sectors. Indeed research has shown that the phenomenon also occurs in sectors such as trading (Madsen & Servais, 1997), the wine

industry (Moen, 2002) or footwear (Simoës & Dominguinhos, 2001). As Zucchella (2001:6): states 'the "high-tech bias" may lead research to indicate the industry/product as a qualifying feature of born global firms, while it is only one of their possible attributes". Therefore, I would claim that using names like global high-tech firm and high-tech startups as synonyms for born global or international new venture does not do justice to low-tech startup that engage in rapid internationalisation. Also, not all global high-tech firms are startups, and not all and high-tech startups are globalised.

Building on the notion that small ventures are also involved in more advanced entry modes, Dimitratos, et.al (2003) and Ibeh et al. (2003) have introduced the concept of the Micro multinational (mMNE). Micro multinationals are defined as '*internalised SME's that control and manage value-adding activities in more than one country, using such advanced market servicing modes as international licensing agreements, international franchising, international joint ventures or foreign subsidiaries'* (Ibeh et al. 2003: 2). This definition is not limited to startup companies: size rather than age is used as one of the defining criteria. Therefore, this definition is not suitable for my research. Further, although the new ventures with international subsidiaries form a highly interesting subgroup of international new ventures, this is not what I am interested in personally.

2.3 Comparison of the Concepts

Most authors have treated the different concepts and definitions as being synonymous or use the existing concepts and definitions in a disorderly fashion. For instance, many authors state they adopt the definition of the born global firm as formulated by Knight (1996), yet they change some of the operational measures used to identify such firms without explaining why this was deemed necessary. Also, recently, Rasmussen and Madsen suggest (2002), that 'global startups' might be considered to be the only real type of international new venture. The reason is that such firms are extremely flexible, proactive on a global scale, working in a large number of networks and relations whereas other firms are traditionally experiencing more rapid internationalisation (Rasmussen and Madsen, 2002). Nevertheless, these authors chose to adopt the name born global to describe this type of firm, as this name is most widely used and as they have used it in their previous work (e.g. Knight, Madsen, Servais & Rasmussen, 2000, Madsen & Servais, 1997, Rasmussen, Madsen & Evangelista, 2001). Another example that may add to the confusion concerns Jones and Tagg (2001) who point to the striking similarity between their International New Venture and the global startup (defined by Oviatt & McDougall, 1994). Oviatt and McDougall (1995) adopt the definition of a born global firm as formulated by Knight (1997) to obtain their sample of International New Ventures. Also, looking at the literature it is often unclear why some characteristics and / or dimensions of the companies are included in the different definitions. For instance, many studies on 'born globals' (implicitly) suggest that these firms are often involved in a variety of international activities, yet in the operational definition only international sales is included. This unconsidered use of labels and definitions results in substantial confusion and even in contamination of the concepts. An overview of the different definitions and their dimensions is shown in Table 2.

Dimension	*Global Startup*	*Born Global*	*INV*	*MMNE*	*HTSU*
Scope	Coordination of multiple value added activities (Oviatt & McDougall, 1994	International sales (Knight, 1997, Knight & Cavusgil, 1996, Harveston, 2000, Moen, 2002)	Combination of resources and sales of outputs (McDougall & Oviatt, 1994)	Manage and control one or more value adding activities abroad (licensing, franchising, JV's etc) Dimitriatos et al., 2003, Ibeh et al., 2003)	Not mentioned
Intensity	Not mentioned	25% international sales levels (Knight, 1997, Knight & Cavusgil, 1996, Harveston, 2000, Moen, 2002)	Not mentioned	Not mentioned	Not mentioned
Time to entry	From inception (=Observable commitments) (McDougall et al., 1994)	Starts within 3 years (e.g. Knight, 1997) Reaches specific level (25%) within 3 years (e.g. Harveston, 2000) Reaches specific level (25%) within 10 years)	From inception (McDougall & Oviatt, 1994)	Not mentioned	Not mentioned
Company age	Not mentioned (label suggests: startups)	< 20 years Knight, 1997, Rasmussen et al.) < 10 years (Moen, 2002)	Not mentioned	Not mentioned	Not mentioned (Label suggests startups)
Purpose	Seek to derive a significant competitive advantage (McDougall & Oviatt, 1994)	Not mentioned (Knight, 1997; Harveston, 2000) Seek to derive a significant competitive advantage (Hurmelinna et al., 2002, Dominguinhos, 2002)	Seek to derive a significant competitive advantage (McDougall & Oviatt, 1994) Not mentioned (Jones, 2001)	Not mentioned	Find markets and technology (Burgel & Murray (2000)
Global diversity	Unlimited number of countries (McDougall & Oviatt, 1994)	Not mentioned (Knight, 1997) > 3 countries (Harveston, 2000) > 5 countries (Kandasaami & Hoang, 2000)	Depending on the type a few or many (McDougall & Oviatt, 1994) Many (Jones, 2001)	More than one foreign country (Dimitriatos et al., 2003, Ibeh et al., 2003)	Not mentioned
Technological intensity	Not mentioned	Not mentioned	Not mentioned	Not mentioned	High (Roberts & Senturia, 1996; Preece et al., 1998;Burgel & Murray, 2000)
Company size	Not mentioned	Not mentioned	Not mentioned	SME (Dimitriatos et al., 2003, Ibeh et al., 2003)	Not mentioned

Table 2 Overview of concepts and included dimensions

Although each of the different concepts and definitions has its merits, looking at the number and nature of the differences, it can be concluded that the various concepts should not be used as synonyms, as they often have been before. When using different dimensions to describe the firms, findings from empirical research are not readily comparable. This may result in drawing false assumptions about such firms, and limited applicability of the research in practical situations

In order to make sense of the different concepts and dimensions as described in Table 2, I will discuss their benefits and drawbacks and explain why I decided to adopt the concept global startup in the following paragraphs.

In the literature the following dimensions or characteristics are used:
(1) Diversity or scope of the international activities
(2) International intensity
(3) Company age
(4) Timing of international activities (time to entry).
(5) Global diversity of the international activities
(6) Purpose of the international activities (strategic choice
(7) Technology intensity
(8) Company size

Scope and intensity. In my view, the first two dimensions have to be discussed in combination because they are closely related. Many definitions include a measure of international intensity based on international sales levels (e.g. born global firms have over 25% export sales). In most of these definitions sales has been the only type of international activity included. Only a small number of authors have included other types of international business activities in their definitions and descriptions. For instance Knudsen and Madsen (2003) include both international sourcing and international sales, while McDougall, Shane and Oviatt (1994) refer to multiple value added activities.

In my view, the strong focus on international sales as a measure of 'international intensity' in the definitions of born globals of Knight (1997) and others, make these definitions less applicable in the context of the actual startup process of such firms. Sales activities may start at a relatively advanced stage in the startup process, i.e. after ideas have been developed, resources have been acquired and combined, and networks have been set up. These other activities may already take place in an international or even a global context (Fletcher, 2001, Karagazoglu & Lindell, 1998, Korhonen, 1997). Therefore, excluding these activities from the definition and analysis of global startups may result in a less than complete understanding of the early development process of such firms. In addition, using international sales levels (as a measure of international intensity) in a definition of born global firms, means we can only determine if a firm is a born global once the firm is already quite firmly established. Therefore, particularly when studying how such ventures come into existence and develop including a measure of scope (e.g. multiple value added activities/co-ordination of many activities along the value chain) seems more applicable and insightful than a measure of international intensity (based solely on sales). Consequently, the definitions of the International New Venture and global startup (as described by Oviatt & McDougall (1994) are better alternatives when studying the phenomenon in the context of the startup process than the definitions of born globals (e.g. Knight, 1997).

Age and Time to Entry. With respect to company age and time to entry, considerable differences were identified from the literature. In most born global definitions, the moment when the firm *begins* its first cross border activity is set at three years; other definitions (e.g. Harveston, 2000) stipulate that the international activities *reach a certain level* by the end of the third year. In my view the latter approach is preferred. The reason for this is that some firms may *begin* international activities early in their existence but only *expand* these after a considerable time. When the initial international business remains limited to incidental activities one can hardly speak of global startups or born globals. This has to be reflected in the definition used in this study. The descriptions of definitions of the International New Venture and global startup of Oviatt and McDougall (1994) offer a better alternative than the born global definition. The reason for this is that it provides a more theoretically sound cut-off point, and fits better to the goal of this research, which is describing the entire global startup process of such firms. When elaborating their definition they state that internationalisation starts from inception. Inception is defined as the moment where observable commitments are being made. Following Stinchcombe (1965) they argue that for the average firm it takes about six years from this moment of inception to overcome its liability of newness. In my perspective including a period prior to 'official foundation' (e.g. registration of the firm at the Chamber of Commerce) allows us to look at what happens during the preparation phase, and that this period may offer an excellent insight into the motivations and antecedents of the early internationalisation. Also, I am of the opinion that including a period that seems sufficient to overcome the liability of newness (about 6 years) has more merit than the arbitrarily period of three years, when investigating the global startup process fully[8].

Global Diversity. Despite the word 'global' in the label, very few authors have used a measure of global diversity in their definition of born globals (Wakkee & Harveston, 2003). Global diversity refers to the range or number of countries or regions in which a firm is active. Not including a measure of global diversity has resulted in some ambiguity. In fact, Knight et al. (2000) remark that most of the 'born globals' in their sample actually limit their activities to European markets. A few authors have tried to deal with this problem by adding a measure of globalisation to their definitions. Harveston (2000) states that born globals have activities in at least three foreign markets, while (Knudsen & Madsen, 2003) differentiate between international and global firms on the basis of the activities performed outside the home continent. Oviatt and McDougall (1994) take a more qualitative approach in their definition and indicate that the activities should take place in multiple countries (International New Venture) or even in an unlimited number of countries (global startup). As Hordes, Clancy and Baddelay (1995) state, significant differences exist between firms that are merely international or multinational and firms that are truly global. In their perspective, from the beginning global firms are faced with a number of additional challenges than those faced by international startups. One the one hand, the more countries and continents the activities take place in, the more the firm has to deal with differences in legal systems, culture, language, and such differences add to the complexity of the process. On the other hand, when the number of countries or regions increases, new opportunities for doing business arise. Such issues are particularly relevant in the context of our research questions. Consequently, a measure of global diversity should be included in the definition of a global startup. From a

[8] This may also provide us with the opportunity to establish differences between firms that begin international activities even before the actual foundation and firms that do so in later stages of the startup process.

European perspective, I rather use the number or variety of regions (e.g. continents or trade blocks) instead of the number of countries. For example an Austrian firm, which is active in 7 different countries, may very well be active only in its neighbouring countries, -most of which of which are part of the European Union, but not beyond. Such a firm can hardly be called a global firm.

Purpose. Further, in the definition of the International New Venture and Global Startup as offered by Oviatt and McDougall (1994) and some definitions of born globals (e.g. Dominguinhos 2002, Hurmelinna et al., 2002) the purpose of the international activities is included as a characteristic of such firms, i.e. to seek a competitive advantage. Also in further explaining his definition of a born global Knight (1997) suggests that such firms do not simply react to requests and orders from foreign customers but proactively seek these opportunities. In this sense the international activities are not only the result of a strategic decision, but also a strategic necessity inherent in the orientation of the firm. As a result, the purpose of internationalisation should be an important element in the definition of the ventures under investigation.

Technology intensity. It is often suggested that new venture internationalisation is most widespread in high-tech industries (Harveston, 2000, Roberts & Senturia, 1996); however, other studies have shown that it is not limited to such sectors. Indeed research has shown that the phenomenon also occurs in industries such as the wine industry (Moen, 2002) or footwear (Simoěs & Dominguinhos, 2001). As Zucchella (2001) states: 'the "high-tech bias" may lead research to indicate the industry/product as a qualifying feature of born global firms, while it is only one of their possible attributes'. Therefore, using names like global high-tech firm and high-tech startups, as synonyms for born global firms or International New Ventures does not do justice to low-tech startup that engage in rapid internationalisation. Also, not all global high-tech firms are startups, and not all high-tech startups are global. Nevertheless, knowledge-intensity seems to be an important characteristic of most of the firms under investigation and especially in the context of this research.

Size. Finally, only one of the concepts, the micro Multinational, refers to the size of the companies. As already stated this research focuses on startups and disregards the size of these firms. Although a startup will most likely remain am SME throughout its startup period, this size dimension seems irrelevant to the concept of a global startup. Rather the studies on mMNE's simply focus on a different set of companies.

2.4 Preliminary Conclusion

To date, researchers have typically used different concepts and definitions to describe firms that are internationally active from inception as being synonymous. The analysis of the different concepts and definitions offered above clearly indicates that these concepts should not be treated as such, but that instead, despite some similarities considerable differences exist between these types of firms. Each of the concepts and definitions may have their merits in their own field. The definition of the born global firm is precise and easy to use in large-scale quantitative research that focuses on international sales activities. The international new venture concept offers a framework to classify different types of firms that are all involved in international activities from an early stage. Whereas the definition of the international new venture is more closely linked to the theory of new ventures than the born global definition, it is less easy to adopt in quantitative research because of its qualitative nature. Concepts

such as high-technology startups and global high-technology firms are useful when studying the relation between internationalisation and technology intensity or technology intensity and business development. The MicroMultinational, is a very recent concept and points to an interesting phenomenon not previously addressed in the literature, namely the use of more advanced entry methods by Small and Medium Sized Enterprises (SME's).

In the context of this investigation it is clear that the concept global startup as offered by Oviatt and McDougall (1994) is most applicable. The label global startup accurately describes the type of companies that will be investigated: they are still *startups* but already *globally* active. The definition of a global startup as an entrepreneurial firm founded by strong internationally experienced and skilled entrepreneurs that from inception seeks to derive a significant competitive advantage from the co-ordination of multiple value-chain activities in an unlimited number of countries around the world, has a strong theoretical basis and seems to be accurate in its description of these new ventures showing a radical international behaviour from the start. In my view, the qualitative nature of the definition will not result in any problems considering that the empirical research will also be qualitative in nature and no need exists within the context of this research to identify large groups of global startups from a population of firms.

When seeking to discover what a global startup is, deriving a (n abstract) definition from existing literature is only a starting point. In order to develop a better and more thorough understanding of what it actually means to be a global startup we also need to look at practical examples of such firms. This will be done in the following chapter.

In order to avoid confusion between the firm and the process, in the remainder of this research I use the labels global startup firm and global startup process. The label international new venture is adopted when talking about the (all) different types of firms whether they are referred to as born global, high-technology startups, international new venture etc.

3. Exploratory Cases

3.1 Introduction

In order to develop a better understanding of what a global startup firm actually is, finding a definition in the literature is not sufficient. In order to create a better understanding of what it means in practice if a firm, from inception seeks to derive a significant competitive advantage from the co-ordination of multiple value-chain activities in an unlimited number of countries around the world, and in order to determine whether this definition does indeed accurately and completely describe such firms, I conducted a series of exploratory case studies. The results of this exploratory investigation are presented in the following paragraphs. After describing the methodology I used and briefly introducing the case studies, I will discuss the nature of global startup cases in more detail on the basis of the characteristics, as included in the definition and as become apparent from the cases. This chapter ends with an extended definition and description of a global startup firm.

3.2 Method

In the following paragraphs I first describe how I selected the cases to be included in this exploratory research. After that I list the sources of data used in the investigation. Furthermore, several remarks about the quality of the method are made.

3.2.1 Case Study Selection

The case studies were conducted between 2001 and 2003 and consisted of analysis of five existing previously published by other researchers, and four new case studies. I decided to both use existing case studies and conduct new case studies for three reasons. First, the existing case study descriptions in the literature provide a first understanding of the concept. They also indicate how other researchers have looked at the phenomenon. The existing case studies include companies referred to under a variety of labels but that all have been called global and new. In this way I reduced a possible selection bias that would influence further analysis. Second, some of the existing case studies represent cases of global startups from different parts of the world, even though they are all based in Western societies, thereby reducing a cultural bias. Furthermore, some of these cases are based on well-known companies. The recognisability of these cases contributes to their attractiveness and this adds to our understanding of what a global startup actually is.

To select the existing cases I first drew up a list of all case studies published in the literature[9] from which I then selected five cases based on the following criteria:

(1) The company's real identity is revealed,
(2) The descriptions are rich and revealing,
(3) The cases cover different parts of the world, and
(4) The cases represent different industries to reduce the effects of industry pressures.

In addition to the existing cases, four new case studies were also conducted to deal with issues not covered in the existing case studies. Also, talking to the entrepreneurs

[9] Appendix 1 shows a table listing all case studies identified from the literature and provides further information on the case study protocol.

in person would contribute to the creation of a 'feel' for the phenomenon. All the new cases had to be less than 6 years old at the time of investigation. The reason for this was that these firms are likely not to have overcome their liability of newness (Stinchcombe, 1965) and can therefore still be considered to be in their startup period (Oviatt & McDougall, 1994).

To identify the cases I contacted people at the University of Twente and the University Migel Hernandez Elche (Spain) who work with startups professionally as Liaison Officers or directors of support programmes[10]. I provided them with a very basic description of what I believed to be a global startup: "a very young firm that is already involved in several types of international activities in several countries (not just Europe)" and asked them if they could provide me with the contact details of firms fitting this description. From this I obtained access to three Dutch cases and one Spanish case. The inclusion of the Spanish case was made to balance for some of the cultural, economic, and legal differences in the national context.

3.2.2 Sources of Data

The information obtained for the existing case studies included the case description as published in the original study. Further, an Internet search using academic search engines and some Internet browsers was conducted to find additional information. The information for the new cases consisted of information obtained from a single interview conducted with the founding entrepreneur of the company and additional information found through the Internet. In addition, in some cases the original business plans of these companies were obtained either directly from the entrepreneur or through my contact persons. Table 3 lists the types of data sources utilised for each of the case studies.

Case	*Original publication*	*Interview*	*Website*	*Business / marketing plan*	*Brochures / reports*
Ecofluid	X		X		
Logitech	X		X		X
Heartware	X				
Sci Tex	X		X		
ChipIdea	X		X		
Micronit		X	X	X	
NedClad		X	X	X	X
Lionix		X	X		X
Illice Biotech		X	X		X

Table 3 Data Sources for Exploratory Cases

3.2.3 Methodological Considerations

The purpose of investigation was to create a better understanding of what a Global Startup actually is. Even though, this investigation is clearly exploratory in nature, several quality considerations have to be taken into account. These will be reviewed briefly.

Two points have to be made regarding the selection of the cases. First, even though global startups do not have to be high-tech as discussed in the previous chapter, each of the cases included in this exploratory research are high-tech in nature and can even be considered to be university spin-offs based on scientific research

[10] In Twente I spoke with Jann Van Benthem director of the TOP programme and with Dr. Kees Eijkel, Commercial Director of the MESA+ institute. In Elche I spoke with Domingo Galiana Lapera and Ignatio Mira Solves from the Global Start project

outcomes. This choice creates a limitation with respect to the external validity of the findings in a low-tech setting. However, this was deemed acceptable because the remainder of this study focuses on high-tech global startups. Therefore, including only high-tech companies in the new cases would yield the best potential of finding an interesting case study to be used in the remainder of this study. With regards to the existing case studies it turned out that no low-tech firms meeting the criteria were identified from the literature. Second, because my contact persons both worked at a university (liaison office) it is not surprising that they provided me solely with the details of so-called university spin-offs. The origin of these companies may affect the nature of these global startups and as a result the generalisability of the reported findings. Yet, by cross-comparing these findings with the findings from the existing case studies hardly any differences between the new and the existing cases were found that could be completely attributed to the spin-off origin of these new cases. Therefore the effect of this sampling bias seems limited.

With regards to the data sources, Table 3 shows that different sources of data have been used to analyse the different cases. For each case I included at least two sources of data, thereby ensuring some form of triangulation (Yin, 1994). With respect to the existing cases, the different sources were more useful for complementing the information rather than to compare and contrast. The fact that very different sources have been used does reduce the comparability of different cases to some extent, especially because for some case much more information is available than for others. This also becomes apparent from the introductions of the different cases. However, because the goal of this investigation is merely to create an understanding of what it means to be a global startup rather than to develop and test an operational measure, in my perspective these differences do not affect the outcomes of the study.

The interviews were not taped, but interview reports and the final case study reports were sent to the entrepreneurs. They were asked to review the case study report to confirm factual information and discuss findings and conclusions. All entrepreneurs indicated they the reports were accurate. The reports of the existing case studies were also sent to the manager of the companies (if these still existed)[11], for approval. However, so far no responses were obtained. Further I also sent copies of an earlier version of this chapter to the original authors of the existing case studies for comments.[12]

3.3 The Cases

In the following paragraphs each of the case studies will be briefly introduced. Basic information about the cases can be found in Table 4. After this introduction, I review and discuss to what extent each of the characteristics listed in the previous chapter fit the different cases. Also, I describe and discuss other characteristics as they emerge from the cross-case analysis.

Ecofluid Ltd. (Oviatt & McDougall, 1995)

Ecofluid Ltd. was founded in 1991, two weeks after the fall of the Communist regime in Czechoslovakia. Ecofluid's founders (twin brothers) had previously worked in academic positions and decided to commercialise their water-treatment technology they had been researching. Because of the economic, political and financial situation in their home country the founders realised that in order to obtain financial resources, investors had to be sought internationally. Also, the potential revenue in the domestic

[11] The manager of Heartware International could not be traced.

[12] Responses were obtained from Dr. Dominguinhos and Dr. Oviatt. In general their comments reflected a general agreement with my interpretation of their case studies.

market would be limited. Therefore, customers had to be targeted internationally as well. Customers include municipalities, hospitals, hotels, agricultural firms and industrial plants and come from various countries in North America and Europe including the U.S., Canada, Spain, Portugal, Italy, Czech Republic and Slovakia. By the end of 2003 Ecofluid had offices in Canada, Spain, the Czech Republic, and Slovakia where various value-added activities are performed including sales, R&D and production.

Logitech (Jolly, Alahuhta & Jeannet, 1992)
Founded in 1982 by a Swiss and two Italians, Logitech SA was truly international from the very start. Dreaming of setting up a company with a global reach, the founders decided to set up headquarters both in Switzerland and the U.S. Within a few months operations were expanded to Taiwan and Ireland. The rest of the world soon followed. By 1989 when the case study was first published the company sold 65% of its produce in the U.S. 28% in Europe and 7% in the Far East. Besides sales, international activities included engineering and manufacturing in three continents. For instance, R&D activities were moved from Switzerland to California quickly to benefit of huge presence of specialised and well-trained human resources and enormous R&D activity in Silicon Valley. By the end of 2003 Logitech employed over 4800 people and had offices in over 25 countries. Company shares are sold on the stock markets in Switzerland and on the American NASDAQ.

Heartware International Ltd. (McDougall et.al1994)
Heartware International Corporation (Heartware) was a medical equipment company founded in 1988. During his previous employment Heartware's founder was introduced a new technology to monitor heartbeats developed at the University of Maastricht in the Netherlands. When his previous employer did not want to pursue the opportunity offered by this technology (and the co-operation with the University of Maastricht), the founder decided to acquire the product rights and to market the system himself. It was agreed that Heartware would pay the University of Maastricht a monthly fee in exchange for the rights to the revenue, and the assembly, inspection and testing of all the systems by the University. Also Heartware agreed to payment of royalties to two contact persons at the University who would provide assistance with sales demonstrations, installation and service calls. The company's founder, had previously worked at the international sales departments of a chemical plant and a medical equipment manufacturer, and he had also spent some months in Spain as a student. He had developed a clear global vision and was enthusiastic about expanding the firm internationally to capture international opportunities. Indeed, from the start the company was truly global. Product development and technical support thus originated in the Netherlands where a close strategic alliance was formed with the University of Maastricht. Headquarters and investors were located in the U.S. Human resources were found in the U.S. and the Netherlands. Sales came from the U.S., the U.K., Italy, Spain and Brazil and distributors were found in the U.S., the U.K., Saudi Arabia, South Africa and Turkey. Although the future looked bright for Heartware, when the company's key contact person at the University of Maastricht was suspended, differences arose with respect to the interpretation of the contracts between the university and Heartware. When no new partner was found, it was decided to terminate the venture only two years after startup.

Sci Tex (Ray, 1989, 1995)
Founded in Israel, Sci-Tex (Scientific Technology) develops, manufactures and markets electro-optical systems. The company was founded in 1968 as a spin-off from the American company where the founder, had previously worked. The founder's life experience on two continents proved useful in expanding the company globally. This global expansion was essential as the domestic Israeli market could not compensate the necessary investments in R&D and would not enable company growth. The first few years however, Sci Tex experienced technical success but commercial failure. This only changed when a new manager was added to the tam. This new Canadian manager was the key to finding a market niche in supplying specialised equipment to the textile industry. He got Sci-Tex out of the military business and introduced both a bottom line and marketing orientation to a R&D company. This allowed the small firm to compete even with the largest players. Within a short period after this redirection the company was involved in both sales and collaborative activities in North America, Europe, Asia and of course Israel.

Chipdea (Simoẽs & Dominguinhos, 2001)
ChipIdea Microelectrónica S.A. was founded in February 1997 by three University Professors from the Instituto Superior Técnico (IST). ChipIdea is the only company in Portugal, which possesses advanced microelectronics design capabilities, particularly in the areas of analogue and mixed-signal integrated circuits, and which is fully operating in the global semiconductor market. By the end of 2003 the company employed over 120 people and continues to grow. In fact, ChipIdea Microelectronics SA is Europe's 32nd Fastest Growing Small-to-Medium Sized Business. International activities include sales in Europe, North America and Asia Pacific, collaborative R&D with partners from Israel, China and the U.S. and production and design centres in China (Macao).

Micronit
Micronit is a Dutch startup founded by two recent graduates of the University of Twente in 1999. When the company first started it was mainly involved in the development of sensors to analyse fluids for medical and chemical purposes. Soon however, the focus shifted to the development, design and production of all-glass lab-on-chips. At this moment, Micronit is the only company that is able to rapidly deliver glass microchips in various dimensions, created with different techniques and different kinds of glass. From the very start the founders of the company had a clear global vision. They realised that the Dutch market would simply be too small to justify the necessary investments in R&D. At the same time their products offered clear added value to research labs around the world. Even though the founders explored possibilities in Asia and Eastern Europe, today Micronit's activities focus on Western Europe and North America, with international sales being the most important cross-border activities. For instance, very early on two large U.S.-based pharmaceutical companies were attracted as clients. In addition, in relation to product development the company co-operates closely with some of its international partners. To this date, resources are mainly sourced domestically. For instance venture capital was attracted from both the university and a regional participation company. Also, research facilities, technology (in the form of patents and licenses) and raw materials are obtained locally.

NedClad

NedClad Technologies was founded in 2000 by a group of entrepreneurs after a series of discussions and a market research initiated by the University of Twente and the NAM (Dutch Oil Society) regarding Laser Cladding. Laser cladding is a new technology that can be used for the revision of engines, axis etc. It soon became apparent that the actual production (cladding) would mainly be focused on the domestic market as a result of the transportability of both the required equipment and the goods that needed the cladding. However, the entrepreneurs realised that the technology would have a global potential and could be licensed out to companies all over the world. Therefore, it was decided to split the company in two parts: one production firm and one research oriented company. The production company would be focus on the domestic or (EU-) regional market. The research company is currently setting up operations and is involved in discussions with potential global customers. One of the main problems the company is facing is the fact that to this date ship-engines cannot be insured after they have been revised as the old technology yielded unsatisfactory results. To overcome this issue and open up a new market, NedClad has been involved in negotiations with the world's largest ship-insurance company Lloyds, to change the insurance-conditions and make cladded engines to be insurable. However, due to several operation issues this process seems to take more time than was originally envisioned. Therefore, since a few months the firm has started to explore the possibilities of using their cladding technology as an environmental friendly substitute for hard chrome plating which could open up new international markets very soon. So even if this company did not yet reach its global potential fully at least the company seems to be heading in that direction rapidly.

Lionix

Lionix was founded in 2000 as a spin-off from the University of Twente under the name Lion Photonix. In April 2002, the company merged with a new business unit of another high-tech firm in Twente called 3T. After this merger, the name was changed into Lionix. Today Lionix is a leading provider in development and small to high volume production of leveraging and innovative products based on Microsystems technology and MEMS. The core technologies are integrated optics and Micro fluidics. Lionix' customers operate in telecom, industrial process control, life sciences and space markets and include OEM's, multinationals, as well as research institutions from around the world. By the end of 2003 the company was involved in several strategic alliances including both Dutch and foreign partners from Denmark, Norway and the UK. These alliances enable Lionix to offer complete solutions, and to control the process of development into production as well as the manufacturing of the final product that would not be achievable if the company were working on its own. Cooperation is based on subcontracting, licensing of IP or joint ventures. Furthermore, the firm has sales representatives in Israel, the UK and the US. Finally, the company staff includes several foreign employees, which has resulted in a multinational culture.

Illice BioTech

The final case concerns a company called Illice BioTech. The Spanish firm was founded in 2001 by a professor of the University of Miguel Hernandez in Spain. This firm is active in the field of molecular biology; it prepares drugs discovered in the university laboratories for clinical testing. The entrepreneur mainly sees his job a preparing the university's research outcomes for commercialisation. The research is being conducted at university facilities, mainly because the entrepreneur is still

working at the research centre. Further, the entrepreneur clearly has a global vision. He is aware of the global nature of his market and does not feel that geographical borders restrain his activities. Although the firm was founded less than 2 years ago, the entrepreneur has been able to initiate several international operations. The activities include attracting resources such as financial investment, advice and practical support from foreign suppliers. Further, contacts have been made with a number of (potential) customers and partners. These activities are being undertaken in the EU, Australia and the US. In order to obtain the (financial) support the entrepreneur is looking for, he contacted a German venture capital firm. This venture capitalist is probably the firm's most important partner. He provides the entrepreneur with practical assistance, for instance in writing business plans and building his network. Furthermore, the venture capitalist has pointed the entrepreneur to several opportunities.

3.4 Findings and Discussion

A global startup is defined as a firm that from inception seeks to derive a significant competitive advantage from the co-ordination of many different activities along the value chain in a wide number of countries (Oviatt & McDougall, 1994). This definition includes four elements: (1) time to international entry; (2) purpose of the international activities; (3) scope of the international activities and; (4) the location of the international activities. In addition to these four dimensions, their description also suggests that global startups are (5) entrepreneurial ventures and (6) founded by strong internationally experienced and skilled entrepreneurs. Finally, because in this study the focus is on networking, a final dimension is included: (7) the role of networks

3.4.1 Time to entry

The name global startup firm already suggests that this type of venture begins to globalise its activities while it is still in its startup phase. The evidence from the case studies shows that global startups are really globally active during their startup process. In fact, the inception of the firms was internationalised in many ways. Each of the companies introduced above initiated various different types of border crossing activities in multiple regions during its startup process. For instance, both the founders of Ecofluid and of Illice Biotech realised that a successful venture launch would require external financial investments. As it was not possible to obtain domestic funds, they did not hesitate to seek funding elsewhere. At the same time, a customer base and partnerships were also sought globally from day one. The startup (and in the end the survival-chance) of Heartware was also strongly connected to the international alliance with the University of Maastricht. Without this contact and alliance the venture would not have come to being. Such an approach is truly different from one that that focuses on international sales in potentially close markets. In the case of Micronit, the founders presented their sensors at several conferences and fairs, prior to the launch of his venture. From this two propositions can be formulated.

P1. The startup process and the globalisation process of a global startup process are highly integrated and cannot be seen in isolation

P2. Global Startups begin in international activities even before the start of their actual operations

3.4.2 Purpose

According to Oviatt and McDougall a global startup engages in a variety of border-crossing activities in order to develop a competitive advantage. Although the companies all strive (d) to become the market leader in their industry, the term competitive advantage does not really apply to many of these firms. The reason for this is that a competitive advantage can only be achieved vis-à-vis competitors. The cases presented above include many companies that are so highly specialised that they are in fact the only provider to the technology, product or application in the entire world. If competition does exist for these companies it is with providers of more traditional products. For instance, NedClad competes with companies using 'traditional' laser technologies. Also, it seems that if multiple players are active in a similar field (for instance the cases Micronit and ChipIdea, both are engaged in the development of the lab-on-a-chip) the market is not yet governed by traditional competitive rules. At this stage, some of the global startups (e.g. Lionix, Micronit, and perhaps even ChipIdea) have to focus on creating new markets rather than competing in these markets. As several entrepreneurs emphasised the innovative nature of their product demands major investments in creating awareness and acceptance of the technology and/or its applications and why seeking of a competitive advantage does not seem to be the main purpose for going internationally early on.

So what is the purpose for internationalisation *that* early? According to the definitions of McDougall, Shane and Oviatt (1994) Hurmelinna et al. (2002) and Dominguinhos (2002) seeking competitive advantage is the main engine. Looking at the cases, it seems that the nature of the opportunity on which these companies are based is global. In other words, the products developed and or produced by the market have global sales potential and/or can only be created using resources obtained internationally and/or in co-operation with partners across the globe. The reason for this is that on the one hand the product is highly specialised and only offered by one or two companies while at the same time sought after by a small group customers around the world, while at the same time these products do not have to be adapted to local standards. On the other hand, the required resources and skills needed to create these products might be equally specialised and offered by very few and globally dispersed suppliers. In addition the domestic market may be too small or even inexistent. For instance, the founders of Ecofluid and Illice BioTech, Heartware and Sci Tex all set out and succeeded to obtain financial capital from external (foreign) investors as they could not obtain the necessary funds domestically. Micronit realised from the start that its products would offer an added-value to research labs around the world, the Dutch market would simply be too small to compensate the large financial investments in R&D. NedClad realises that if the insurance company will accept cladded parts in ships insurable, the world is their market. Thus rather than to seek a competitive advantage, global startup firms internationalise from the start to pursue global opportunities. This idea has also been suggested by, for instance Ray (1989, 1995) and Dominguinhos (2002). In other words, these firms are able to recognise and exploit opportunities wherever in the world they arise.

P3. Global Startups engage in international activities in pursuit of opportunities instead of achieving a competitive advantage directly

3.4.3 Scope

According to Oviatt and McDougall global startups are involved in the co-ordination of multiple value-creating activities across national borders. Each of the cases showed a variety of international activities. The entrepreneurs in the new cases all indicated that of these activities international sales was the most important as this is the activity yielding revenue. Also international sales activities are the most formalised of all activities. Whereas some of the sourcing activities just happened to be international because the best supplier was international, sales was proactively pursued. In most of the cases international sales is achieved through direct export an / or d the use of agents or distributors located abroad. Further, a company like Logitech has its own stores around the world, which is an example of foreign direct investment. This shows that from a very early age, different entry modes are being used than is often suggested as common or even possible for new ventures in traditional internationalisation models (such as those of Johansson & Wiedersheim-Paul, 1975, Johansson & Vahlne, 1977, Bilkey & Tesar, 1977).

Besides the international sales activities, all cases show its involvement in other types of formal and informal cross border activity[13]. Some firms are involved in some sort of cross border R&D, if only by including foreign customers in the development of new products as is done by Micronit. Other companies, e.g. Logitech, Ecofluid and Sci Tex locate their R&D activities abroad to benefit from the potential of the innovative industrial clusters, and highly skilled personnel. Furthermore, whereas the literature mainly discusses outward (export, foreign subsidiaries) and downstream (marketing, sales) types of international activities, many of the global startups introduced above are also using foreign (tangible and intangible) resources of some sort. For instance, Lionix has obtained international human resources in the form of non-Dutch employees who are working in the Netherlands. ChipIdea has chosen to set up operations in China (one of the reasons was to benefit from cheaper labour costs). Findings similar to the ones reported here have also been shown by for instance Jones (2001) in relation to high-tech startups.

Finally, the case studies show that the international activities do not always take the traditional form: many of the products are so radically new, that awareness creation and acceptance is critical. Traditional marketing techniques may not suffice. Consider the case of NedClad. Until recently engines and axes of large ships could no longer be insured after they had been revised, because revision with traditional technologies would reduce the quality and reliability of the engine. Cladding however would improve rather than reduce quantity and reliability of these parts. Therefore, the company became involved in negotiations with a large insurance company. If this insurance company accepts the technology new opportunities are opened up for NedClad both domestically and internationally. Creating technology acceptance and setting new industry standards together with foreign partners and counterparts is thus essential for global startup firms. From the above it can be concluded that global startup firms are indeed, as the definition suggests involved in the co-ordination of multiple activities along the value chain using various entry modes.

The concept entry mode is frequently used in relation to international sales (direct export, use of domestic or international agents, setting up sales offices abroad (e.g. Johansson & Wiedersheim-Paul, 1975, Cavusgil, 1980). For instance, a company can use direct sales, agents, local distributors, or a local sales subsidiary to enter different

[13] With formal referring to those exchange activities governed by contracts and informal activities referring to those exchanges which are not governed by contracts but rather by social networking

markets. The cases show that the use of different entry modes is not limited to entering sales markets but more general to entering various international networks whether these are related to sales, R&D, production or simply the exchanges of ideas and information across national borders. From the cases it seems that global startups use entry modes that range from cross-border activities that are directed from the domestic market, the use of intermediaries (e.g. sales agents or distributors), partnerships (e.g. joint R&D) or setting up foreign subsidiaries either through Greenfield operations or joint ventures. From this two propositions are derived

P4. Global Startups are involved in a wide range of formal and informal value added activities across national border

P5. Global Startups use a variety of network entry modes

3.4.4 Global diversity

The companies introduced above are globally rather than internationally active. Each of the companies is active in Europe and North America. However, all cases except Ecofluid and Illice Biotech also show that markets in Asia, The Middle East and Latin America are not beyond the reach of these new ventures. For instance, ChipIdea has set up wholly owned facilities in a country as remote and perhaps as exotic as China within a few years after its inception. Furthermore, Heartware, ChipIdea and (not surprisingly) Sci Tex were involved in activities in the Middle East. Also, a company like Micronit has been aware of potential opportunities for their sensors for wastewater analysis in less developed countries in Africa at a very early stage in its existence. Even though this has not yet resulted in concrete projects or sales, this is a clear indication of the global vision propagated by the founders of global startups. Similarly NedClad has not yet been able to set up concrete business activities outside Europe, but nevertheless the company engages in informal exchange of ideas and knowledge with counterparts from Australia, North and South America. The information obtained in this way affects the direction of the company by showing where interesting opportunities may exist or be created.

Interestingly, from the cases it also became apparent that activities that are being performed domestically are located there on the basis of the opportunities that exist domestically rather than on the basis of personal preferences or domicile of the entrepreneurs. For instance, the founders of Micronit and Lionix realised that in the Netherlands they had access to excellent, perhaps even the best R&D and production facilities (at the MESA + institute) was at least as important, if not more, in their decision to found the company in the Netherlands than the fact that it was their domicile. If there had been no such institute in the Netherlands, the company would simply be founded in a country or region that has. The findings indicate that suggestion by Oviatt and McDougall (1994) that the number of countries in which such firms operate is unlimited is in fact true. Cultural, technological, political and legal differences do not seem to limit global startup firms in their activities. Rather the presence of resources, partners and customers (or in other words the pursuit of opportunities) determined where activities were undertaken. This indicates that global startups are truly able to think in terms of a borderless world.

P6. Global Startups are active in a wide number of regions of the world

P7. Global Startups internationalise their activities following the presence of opportunities rather than following a pattern of increasing physical and cultural distance

3.4.5 Entrepreneurial nature

This entrepreneurial nature of the global startup firms has already been shortly addressed under the section dealing with the purpose of the internationalisation. In that section it was concluded that global startup firm mainly start global because they pursue global opportunities. This pursuit of opportunities is central in entrepreneurship (Shane & Venkataraman, 2000, 20001, Singh, 2001, Zahra & Dess, 2001, Van Der Veen & Wakkee, 2004). However, the entrepreneurial nature of the cases is also found in several other characteristics and behaviours.

First, it is often suggested that entrepreneurial firms seek high growth (e.g. Harveston, 2000). Such high growth rates are also often mentioned in relation to global startups and other types of international new ventures (e.g. Jolly, et al., 1992, McDougall & Oviatt, 1994, 2000; Zahra & George, 2000). This may suggest those global startups are high growth companies. Looking at the empirical evidence, the cases do not show a consistent picture. Although some of the cases, - particularly Logitech and ChipIdea,- have indeed experienced rapid growth, most of the Dutch global startups remain small in terms of employees. In fact in several new cases (Micronit, Illice BioTech), the entrepreneurs indicated that they were not interested in running large multinational firms and that they rather use strategy of co-operation to avoid having to grow too fast in terms of the number of employees. For instance, Lionix is involved in a number of (international) strategic alliances that allow the company to attract customers and orders it could never handle without having to grow rapidly. Also, it seems that some global startups prefer spinning-off new business units to growth. For instance, the entrepreneurial team of NedClad realised that it would be best to separate the more standardized activities from the more innovative research-oriented activities. It was decided to set up two different organisations to pursue both opportunities.

Furthermore the lack of rapid growth in some cases, such as Illice BioTech seems to be the result of the research-intensive nature of the business where the period between start and actual generation of profits may be extensive. Growth might only start after ten or even fifteen years. Also, the founders of both Lionix and Micronit have suggested that growing (in term of employees) is not their main goal. In fact, they suggested that as soon as the firm would become too large they would rather spin-off some activities and create new organisational units or even new startups. From this, I conclude that growth in the traditional sense is not inherent in the nature of global startup firms. In this respect they are no different from other entrepreneurial ventures. As Wiklund (1998) found, entrepreneurship and growth are not necessarily inseparable.

Also, entrepreneurship is often associated with proactiveness, innovativeness, risk-taking and competitive aggressiveness or in other words: Entrepreneurial orientation (e.g. Covin & Slevin, 1991, Lumpkin & Dess, 1996, Lumpkin, 1998). Although this entrepreneurial orientation is a construct that particularly applies to established ventures (as it measures historic behaviour) the companies described in the case studies, no matter how recently they were founded, all show signs of this entrepreneurial orientation. Whereas most other firms begin international activities as a result of unsolicited orders from abroad, global startups proactively seek customers and create markets for their products and services. For instance, all companies have been highly active in creating a market by developing radically new, high value-adding

products and finding customers for these by presenting them at trade fairs, conferences, etc. The founders of Micronit indicated they travelled abroad frequently to explain the benefits of their products to potential customers or partners, even if this would only result in sales on the longer term. Even though, it is often suggested that high-tech firms are more research-oriented than market-oriented (e.g. Roberts and Senturia, 1996, Jones- Evans, 1995) all the cases showed evidence of at least a strong sales orientation and proactive market approach. Yet, they did not engage in market research activity of any kind.

Next, each of the companies is highly innovative as can be seen in the types of products they develop. All companies were founded on the basis of innovative technologies and R&D continues to be the main function (besides sales) for all. A good example of the innovativeness of Scitex is the high number of patents (over 700) owned by the company. Some other entrepreneurs (e.g. Lionix) indicated that obtaining patents was of no use, as the rate of innovation would make the patents obsolete before they could be obtained.

Finally, all the founders are highly educated, many have Ph.D. degrees. For instance, he founders of Lionix, Illice BioTech and ChipIdea were employed as researchers before founding their company and they continue to work closely with these universities. The risk taking and proactive nature of the cases is perhaps most clear in the foundation of Ecofluid which was founded within days from the fall of the communist regime, while knowing the domestic market would be virtually inexistent and financial resources would have to be obtained from foreign investors. The innovative nature of all the cases can be seen in the types of products these companies have brought to the market. For instance Logitech was the first company to bring to the market cordless computer desktop-aids while ChipIdea was one of the first companies in the world and still is the only company in Portugal which possesses advanced microelectronics design capabilities, particularly in the areas of analogue and mixed-signal integrated circuits. The NedClad case provides a good example of proactive, risk taking and innovative behaviour as well. In order to build a global market for its technology and services the firm is trying to change the rules of the industry by convincing the insurance company Lloyds to change its insurance regulations. Also the company decided to invest large amounts of money in a new laser-source without having a clear (potential) customer base and thus without the guarantees that the entrepreneurs will ever be able to earn back their investment.

Starting a new venture always involves some level of risk taking, as the entrepreneurs must invest time and other resources (and typically quit previous employments at least partially). Starting in high-tech industries is often associated with even higher levels of risk taking since R&D investments may be required and time to break-even is often extensive due to long R&D periods. The fact that global startups may not be able to survive unless they are able to set up global operations quickly (e.g. when no domestic market is available) also adds to the level of risks associated with startup (e.g. Oviatt & McDougall, 1994; Bloodgood, Sapienza & Almeida, 1996). After all, it may be more difficult to establish relationships with counterparts from different parts of the world when compared to establishing such relationships domestically. The data on the existing cases studies provides very little information with respect to the risk taking behaviour of the founders besides them giving up their previous jobs and investing their time and personal financial resources in the new venture. From the new cases especially NedClad's founders have made a relatively high financial and risky investment when they decided to buy their own laser facility rather than to only use the access to the laser facilities provided by the University of Twente. Further, all founding entrepreneurs (Micronit, NedClad, Lionix and Illice BioTech) seemed to

realise that the need to set up global operations might make starting in their sector more risky. However, all of them added that it would also provide them with additional opportunities and that therefore the risks were worth taking.

The four new cases showed that global startups might not necessarily have high levels of competitive aggressiveness. In line with the notion of emerging markets and technologies and focus on pursuit of opportunities rather than creating a competitive advantage the entrepreneurs do not feel a need to eliminate the competition. Rather as formulated by the founder of Micronit, "for the moment there is room for many new ventures in addition to the larger incumbents, in time they will all need to find their own niche market but for now it is enough to create good products and we are willing to co-operate with potential (future) competitors rather than competing against them as we will all benefit. However, the founder of Lionix mentioned that the lack of fierce competition will change and competition will become intense when Microsystems technologies become more mature. He already anticipated that competition would truly be global. No data was obtained in relation to the existing cases to determine whether or not they had high levels of competitive aggressiveness.

From the above, it can be concluded that global startups do have relatively high levels of entrepreneurial orientation, as do other types of high-tech startups. However, due to the need to set up global operations especially the risk of founding a global startup may be higher. Also, the case studies provided several examples of innovative behaviour both with respect to technology and market development. Two propositions can be formulated:

P8. Global Startup firms are not necessarily high growth companies in terms of number of employees

P9. Global Startup firms are characterised by relatively high levels of entrepreneurial orientation[14]

3.4.6 The role of the entrepreneur

The entrepreneur's international experience and skills is often thought to explain the rapid internationalisation of INV's (e.g. McDougall, Shane & Oviatt, 1994). In order to operate in such a global context the entrepreneur (ial tam) must have international skills and experience. Although most studies acknowledge the role of the entrepreneur, entrepreneur-based characteristics have so far been treated as factors influencing the internationalisation of new ventures (e.g. McDougall, Shane & Oviatt, 1994, Harveston, 2000) rather than as a part of their identity.

Looking at the empirical evidence, it is clear that each of the companies is indeed founded and directed by a single entrepreneur or a team of entrepreneurs that strongly dominate the development of the company. The global vision that is often associated with global startups was apparent in all entrepreneurs. From day one they were aware of the global nature of their company's opportunity. They realised that on the one hand, their products would offer added value to customers around the world and that on the other hand, global activities were essential in setting up these activities.

[14] Although there may seem to be a strong relationship or even correlation between this issue and proposition 3 (global startups engage in international activities in pursuit of opportunities), the main difference is that proposition 3 deals with why startups go global (to pursue opportunities) while the proposition 9 deals with how this is done (by innovative, proactive and risk taking behaviour.

However, considerable variety exists with respect to their actual international experience. The founders of Sci Tex and Logitech indeed have considerable experience in living and working abroad. Yet, the direct effect of this international experience is questionable. In the case of Sci Tex this international experience enabled the founder to obtain international venture capital to finance his venture. Alternatively, Lionix founder suggested that in his perception, his work experience in France and Switzerland this experience is not the main reason why the firm is globally active nor does it determine (or limit) the location(s) where international activities take place. Also some of the other founders did not have such hands on international experience and they were nevertheless able to set up global operations. An explanation for this may be found in their background though. Except for the founders of NedClad and Micronit, they all had backgrounds in academia. Universities are typically highly international organisations where students and faculty members from foreign countries visit regularly. Also, scholars are used to participating in international conferences. This international culture may give these entrepreneurs sufficient confidence to operate internationally. Also, the (non-American) entrepreneurs were able to communicate in foreign languages (typically English and one other language) proving them with additional confidence to set up international operations.

Several entrepreneurs indicated that some markets were considered more difficult to enter and were thus avoided as much as possible. For example, one of the entrepreneurs suggested that Japanese companies were more difficult to do business with because of their culture and because they might 'steal' the concept. Also, the French market was considered to be difficult to enter because of the language. Despite such difficulties, none of the entrepreneurs felt that doing business internationally was truly more complicated than doing business domestically. All Dutch entrepreneurs indicated they felt confident in doing business in other cultures in general. This suggests that the perception of the entrepreneurs considering their international skills is more important than formal education, training or experience in international business when founding a global startup.

P10. Global startup firms are typically founded by internationally skilled and confident entrepreneurs

3.4.7 The role of the network

Besides these characteristics the analysis of the cases indicated that one more characteristic not previously addressed in the definitions and descriptions is also inherent in the nature of global startup firms: their embeddedness in an international network: Even though the importance of the network in internationalisation has been widely acknowledged (e.g. Coviello & Munro, 1995, Blomstermo & Deo Sharma, 2002), the embeddedness of global startups in a global network has not yet been included in any of the definitions identified in the literature. Yet, in each of the cases the presence of a domestic or international partner and the existence of international network contacts was a critical success factor: This partner was either a university of research institute (as was the case for Micronit, Heartware) or a financial investor (for instance, Ecofluid). Illice Biotech relied on both a university research institute and an investor. However, in each of the cases this partner played an important role in providing the companies with access to resources such as finance, research facilities, Intellectual Property Rights etc. For the startups it would have been very difficult or even impossible to obtain such resources on their own or by other means and without these the companies could simply not exist. For instance, access to a fully equipped clean room is critical to the development of sensors as produced by Lionix. Further,

these partners often helped the companies in setting up their organisation and their initial customer base. For instance Micronit enrolled in the TOP programme, which provided them with access to a business coach that helped them avoid some of the major pitfalls a startup usually makes. The German investor of Illice Biotech also served as a mentor to the founder, who had no business experience at all. Finally, in some cases the partners also helped the startups in creating some level of credibility, which usually requires an extensive track record. For instance the founder of Lionix indicated he often used his alliance with the world-renowned MESA + institute to gain a foothold at his customers.

The importance and benefits of having close relationships with a strong partner is clear from all the cases; yet the dangers of such a dependency on having a strong relationship with a single dominant partner were best shown in the Heartware case. When the relationship with the University of Maastricht became troubled the survival of the company was endangered and eventually, the company was terminated because no solution could be found.

Literature on entrepreneurship (e.g. Aldrich & Zimmer, 1986; Birley, 1995) it can suggests that all firms are embedded in a network. What makes global startup firms different is the fact that they are embedded in *international* networks from a very early stage. Both the interview data and the data obtained from the company websites indicate that each of the cases have networks consisting of individuals and organisations from multiple countries and regions, even when the founders had no contacts in these countries prior to starting the venture. Thus embeddedness in an (international) network should be regarded as a defining characteristic of global startup firms

P11 Global startups often rely on the relationship with strong partners; this may be commercial partners or research institutes.

P12. Global startups are embedded in international networks from the start

An overview of the findings is shown in Table 4

Dimension	*Ecofluid*	*Heartware*	*Logitech*	*Sci Tex*	*ChipIdea*
Time to entry	Before start	Before start	At start	?	?
Purpose	No resources and market found domestically	Resources and market globally dispersed	Pursue opportunities wherever they arise	Pursue opportunity offered by technology and market	Pursue opportunity offered by technology
Scope in 2003	Sourcing, sales, R&D, production etc	Sourcing, R&D, Marketing, Sales, Support	Sourcing, R&D, Marketing, Sales, Support	Sourcing, R&D, Marketing, Sales, Support	Sourcing, R&D, Marketing, Sales, Support
Diversity	Europe, North America	North America, Europe, Asia, Middle East	North America, Asia, Europe, Africa, Australia	North Africa, Europe, Middle East, Asia	Europe, North America, Asia
Entrepreneurial nature	High level of EO	High level of EO	High Level of EO	High Level of EO	High Level of EO
Role of Entrepreneur	Strong, no international experience, former researcher	Strong, international experience	Strong, international experience + composition	Strong, international experience	Strong, no international experience, international confidence, research background
Role of the Network	Unclear, seems VC played an important role	Partnership with Dutch University made startup possible and break up of alliance caused the end of the venture	No evidence of strong partner	Limited evidence of strong partner	Strong partner in the form of a University

Dimension	*Micronit*	*NedClad*	*Lionix*	*Illice Biotech*
Time to entry	Before actual start	Before the start	At start	
Purpose	No resources and market found domestically	Resources and market globally dispersed	Pursue opportunities wherever they arise	Pursue opportunity offered by technology and market
Scope in 2003	Sales, R&D cooperation with North American professors	Sales, search for partners and alliances, licensees	Sourcing, R&D, Marketing, Sales, Support	Sourcing, R&D, Marketing, Sales, Support
Diversity	Europe, North America	Europe, North and Latin America	North America, Asia, Europe, Australia	Europe contacts in North America
Entrepreneurial?	High level of EO	High level of EO	High Level of EO	Mid Level of EO
Role of Entrepreneur	No international experience, international confidence	Limited international experience, internationally skilled and confident	Strong, international experience + composition	No international experience, international confidence, research background
Role of the Network	Strong alliance with University of Twente	Strong alliance with University of Twente + DemarLaser	Strong alliance with University of Twente	Strong dependence on relationship with Venture Capitalist

Table 4 Overview of findings

3.5 Conclusions and Implications

As indicated in the introductory chapter of this dissertation, the first purpose of this research was to contribute to the development of a better understanding of the concept global startup. To this end, I investigated the literature and conducted the exploratory case studies presented above. By combining these sources of information, I believe a clear and workable picture of the global startup has emerged.

From the literature review it was concluded that the concept global startup and the definition of this concept by Oviatt and McDougall as a firm that from inception seeks to derive a significant competitive advantage from the co-ordination of multiple value-chain activities in an unlimited number of countries would best describe the type of companies under investigation in this research. From the exploratory case study reported above 12 characteristics of such firms were identified (see Table 5 for an overview).

#	*Proposition*
1	The startup process and the globalisation process of a global startup process are highly integrated and cannot be seen in isolation
2	Global Startups begin in international activities even before the start of the actual operations
3	Global Startups engage in international activities in pursuit of opportunities instead of achieving a competitive advantage directly
4	Global Startups are involved in a wide range of formal and informal value-added activities across national border
5	Global Startups use a variety of network entry modes
6	Global Startups are active in a wide number of regions of the world
7	Global Startups internationalise their activities following the presence of opportunities rather than following a pattern of increasing physical and cultural distance
8	Global Startup firms are not necessarily high growth companies in terms of number of employees
9	Global Startup firms are characterised by relatively high levels of entrepreneurial orientation
10	Global startup firms are typically founded by internationally skilled and confident entrepreneurs
11	Global startups often rely on the relationship with strong partners; this may be commercial partners or research institutes
12	Global startups are embedded in international networks from the start

Table 5 Overview of Propositions

Considering both the descriptions in the literature and the exploratory case studies I would describe a global startup as a highly entrepreneurial startup that is involved in a variety of international activities around the world. This is done because these companies proactively pursue opportunities wherever in world they arise because resources, partners, and customers are located there. Global startups seem to be able to combine technology and innovation with a clear understanding of market needs. Whereas many high-tech firms are research-oriented (Jones-Evans, 1995), global startups are also driven by a sales orientation. Because they often operate in such radically innovative industries creating awareness of their technology, products and applications is much more important to these companies than establishing a competitive advantage. Even when the founders have no formal *international* education, training and or working experience abroad, they have developed a global vision and feel confident enough to operate in the global arena. Often global startups rely on partnerships with established organisations such as research institutes or venture capitalists. Such relationships may be dangerous to the development of the firms but nevertheless help these firms to overcome some of the major problems associated with both startup and internationalisation, namely lack of resources, reputation and organisation. Further, global startups are often involved in a variety of alliances with

other firms to compensate for their small size, lack of experience and/or to avoid growth.

This description provides an answer to the first research question of this thesis: What is a global startup. As stated in the introduction, the purpose of this question was not simply to select an existing definition or come up with yet an additional definition (to add to the multitude already to be found in the literature). Rather I sought to gain an initial insight in the theoretical concept and the complex reality faced by ventures that are involved in truly global activities from the start.

The picture of the global startup firm has important implications for research. First, as already suggested in the previous chapter, it is clear that the concept global startup is not a synonym for the born global firm. Although some born globals may be considered global startups and vice versa this is not always the case. Global startups are a very radical manifestation of international new ventures and should be treated as such. This suggests that generalisability of research findings across the different types of companies is limited.

Second, the analysis of the cases suggest that traditional measures used in the investigation of firm development might not always apply to global startups or reflect the range and complexity of their activities. For instance, global startups may be involved in more informal types of international activities that are usually not included in investigations of internationalisation processes. A good example in this respect are the negotiations between NedClad and Lloyds which may lead to important changes in the market and the creation of previously un-existing opportunities. If we want to understand the development of global startups such activities should not be avoided. Also, the cases show that traditional measures of growth (e.g. in terms of sales and number of employees) may not provide accurate ideas concerning for instance the success of such firms. As suggested by for instance Wiklund (1998) not every entrepreneurial firm is interested in growth. Global startups may be highly successful in the creation of new products and applications or in the exploitation of increasingly complex projects by using strategic partners or by spinning off activities and creating new organisations. These observations about the type of activities and applicability of operational measures, however not only applicable to global startups, but also to other types of entrepreneurial startups and would call for more careful and detailed measurement whether conducting qualitative case studies or quantitative surveys.

As mentioned previously, a description of such a qualitative nature as offered above can be used easily to identify potentially interesting case studies and develop a general understanding of the phenomenon because it is so very rich and contributes to the understanding of the concept both from a theoretical and empirical point of view. However, it its present form the description cannot be used to identify large numbers of global startups from a population of firms for quantitative research purposes. In order to be able to use the description in surveys the best approach would be to review the different propositions and translate them into operational measures. In the discussion in Chapter 8 I will come back to this issue. However, because this research is based on the case study format it is not necessary to engage in that process here.

Finally, the findings show that indeed the startup process and the globalisation process of these firms are highly integrated and cannot be seen in isolation and that the network plays an important role in this process. This means that when studying the global startup process we cannot 'simply' investigate the internationalisation of a new venture or focus on international sales activities alone. When we seek to understand how global startups come into existence and begin to develop we rather should study the startup process in the global context. Because of this, entrepreneurship theories seem to be appropriate for studying this process.

PART 2. THEORY

4. Building blocks of an entrepreneurship-in-networks perspective

4.1 Introduction

As stated in the introductory chapter of this dissertation, I adopt an Entrepreneurship-in-Networks perspective to examine the global startup process. Although several authors have borrowed elements from entrepreneurship theory and from network theory, an integration of the two has not yet been applied to the context of international new ventures. In the following paragraphs I put forward what I mean with the Entrepreneurship-in-Networks perspective. Also I describe what the implications for applying this perspective to high-tech global startups are and argue why the entrepreneurship-in-networks perspective is appropriate for answering the research questions at hand.

4.2. Entrepreneurship-in-Networks

As the name suggests, the entrepreneurship-in-networks perspective draws on and integrates two theoretical views on the firm: entrepreneurship theory and network theory. In the following paragraphs I will first describe what the core of entrepreneurship is and how it has been described and discussed in the literature and how I look at the phenomenon and the field of research from a theoretical point of view. This is important because entrepreneurship itself has been studied from a variety of perspectives. From this it will follow why networks are important in understanding entrepreneurship and entrepreneurial processes.

4.2.1 Entrepreneurship

A large variety of different definitions of what entrepreneurship is and what the field of entrepreneurship research entails can be found in the literature (Van der Veen & Wakkee, 2004). These different definitions reflect the theoretical backgrounds of the different scholars. The fact that scholars in entrepreneurship have come to the field from economics, psychology, strategy, sociology etc, is clearly reflected in their work and definitions. An early definition of entrepreneurship by Weber ([1889] 1990: 57, in Swedberg, 2000) reads: "Entrepreneurship means the taking over and organisation of some part of an economy, in which people's needs are satisfied through exchange, for the sake of making a profit and at one's own economic risk." Knight (1921), who emphasises the entrepreneur's role in bearing the uncertainty of market dynamics states that 'Entrepreneurs attempt to predict and act upon change within markets'. Schumpeter defined entrepreneurship as carrying out new combinations of products, processes, organisation, and markets, in ways that create disequilibria in the economic system (Schumpeter, 1934). Alternatively, according to Kirzner (1979) an entrepreneur recognises and acts upon market opportunities. In contrast to Schumpeter's viewpoint, the entrepreneur moves the market toward equilibrium. Another example is Cole (1965); he defines entrepreneurship as the purposeful activity to initiate, maintain and develop a profit-oriented business. Similarly Gartner (1988, 1990) states that entrepreneurship is about the creation of new business. Several authors (e.g. Aldrich, 1999, Thornthon, 1999) have adopted this notion that entrepreneurship is the creation of new organisations, however, the majority of recent definitions of entrepreneurship tend to focus on the pursuit of opportunity (Kirzner, 1979; Stevenson & Gumpert, 1985; Stevenson, Roberts & Grousbeck, 1989; Churchill & Muzyka, 1994;

Venkataraman, 1997; Timmons, 1999; Shane & Venkataraman, 2000). Often cited is the definition by Stevenson, Roberts and Grousbeck (1989). They define entrepreneurship as a process, by which individuals -either on their own or inside organisations- pursue opportunities without regard of the resources they currently control. Wiklund combines many of the earlier definitions and states that entrepreneurship is: "Taking advantage of opportunity by novel combinations of resources in ways which have impact on the market" (Wiklund, 1998: 2).

From these definitions it is clear that the pursuit of opportunities is a central concept in entrepreneurship (Shane & Venkataraman, 2000, Eckhardt & Shane, 2003). Several authors have tried to define opportunities (e.g. Casson, 1982, Teach et al., 1989, Stevenson & Jarillo, 1990, Kaish & Gilad, 1991, Herron & Sapienza, 1992, Christensen et al., 1994, Timmons, 1994, Kirzner, 1997, Shane & Venkataraman, 2000) Combining and integrating most of the previously existing descriptions, Puhakka (2002: 27-29) recently defined an opportunity as: 'A new means-ends relationship between goods, services, raw materials, and organising methods coming into existence as a long-term profit potential based on a recognised market position, in which a venture is competitive beyond the short run and through which a venture can offer products and services that are attractive, durable, and timely and add value to buyers and/or end users'. It should be noted that opportunities are classified in several ways. For instance, some have differentiated between different types of opportunities on the basis of their origin. While some opportunities lie around waiting for the neo-classical arbitrageur to stumble onto them, others lie buried in the soil waiting to be dug out by the Kirznerian alert individual. Yet others require several stakeholders, including founding entrepreneurs to act effectually to "create" them (or nurture them into being) in a dynamic and interactive process of contingency, design, and negotiation. Others classify them on the basis of their newness. For instance Davidsson (2002) has developed a framework that classifies different types of opportunities on the basis of two dimensions: the newness to the firm and the newness to the market. Only those opportunities that are new for both the firm and the market can be considered truly entrepreneurial.

Looking at the definitions of entrepreneurship and opportunity, they share many elements such as novel combinations of resources, impact on the market, profit potential etc. From this it may be concluded that entrepreneurship and the pursuit of opportunities are (almost) synonymous. This opportunity-based and process-oriented view on entrepreneurship will be carried throughout this research and will form the core of the model that will be developed in the next chapter.

4.2.2 Networks and Entrepreneurship

The entrepreneur is the driving force behind the pursuit of opportunities (Knight, 1921; Van Der Veen & Wakkee, 2004). However, entrepreneurship involves economic actions between actors and does not occur in a vacuum but is conditioned by ongoing structures of social relationships (e.g. Granovetter, 1973; Birley, 1985, Groen, 2002). In other words, the entrepreneur is embedded in a social context and needs to interact with other actors to exchange information and resources to exploit the opportunity and create value.

Investigating entrepreneurship from a network perspective has become fairly common over the years (Hoang & Antoncic, 2002; Borgatti & Foster, 2003) and is rapidly becoming a core concept in entrepreneurship research. Basically, a network is a set of actors connected by a set of ties (Granovetter, 1973). The actors (often called "nodes") can be persons, Teams or organisations. Ties connect pairs of actors and can be directed (i.e., potentially one-directional, as in giving advice to someone) or

undirected (as in being physically proximate) and can be dichotomous (present or absent, as in whether two people are friends or not) or valued (measured on a scale, as in strength of friendship). When focusing on a single focal actor, that actor is called the "ego" and the set of nodes that ego has ties with are called "alters." The ensemble of ego, his alters, and all ties among these (including those to ego) is called an ego-network. Since ego-networks can be collected for unrelated egos (as in a random sample of a large population), ego-network studies blend a network-theoretic perspective with conventional, individual-oriented methods of collecting and processing data (De Koning, 1999). In this study I focus on the network from this ego perspective.

The network perspective on entrepreneurship basically relies on three premises (Aldrich & Zimmer, 1984, Birley, 1986, Elfrink & Hulsink, 2001). First, networks direct, channel, facilitate and constrain the entrepreneur in recognising opportunities (Aldrich & Zimmer, 1986, Carsrud & Johnson, 1989, Gilmore & Carson, 1999, De Koning, 1999). The network is a source of information about a diverse set of topics, ranging from potential markets for goods and services to innovations and promising new business practices, that enables entrepreneurs to locate and evaluate opportunities (Aldrich & Zimmer, 1986). In addition to searching information, entrepreneurs also turn to their network for support and encouragement to maintain long-term motivation and overcome obstacles (e.g. Birley, 1985, Tjosvold & Weicker, 1993) Birley (1985) already found that the number of informal (friends and family) and formal (e.g. banks and accountant) ties affects the success of the entrepreneur in recognising opportunities. Second, entrepreneurs draw on their network for access to resources in order to exploit the opportunity (Aldrich & Zimmer, 1984, Birley, 1986). Entrepreneurs rarely possess all the resources required to exploit an opportunity once recognised (Brush et al., 2001) Moreover, entrepreneurs need to keep abreast of current trends if they are going to adapt and implement their business plans successfully. Knowledge of new technologies, changing consumer trends, and new ways to manage and solve problems can have important implications for how they position their products and manage their companies (Tjosvold & Weicker, 1993). Social transactions involving friendship, trust, and obligation (Starr & MacMillan, 1990) play a critical role in building the initial resource base as this enables the firm to acquire resources far below the market price. Third, because new ventures do not appear as accountable and reliable as existing organisations, they need to create the external perception that they are legitimate to garner resources and survive competition with established organisations (Delmar & Shane, 2001).

A firms position in the network has consequences along three dimensions, namely (1.) what information is available to the firm, (2.) its timing, and (3.) referrals. First, network is a source of information to firms about what goes on in the environment and market. The same information is not available to all the firms in the market. Secondly, position in the network is influencing when a particular piece of information will reach a particular firm. Finally, referrals imply that a firm's interests are represented in a positive light, at the right time, and in the right place (Burt, 1997). Firms placed centrally in a network receive more, better, and earlier knowledge than their competitors. This is a source of advantage and may exert influence on the internationalisation of firms. Network may also produce unexpected random information to firms. Firms may observe the benefits of this knowledge and may integrate it in their own structures and behaviours.

Networks are dynamic and develop over time. Through trial and error and coordination both parties evaluate the feasibility and fit of potential resources to the start-ups needs. In particular, some of the weak ties develop incrementally and become more structured as communication and coordination intensifies (Larson and Starr, 1993). As a result some weak ties become strong ties. Strong ties can become trust-based relations with mutual commitment and interdependence. Dependent on the firm's position in the network, the activities are channelled and facilitated but also constrained and inhibited (Aldrich & Zimmer, 1986; Birley, 1986; Carsrud & Johnson, 1989; Hoang & Antoncic, 2002). Although recognising the importance of the entrepreneur's position in the network, in this study I will not conduct an analysis of network structures and the firm's position in the network.

4.3 Entrepreneurship-in-Networks and Previous Research on INV's

To date, there has not yet arisen a singular theoretical perspective to study the international new venture phenomenon. In fact, many (more practice oriented) studies do not adopt any theoretical framework at all (e.g. Rennie, 1993, Oviatt & McDougall, 1995). Many other studies (for instance Wickramasekera & Bamberry, 2003) draw on several fields and perspectives (e.g. export marketing, resource-based view, knowledge-based view).

4.3.1 International Entrepreneurship in Previous Research

A relatively large number of authors state they build their model (partially) on an entrepreneurship perspective (e.g. McDougall, Shane & Oviatt, 1994, Oviatt & McDougall, 1994, Harveston, 2000, Crick & Jones, 2000; McAuley, 1999, Autio et.al2000, Simões & Dominguinhos, 2001; Teixeira, 2000). However for most of these authors, this basically means that they recognise the important role of the individual entrepreneur in explaining why some firms internationalise earlier and more rapidly than others, along with many other environmental and firm-level characteristic. For instance, McDougall, Shane and Oviatt (1994) argue that founders of international new ventures are individuals who see opportunities from establishing ventures that operate across national borders. They are "alert" to the possibilities of combining resources from different national markets because of the competencies (networks, knowledge, and background) that they have developed from their earlier activities. Following the logic of the resource-based view of the firm, they argue that other entrepreneurs do not match the possession of these competencies. Only entrepreneurs who possess such competencies are able to combine a particular set of resources across national borders and start an international new venture. Other studies (Harveston, 2000, Fischer & Reuber, 1997, Saarenketo, 2002) confirm that in general founders of international new ventures are strongly outward-minded: they know external markets either from working for multinationals through being placed in export departments or through experience abroad. They are typically have high-level academic qualifications, speak foreign languages; and maintain a network of extensive and intensive international contacts. This has enabled these entrepreneurs to develop knowledge of international markets and ability to enter these markets rapidly.

Although the recognition of the entrepreneur's knowledge and skills and their role in starting global is valuable, I believe that the entrepreneurial resources and capabilities does not do justice to the field of entrepreneurship, particularly when looking at it from an opportunity-based perspective.

Some of the authors (e.g. McDougall, Shane & Oviatt, 1994, Crick & Jones, 2000, Andersson & Wictor, 2001) point to the ability of these entrepreneurs in recognising international opportunities. Yet, very few authors (e.g. Ray, 1995, Oviatt & McDougall, 2000, Zahra & George, 2000, Dominguinhos, 2002) have looked at the role of opportunities in the internationalisation process and or investigated how entrepreneurs pursue opportunities globally. In a recent study, Oviatt & McDougall (2000) define international entrepreneurship as the combination of innovative, proactive and risk-seeking behaviour that crosses national borders and is intended to create value in organisations. Similarly Zahra and George (2000), state that international entrepreneurship is the process of creatively discovering and exploiting opportunities that lie outside a firm's domestic markets in the pursuit of competitive strategy. From this perspective, companies engage in international activities to obtain valuable resources at low costs, to serve global (niche) markets with unique products and services.

The underlying foundations of the entrepreneurship perspective are thus generally accepted and acknowledged by most researchers in the field, but very few have actually investigated the research questions that arise from these foundations such as the origin of the opportunities on which the companies are based and general company development besides internationalisation. Exceptions are studies by Ray (1989, 1995, and 2003), who stresses the entrepreneurial nature of global startups by explaining their constant search for new opportunities wherever they arise. Also, Dominguinhos (2002) tries to explain how global opportunities were created and what the role of the entrepreneurs in the international behaviour of the firm is. Specifically, on the basis of four case studies Dominguinhos (2002) argues that the founders of international new ventures act as discoverers of opportunities and that this is the key element in understanding this phenomenon. Also he argues that prior knowledge corridors are crucial for such entrepreneurs, in opportunity recognition and in their exploitation process.

4.3.2 International Network perspective

Already in early literature on internationalisation, networks have been used as the primary explanatory factor. For instance, the members of the Industrial Marketing and Purchasing Group (IMP) such as Johansson & Wiedersheim-Paul (1975), Håkanson & Snehota (1986), have examined the role of networks in internationalisation process. Yet, these studies have traditionally looked at the international marketing and purchasing rather than on international business startup and or general international business development. Also, typically these studies have focused on established firms rather than startups. More recently, network models are a popular means to explain the internationalisation of new ventures often in combination with elements from entrepreneurship theories (e.g. Coviello and Munro, 1995, Blomstermo & Deo Sharma, 2000, Zucchella, 2001). In general, such models of internationalisation suggest that networking facilitates access to knowledge, allows newly born firms to overcome some resource constraints and to manage a global reach since inception without bearing the costs of a global proprietary structure (Zucchella, 2001: 16).

More particularly, Coviello and Munro (1995) found that new ventures linked themselves to networks of established players that presented the firms with new opportunities and potential partners. Network relationships were also found to constrain the scope and nature of the market opportunities. In order to reduce dependency on, and control by, dominant players, new ventures had to diversify products and markets. Establishing and utilising relationships is seen as effective means for harnessing a marketing infrastructure and levering marketing capabilities.

The case studies do show that more established ventures tend to develop in-house marketing/sales expertise to avoid control by other network players. From this perspective it thus seems that the internationalisation efforts of SME's are shaped by the interests of other players in their network of relationships (Coviello & Munro, 1995).

Blomstermo and Deo Sharma (Deo Sharma & Blomstermo 2000, Blomstermo & Deo Sharma, 2002) combine elements from the knowledge-based perspective and the network perspective and describe new venture internationalisation as a process of 'learning in networks'. Specifically they argue that international new ventures are embedded in a network, which helps them in going international, by supplying information about foreign markets, helping to identify customers abroad and by pointing to cross-border opportunities. Network ties supply information about prospective customers, find co-operative partners and offer new business opportunities abroad. Therefore, they propose that born globals enter international markets based on the knowledge supplied by their weak network ties and that their international process is characterised by the strategy of exploration (March, 1991). The strategy of exploration captures things like search, risk taking and experimentation. The selection of foreign markets is based on perceived market potential (Blomstermo & Deo Sharma, 2000). Entry into a large number of foreign markets and the use of a variety of different entry modes allows these firms to establish ties in the market. The majority of these ties are indirect and weak. Through these weak ties born globals develop a knowledge base and an absorptive capability that is more versatile and diversified and that consists of a large variety of cues in foreign markets (Deo Sharma & Blomstermo, 2002).

Considering the need for international co-operation, Hurmelinna et al. (2002) examine the role of trust and contracting in the internationalisation of born globals conceptually. They propose that it is more difficult for born globals to draft contracts than for other firms because of their lack of experience in combination with the need to deal with international legislation. Also they propose, that trust is relatively more important to these firms than to others to compensate for their limited knowledge of local legislation. Finally, they propose that born globals are relatively better in building fast trust than other companies as their success in founding an international company might be seen as reflecting their social skills, thus facilitating the creation of trust.

Zucchella, (2001) found that in Italy, many born globals are located in industrial districts. She argues that in these local, informal networks a collective international knowledge capital develops that helps the entrepreneurs to enter international markets and overcome their lack of resources. Such territorial information systems result from a complex mix of imitative behaviours, high frequency of spin-offs, low-cost participation of foreign trade fairs, existence of intermediary organisations, shared service centres and enterprise associations (Beccattini, 2001, DATAR, 2001, Viesti, 2000: in Zucchella, 2002).

With regard to networking strategies Autio, Lummaa and Arenius (2002), identified three distinct activity sequences that characterised a firm's internationalisation strategies: positioning in, leveraging of and consolidation of value networks. As the case companies were small, they mainly integrated their products and services to the partners' or customers' products and services. In all cases, also the technology and field of business was new and markets were rapidly developing. Some of the case companies conducted some R&D co-operation with their partners, but mostly the co-operation was related to learning and developing the business model and exchanging information with their partners. Most companies considered themselves important to their key and channel partners and aimed at solidifying

sustainable operation through their technological and business expertise. The power of the case firms in the value network seems, therefore, to depend on the strength and applicability of their technology and the firms' knowledge and experience in their field of business. In general, the firms' value network played a very important role in the internationalisation process. In the studied cases the customers were rather country specific, but competitors and partners were mostly international. Thus, achieving a central network position and leveraging this position for further country expansion became an important issue. Consequently, many of the case companies aimed at customers that planned to internationalise their own operation. The companies leveraged their partnerships the known brands of their partners in entering new markets and approaching potential customers. The case companies also developed the business model and maintained close interaction with their customers to learn about the emerging market together with these. In addition there was potential for joint product development with the partners. Furthermore, the case companies used their partnerships as insulation

Ripolles et.al(2002) found that the size of the personal network and the frequency of the interaction with this personal network during the period of business creation (pre-founding) were positively and significantly related to obtaining both tangible and intangible resources for successful early internationalisation. To their surprise, no significant relationship could be established between network density and obtaining resources. Yet, the data suggests that diversity rather than density may explain obtaining the required resources. This is no surprise considering that a diverse network of many weak ties may provide the entrepreneur with a larger number of indirect links from which to obtain resources (Granovetter, 1973). Unfortunately, the paper does not show what the tangible and intangible resources constitute. Therefore, the study does not provide real insight into the content of the interaction process between the entrepreneur and the personal network. Also, the authors do not show to what extent the personal network itself is internationalised and how this influences the internationalisation process of new ventures.

4.3.3 International Entrepreneurship – in – Networks perspective

Building on both the (international) entrepreneurship perspective and the network perspective, Crick and Jones (2000) acknowledge the dominant role of the entrepreneur in the establishment process of international new ventures and state that the market entry pattern of such firms does not follow a pattern based on geographical distance, but rather it follows the entrepreneur's network of contacts. Similarly, Dominguinhos (2002) who discusses how entrepreneurs use their network contacts to identify and develop opportunities.

Also in the work of Rasmussen, Madsen and Evangelista (2001), the use of network contacts to identify new market opportunities is mentioned implicitly, while further adopting a more traditional export marketing approach to the phenomenon of the international new ventures. Yet, other than these, surprisingly few studies linking entrepreneurship theory and network theory to international new ventures have been performed to date. In fact, after analysing all hypotheses studied so far in the field, Kirwan (2004) recently suggested that networks are one of the most under-researched areas in relation to international new ventures.

4.4 Conclusions and implications from previous research

From these previous studies I conclude that networks are indeed an important factor in starting global and can help understand why entrepreneurs behave in a certain manner. The entrepreneurship-in-networks perspective is particularly suitable to studying startup processes as it has been developed specifically in the context of new ventures. Most other perspectives that have been used in the study of international new ventures (e.g. the resource-based or knowledge-based view, or the export marketing view) have been formulated in the context of established ventures instead and therefore do not always fit the realities and complexities associated with startups. Perhaps even more importantly, these theoretical perspectives have not been developed in the context of new ventures and build on many premises that would apply much better to large and established firms than to startups. Also, the entrepreneurship-in-networks perspective applies particularly well to startups as a considerable body of knowledge on entrepreneurial networking in the context of startups has been established over the years (e.g. Birley, 1985, Greve, 1995. Hoang & Antoncic, 2001) Further, the entrepreneurship-in-network perspective is suitable for studying process, while again the resource based view can only be used to examine static situations. The propositions derived from the cases are also a indication that entrepreneurship and networks are indeed important elements in the global startup process. As proposed global startups are founded by strong entrepreneurs, they internationalise to pursue opportunities, its is the location of the opportunity that drives the globalisation process, and the role of networks (and partners) is critical in obtaining access to resources and entering global markets. Finally, for global startup firms, the startup process and the globalisation process are integrated rather than 'simply' occurring simultaneously. Therefore, as argued in Chapter 1 whereas most authors have taken the internationalisation (or globalisation) of such ventures as the starting point for their investigation, in this research the entrepreneurial (startup) process is taken as a starting point instead. The entrepreneurial perspective allows for a more holistic view on the development of global startup firms than is typically achieved through processes based on internationalisation theory (e.g. International New Venture Theory; Autio & Sapienza, 2000, Oviatt & McDougall, 1994, Moen, 2002). This holistic perspective is necessary because as suggested by Fletcher (2001), internationalisation is not limited to sales alone. As a response to many developments in international environment, more complex forms of international behaviour have evolved including wide ranges of value-chain activities, inward and outward driven activities etc all related to pursuing opportunities in an international arena.

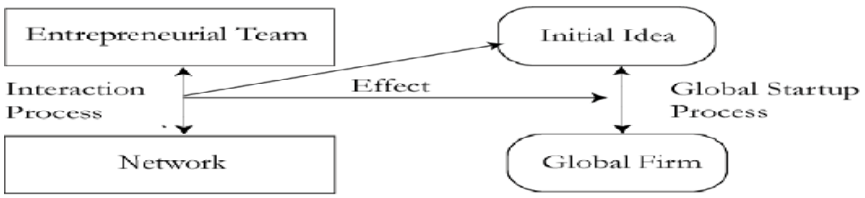
In this chapter, the building blocks of the theoretical perspective and research framework have been discussed. In the next chapter these insights will be used to develop a model to structure and guide the empirical investigation of the global startup process.

5. Entrepreneurship in Networks Framework

5.1 Introduction

Building on the building blocks of the theoretical perspective as described in the previous chapter, in the following paragraphs a framework will be developed to guide and structure the empirical research. The goal of the empirical research is to describe the global startup process and explain the global startup process in terms of the interaction between the entrepreneurial team and its network. To this end the preliminary research model presented in chapter 1 (and repeated in Figure 5) is elaborated.

Figure 5 Preliminary Research Model (repeated from Figure 3)



In the following paragraphs I first explain what dimensions of the global startup process will be included in the framework and how they will be analysed in light of the theoretical perspective. After that, I describe which dimensions of the interaction process are included, and how these are analysed. I end this chapter with a discussion of how I describe and analyse the relationship between the interaction process and the global startup process.

5.2 The Global Startup Process

There are many ways to describe processes. Following Van der Ven and Poole (1995), in this research, a process is defined as the order and sequence of events in an organisational entity's existence over time. Change, - one type of event-, is an empirical observation of difference in form, quality, or state over time in an organisational entity such as the organisational strategy of the organisation as a whole. Development is a change process from the initiation or onset of the entity to its end or termination (Van de Ven & Poole, 1995: 512). A process theory is an explanation of how and why an organisational entity changes and develops. This explanation should identify the generative mechanisms that cause observed events to happen and the particular circumstances or contingencies behind the causal mechanisms (Harre & Madden, 1975, Tsoukas, 1989; in Van de Ven & Poole, 1995: 513).

As stated in Chapter 1, in this research I adopt a teleological view on the global startup process. Basically according to teleological views, it is assumed that the organisation is purposeful and adaptive and that it by itself and with others, constructs an envisioned end state takes action to reach it, monitors the progress, and takes new actions on the basis of what was learned or intended originally. According to Van de Ven & Poole (1995) this teleology inherently affords creativity as the actors involved

in the process have the freedom to enact whatever goals it likes; also it allows for changing the desired end-state (or developmental paths) on the basis of interactions with the environment. At the same time, it is recognised that actions are limited by the environmental conditions and available resources. Further teleology does not prescribe a necessary sequence of events or specify which trajectory development an organisation will follow. Instead, teleology enables us to assess whether the prerequisites for achieving the desired end-state are fulfilled over time. So in short, a teleological model views development as a cycle of goal formulation, implementation, evaluation and modification of goals based on what was learned by the organisation. This sequence emerges through purposeful social construction amongst the actors involved in and around the organisation.

From the theoretical perspective described in the previous chapter, a number of assumptions can be formulated:

- Entrepreneurship is about the pursuit of opportunities
- Opportunities are new means-end relationships that offer value
- Opportunities can be discovered or developed
- The pursuit of opportunities is driven by entrepreneurs
- Entrepreneurs pursue opportunities solo or in a team
- The pursuit of opportunities takes place in networks
- The network directs, channels, facilitates and constrains the entrepreneur in recognising opportunities
- Entrepreneurs draw on their network for access to resources in order to exploit the opportunity
- Networks help the entrepreneur and his venture to build legitimacy

From this we can derive a model of the entrepreneurial process. At the core of the model is the pursuit of opportunities. In terms of teleology the creation of value through the pursuit of the opportunity would be the goal of the process. In the following paragraphs the three basic stages of the entrepreneurial process (opportunity recognition, preparation and opportunity exploitation) are discussed briefly[15].

Several authors including Long and McMullan (1984); Bhave (1994) De Koning, (1999) and Puhakka (2002) have modelled the opportunity recognition process. From their work it seems that the essence of the opportunity recognition process is that the entrepreneur develops an initial idea into a viable business opportunity by matching attainable resources and perceived market needs and then evaluating the opportunity before deciding whether or not and how to exploit this opportunity. According to De Koning (1999) and Bloodgood et al. (1995), the initial idea may be found through scanning the environment and interaction with multiple weak ties or as a result of a chance discovery. Through talking with several strong ties (family members or trusted friends) the competitive environment is analysed, the idea takes shape and the entrepreneur may begin to recognise the value of the idea and decide it is worth being pursued (de Koning 1999, Puhakka, 2002). To develop the idea into a full-fledged business opportunity the entrepreneur proactively searches for specific information and assesses required resources (and potential resource providers). According to Puhakka (2002) this process is enhanced by creativity, intrinsic motivation, management experience, the amount of social interaction, and commitment to

[15] A more elaborate discussion of the literature on this topic can be found in Van Der Veen and Wakkee, 2004)

relationships. At a given point the entrepreneur must decide whether the opportunity is sufficiently developed and whether or not it will actually be exploited. If the answer is yes, the entrepreneur or entrepreneurial team begins to prepare the exploitation.

During the preparation, the business opportunity is translated in a concrete business concept leading to exchange with the market. The business concept incorporates all ingredients that are necessary to enable this exchange. One of the most important steps in this process is the development of a resource base (see for example Brush, Greene, Hart and Haller, 2001). De Koning, (1999) suggests that in particular strong ties are important in getting these resources as strong ties are more motivated to help the entrepreneur than the weak ties and provide entrepreneurs with (access to) resources at a below market price as a result of a stronger emotional and multiplex bond. Thus a network with sufficient strong ties raises the chances that a potential entrepreneur will act as it reduces the perception of uncertainty about the returns of investing in certain opportunities (Elfrink & Hulsink, 2001). Also, the creation of a (new) organisation (Bruyat & Julien, 2001, Gartner, 1985, 1988) the development of a network (e.g. Greve, 1995) the development of products or services and the business plan have to take place at this stage.

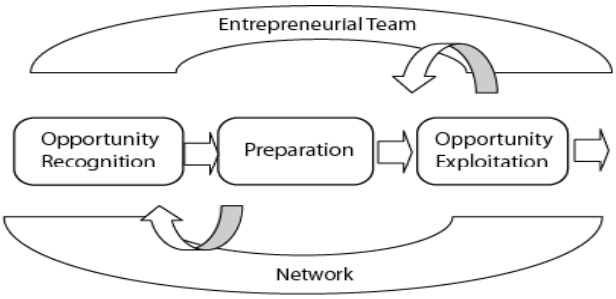
When this has lead to the creation of marketable products or services, exchange processes between the firm and its customers begin to take place. At any point during the exploitation process, the entrepreneur may realise that an appropriate resource base to exploit the opportunity is not viable. Likewise, the demand for the product or service turns out to be insufficient for profitable exploitation. In these cases, the business concept may be revised or even abandoned (Herron & Sapienza, 1992).

Throughout the actual opportunity exploitation process the exchange with the market will increase to a higher level. The entrepreneur continues to update the opportunity by adding new or improved goods and services to the market and / or by improving its internal operations. This leads to the creation of value in terms of financial gain, innovation, more choice for customers, increased knowledge etc (Autio, Sapienza & Almedia, 2000). The creation of value might be regarded as the outcome of the entrepreneurial process (Zahra & Dess, 2001). The process of value creation ends when the opportunity is abandoned or does not longer add value to the entrepreneurial team or the market. For instance innovations can make the product or service obsolete, or the entrepreneurial team does no longer enjoy working on the opportunity and therefore decide to focus on other (business or personal) opportunities (Van Der Veen & Wakkee, 2004). During the value-creation process the venture becomes more and more established and more day-to-day management activities becomes more important. Yet, at the same time, the entrepreneurial team should try to recognise new opportunities that either expands on the current opportunity by adding to the product line or expanding into new markets, or markets that are new to the firm (Churchill & Muzyka, 1994).

The entrepreneurial process may be opportunity-based; the entrepreneur is nevertheless the driving force throughout the process: initiating and directing the process from the original idea to the exchange with the market. One of the fundamental assumptions in entrepreneurship research is that individuals are different with respect to, personal traits, experience, skills and cognitive capacity (Cohen & Levinthal 1990; Brockhaus & Horwitz, 1986, Hills, Lumpkin & Singh, 1997, Shane, 2000) and motivations (Birley & Westhead 1994). Entrepreneurs act in self-interest but that self-interest is not limited to short-term considerations only and not exclusively to economic outcomes (Wiklund *et al.* 1997). From this we can conclude that opportunities are not just out there for everyone to recognise and exploit. Because of differences in experiences and resource endowments people will come up with

different ideas for new ventures. What is a viable opportunity for one person is not an option for most other individuals. This suggests that the recognition of opportunities is subjective and highly personalised. Also, the other elements of the entrepreneurial process are strongly influenced by the entrepreneur (Van Der Veen & Wakkee, 2004). Research in this area suggests that particularly knowledge and experience and cognitive styles of the individual entrepreneurs and the size and composition of the team influence the course and the content of the process. For instance, one entrepreneur may begin preparatory activities while still involved in the development of the opportunity, while others want to have a complete picture of the future venture in mind before they make any real commitments to the firm. Similarly, throughout the process different entrepreneurs make different judgements regarding the success of their venturing. They will do so on the basis of very subjective ideas on value creation. What is satisfactory for one entrepreneur may not be satisfactory for another.

Figure 6 A Model of the Entrepreneurial Process



Although the three stages in the process (1. opportunity recognition, 2. preparation and 3. the actual exploitation) are displayed as being sequentially organised this is not actually the case. In reality, the process is highly dynamic and iterative (Bygrave & Hofer, 1991; Ropo & Hunt, 1995) as the three stages may be more or less overlapping and many feedback loops exist both within the three stages and between them. As the process unfolds, changing circumstances may require actions to change or go back on certain decisions. The two bold arrows in Figure 6 represent these characteristics. As Bygrave and Hofer (1991) state, the entrepreneurial process is holistic because its course is influenced by its environment and sensitive to a multitude of antecedent variables: the strength and number of competitors, the needs of future customers, etc. Further, the role of the entrepreneur is critical throughout the process. The influence of the entrepreneur and the entrepreneur's interaction with the network in the process is represented in Figure 6 by the linked curves above and below the process.

This model of the entrepreneurial process is highly generic and will apply to many different kinds of organisations, whether describing entrepreneurial processes in new or established ventures, commercial ventures or not-for-profit organisations, global or domestic firms. We suspect however, that the process of starting, for instance, a consultancy firm is different from commercialising a technological invention. Also, the type of issues an entrepreneur has to deal with when starting a local venture will significantly differ from a global start-up (Van Der Veen & Wakkee, 2004). Therefore there is a need to translate the generic model of the entrepreneurial process to more concrete and different situations.

5.3 Dimensions of the Entrepreneurial Process

In this section I will explain how I am will examine the central part of the model presented above. Processes involve many different dimensions. Although, I seek include as many dimensions as possible in order to develop a clear understanding of the complexities involved in the global startups choices and restriction were necessary. From more general strategic management literature (e.g. Pettigrew, 1985, De Wit & Meyer, 1998) I concluded that strategy has been described on the basis of three dimensions: process, content, context. The same constellation could be used to describe entrepreneurship or entrepreneurial process. However, in my perspective the term 'course of action' is more suitable for describing the first of these dimensions (process) in the context of this research. The reason for this is that we are already examining a process. Using the same term at two different levels of analysis would be confusing.

5.3.1 Content

The **content** refers what is actually being done to reach the desired state (a viable firm that has global operations by the end of its startup process). To this end it will be examined

- What (type of) opportunity is being pursued?
- What activities are being initiated during this pursuit?

With respect to the nature of the opportunity, opportunities can be classified on the basis of several dimensions. Davidsson has classified opportunities on the basis of their 'newness to the firm' and their 'newness to the market' (Davidsson, 2002). According to the authors, only opportunities that are considered new to the market and new to the firm are real entrepreneurial opportunities. Not every entrepreneurial opportunity is however technology intensive. For instance, take the recent Dutch startup called 'Rent-a-bob' that sells a special type of Taxi service for those people who, after drinking too much, want to be driven home in their own car. This company is based on an opportunity that is new to both the firm and the market but involves no new technology at all. Therefore a third dimension is added to the framework: technological intensity. In the context of radical technological innovations, the opportunity may not only be new to the firm and the market, but in fact an entirely new market may be created as old technological paradigms become obsolete and entirely new possibilities open up. For example, recent developments in the human genome project have created an entirely new market. Therefore a fourth dimension is added to the framework: newness of the market. Finally, as this research deals with global startups a fifth dimension is added: the global nature of the opportunity. This global nature may be related to either the output side or the input side or both. Global opportunities on the outside relate to those opportunities that are based on products that can be sold around the world and / or need to be sold around the world because the domestic market is too small to sustain the venture. Global opportunities on the input side relate to those opportunities that can only come into existence as a result of combinations of resources obtained from around the world.

Dimension	*Type of opportunity*
New to the firm	Entrepreneurial opportunity
New to the market	
Newness of the market	
Technological level	High-tech opportunity
Global nature	Global opportunity

Table 6 Opportunity Classification

With respect to the type of activities that are being performed to pursue the opportunity it can be said that some basic activities like developing an initial idea into a viable business opportunity take place in any entrepreneurial process. However the way this is done differs with every individual entrepreneurial process. The start of the opportunity recognition process may for instance be internally or externally stimulated (Bhave, 1994). Externally stimulated entrepreneurs start with a wish to start a business and then begin to search for a suitable venture idea. Internally stimulated entrepreneurs typically start with solving a particular problem for oneself or a friend and only afterwards they realise that the problem is general enough to constitute a business opportunity. Bhave associates the two processes with respectively, opportunistic search versus 'problemistic' search (see also Cyert & March, 1963). Other authors (for example Vesper, 1989, Gaglio, 1997) differentiate between deliberate search and serendipity. At a later stage in the entrepreneurial process, entrepreneurs may decide to focus on R&D and licence the technology to other firms because it does not yet have sufficient resources or channels to the market, whereas others may also decide to produce and sell in addition to the R&D activities it undertakes.

5.3.2 Course of Action

The **course of action (further called course)** of the process refers to both timing and interdependency of the activities performed during the process. Following the notion that the trajectory of the process is not fixed or predetermined, we need to look at how the process unfolds over time, what activities are initiated when, how these activities are related and how we define the beginning and end borders of the process. For example, with respect to timing, an established venture may be able to build the necessary resource base to exploit an opportunity much faster than a new venture because it can either re-allocate some of its existing resources or attract or gain access to new resources by using its (existing) network. New ventures may require more time to build a similar resource base because it cannot benefit from earlier activities.

5.3.3 Context

Finally**,** the **context** refers to the environment in which the process takes place. For the purpose of this research, three levels of context will be investigated. The micro context refers to the organisation in which the activities take place. This organisation may be the venture under investigation, but in case of for instance a spin-off, it may also refer to the organisation from which the new venture originates and where more or less activities are performed in the light of the pursuit of the opportunity. Second, the meso context refers to the market or industry on which the venture is active such as for instance BioTech or the market for ICT business to business services. A venture that seeks to pursue a highly innovative, technology-based opportunity is for example

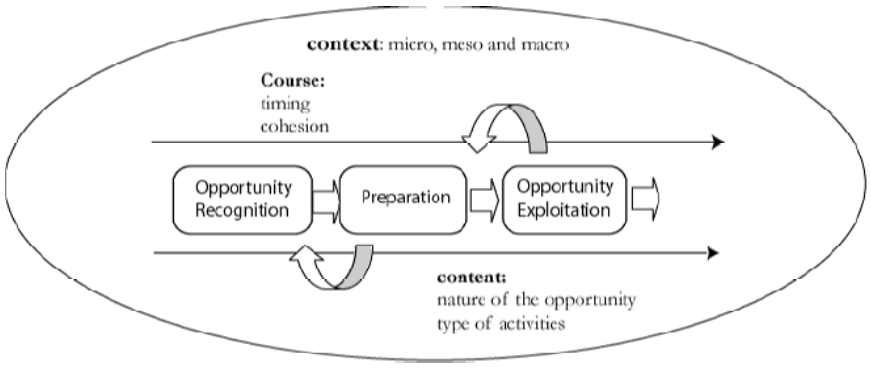
likely to be active in a highly dynamic and perhaps even emerging industry with only a few dominant market players. Alternatively, a venture that pursues an opportunity that is based on imitation can be active in a more mature industry with less turbulence but higher entry barriers set up by other players in the field. Similarly, the first venture may have to operate on a larger geographical market simply because it operates on a niche market where regional or even domestic sales may not compensate investments in R&D. The imitator may find sufficient market in its own region. Finally the macro context refers to the geographic environment in which the activities take place. A real global startup is active in a global context. However, some global startups may for instance be mainly active in the European context during opportunity recognition before moving on to a really global context during the early stages of opportunity exploitation.

5.3.4 Integration and Interaction

Clearly these three dimensions of the entrepreneurial process (content, course and context) are highly interrelated. The content determines in part in what context the process takes place. For instance a highly innovative, technology based opportunity will most likely be pursued in a dynamic industry, most likely cross-border. Both the content and the context can also affect the course of the process. For instance, lengthy periods between finding the initial idea and closing the first sales may be the result of the need for extensive R&D. It is often suggested that the patterns firm behaviour (e.g. internationalisation) is contingent upon and a function of its past experiences and previously accumulated knowledge and contacts (e.g. Johansson & Vahlne, 1977, Bilkey & Tesar, 1977, Reid, 1993, Eriksson, Johansson, Majkgård & Deo Sharma, 1997, Eriksson, Majkgård & Deo Sharma 2000)). Also, the use of a clearly formulated strategy can result in a situation where the different activities performed by the entrepreneurial team or the venture are much more closely related than when no strategy is being used and the entrepreneurs simply react to stimuli from the environment.

In Figure 7, I graphically show the part of the model that is described above and along what dimensions I will examine this part.

Figure 7 Process elements and dimensions



5.4 The Interaction Process

Interaction refers to the process where two or more participants or actors carry out activities toward one and another and exchange valuable resources Hallen, et al. (1991). In the literature many different descriptions or classification of network interaction can be found. For instance Burt (1994) has examined network constellations including dimensions such as network density and network position. The Industrial Marketing and Purchasing (IMP) Group (e.g. Håkanson & Snehota, 1995) has studied networks from an actor-activity-resource perspective in the context of supplier-buyer relationships. The Actor, Resource and Activity (ARA) model of business-to-business markets (Håkanson & Snehota 1995) was developed based on many years of empirical research by the IMP Group (cf Ford 1990; Håkanson 1982; Håkanson & Snehota 1995). In this model, three analytical levels (firms, relationships, network) interact, with the firms' resources, activities and actors and their analogues at the relationship (resource ties, activity links, actor bonds) and network (resource constellation, activity pattern, actor web) levels "conditioning" each other.

Similar to the IMP Group I will examine relational aspects of the network rather than structural aspects (as is done by e.g. Burt, 1992). However, several adaptations were made. Whereas the research conducted within the IMP Group has typically focused on long-term relationships in the marketing and purchasing context, in this study the interaction between the entrepreneurial team and all its contacts, not focused on marketing and purchasing issues and working from an entrepreneurship perspective. To make this difference clear and to prevent readers from placing this work in the IMP tradition I decided not to use the terminology used by the IMP Group. Whereas the IMP group has focused on Actors, Resources and Activities, in this research I include the following dimensions of interaction in my analysis:

- The nature of the organisation and
- The nature of the relationship
- The resources exchanged
- The network activities
- Communication in the interaction

The following paragraphs describe why these dimensions were included and what they constitute exactly.

5.4.1 Nature of the organisation

In examining the nature the organisation I will examine the type of organisation and the location of the organisation.

Organisation Type. First, it was decided to examine with what type of organisations global startups interact during the global startup process. From the literature, it seems that diverse heterogeneous rather than homogeneous network contacts provide a wider the variety of information and other resources potentially accessible to the venture (e.g. Aldrich & Zimmer, 1986; Aldrich, 1999, Pesämaa & Goel, 2003). Pesämaa and Goel (2003) argue that firms that are operating in younger industries, as many global startups do, may require even more diverse and heterogeneous networks to overcome their liability of newness by selecting partners carefully. The reason for that is that heterogeneous networks may offer credibility, reputation, and institutional legitimacy that may be critical resources for firms in nascent industries to get sustaining resources such as customers and suppliers – especially if these groups are

required to make investments of their own as a precondition to using the industry's output. Further they argue that the more specialized and sensitive the core technology of the firm is, the more a heterogeneous network would be favoured. This follows from the classic arguments of Thompson (1960), about protection of the technical core as the key aspect of organization. A heterogeneous network would tend to buffer the specialised technical core better than a homogeneous network, which may not be adaptable to changing conditions. Indeed several case studies on international new ventures (Coviello & Munro, 1995, Rasmussen, Madsen & Evangelista, 2000) have shown these firms interact with a variety of organisations including SME's, multinationals, research institutes, venture capitalists, semi-governmental organisations etc. As these different types of organisations are likely to provide the company with different types of information, resources and new network contacts being involved with a wide variety of organisations seems beneficial to the development of global startups.

Location. Because this research deals with gaining insight into international entrepreneurship, I decided to also classify network contacts on the basis of the location. As was argued above, entrepreneurs interact both with contacts that are located very close and actors that are located at the other side of the world (e.g. Coviello & Munro, 1996; Zucchella, 2001). Because distance may hinder frequent communication, it may seem that international contacts are more likely to belong to the network of weak ties. Yet, this is not necessarily the case. For example, the Heartware International (McDougall, et al., 1994a, 1994b) and the Illice Biotech case showed examples of strong ties between the focal firm and its founder and a foreign research institute (the technology provider) and venture capitalist (the investor).

5.4.2 Nature of the Relationship

As mentioned the members of the entrepreneurial team interact with a variety of actors in their network throughout the entrepreneurial process. There are several ways to classify contacts or actors in a network. In this study I examine the strength of the tie, and the type of relationship.

Strength. One way to classify contacts is on the basis of the strength of their tie with the ego (Granovetter, 1973; Koning, 1999, Haythornthwaite, 2001). Tie strength varies along a continuum from weak to strong. Granovetter (1973) states that the strength of a tie (in this case the members of the entrepreneurial team) is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy and the reciprocal services that characterise the tie (p. 1361). Also, multiplexity, meaning that the relationship has multiple contents, might indicate a stronger tie (Kapferer, 1967). Typically strong ties show similarities in attitudes, background, experiences, and access to resources (McPherson & Smith-Lovin, 1987). De Koning (1999) and Ardichvilli et.al(2003) differentiate between three types of network contacts based on the strength of the tie: inner circle, action set, network of weak ties. In this classification the inner circle consists of a very small group of two or three people the entrepreneur communicates frequently almost on a daily basis with. These people provide the entrepreneur with advice, moral support and other help in pursuing the opportunity. The composition of the inner circle tends to be stable over a time and usually consists of long time personal friends or mentors. The action set consists of those individuals and organisations from the network of weak ties that are entrepreneur turn to for specific activities or tasks such as the initial product development or firm foundation. During the completion of the tasks the communication between the entrepreneurial

team and the members of the action set may be frequent yet focused on the specific topic (De Koning, 1999). At any given time an entrepreneurial team may have several different action sets and some contacts may be part of more than one action set. Those contacts that belong to multiple action sets are likely to be (come) strong ties as communication is frequent and the content of the relationship is multiplex at the same time. For that reason in this research I will distinguish between four types of contacts: the inner circle; the network of strong ties, the network of weak ties, and the action set; with the members of the action set originating either in the network of strong or of weak ties. This typology will be followed in the remainder of this research

Ventures with large number of heterogeneous weak network ties seem to have an advantage compared to companies that have more narrow and homogenous strong ties (Burt, 1982; Rogers, 1995). Weak ties connect distant and otherwise disconnected firms. According to Blomstermo and Deo Sharma (2002) weak ties have three benefits. First, firms are in a better position to maintain a large number of weak ties than a large number of strong ties from a cost perspective (Hansen, 1999; Boorman, 1975; Scott, 1975). Strong ties imply a more frequent and tight interaction between firms and they are costly to maintain. Especially in the context of global startups, this aspect is highly relevant. Maintaining a large number of strong relationships with actors located at varied locations around the world would take up far more time and financial resources than any startup firm could afford. Second, weak ties supply more novel knowledge than strong ties (Granovetter, 1973, Rogers, 1995). The stocks of knowledge in firms that are involved in weak ties are dissimilar. Firms engaged in strong ties adapt to each other and develop similarity in knowledge base. Interacting with weak ties from around the world therefore seems to provide global startups with new knowledge and information about opportunities in international markets and knowledge about those markets.

Finally, weak ties imply a de-coupling between firms, and this is less a restrain on the adaptive behaviour of firms (Weick, 1976). Firms engaged in weak ties are in a better position to search for new knowledge, enjoy greater autonomy, and adapt. Thus, firms may go outside their existing channels in search for knowledge. Strong network ties, on the other hand, restrain the knowledge search and the adaptive response of firms. This third element is a further indication that the reliance of a strong dominant partner may endanger the development and even the survival of the new global startup as was shown also by the example of Heartware International (McDougall et al., 1994)

At the same time, research has shown that the existence of several strong ties is necessary in the startup phase, because strong ties are more likely to provide recent startups with access to below market price resources or provide them with referrals (e.g. Birley, 1985, Brush et.al2001). The importance of strong ties was also apparent from most of the exploratory cases. Due to the time and costs involved with maintaining strong ties it seems likely that global startups establish strong ties mainly with actors that are located at relatively close proximity to the venture. However, as shown from for instance the Illice BioTech case, these strong ties can very include international contacts.

Within the context of global startups (or international new ventures in general) no studies have so far described the role of the inner circle. Also, in the exploratory case studies no examples were found of the role of such an inner circle. One reason for this may be that the inner circle consists of personal friends and mentors of the entrepreneurs who have no direct formal relationship with the venture. Because of the personal nature of the relationship and the frequency of the communication, it seems likely that the members of the inner circle are typically domestic contacts.

Type of relationship. A second way to classify the contacts is on the basis of their role. This role describes the type of relationship between the entrepreneurial team and the contact. For instance the contact can be the parent organisation from which the venture originally spun-off, it can be a supplier, consultant, investor, customer etc. Because of their different roles these different relationships can also provide the global startup with different types of knowledge and resources. Each of these types of relations can potentially be a both weak and strong tie. Also, the entrepreneurial team can have several types of relationships with their contacts at the same time. For instance, the parent organisation can be (come) an investor and the supplier could become a partner in a joint venture. If multiple types of relationships exist between the contact and the entrepreneurial firm exist at the same time, a relationship is called multiplex (Granovetter, 1992).

5.4.3 Resources

Investigating the resources involved in an interaction process means looking closely at the nature of the underlying relationship between actors rather than assuming that content either does not matter or that all ties are essentially instrumental (Podolny & Baron, 1997). According to some authors, variations in the type of resources that are being exchanged are not well understood, although they have been linked to outcomes as various as strategic alliances among firms and individual promotion within firms (Podolny & Baron 1997; Gulati & Westphal 1999).

In the literature many resource or capital typologies can be found to classify the type of resources required when pursuing a particular opportunity. Following Parsons (1964), Groen (1994, 2002) suggests we can distinguish between the exchange of economic (e.g. money), cultural (e.g. knowledge and experience), political (e.g. power and legitimacy) and social (e.g. friendship) capital. McLoughlin and Horan (2000) include financial and economic exchange, technological exchange, knowledge exchange, legal exchange and informational exchange. In the literature many resource typologies can be found (Barney, 1991, Hall, 1992, 1993, Greene, et al., 1997, Wiklund, 1998, Brush et al., 2001, Heirman et. al 2003). One of the major problems with these different typologies is the apparent randomness of how they have been chosen for inclusion in different researches. Clearly in many cases the lists of resource-types included in a particular study is far from complete. The classification of capitals into four groups (economic, strategic, cultural, and social) as is being used by Groen (1994, 2003, forthcoming) is based on strong theoretical arguments and seems to include the entire range. However, this framework has not yet been completely developed. Development, elaboration and discussion of this framework is beyond the scope of this research[16] the main drawback of this 4-capital configuration in my perspective would be that they are too general to be used as they are and additional sub-classification would be necessary to make actually clear what type of resources / capitals belong in each of the groups and what their exact meaning is. Typically, I find the meaning of different resources included in the various classifications is more immediately clear than the meanings of different capitals as they have been used in the literature. For this reason I decided to use the term resources rather than term capitals.

Regarding the issue of which resource classification to use in this research, I decided to start with the classification used by Brush et.al (2001). These authors have distinguished between six types of resources: financial capital, raw materials,

[16] Several other researchers at the NIKOS institute are currently involved in the generic development of the framework (e.g. Groen, 2004) or elaborating and specifying this framework in the context of global startups (e.g. Kirwan, 2004)

technology, human resources, organisational resources and social resources. As social resources are already included in the analysis (type of contacts and type of relationship) this resource type will not be discussed here as a separate resource. It should be noted that while conducting a pilot study (Wakkee, 2003) it became apparent that more detailed classification of resources was necessary. In the presentation of the findings and section on recommendations for further research, I will come back to the issue of resource classification. The sub classification of the resources as was eventually used in this study is shown in Appendix 5.

5.4.4 Network Communication

Finally, the network activity has to be described. In the literature many different approaches can be found to describing network activities. For instance, Lechler (2001) describes social interaction between members of entrepreneurial teams or innovation tams in terms of communication, cohesion, work norms, mutual support, co-ordination and conflict resolution. Because of our interest in the use of the network and the way of overcoming time and distance to globally dispersed network contacts, it was decided to focus on three dimensions of network activity: the antecedents and development of the relationships, the frequency and the communication channel or medium

Origins. Most research on entrepreneurial networking has examined the content or the consequences of the interaction between two or more actors rather than the origins of network contacts (Noorderhaven, Koen & Beugelsdijk, 2002). The origins of the network contacts can provide significant insight in how the entrepreneurial team uses its network during the entrepreneurial process. As suggested by Lorenzoni and Lippirani (1999) entrepreneurs can to some extent determine the shape and design of their network. Reviewing the literature strategic intent (Lorenzoni & Lipparani, 1999) and proactive ness (Sarkar, Echambadi & Harrison, 2001) seem to be the most promising factors explaining how entrepreneurs can build up their network. Strategic intent refers to partnering at an early stage, with a vision into the future, appears to be an essential precondition for the rapid development of the relational capability necessary to efficiently steer the process of boundary redefinition' (Lorenzoni & Lippirani 1999: 335). While, Sarkar, Echambadi & Harrison, 2001 define 'alliance proactive ness' as efforts to identify potentially valuable partnering opportunities, and to initiate pre-emptive actions in response to identified opportunities' (Sarkar, Echambadi & Harrison, 2001: 702) strategic orientation (representing the innovativeness, adaptability, *and* proactive ness of the firm).

The importance of strategic orientation, strategic intent and especially pro-activeness suggests that entrepreneurs should try to be relatively aggressive in building their network instead of waiting to be 'invited' to participate in established networks (e.g. by waiting for unsolicited orders). This proactiveness can take various shapes. For instance, entrepreneurs can use directories (like the Yellow Page or the Internet) or participate in trade fairs, or social events to identify and target potential new contacts directly. Also, the entrepreneurs can, proactively or reactively, activate existing contacts as intermediaries or brokers to introduce them to new and previously unknown contacts. Also, when the firm becomes more widely known, the entrepreneurs (or the firm) may also be contacted by previously unknown actors. For instance, the company may be invited to participate in a new research project or receive unsolicited orders.

However, new network contacts do not only get established as a result of proactive behaviour from the side of the entrepreneur. New network contacts are also established as a result of chance meetings with or (chance) introductions to new contacts made by existing contacts. Further, previously unknown contacts may also take the initiative in establishing the first contact (e.g. through unsolicited orders). Many such unsolicited contacts are likely to be the result of activities the firm has undertaken to increase its visibility and the awareness and acceptance of its existence in the eyes of potential new contacts through its marketing efforts.

Frequency. Frequency refers to the number of (direct) interactions between the entrepreneurial team and its different contacts over a given period of time (e.g. Granovetter, 1992). As mentioned in the section on tie strength frequency is often considered as a dimension of tie strength (Granovetter, Haythornthwaite, 2001). The development of stronger relationships requires time and effort; this suggests that entrepreneurs may need to interact frequently with their counterparts. However, the larger the network and the more geographically dispersed a network is, the more difficult it will be to engage in frequent interaction with external contacts. Because the network of a global startup will inevitably include many globally dispersed contacts it seems relevant to examine how often the entrepreneurs in fact interact with their network contacts. For this reason I decided to look at the frequency as a separate variable in the analysis in addition to using it as a measure of tie strength.

Channel. In daily communication entrepreneurs use a variety of media to exchange information with their partners and employees as well as their external contacts, mixing face-to-face contact with e-mail; searching the Internet with asking friends and reading books; sending regular mail and e-mail with use of the telephone (e.g. Haythornthwaite, 1999). Communication channels differ, not only in terms of their content, but also in regard to how they awaken and alter thoughts and senses (McLuhan, 1964). Whereas previous research suggested that media richness determined largely which medium fitted a specific task best (Daft & Lengel, 1986; Trevino, Daft & Lengel, 1990) the different media are now more often considered as complementing each other in a specific task; e-mail and video-conferencing as a support for face-to-face communication; live audio as a support for Internet pages; telephone as a support for e-mail (Garton et al., 1997; Haythornthwaite, et.al1998; McKenney, et al., 1992; Rice, 1992a; Rice & Case, 1983; Rice & Shook, 1990). Rather than looking for the best-fit individuals seem to look for the most convenient and available medium. At the same time, Haythornthwaite, (1998) and Haythornthwaite and Wellman (1998) determined that weaker ties pairs use fewer media (and often only one medium) to interact, while stronger ties do not only communicate more frequently but also using more different types of media.

As a result of distance and differences in time-zone the entrepreneurs may not always be able to communicate face-to-face or even using other direct channels of communication like telephones with their contacts especially when the number of international contacts is increasing and if these contacts are globally dispersed. This implies that when the number of international contacts increases as is expected to occur throughout the global startup process, the entrepreneurial team will have to rely more and more on the use of intermediaries for communication with foreign counterparts. These intermediaries reduce the number of direct contacts the entrepreneurial team has to interact with personally, using face-to-face communication. By reducing the number of contacts with whom the entrepreneurs

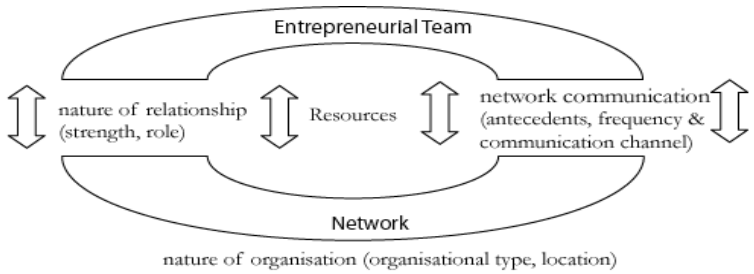
have to interact personally and face-to-face more time and resources are left to meet those contacts for who direct personal and face-to-face communication is essential.

New media, like e-mail and Internet, support existing social networks by increasing the channels and opportunities for contact, allowing connection across time and distance. They expand the reach and basis for maintaining social networks, allowing previously unconnected individuals to make connections (Constant, Kiesler & Sproull, 1996). Furthermore, they extend the kind of connections individuals can make, such as maintaining ties based on specific interests with individuals no matter where these are located in the world (Culnan & Markus, 1987; Wellman et al, 1996). This potential of online media to provide weak connections among many, and to sustain and intensify strong connections among few, suggests that global startups rely considerably on the use of such media in building their network across the globe. At the same time, the literature on knowledge management suggests that when exchanging intangible resources in the form of tacit knowledge and information personal contact may be essential (Saxenian, 1994, Von Hippel, 1994). Therefore it is expected that in addition to frequent use of modern communication technologies the founders of global startups will spend considerable time travelling and meeting with international contacts.

Development of the Interaction

As stated previously, during the course of the entrepreneurial process, the number, type and nature of contacts with whom entrepreneurs interact as well as the content and method of interaction is subject to considerable change (e.g. Ring & Van De Ven, 1994; Gulati, 1995, Isset & Provan, 2002). Also, over time different channels of communication may be used. For instance, some previously weak ties can become stronger with time. Alternatively some contacts belonging to the action set during the early stages of opportunity recognition can drift away from the venture at later stages of the venture's development. The type (and the amount) of resources that is being exchanged in interaction with external contacts (or in other words the multiplexity of the relationship) will change throughout the course of the entrepreneurial process. By describing the interaction between the entrepreneurial team and its contacts at many points in time, the development of the network and the specific relationships become apparent. The model of interaction, with the network-dimensions to be included in the investigation is graphically shown in Figure 8

Figure 8 Interaction Elements and Dimensions

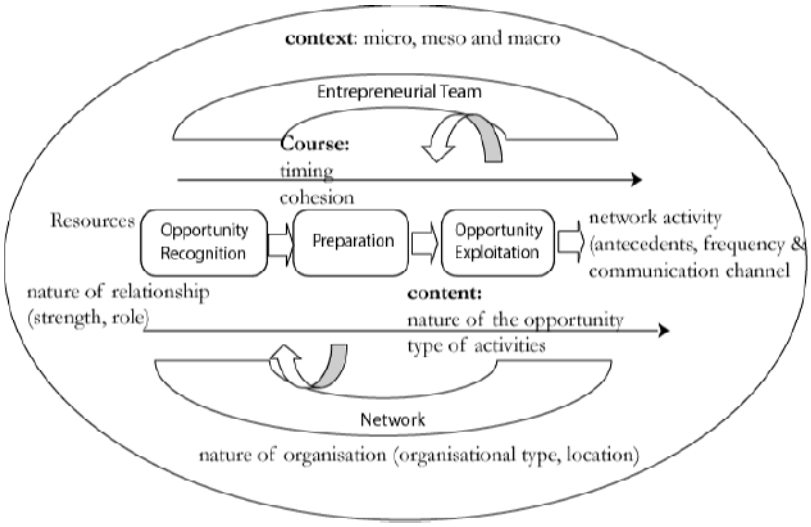


5.5 Research Framework

The dimensions of the global startup process and the interaction process can be linked to the initial model of the entrepreneurial process. At the centre of this framework is the three staged entrepreneurial process. This process will be described in terms of the content and course; both are shown through the horizontal above and below the process and the context, which is depicted as the circle in the background. The interaction between the entrepreneurial team (above the process) and the network (below the process) is described in terms of the nature of organisations or composition of the network (shown below the network), the nature of the relationship, the content of the exchange and the network activity (shown between the entrepreneurial team and the network).

The framework might also be used to describe other entrepreneurial processes than the global startup process. Therefore in the following paragraphs I describe how the characteristics of global startups are expected to affect the different dimensions included in the research framework. The complete model with each of the dimensions to be included in the investigation is shown in Figure 9

Figure 9 Research Framework



5.6 Implications

The following paragraphs describe how the characteristics of high-tech global startups are expected to influence the content, context, and course of the opportunity recognition, opportunity exploitation and value creation process. In this section I build both on the characteristics of global startups as formulated in proposition 1- 11 (see Table 3) and on previous research from the fields of international new ventures and (high-tech) startups.

5.6.1 The Entrepreneurial Team

Before describing the three stages of the global startup process, I first explore the characteristics of the entrepreneurial team, as it is this tam that drives the process. Typically, in the literature on entrepreneurship the focus has been on the individual entrepreneur. This is not surprising considering that indeed most firms are founded by individual entrepreneurs. Also, the 'lone' entrepreneur may appeal most to the imagination and fits individualistic cultures as are dominant in the U.S. and Western Europe. However, as Churchill and Muzyka (1994) or Gartner et al. (1994) argue the "entrepreneur in entrepreneurship" is typically plural not singular, suggesting that entrepreneurial events are more likely to be supported by a team of entrepreneurs rather than a single individual. Evidence suggests that especially high-tech firms are more likely to be founded and managed by entrepreneurial teams rather than by solo entrepreneurs (Flynn & Hynes, 1999). In the literature on international new ventures, hardly any attention has been given to the size or composition of the founding team. Yet, in a number of studies (Jolly et al., 1995; Oviatt & McDougall, 1995; Autio et al., 1997) evidence was found that entrepreneurial teams rather than solo entrepreneurs were involved. Also, most of the cases presented in the previous chapter (except Illice Biotech, Heartware Int. and Sci-Tex), the global startups were founded by teams.

Members of the entrepreneurial team are most commonly highly educated (e.g. Bower, 2003, Radosevich, 1995; Jones-Evans, 1995). In fact, as was also shown in the previous chapter (e.g. Ecofluid, Illice BioTech) founders of high-tech (global) startups are often academics seeking to commercialise nascent technologies (Radosevich, 1995; Bower, 2003). Such entrepreneurs are often referred to as academic entrepreneurs (Jones-Evans, 1995; Samson & Gurdon, 1990; Franklin & Wright, 2000). Their previous experience with the technology is typically the primary resource available to the new venture and the source of the initial idea. The possession of high-level knowledge of the technology is critical as technological advances are likely to occur too rapidly to permit less informed entrepreneurs the time and opportunity to develop the skills and understand the technology to such an extent that they can gain a competitive advantage (Feeser & Willard, 1990). Alternatively, founders of high-tech ventures often have limited competencies in non-technological areas (Oakey et.al1988; Roberts, 1990) and possess little prior market knowledge and linkages, no previous experience of professional investors and their requirements (Roberts, 1990; Franklin et al., 2001; Bower, 2003).

Yet, high-tech ventures are not always founded by academics; in some cases they are founded by external professional entrepreneurs that are 'selected' by the research institute to commercialise the technology or innovation. Such entrepreneurs have been called surrogate entrepreneurs (Radosevich, 1995). Combinations of the two models in which the academic entrepreneur team up with 'professional' entrepreneurs to benefit from synergistic capabilities (Gartner, 1985; Flynn & Hynes, 1999; Aspelund, 2002) are also common. In fact, some initial ideas can only be transformed into a viable business opportunity when such different individuals co-operate.

Even if several or all members of the entrepreneurial team have the same or a similar background, a team founded venture may still benefit from complementary or even synergetic characteristics, knowledge and skills of the team members (Bird, 1989; Kamm et al., 1990, Cooper & Bruno, 1977; Mayer et al., 1989; Vyakarnam et al., 1997).

The down side of a team is, however, that typically in a new venture the team members do not yet have a shared history of being entrepreneurs. Even if they were colleagues in their previous employment, it is unlikely that they have previously shared the responsibility of a venture. Yet, joint work experience is often linked to successful venture creation (Roure & Keeley, 1990; Eisenhardt & Schoonhoven, 1990) as it leads

to more rapid speed in decision-making, higher trust, coordination (Stinchcombe, 1965), cohesiveness (Goodstein & O'Reilly, 1988) and richer communication (Zenger & Lawrence, 1989). Alternatively, high venture that is founded by a team that includes a (former) scientist with no business experience and an entrepreneur with significant business experience but no scientific experience may be negatively affected by this heterogeneity.

With respect to global startups, the exploratory investigation already revealed that founders of global startups often have high levels of entrepreneurial orientation and are typically skilled and confident in doing business internationally. In addition, a considerable number of studies have investigated the effect of a global orientation or mindset on internationalisation (Saarenketo, 2002; Knight, 1997; Moen, 2002; Numella et al., 2002; Harveston, 2000). Founders and managers of global firms were found to have a geocentric mindset that allows them to view the world as a whole (Calof & Beamish, 1994, Lindqvist, 1991, Perlmutter, 1969, Rennie, 1993). Cavusgil and Knight (1997:5) found that founders of international new ventures possess a global orientation, which is 'a bundle of dispositions and competencies the sum of which appears to be positively correlated with export-marketing performance'. As shown by Harveston and Kedia (2004) founders of international new ventures seem to have developed mental models that allow them to think of internationalisation in highly positive terms. When talking about their business, words like customers, international and foreign are frequently used. Many authors have argued that such entrepreneurs have developed such global mindsets because of international working or study experience (Almeida & Bloodgood, 1996; Autio et al., 1997; Bloodgood et al., 1996; Burgel, et al., 1999; Burgel & Murray, 2000; Saarenketo, 2002; Niina et al., 2002; Harveston, 2000; McDougall et al., 2003; Reuber & Fischer, 1997; Roberts, 1997; McDougall et al., 1994; Moen, 2002). As was argued in the previous chapter, even when the founders have no formal international education, training and or working experience, many of them have developed a global vision and feel confident enough to operate in the global arena.

5.6.2 The Opportunity Recognition Process

Whereas established firms typically pursue opportunities that build on earlier opportunities (if only because they focus on the same industry), the opportunity pursued in a startup originates in its founders rather than in its organisation. Consequently, following the opportunity-classifying framework of Davidsson (2002) startups by definition pursue opportunities that are new to the firm. The opportunity recognition process typically consists of three activities: discovery of the initial idea, developing the idea into a business opportunity and evaluating the business opportunity. In the context of a high-tech global startup the initial idea is often the result of a technological innovation in a research institute.

Already the discovery of the initial idea may be an international or global affair. After all, many research centres (especially those at universities) employ international researchers and thus the discovery may be a joint effort of many nationalities. In fact it could be a foreign researcher who decides to pursue the idea further, either in the country where the idea was developed or in his or her home country (as was for instance the case in the Sci-Tex case). As shown in the Heartware case (Oviatt et al., 1994), an entrepreneur may also recognise the value of an innovation if he is not personally involved in the development of a new technology or application and even if this innovation took place on a different continent. As was shown in the exploratory cases, the parent or source organisation where an idea or technology was originally conceived often continues to play an important role in the process and will often

remain a strong tie through the entire global startup process. The Dutch global startups described in the exploratory research continue to use the University's research facilities and are often involved in joint research projects or employ and / or supervise Ph.D. researchers from the University hoping to benefit from their research.
After the initial idea has been discovered, it has to be developed into a business opportunity (e.g. De Koning, 1999, Puhakka, 2002). Above it was explained that this development involves a process of thinking through talking to evaluate the ideas so far. This may involve 'testing' the idea in front of an audience. For instance, when an idea is based on a technological innovation this testing may include publication of paper in a scientific journal or conference. The responses of the international audience (often other scientists) can help shaping and developing the ideas. Next, once the ideas get more shape, entrepreneurs have to start thinking about the target group or market on which to exploit the opportunity and seek out and target potential lead customers and introduce them to the opportunity to obtain their feedback and support. Often these lead customers will be larger commercial, often multinational, firms that do not necessarily originate in the same country as the entrepreneurial team or the opportunity. Further the team also has to begin to think about where and how to obtain (access to) the required resources. Most authors suggest that the first part of this process involves thinking through talking with weak ties (De Koning, 1999), while the second part involves frequent interaction with strong ties (Brush et. al, 2001). Strong ties are typically family members, close friend and former business associates (employers, co-workers etc). Unless the entrepreneur has been living and working abroad for considerable time these strong ties are most likely to be domestic contacts rather than international contacts.

Global startups that are spin-offs will benefit in particular from their relationship with their 'parent organisation' as they are often allowed to make use of its facilities to develop the initial idea further. Not surprisingly, even if they are not direct spin-offs, proximity to a research institute or university matters to high-tech firms (Nooteboom, 2000, Van Der Panne & Dolfsma, 2002). The reason for this is that joint research projects, spill over-effects and informal exchange of (tacit) know-how contribute the regional knowledge base from which the firm can benefit (Jaffe, 1989, Audretsch & Feldman, 1996). However, since resources are often specialised the number of potential providers may be limited and establishing international linkages may be necessary as well. Gaining access to these communities (scientists, lead customers), the entrepreneurial team must proactively try to establish linkages to external organisations. However, new ventures (and teams) do not yet have an established network, are (relatively) unknown by the outside world, have no track record to show for and as a consequence they typically lack legitimacy and credibility (Hannan & Freeman, 1980, Stinchcombe, 1965). As a result new contacts may worry if the new venture or the team will meet specifications, and be cooperative when things go wrong, potential investors will be slow to invest in the organisation until it shows that it has the ability to produce quality products and services, keep customers/clients happy, and be accountable (Hagar et al., 2004). Much of these legitimacy problems stem from a lack of knowledge and understanding of the new venture from the side of these counterparts (Shepard & Zacharakis, 2003).

The need to establish linkages to organisation from around the world further adds to the problem of building a network (e.g. Fontes & Coombs, 1996). Setting up a global network entails that the entrepreneurial team has to deal with considerable variety in terms of culture, legislation, language, political systems etc. This variety increases the complexity of the co-operation considerably (Hymer, 1976). In addition to the problems related to differences in national environments, a company that

operates around the world has to deal with distance and time. It is often suggested that building trust and exchanging tacit information (both of which are essential in setting up a viable company) requires face-to-face contact and frequent interaction. However, meeting foreign counterparts frequently requires both too much time and too many financial resources. As argued above, both time and financial resources are scarce in startups. In addition, telephone or videoconferencing (to compensate for face-to-face meetings) may be difficult to set up due to the different time zones in which the firm and its counterparts are operating. Both problems negatively affect building up an international network, gaining legitimacy and building a resource base as additional information and time is required.

Especially parent companies or other organisations that have been involved in the discovery of the idea and opportunity may play a role in overcoming the problems in relation to building a global network and they may act as an intermediary to other actors (Radosevich, 1985, Galaskiewicz & Bielefeld, 1998).

On the basis of the information acquired during the elaboration and evaluation processes the entrepreneurs have to decide whether or not the opportunity is worth pursuing (Bhave, 1994). This decision to exploit is not necessarily a formal or conscious decision. Also, the timing of this decision may vary. Some entrepreneurs might commit themselves to starting a business when all they have is a basic idea. Others might elaborate their ideas and only become fully committed once all obstacles to opportunity development and resource acquisition have been overcome. Nevertheless, at a certain point during the opportunity recognition process the entrepreneurs become sufficiently committed to the opportunity that they start to prepare for the exploitation. This decision making process, again involves seeking advice and moral support from family and friends and other strong ties. Therefore, it is expected that this final element of the opportunity recognition process again mainly takes place in a domestic context.

To summarise, it seems that the opportunity recognition process of a high-tech global startup firm moves back and forth between a domestic and a global context. During this process the entrepreneurial team interacts mainly with research institutes where the initial idea is often discovered. In addition, the members of the entrepreneurial team communicate frequently with other strong ties with whom mainly intangible resources such as knowledge, advice and moral support are exchanged. Because of the high level of tacit knowledge and trust involved at this stage, face-to-face communication seems critical. Also personal contact seems essential when obtaining feedback from other (international) early users and participants, personal contact. These early users will want to see the product or technology in action before being able to provide feedback and thereby help the entrepreneurial team in its development and evaluation of the opportunity.

5.6.3 The Preparation Process

After the decision has been made to exploit the recognised opportunity, the entrepreneurial team has to prepare for this exploitation. As explained above this preparation involves building a resource base, developing (prototypes of) products and services, creating an organisation and developing the business plan or strategy. Also the firm must start building a name and reputation for itself and its products.

What resources are required depends largely on the nature of the opportunity and on the strategic choice of the entrepreneurial team about the market in which they want to exploit this opportunity (e.g. the goals and the needs they have and the stage of development they are in) but also across sectors and across time (Herron & Robinson, 1993, Elfring & Hulsink, 2003).

Whereas established ventures may already have accumulated sufficient resources to exploit newly recognised opportunities through previous activities, starting entrepreneurs rarely possess all the resources required to seize an opportunity. Considerable shares of the resources that can be used in the venture originate from the personal resource endowments of the entrepreneurs. This may include their knowledge and experience, the network contacts, but also their time and in many cases even part of their financial resources (Brush et al., 2001) Therefore, one of the crucial, but time consuming, tasks in a new venture is to build an initial resource base. This task is especially difficult in the initial stages of a start-up as the financial resources are limited and the firm has hardly any ability to generate internal resources and revenues (Brush, 2001, Garnsey, 1998).

It seems obvious that technical resources are the most important aspect of physical resources for a high-tech startup compared to access to raw materials and plants and manufacturing (Heirman, Clarysse & Van Den Haute, 2003). Closely related to these technological resources are human resources. As already mentioned the founders of high-tech startups are typically highly educated. Potentially required employees also have to be highly educated and well trained. Further, high-tech ventures typically also have high needs for financial resources because investments in R&D can be extensive and the time-to-market can be long.

In the context of high-tech global startups, the desired resources may not all be obtainable domestically either because of their specialised nature or because of market conditions (see for instance the Ecofluid case). Rather, it seems that in many situations the best resources are globally dispersed. The members of the entrepreneurial team should also stay up to date with regards to technological developments and innovations at other research institutes and laboratories of potential competitors and partners around the world. Although, the 'local research' institute can serve as a channel for information on such developments it is essential that the entrepreneurs also establish their own direct linkages to these (foreign) institutes and organisations. Consequently, as argued by Fontes & Coombs (1997) the limitations of the local technological supply may force high-tech startups to search abroad for technological knowledge.

Fontes and Coombs (1996) describe several potential ways to access foreign technology including the use of user-supplier relationships with large foreign firms acting in the local market, participation in international collaborative R&D projects, and integration in international (sector) networks in their field of activity. Other mechanisms for startups to obtain access to technology intensive resources include hiring scientists and engineers (Almeida & Kogut, 1999), forming alliances (Eisenhardt & Schoonhoven, 1994) and appropriation of informal networks (e.g. Liebeskind, et al. 1996; Almeida & Kogut 1997). Further, several previously published case studies on international new ventures show that amongst others conferences and trade fairs are used to establish these linkages (e.g. Rasmussen et.al2000).

During the preparation process, the entrepreneurial team also needs to accumulate market knowledge; and in the context of global firms country specific knowledge for a large number of foreign markets. Eriksson, Majkgård and Deo Sharma (2000) identify three types of experimental knowledge in relation to doing business internationally: business knowledge, institutional knowledge and internationalisation knowledge. Business knowledge is the knowledge a firm has of the customer base, competitors and the market conditions, in particular foreign markets. Institutional knowledge refers to the knowledge of governmental and institutional frameworks, rules, norms and values in the particular markets. Internationalisation knowledge concerns a firm's

knowledge of its capabilities of engaging in international operations and of its resources for doing so. As suggested by Zucchella (2001) such knowledge is often present in regional clusters. In these local, informal networks a collective international knowledge capital develops that helps the entrepreneurs to enter international markets and overcome their lack of resources. In order to access this knowledge and information, the entrepreneurial team therefore has to establish connections to many actors in the regional clusters. This can be done amongst others through local network events and through established connections with dominant players in the cluster. These may include other startups, established firms, intermediary organisations, agencies and others. Besides these regional actors however, the members of the entrepreneurial team will also have to attract information from foreign actors located in the targeted markets. The reason for this is that these actors have a location advantage and will therefore be better informed and thus better sources of information for the firm.

In addition to these intangible (knowledge-intensive) resources, a startup also needs (more) tangible resources to be able to establish an organisation and create (develop, produce) its products and services. Especially financial resources can be critical at this stage (Evans & Leighton, 1989) as this allows the entrepreneurial team to buy other resources, hire advisors, pay the salary of potential employees, to pay for international travel and, if possible, compensate the members of the entrepreneurial team for their efforts and thereby facilitates the actual exploitation of the opportunity. In some cases the members of the entrepreneurial team will try to obtain these financial resources in the form of venture capital. Although most likely venture capital will be sought locally (as venture capitalists often also supply management advice) but as was shown in the exploratory cases (e.g. Illice Biotech and Ecofluid) venture capital may also be sought actively abroad if domestic venture capital cannot be found or if the costs of capital are lower abroad. Also, because venture capitalists may provide access to a network, searching foreign venture capital may be useful to global startups. Other sources of finance could be banks, personal loans from friends and family members and will therefore in most cases be domestic as well. Other tangible resources may include production and office facilities, employees, raw materials and machinery. As suggested by Almor and Hashai (2004), production will most likely be done domestically in order to benefit from. Therefore, production facilities and (production) employees will most likely be sought domestically. The raw materials and machinery may be sought both domestically and internationally, depending on the availability of these resources in the domestic market. I expect that the more specialised these are, the more likely they will have to be obtained from foreign suppliers (especially in a small country).

Building an organisation is the second important element of the preparation phase after attracting resources. Although some global startups establish offices in different parts of the world from the outset (e.g. Logitech, Jolly et al., 1992) it seems that most global startups work from one domestic location and use partnerships and arm's length operations to conquer the world (McDougall, Shane & Oviatt, 1994). Therefore, it seems that building an organisation will mainly be domestic affair. Although some (previously established) international contacts may be used to obtain information and advice, most contacts in stage will be with domestic actors such as consultants, accountants, banks etc.

Even after the official foundation, startups typically have not yet set up real organisational structures, routines and procedures. This may result in inefficiencies in the production or sales processes (Stinchcombe, 1965). The lack of organisational routines, which is common in all new ventures, may even be clearer when looking at

high-tech startups. The reason for this is again the innovative nature of the firms. The more innovative the opportunity (and the resulting products and services) the more likely it is that the firm cannot build on organisation routines it has developed itself but also that it cannot find examples of suitable routines in other (more established) ventures. As Shepard and Zacharakis (2003) suggest, overcoming legitimacy problems involves building knowledge with potential partners. However, the more innovative an opportunity is, the more knowledge is required to make potential network partners understand the value of the opportunity and the products and services. At the same time, the firm has to protect the technology on which the opportunity is based from potential competitors. This can be done in several ways such as patenting, maintaining secrecy or relying on lead time and manufacturing or design capabilities to stay ahead of any potential new entrants and competitors (Hall & Ziedonis, 2001). As Hall and Ziedonis (2001) argue, patents and other intellectual property rights can not always be used because for instance insufficient financial resources are present to defend a violation of these rights or because the rate of innovation makes patents obsolete before they are even filed, secrecy may be essential. Thus, high-tech firms have to carefully balance the information they spread to the market.

Using the different resource and certain kinds of organisations, (prototypes of) the products and services that are to be marketed have to be developed as part of the offering. This offering is the entrepreneur's solution to the market need as perceived by the entrepreneur in the opportunity recognition process. Besides the actual product and service can also include the distribution and after-sales service. Also at this point, the entrepreneur must decide what will be his intended customers, selling price, outlets etc. In short, a concrete marketing plan should be conceptualised and executed. In a global startup, the marketing plan will have to deal with issues resulting from being active in multiple countries simultaneously. As the time and resources of the entrepreneurial team will be limited it is critical that partnerships are used. Many studies on international new ventures have mentioned the use of foreign distributors (references) to market the offering in different parts of the world. Finding potential distributors is therefore an important task at this stage.

Further, because of the innovative nature of the offering, the entrepreneurial team has to spend considerable attention to creating awareness and acceptance of the products (technology and application) by its customers. One way to do so is to establish a partnership with another large, established and well-known player in the industry. For instance, many small Biotech startups co-operate closely with the large pharmaceutical companies. This partner could very well be a foreign partner and is typically a multinational itself. This strategy can give the startup access to a large distribution channel as well. Alternatively, the entrepreneurial team can also try to create awareness and acceptance by itself.

Basically creating acceptance and awareness begins with defining and confirming the 'high-level value propositions' with early users, partners and participants in market demonstrations. This means that the entrepreneurial team should explain the technology, its uses, its costs, performance, capabilities, benefits, and or safety issues to the potential users, starting with the early users and a high-level value proposition and gradually moving to a broader category of potential users and a wide range of applications (Strategis, 2004).

While building awareness of the products and acceptance of the underlying technology on the one hand, the entrepreneurial team must at this stage also consider how it is going to protect its technology from competitors. Above it was already argued that a firm could use patents, secrecy but also lead-time and design and manufacturing capabilities to stay a head of competition and prevent others from

stealing its innovation. As was argued above, patenting may not always be the appropriate strategy because of the costs (of legal defence in case of breach of the intellectual property rights) or because rate of innovation may cause the patent to be obsolete before it is filed. Yet, on the other hand, the presence of a patent may help building acceptance of the technology and building legitimacy or prevent hold-ups caused by other patent holders (Hall & Ziedonis, 2001). Maintaining secrecy, although often less expensive than patenting may be difficult and also endanger the process of creating market acceptance.

None of the previous studies on international new ventures discuss the issue of protecting technology in a global context. However, it seems only logical that in a global arena protecting yourself from a breach of the intellectual property right may be even more expensive and difficult. Also, considering that global startups often rely on partnership and arm's length activities it seems that secrecy may also be difficult to maintain. Consequently it is expected that global startups will mainly rely on lead-time and manufacturing and design capabilities rather than patents or secrecy to protect them and stay ahead of competition.

The building of a resource base, the creation of an organisation, and the development of the offering are mutually reinforcing processes and will take place in parallel to each other. Ultimately, these actions will lead to concrete exchange with the market. Bhave (1994) describes this as 'bridging a boundary' between the supply side (the entrepreneurial firm) and demand side (market). From the above it seems that he local network plays a very important role in the preparation for exploitation in a global startup because at this stage physical proximity is important to exchange (tacit) knowledge and information (Rogers & Larsson, 1984; Zucchella, 2002). In addition to these local contacts however, the entrepreneurial team also has to seek (specialised) resources internationally if these cannot to be found (for a reasonable price or at a reasonable quality) domestically (Fontes & Coombs, 1996). Creating the marketing plan, creating awareness and acceptance in market and protecting the technology seem to be activities that although they may be organised domestically have to take the world market in consideration. Somewhere in the preparation phase the actual global startup firm is (legally) founded and through this process it becomes increasingly established. However, this establishment process is not completed at the time of the first sale because the firm has not yet built a stable and viable position on the market (Van Der Veen & Wakkee, 2004).

5.6.3 Opportunity Exploitation in a high-tech global startup

During the actual exploitation the firm creates value for itself and for its stakeholders by engaging in a variety of exchanges with these counterparts. During the exploitation all the activities described in the preparation phase continue to be important and most likely they will continue to expand as the company needs more and more resources to expand its operations and has to protect itself from an increasing number of potential competitors and other counterparts. In addition to these activities however, the value-creation or exploitation process is characterised for a large part by sales activities as these generate income and thus value to the firm. Throughout this process however, the entrepreneurial team should continue to gain market knowledge (e.g. knowledge of segments, needs and applications, growth potential, early versus late adapters, pricing, competing technologies etc.) in order to be able to build and expand its market from the early adopters to the late markets and broad customer base.

In global startups a very significant part of these sales are generated from international sales. As shown by for instance Rennie (1993) some will sell more than

70% of their produce to foreign customers. It seems likely that because of their technological intensity, high-tech global startups first focus on technology advanced regions with its early applications before moving toward less developed countries with a wider range of (simpler) applications. In order to identify and attract potential customers the global startup firm must initiate marketing activities that are catered to the world market. For instance, advertising in domestic industry journals or exhibiting at national trade fairs will not be sufficient. Instead, websites (in multiple languages) and visits to international trade fairs may be essential. Fontes and Coombs describe four strategies used by internationally active high-tech startups to access foreign sales markets. These strategies are (1) the use of local firms or individuals as intermediaries in the foreign market; (2) internationalisation supported by integration in a group; (3) use of relationships with large companies to access their commercial channels and; (4) profit from the market impacts of participation in international research programs (Fontes & Coombs, 1997; p. 26).

The process of creating awareness and acceptance of the products and services (or the underlying technology and its applications) that started during the preparation phase should continue. Whereas building acceptance focused mainly on the early users and high-level value proposition during the preparation phase, during the actual exploitation process it should increasingly focus on building a broad public acceptance of a wide range of applications.

In order to increase market demand at this stage the entrepreneurial team should also focus on improving the quality while reducing the cost of the offering so that the new innovative product can compete with incumbent products. Improving quality includes issues like increasing performance levels, reliability, durability, etc while reducing costs include issues like increasing efficiency in manufacturing and sales, finding alternative components and materials etc. As the venture may not (yet) have sufficient resources it may not be able to do this on its own. Partnerships with research institutes or other (startups) in the same or related industries may have to be formed.

Although the venture is still relatively unknown to the outside world, potential customers increasingly seek contact for information or to place unsolicited orders. Nevertheless, it is expected that pro-active behaviour from the side of the entrepreneurial team continues to be critical in building up a stable and broad customer base. As the number of contacts increases, and especially if these contacts are globally dispersed it is no longer possible (or necessary) for the entrepreneurial team to communicate frequently and in a face-to-face manner with each and every one of these contacts. In order to deal with the distance to (and time difference with) many of these (potential) contacts the entrepreneurial team must set up alternative ways of communicating. This could involve frequent travel, setting up and staffing offices abroad, using agents, or using modern communication technology or combinations of these. Research suggests that especially agents such as local distributors are often used (e.g. Oviatt & McDougall, 1994, Coviello & Munro, 1996) Also, it has been suggested that innovations in communication technology are important drivers of the international new venture phenomenon and therefore, it seems that these technologies are also used frequently by entrepreneurs. However, to this date no studies have been performed to examine the communication behaviour of international new ventures. Although some global startups may at this stage begin to set up international offices (e.g. Logitech), it seems that this strategy is not used frequently by global startups (McDougall, Shane & Oviatt, 1994).

The entrepreneurial team can use its local partners, such as the 'parent organisation' or actors in the regional cluster to gain additional information and form

partnerships. But it seems that the exploitation and value-creation process takes place in a global context, involving interaction with many actors from many different countries.

In addition to dealing with liabilities related to newness and technology, a global startup also has to overcome liabilities of foreignness. Liability of foreignness refers to the disadvantage internationally operating firms have in international markets in comparison with their local competitors with for instance knowledge of local customs and networks (Hymer, 1976, Johansson & Vahlne, 1977). Global startups need to deal with this liability of foreignness in a large number of countries at the same time. This may take up a considerable part of the venture's time and resources.

5.7 Wrapping up

The aim of my research is to develop an understanding of the global startup phenomenon in general by focusing on the global startup process. In particular, I seek to describe the global startup process and the interaction between the entrepreneurial team and the network during this process. All this will be done from an entrepreneurship-in-network perspective. The fundamentals of this perspective were explained in Chapter 4. From this perspective a generic model of the entrepreneurial process was created first. The entrepreneurial process is the process in which the members of the entrepreneurial team interact with actors in their network to recognise opportunities, prepare the venture for exploitation and exploit the opportunities to creation of value. Although this process is opportunity based rather than entrepreneur based, the entrepreneur (ial team) drives the process by initiating it and giving it direction. The entrepreneurial team, although purposeful and capable of free choice is not independent. Rather it is facilitated, directed, constrained and hindered by its environment and the actors in its environment. Next, some characteristics of global startups were reviewed that were expected to affect the translation of the generic entrepreneurial process to the more specific global startup process. After that I first explained which dimensions of the process would be examined. Then I described how the characteristics of the global startup were expected to affect the global startup process on these dimensions.

Before presenting the actual case study in Chapter 8, Chapter 6 reviews the methodology followed to collect and analyse the data and Chapter 7 provides an overview of the global startup process of the case-company.

PART 3. EMPIRICAL RESEARCH

6. Method

6.1 Introduction

As explained in the introductory chapter of this dissertation, the empirical study is based on a single longitudinal case study. The case study approach has often been viewed as a less desirable research strategy than others (e.g. survey, experiment) for several reasons. The most important criticism concerns the lack of rigor. According to Yin, this is not the problem of the case study approach in general, but caused by too many bad examples where the "investigator has been sloppy and has allowed equivocal evidence or biased views to influence the direction of the findings and conclusions" (Yin, 1994, p. 9). Also, the idea exists that case studies offer little basis for scientific generalisation as a result of the small number of cases. However, case studies are, just like experiments, generalisable to theoretical propositions and not to populations. The goal of a case study is to expand and generalise theories (analytic generalisation) and not to list frequencies (statistical generalisation). Finally, case studies are often considered to take too long and to result in massive unreadable documents.

These concerns make it extremely important to be extra careful in designing the case study. A research design is a plan that that guides the investigation in the process of collecting, analysing and interpreting observations. It is a logical model of proof that allows the researcher to draw inferences concerning causal relationships among the variables under investigation. The research design also defines the domain of generalisability, that is, whether the obtained interpretations can be generalised to a larger population or to different situations (Nachmias & Nachmias, 1992, : 77-78 in Yin, 1994, p. 19). The remainder of this chapter will be devoted to this issue.

6.2 Case Study Definition

The case study approach adopted in this research is based on Yin's case study research approach (Yin, 1994). Yin (1994) defines as case study as an empirical enquiry that investigates a contemporary phenomenon within its real life context when the boundaries between the phenomenon and the context are not clearly evident. Because of the unclear boundaries between the phenomenon and its context, it is important to describe the phenomenon under investigation and the context in which it is studied precisely or in other words defining what the 'case' is. Typically, the case is a system of action rather than an individual or group of individuals. According to Yin (1994) case studies tend to be selective, focusing on one or two issues that are fundamental to understanding the system being examined. In this research the case concerns "the global startup process of high-tech firms". Because the entrepreneurial team initiates the venture and influences the content and course of this process, the entrepreneurial team is considered to be the first element in the system. As the study focuses on the development of the nascent global startup firm rather than on the development of the entrepreneur, the global startup firm is the second element to be included in the system. Finally, entrepreneurship takes place in a (social) exchange network of firms, individuals and other organisations. In this research the role of the network in the global startup process is examined. Thus, the network is the third element in the system. Consequently the case study domain incorporates the interaction between the entrepreneur, the firm and the network during the global startup process.

Further, as Yin states, specific time boundaries need to define the beginning and the end of the case. In relation to time the founding and globalisation process of high-tech global startups will be confined to the first five years after the entrepreneur first

becomes involved in setting up the venture. This moment is defined as the moment in which the entrepreneur both has identified an initial idea (which in this case took place in November 1994) for the venture and starts to purposely collect the required tangible or intangible resources and spans the entire startup period following this initial discovery. From the literature it was derived that it usually takes about six years after the start of the actual business activities for a firm to overcome its liability of newness (Stinchcombe, 1965) and can no longer be called a startup (McDougall, Shane & Oviatt, 1994). As the entrepreneurs began their preparatory activities in December 1996 the six-year period ended at the start of 2003. However, it was later decided that May 2003 actually formed a more nature cut-off point as at that time the firm moved into their new premises, - a change which could in this case be seen as the start of a new period.

6.3 Quality Considerations

The empirical part of this dissertation is an account of my interpretations of the data. I relied on existing literature to identify the concepts, attributes and values, and to generate ideas. New concepts, attributes, values and ideas emerged during the data collection and analysis. I contemplated my data and tried to consider it from different perspectives to generate ideas and frameworks. Supporting evidence gave strength to the ideas and interpretations while contradictory evidence lead to questions about my original interpretations and ideas.

Several criteria exist to evaluate the quality of empirical research. According to Yin (1994) and Miles and Huberman (1994) these are:

- Internal validity: establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships or in order words: internal validity concerns the extent to which alternative explanations can be eliminated. According to Eisenhardt (1989) the 'why' question helps to establish the internal validity of a research.
- External validity: establishing the domain to which the study's findings can be generalised.
- Construct validity: includes the convergent and discriminant validity. Convergence means that evidence from different sources gathered in different ways all indicates the same or a similar meaning of the construct. Discriminability means it is possible to empirically differentiate the construct from other constructs that may be similar, and to point out what is unrelated to the constructs. In this study, construct validity was sought by using multiple sources of evidence, creating chains of evidence, and having key interviewees review drafts of the case study reports, as proposed by Yin (1991).
- Reliability: demonstrating that the operations of a study, such as the data collection procedures, can be repeated with the same results. In this study reliability is achieved by describing carefully which procedures have been used, using a case study database and field notes and staying close to the original data in the case study report. For instance, many literal quotes and the sources of these quotes, and their locations in the case study database are reported in the text.
- Credibility: demonstrating that in the study the multiple realities are represented adequately. To this end, both the informants' interpretation of specific events as well as my personal view on the events and an evaluation of why differences in perspective may exist s included in the report. The case material is as detailed as possible in view of the limitations set by the need to protect the identity of the case companies.

Miles & Huberman (1994) further list 13 questions testing the internal validity, credibility, and authenticity of results. Table 7 lists these considerations and my approach to dealing with these considerations.

6.4 Case Description and Selection

The case study is based on a Dutch global startup firm that was founded as a spin-off from a Dutch university in 1998 by a university researcher and a former business consultant. The company's core technological competence is grounded in a sound-measuring sensor, which was discovered in 1994 and further, developed over the following years during a Ph.D. research. The firm seeks to develop, manufacture and sell value-added applications based upon this technology. Currently, the company is the only provider of these sensors and therefore it competes mainly with established producers of traditional microphones in the global marketplace. Because of the radical nature of the innovation, creating awareness and building acceptance of the technology is critical. The privately owned company currently has 4 employees.

This company was selected to participate in the study of the global startup process for four reasons. First, because of the mutual relationship the entrepreneurial team and I had with the university an initial level of trust existed through the common background. Second, because of the close contacts between the firm and the university, it was possible to obtain information on this company through other sources (e.g. interviews with university officials working with this company). Finally, and most importantly from an initial interview it was clear that Sound Inc. was already fairly globalised[17] at the start of the exploratory research (ensuring that he firm was indeed a global startup) and also seemed to have good chances of surviving throughout the period of this investigation. Clearly the company for this company the startup process and the internationalisation process had been highly integrated so far, the firm engaged in a wide range of formal and informal international activities from the start, in multiple regions of the world and was embedded in a global network.

Even though the study of 'failure' can offer interesting insight into the global startup phenomenon (as was shown by McDougall and her colleagues in the publications on the Heartware case), the research questions would not be answerable if the company would fail early on in the investigation. Finally, Sound Inc.'s officials offered to provide access to a wide variety of interesting data sources on their own accord and therefore they provided an interesting opportunity of research.

[17] Perhaps even more so than some of the companies involved in the exploratory research.

Consideration	*This study*
How context rich and meaningful (thick) are the descriptions	The data proved to be very rich and revealing. At times reading the documents felt like being present at meetings or listening in on telephone conversations. Due to the high frequency of e-mail interaction the e-mail chains resembled what Groen & Nooteboom (1998) called intellectual mid-wivery.
Does the account ring true, make sense, seem convincing or plausible, enable a vicarious presence for the reader	Yes, although the story is remarkable it does seem logical that it the story as reported in the case study actually happened this way. In order to stay close to the actual reality I tried to include as many quotes from the original data as possible
Is the account rendered a comprehensive one, respecting the configuration and temporal arrangement of elements in the local context	By describing the macro, meso, and micro context and how these changed over time and affected the course and content of the process, I indeed believed I provided a comprehensive account
Did triangulation among complementary methods and data sources produce generally converging conclusions? If not is there a coherent explanation for this?	The various data sources did lead to converging conclusions. Yet, in some instances the entrepreneurs indicated they do not completely agree with my conclusions. For instance according to Mr. Path the role of the University was much smaller than it seemed to me. One possible reason for this is the fact that in general entrepreneurs tend to focus on their personal struggles and achievements and owe them to their own efforts rather than to the help of other people and organisations. After careful deliberation and discussion with colleagues I concluded that the role of the University was indeed as large as I had previously concluded. However, I decided to add the comments of Mr. Path on this issue to the report to include his perspective as well
Are the presented data well linked to the emerging theory?	I have tried to link the data closely to the measures by using a coding table and using the code (or attribute and values)-labels in my report
Are the findings internally coherent, are concepts systematically related?	Evidence from different sources (e.g. interviews and e-mails) indicates the same or a similar meaning of the concepts and measures. From the data relationships emerged between the different concepts that were already expected from the literature.
Were rules used for the configuration of propositions and hypotheses made explicit?	I have not formulated such rules in advance. However, I hope my arguments are consistent enough so that the set of propositions formulated in the discussion chapter seem logical
Are areas of uncertainty defined? (Should there be some?)	However, whenever doubt arose (e.g. regarding the role of the University, the effect of cultural and language differences on the problems between Mr. Wide and Pfon) I reported these explicitly
Was negative evidence sought? Found? What happened then?	I was not looking to describe a success story. I believe the many struggles I described in the text, such as the problems with Pfon, the formation of the Team etc only make the account ring more plausible and make the study more real
Have rival explanations been actively considered? What happened to them?	I found that though the network was indeed as important as considered previously, the role of the individual entrepreneurs and the entrepreneurial orientation of the venture could not be left out of the account. In combination these three elements provide a much better explanation than the network alone would
Have the findings been replicated in other parts of the database?	The archival data was actually research only towards the end of the study. The data found in this data base provide a very similar picture to the other data that had been research before
Were the conclusions to be accurate by the original informants? If not, is there a coherent explanation for this?	The entrepreneurs felt the report provided a very detailed account of what happened and also that is was too personal to reveal their identity. Except for a few remarks no serious comments were received back from the entrepreneurs about the content
Were any predictions made in the study and how accurate were they?	No, but the propositions on the nature of Global Startups were applied to the case to determine to which extent the company was indeed a Global startup and to provide the opportunity to test if the propositions were useful to work with.

Table 7 Quality considerations for case study research (from Miles & Huberman, 1994)

6.5 Sources of Data

An essential matter in case study research concerns triangulation (Hutjes & Van Buuren, 1992; Yin, 1994). Triangulation is a widely discussed technique to enhance construct validity (for instance Eisenhardt, 1989, Hutjes & Van Buuren, 1992, Yin, 1994). Triangulation can be achieved through using different research methods (e.g. case studies and large scale surveys), examining a phenomenon from competing theoretical perspectives, by using multiple researchers in the investigation and by using different sources of information (Hutjes & Van Buuren, 1992, Yin, 1994) In this research, triangulation is achieved mainly by utilising four basic sources of qualitative information:

6.5.1 Interviews

Interviews are one of the most important sources of information in case studies. Three types of interviews can be used: Open-ended, Focused, and Structured or survey. In an open-ended interview, key respondents are asked to comment about certain events. The informants may propose solutions or provide insight into events. They can also confirm evidence obtained from other sources. The focused interview is used when the informant is interviewed for a short period of time, usually to answer set questions. This technique is often used to confirm data collected from another source. The structured interview is similar to a survey as the questions are detailed and developed in advance, much more as they are in a survey. To avoid dependency on a single informant, the researcher must use other sources to verify the authenticity of the information. In this research several semi-structured and focused interviews are conducted with the two founders of the firm as well as with one of the company employees. Further, one interview was conducted with a university official who is frequently in contact with the company and its officials[18]. For each of the informants used in this study a data-sheet was filled in (see appendix 4).

Because of the richness of the other sources of data, in the end the data obtained from the interviews accounted only for a relatively small part of the information obtained in this case study. The main benefits of this proved to be the relative non-obtrusiveness of this research for the company, and the relatively low danger of social desirable information.

6.5.2 Documentation

Documents include letters, memoranda, agendas, administrative documents, newspaper articles, or any other written document that might be relevant to the research. In the interest of triangulation of evidence, the documents serve to confirm evidence collected from other sources or for making inferences about events (Yin, 1994). According to Bell and Loane (2002), analysing documentation before conducting interviews, make good sense. It allows researchers to say: " …we already know quite a bit about your firm from the e-mails that were forwarded to us (and from other documentation), and now wish to ask a few very targeted questions to fill in the gaps". The authors experienced that the managers in their study commented that they really like this approach, because, while sympathetic to researchers, they have high workloads or tight schedules and prefer to spend as short a time as possible on supplying information. In this study several types of documentation are incorporated. These included the company's Internet pages and other Internet pages listing information regarding the company and its technology, brochures published by third

[18] In this dissertation, the concept 'company officials' refers to both the company's founders and the employees.

parties, promotional and scientific publications, press releases, two reports created by interns of the company (one about the marketing plan and the other about the use of trade fairs). Further an analysis of the use of computer systems and web-statistics were included as well. Also a large number of archived faxes and e-mails exchanged between company officials and external contacts between November 1994 and April 2001 were incorporated in the analysis.

6.5.3 Physical artefacts

Physical artefacts can be tools, instruments, or some other physical evidence that may be collected during the study as part of a field visit. The perspective of the researcher can be broadened as a result of the discovery. In this study several artefacts such as photo's and data-sheets are included to create a richer picture. They are used as background materials to increase the researcher's understanding of the company rather than as a source of answers to the research questions

6.5.4 Company E-mails

In this research I also included a less common type of data: company e-mails. These include all e-mails sent and received by company officials from and to other company officials and external parties between December 2001 and May 2002 as well as a large number of e-mails sent and received between February 1995 and April 2001[19]. These e-mails are used to develop a rich picture of the day-to-day operations and activities of Sound Inc. In fact, at the start of this investigation one of the company founders suggested that if I wanted to know what was going on in their firm, I really needed to have access to their e-mails.

Because e-mail messages are hardly ever mentioned as a source of data in qualitative research (other than in the study of e-mail use specifically) it is necessary to explain why it was decided to include company e-mails in this investigation (Wakkee, 2003, Wakkee, Danskin, During 2004). Basically there were five arguments why including company e-mails in this investigation (and others) makes sense. The first two reasons apply particularly well to this study in particular. The remaining three arguments for using e-mail are not specific to this investigation but would apply to all qualitative investigations of business development process.

First, e-mail is an excellent tool to communicate with actors around the world, living and working in different time zones. As Ng, Pan and Wilson (1998) suggest the boundaries of business on the web are not defined by geography or national boundaries, but rather by the coverage of computer networks. Therefore, global startups are expected to use e-mail frequently to make contacts, and build up relationships with a wide variety of individuals and organisations around the globe. Consequently, the study of e-mail messages specifically applies to the context of the global startup phenomenon. Second, considering that one of the research questions (and several of the propositions) concern the interaction between the entrepreneurial team and the network, company e-mails offer direct and detailed insight into at least one of the potential communication channels used in the interaction. Third, e-mail is a rich source of information and besides texts, it can include a variety of files such as

[19] Unfortunately not all e-mails sent and received between February 1995 and April 2001 were included in the archives. Only those e-mails that were considered important by the founders (and particularly by Mr Wide) were burned onto the archive-CD Rom prior to his sabbatical. In hindsight it is difficult to establish to what extent the 'lost' e-mails would have provided additional or different insights into the early stages of the startup process or just how many e-mails were lost. However, according to the entrepreneurs only a relatively small number of e-mails were not included in the archive and most of these were exchanged with one-time contacts only.

computer programs, statistical data, pictures, and even audio and video files. In addition, emotions can be expressed through e-mails (e.g. the use of CAPITALS to express anger or excitement or emoticons (smileys etc.)). Also, e-mails allow for immediate or postponed feedback Pantelli (2001). In combination with their informal nature this leads to the exchange of new information that would otherwise not be exchanged (Sproull and Kiesler, 1986). This suggests that company e-mails are not simply a source of data to confirm or to reject findings from other sources of data, but they also contain a unique set of data that would not be obtainable through other sources. Fourth, because of the spontaneous and informal nature of e-mail communication, and because the messages were not intended to be used in research, the data are not presented nicer than it is as might be done in interviews or even official documentation. Therefore, it is expected that e-mails are a reliable source of data. In this respect, it seems that reading company e-mails is like being present at the organisation and witnessing face-to-face meetings or listening in on telephone conversations. For these reasons it is expected that company e-mails are an important source of information when studying the development of global startups. Finally, from an investigation of a sub-sample of the e-mails it was concluded that the examination of e-mails is similar to direct observation. The detail and the richness of the information contained in the e-mails made tacit knowledge more explicit for the researcher (Wakkee, 2003).

6.6 Research Process

The empirical investigation can be described as a process consisting of data collection, preparation, and analysis. This process, although described as a sequential process, is neither sequential nor linear. Rather the process can be described as having the following characteristics (Seidel, 1998) the process is **iterative and progressive** because it is a cycle that keeps repeating. For example, when you are *thinking* about things you also start *noticing new things* in the data; you then *collect* and *think* about these new things. In principle the process is an infinite spiral. The process is **recursive** because one part can call you back to a previous part. For example, while you are busy *collecting* things you might simultaneously start *noticing* new things to *collec*t. The process is **holographic** in that each step in the process contains the entire process. For example, when you first *notice* things you are already mentally *collecting* and *thinking* about those things."

6.6.1 Data Collection

The data was collected between May 2001 and October 2003 while have the period over which the data was collected as described above spans more than five years (from 1998 when the firm was founded until 2003 when the data collection period ended). In addition, some of the publications and press releases included in this analysis are from 1994, when the technology was first invented and the company did not even exist yet. Consequently the case study is longitudinal in nature. Between May 2001 and October 2003 the data was collected from various sources.

The first introductory interviews (conducted as part of the pilot study) were conducted in May 2001, the last interviews were conducted in February of 2004 to present the findings and check some last details. The interviews held in 2001 and 2002 were semi-structured interviews. These were not taped but a report of the interview was sent to the interviewee for confirmation of the findings. The interviews conducted in 2003 and 2004 were more focused. These interviews were taped. At two interviews a second researcher was present, thereby increasing the reliability of the findings. For

these interviews, summary reports were made and sent to the interviewee for review and assessment of accuracy as well, thereby increasing the construct validity. In between these interviews the researcher exchanged several e-mails with company officials concerning specific questions in relation to the investigation and publication of some preliminary results (e.g. Wakkee and Van der Sijde, 2002, Wakkee, 2003). In total 7 interviews were conducted with company officials, in five of these cases Mr. Path was interviewed. Mr. Wide was interviewed once at the start of the investigation and one of the company employees was interviewed once. These interviews took place at various locations: at the company head office, at the company's research lab and the principal researcher's office both of which were located at the University[20], at the company's production facility near the University.

During the different interviews several brochures and other documentation was collected. In addition, the interview with Mr. Wide was combined with a tour through the research lab's were Mr. Wide attempted to explain the scientific principles of their core technology. Also during the interview with a company employee in June of 2001, a CD-Rom with archival records (including e-mails, faxes and contracts) was obtained.

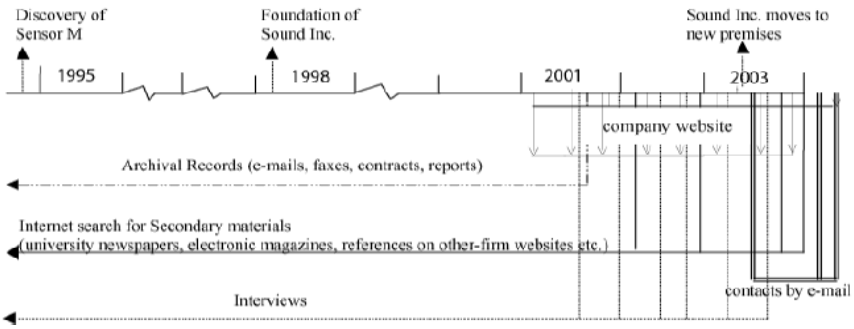
In addition to the interviews with company officials, the Commercial Director of the Beta Institute was interviewed three times of which two interviews focused specifically on Sound Inc. The first of these interviews took place in March of 2001; the last interview was conducted in February of 2003. After that there were several contacts by e-mail.

Between August 2001 and May 2002, company e-mails were collected. However due to a problem with the computer the e-mails between September and November 2001 and between mid-January and mid-February were lost. Therefore the e-mails span a period of approximately 5 months between December 2001 and May 2002. The e-mails included all messages sent or received from the general e-mail address (info@company.com) Although the employees and 'functions' (sales, production, etc) have their own e-mail address, sent or received e-mails that are relevant for more people are sent (automatically) as a copy to this address. Because all employees can access this mailbox, it is also used for internal communication. This use of the info@company.com is rather extraordinary as this info-address usually only used for first contacts initiated by external individuals or organisations. When an e-mail was sent or received from or to this address a copy was sent automatically to the personal mailbox of the researcher. Therefore, the data was collected real time. The e-mails stored on the archive CD-Rom were collected post-date and at once in April 2001.

With regular intervals the website of the company was examined and new Internet pages, photo's, data-sheets, press releases, publications and other documents were downloaded. Also about every three months an Internet search was conducted to find Internet pages published by others that contained information on the company or its technology. In Figure 10, the data collection process over time is shown graphically.

[20] The University from which Sound Inc. spun off is written with a capital U to make a clear distinction between this university and other universities with which the firm interacts

Figure 10 Timeline of data collection and time period covered by the different data sources



6.6.2 Data Preparation

According to Yin (1994), every case study project should strive to develop a formal, presentable database for organising and documenting the data, so that, in principle, other investigators can review the evidence directly and not be limited to the written reports, thereby increasing the reliability of the case study. The development of a database also facilitated the preparation of the data before the actual analysis could start.

First, during the data collection an enormous amount of documents, files, reports, etc were collected. Not all of these proved relevant for the case study. Therefore non-relevant files had to be removed. Examples of such non-relevant files included personal, non-work related e-mail messages like *'Some of us are going to the Lord of the Rings, who is joining us?'* and Spam (impersonal, un-requested, commercial messages) were deleted upon receipt. After removing all personal e-mails and Spam messages and the e-mails for the other company, more than 511 messages remained (Wakkee, 2003). Also, a large number of Internet pages that were downloaded previously were removed as they did not contain any information, but only mentioned the company or the technology such as industry directories, or publications referencing to other publications.

Second, all the relevant files had to be loaded into the case study database. This database is not only useful for the researcher but should, upon inspection, reveal the actual evidence and should report under which circumstances the evidence was collected. These circumstances should be consistent with the specific procedures and questions in the protocol, to show that the data collection followed these procedures. By demonstrating that the operations of the study, such as data collection procedures, can be repeated with the same results, the database is a tool for improving the case study's reliability.

The database was created in Nudist Vivo, a software package for qualitative research. This software allows for creating and editing primary or secondary data for its exploration, organisation and linking as well as the searching, modelling and theorising of an emerging analysis (Barry, 1998, Jemmott, 2002). Because the software can only import Rich Text Format (.rtf) or Text (.txt) documents, all documents had to be saved as text files one by one, before importing each of these files into the Nvivo project database. Also the faxes that were saved as .pdf format had to be opened one by one after which the texts were selected copied and pasted into word

documents. Files that could not be saved as .txt or .rtf format were imported DataBits. The DataBits tool allowed us to incorporate many different types of files (e.g. photographs, Internet hyperlinks, or videotapes) into the project database and inspect them to develop a richer picture. Due to their large number, this made the preparation of the e-mails and faxes for analysis particularly time-consuming. Also, scanning the press releases and saving them as .txt documents was time consuming[21]. Third, the documents included in the database were grouped into set and subsets. Sets refer to groups of documents obtained through the same data-source. Subsets included documents from the same informants (e.g. all interviews with or e-mails sent by the company founder or all e-mails sent to or by an external contact). Other subsets included for instance documents about the same topic (for instance, e-mail messages and Internet pages concerning a particular conference or trade fair). Consequently, many documents were included in multiple subsets. After that, some housekeeping was necessary. First, some e-mails were responses to earlier e-mails, or were forwarded e-mails with some additional lines of text. These e-mails most often included the texts of the original e-mail. Some of such send –reply –forward chains were quite long. In order to deal with this problem and to avoid confusion the e-mails were linked into sets based on the sender/ receiver combination and the subject header. Also, texts of earlier messages included in the e-mail have been highlighted. Related to these chains of e-mails a second problem was identified: in several reply e-mails the response was inserted in the original message. When examining the e-mails the distinction is not always apparent, especially if the original e-mail was not included in the database (because it was sent to another e-mail address or at an earlier date). In order to deal with this problem the section that were believed to be responses have been highlighted. Also with respect to the interview reports, sections of the interviews concerning different topics also have been highlighted in different colours. Finally, although the researcher can read the languages used in the documents (Dutch, English and German), in case of doubt, a dictionary was used or a colleague was asked for help. The translation of these 'unfamiliar words' was inserted in the text and highlighted in yellow. A log was used to keep a record of the adjustments made during the housekeeping.

6.6.3 Data Analysis

In order to analyse the data a commonly adopted technique was adopted: coding. Coding is the process of marking passages of text in a project's documents with nodes. A given node is said to code those passages. Where documents are the basic information in a project, nodes represent all the ideas and concepts and categories and people and things and results in the project. Then coding is way of recording where those ideas, etc. occur in or refer to the project's information. Codes can be theoretical, meaning they are highly abstract drawn from "grand theories" or they can be "in vivo codes", drawn from the stock of common sense knowledge of the members of the investigated social world (Glaser, 1978, p. 70). Some types of categories, described as factual (Richards & Richards, 1995), are relatively easy to define (e.g., female/male, primary/secondary teacher). Referential categories (Richards & Richards, 1995) are those dependent upon textual references in the transcripts. Similarly these can be largely descriptive or more interpretative (Miles & Weitzman, 1994). An *attribute* is a named generic property, e.g. 'Age', 'Marital Status'. (A detailed

[21] Due to the large number of documents included in the database, the software failed many times. It was decided therefore to make several individual databases. The information stored in each of the databases was combined manually towards the end of the investigation.

description of the attributes is presented in Appendix 2 where I list the attributes and values used in this research.)

Codes are used for sign posting. This means that codes are stored together with the "address" of a certain text passage and, drawing on this information, all the possible information provided by the textual data on the relevant topic can be located. According to Kelle (1997) the coding process starts by cautiously identifying the both most important theoretical perspectives to present, and the areas to which these perspectives apply. Thereafter, each incident in the data is marked with a code that stands for the various areas to which it appears to be relevant. The keywords or codes used in the analysis were derived from the research framework presented in the previous chapter and can be found in Appendix 5.

Because of the large quantity of information, the use of Computer Assisted Qualitative Data Analysis Systems (CAQDAS) was considered. One of the obvious advantages of CAQDAS would be the faster and hence more complex coding of data (Barry, 1998), which would save both time and improve the quality of the data analysis. Facilities for enhanced coding and retrieval offer fascinating new possibilities for analysts to "play" with their data and thereby help to open up new perspectives and to stimulate new insights[22].

As the amounts of data were simply too large to code all in detail it was decided that 100 e-mails, 35 faxes were coded in detail (line by line)[23]. The rest of the documents were coded more superficially, taking notes while reading them and using keyword searches to find specific information. The information obtained through this more superficial coding was then compared to the 'pilot-set' to see if the information was similar or if remarkable new insights had come to light. Using these two approaches an overview of the process as it unfolded emerged.

However, as Richard and Richards (1995) suggest, assigning predefined attributes is not enough. The more elements of the texts are coded the richer picture develops. Therefore after having assigned the attributes, every section of each document was indexed resulting in a large number of categories. After this, the procedures and objectives were reviewed and a decision was made as to which sections of the data should be examined more thoroughly on the basis of the now existing codes. Or in other words after the coding process, researchers must begin to make sense of the data and discover patterns in the data, by using the critical incident technique (CIT). CIT consists of a set of procedures for gathering and analysing reports of incidents, actual behaviours observed first hand, that involve "certain important facts concerning

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[22] Despite the obvious benefits of using software tools, many authors have expressed warnings regarding potential methodological dangers of computer-aided qualitative data analysis software (Seidel, 1991; Seider and Kelle, 1995; Coffey, Holbrook and Atkinson, 1996). They have suggested that the use of computers could alienate the researcher from their data and enforce analysis strategies that go against the methodological and theoretical orientations which qualitative researchers see as the hallmark of their work. Also, working with a computer and having computer-printed extracts and coding can provide a veneer of objectivity. Clearly, the quality of the research is still dependent upon the quality of the researcher's efforts in checking the accuracy of transcripts, the definitions of categories for coding and the accuracy of applying those definitions. But a danger would be that once categories are defined and coded by the computer, it is easy to be seduced into accepting them and it is, therefore, important to continue to question categories and definitions. Although, these issues are recognised, I take it that as long as the researcher is aware of these dangers and keeps in touch with the data, the pitfalls can be avoided easily.

[23] The results from this pilot study were reported in a working paper, which was presented at the 6th McGill Conference on International Entrepreneurship. The methodology that I developed during this pilot study was reported in an other paper (Wakkee, Danskin & During) which is forthcoming in the Handbook of Qualitative Research Methods in Entrepreneurship Research (forthcoming) In order to provide a better picture of the (difficulties involved in the) analysis of company e-mails and to show the value of using company e-mails as a source of data in qualitative research the first of these papers is reproduced in Appendix 6).

behaviour in defined situations" (Flanagan, 1954: 335). Incidents typically include three features: a description of the situation, an account of the actions or behaviour of the key player in the incident, and the outcome or result.

In order to determine which incidents played a role in the global startup process of Sound Inc., references to these incidents were examined both in terms of quality (e.g. remarks by principal informants regarding the importance of the incidents) and quantity (the number of references to the incident). By listing the critical incidents and the relationships between them the content and course of the global startup process became apparent.

To analyse the interaction process of the entrepreneurial team, I first identified the most important contacts with or about whom the entrepreneurs communicated. Again the importance was determined based on quality (direct reference to their importance) and quantity (the number of communications with or about the particular contact). Next, all relevant information about these contacts (e.g. location, type of organisation, type of relationship) was listed in tables. Also, I tried to establish direct relationships between the different contacts. With this information I began to develop models of Sound Inc.'s network and how this network developed over time. Further content analysis was used to determine which methods of interaction were usually adopted. To this end I (amongst others) calculated the frequencies of the references to the different communication channels that were used.

6.6.4 Case Study Reporting

The findings of the case study are reported in Chapter 7. Although it was originally intended to disclose the name of the company under investigation as well as those of the principal informants, upon completion of the report, the entrepreneurial team requested me to hide their names and report the case in an anonymous way. They felt the case was too detailed and revealed too many personal issues for their comfort. Therefore, aliases have been used to hide the identity of the firm and its officials as well as those of their external counterparts.

The case study begins with a general overview of the developments in the company from the moment the initial idea was discovered until the company moved to a new building, marking the end of their startup period. After this overview a more detailed analysis of the data is provided following the research framework of chapter 5.

7. Starting Global – The Sound Inc. Case

7.1 Introduction

In this chapter I present an overview of the global startup and interaction process of Sound Inc. The information used for this overview was obtained from the interview data. From this data a general overview was obtained. In order to develop a richer picture, this information was then expanded with information retrieved from e-mails, internal reports, and archival information (in particular faxes and contracts). When information is directly derived from a small number of documents the document number and date of creation will be included.

7.2 The Idea

While working on his Master thesis at a Dutch University in 1994, Mr. Wide made a chance discovery resulting from the classical brain wave: He was conducting research on sensors for the analysis of liquids and their application in petrol cables. Yet as Mr. Wide explained: "… *the device only started to work after I talked to it authoritatively. All of a sudden I realised the sensor unintentionally worked like a microphone".* Mr. Wide immediately went to his supervisor, Professor Charles Fairy. After doing several tests together they concluded his discovery seemed promising and was worth pursuing further (*source: University Newspaper articles dd. 29/06/1995; 30/01/1997; interview report DB1*)

To conduct further experimental tests on the Sensor a research team was formed. This team consisted of Mr. Wide, his friends with whom he was working on the original assignment and a number of other students. Professor Fairy, one of the lead scientists in the department, supervised the team. Each of the members focused on different technological or managerial aspects of the Sensor (*source: University Newspaper article dd. 29/06/1995; faxes February 1995 –November 1995).*

Despite the enthusiasm within the team, it encountered considerable scepticism ("*It cannot possibly work*") from other researchers at the department. Nevertheless, they were eager enough to be part of the experiments as Mr. Wide explained: *"These experiments were really exciting. Curious colleagues kept coming to watch our progress. Sometimes they were handling the buttons three rows deep. At the start of one of the tests two camps were squabbling whether or not the sensor would work or not." Triumphant: "Well, it did work."(Source: University Newspaper June 29th 1995)*

7.3 Technological Development

After finishing his Master thesis – on the Sensor- in the spring of 1995, Mr. Wide asked the Dutch Technology Foundation STW to help him with the application of a patent to protect his finding. Following the advice given by Charles Fairy, Mr. Wide considered this necessary because the Sensor was relatively easy and cheap to build (*sources: interview report AK1 DB1; e-mails Fairy 1-5*). Also Mr. Wide requested STW to grant him a subsidy for further research on the sensor (*source: STW faxes 2-4*). They agreed that STW would apply for the patent and that Mr. Wide would have the first right to buy this patent from the STW at cost-price when he had obtain the financial resources to do so. This construction enabled Mr. Wide to protect his finding from others while not having to come up with the necessary money at the time. However, STW rejected Mr. Wide's request for funding of further research on improving the Sensor and developing (commercial) applications for it (*source: faxes STW 3-).* The department usually hired Ph.D. students with the money obtained from such STW

grants. As a result of the rejection from STW, Mr. Wide could not be paid for doing his Ph.D. research, but the University did offer him the use of the research facilities and equipment as well as supervision (*source: faxes and e-mails exchanged with Fairy / HR department)*. Although disappointed, Mr. Wide accepted this offer and started working on his Ph.D. research, which he would finish in only two years, without being paid and living on his girlfriend's income and a small grant from the Dutch Science Foundation NOW (*source: interview reports AK1-2; DB1*).

Although, the project was mostly research-oriented, Mr. Wide was also thinking hard about the possibilities of commercialising his finding as he realised that the Sensor to have tremendous value for both science and business (*interview report DB1; utilisation report*). By May 1995 the tests and research had resulted in a prototype, which was presented at a trade fair at the end of June 1995 in Stockholm (*source University Newspaper article dd 29/06/1995*). At this conference the Sensor was officially introduced to the international scientific and acoustic community. Although the audience was generally sceptical, the little device also intrigued many people.

Throughout 1995 and 1996 Mr. Wide continued to present his ideas at scientific conferences and made appointments with researchers in many international players in the acoustics industry to obtain technological feedback and inputs to perfect the Sensor. Also to increase the awareness of his invention Mr. Wide gave interviews in diverse local, domestic and even international media (*University Newspaper, University Magazine, Kijk, BBC world radio*)

Also, Mr. Wide and his student team set up a large telephone campaign to contact international players in the industry and potential (lead) users of the technology to obtain ideas for application of the Sensor. This telephone offensive resulted in Utilisation Report which included a long list of potential applications as suggested by Dutch and foreign (multinational) firms, research institutes and national and international umbrella groups (*source University News paper, June 29th 1997; STW Utilisation Report*). With this report he once more tried to convince the STW to provide him with a research fund. Despite the positive responses from several STW officials, the organisation nevertheless continued to reject his proposals on grounds that (1) it was nothing new, (2) it could not possibly work and (3) there would be no market for the device (*source: fax STW 7*).

One of the people he met in this period was Mr. Hills who was an entrepreneur with experience in commercialising an invention. Mr. Hills wanted to support Mr. Wide and his friends. He provided them with financial support, advice and taught them the basics of entrepreneurship. Perhaps most importantly however, Hills introduced Mr. Wide to a number of international market leaders in the acoustics industry and guided them in their discussions and negotiations with these firms (*sources: faxes Hills; interview report DW 1; University Newspaper dd. 30/01/1997*).

7.4 Finding partners

Already, by the end of 1995, Mr. Wide and two of his friends who had been working with him in the student team (Peter and Tony) had formed a Partnership (v.o.f.) called Sound Inc. Team (further called TEAM) to work on the commercial introduction of the Sensor[24]. Yet, Mr. Wide realised that they needed a partner to commercialise the Sensor and to obtain the necessary financial resources to continue his research. Earlier negotiations with a Scandinavian firm Bødø & Knůd, a market leader in the industry, had failed to lead to concrete results, as the parties could not agree on the quality and

[24] Their commitment to the project can be illustrated by the way they signed their faxes and e-mail: *"…a proud member of the Sound Inc. Team."*

performance requirements of the Sensor and the necessary financial investment (*source: faxes BD1-3*).

The first party Hills introduced the TEAM to, was a firm from central Europe, called Akoustika (owned by an American firm). In March of 1996 Mr. Wide had a first meeting with Akoustika to talk about possible co-operation. However, during the course of the summer of 1996 it became apparent that Akoustika did not seem willing to sign the preliminary contract, as the parties could not agree on the terms of co-operation (*source: Faxes Hills 3 –8; A1-5*).

By mid 1996, Mr. Hills introduced the TEAM to another leading manufacturer in the industry, Pfon. When it seemed that also the deal with Akoustika was not going to be signed Mr. Wide and his TEAM began negotiations with this Western European firm. In several meetings at Pfon and at the University, Pfon expressed their interest in the Sensor and in forming a co-operation with Mr. Wide and the Beta institute with respect to conducting joint research on the Sensor. As Mr. Wide explained: "*doing an interesting discovery is one thing, yet bringing to the market is another*" For that, considerable resources and access to the market were essential. Also Mr. Wide still needed to obtain ownership of the original patent and most likely also of several additional patents focused on specific applications. Yet obtaining and maintaining these patents would cost a significant amount of money, which Mr. Wide did not have. After several months of negotiations, Mr. Wide finally received a phone call from Pfon to tell him they accepted his offer. The deal consisted of two related but separate agreements: In the first contract between Mr. Wide personally and Pfon, it was agreed that Pfon would obtain an exclusive license for the Sensor in the audio market for an indefinite period of time. In return, Pfon provided the financial resources Mr. Wide needed to obtain the patent from the STW. The second agreement was made between Pfon and the TEAM for a period of two years. Under this second agreement, the TEAM and Pfon agreed that Pfon would finance the research into the application (of the Sensor) in mobile and wireless telephony to be conducted by the TEAM. Also, Pfon would pay for an additional patent to protect the utilisation of the Sensor as a sound intensity measurement sensor. Related to these agreements, Pfon also closed a deal with the Dutch University for further research into the area as well.

The alliance with Pfon, which was signed on December 16th 1996, provided Mr. Wide and the TEAM with the necessary financial resources to be able to continue their work on the Sensor and their attempts to commercialise the technology as well. This was possible because Mr. Wide had kept the ownership of the patents and the license to Pfon only focused on the audio market. Mr. Wide realised that for TEAM, exploiting the Sensor in the way Pfon wanted, was not considered interesting because the low price of such a product would only be profitable in case of large-scale production. Instead, for them, the real opportunity would be found in sound intensity measurement sensors as they had concluded the utilisation research conducted previously. According to Mr. Wide, strict legislation with regard to noise control by factories, and discotheques would provide a market for the Sensor. After all these organisations do need instruments to measure sound to measure and control the noise and Mr. Wide argued that the Sensor would be more suitable for this job than traditional pressure microphones as a result of this sensitivity and accuracy.

All that needed to be done, before they would actually start working on this opportunity, was for Mr. Wide to defend his thesis two months later in February 1997. Besides the deal with Pfon, the TEAM established an agreement with the Dutch University. For a period of one year, the Dutch University would pay them a salary and would offer them access to the (research) facilities of the Beta Research institute at the University. This would give them almost a year to bring their designs to

perfection and ready for market introduction. Further, they agreed with Hills that he would continue to provide the TEAM with advice, practical support and financial resources in the form of a loan. Combining this with the enthusiastic response from the media and the market, it seemed that the venture was ready for take off[25].

Indeed the TEAM started working on the development of the Sensor as specified in the contract with Pfon. In a number of faxes to both Pfon and Hills, Mr. Wide, Peter and Tony write enthusiastically about their progression: "*You will be pleased to learn that we have now measured a … with a new type of "Sensor-s'" and a new circuit ... Mr. Wide has worked very hard on this circuit and hence we were very pleased with the numbers.*"(*Source: Fax 6005p098 Peter to Hills, Spring 1997*). Also, at first Pfon seemed committed to their co-operation and they even investigated the possibilities of involving Akoustika, with whom the TEAM had not been able to reach an agreement previously, in the project.

Yet, the preparation did not continue to be as smooth as this picture suggests. During the course of 1997 a number of problems began to mount. First, the co-operation with Pfon did not provide the benefits the TEAM had expected. Pfon demanded the TEAM to work on different areas than they had initially agreed in addition to the one agreed to in the contract. As a result the TEAM did not have much time left for other activities. Also, Pfon rejected their results as being insufficient, adding to the frustration of the men. The illness and lengthy absence of Charles Fairy, who was leading a related research project between the Dutch University and Pfon also added to the problems and frustrations It seemed that his absence was not clear to all parties and he was (directly) being accused of not doing his job well by people at Pfon as he did not respond rapidly and or adequately enough to Pfon's requests (*source Faxes Pfon 12-17; Faxes AK 4-6; interview report AK1; interview report KE1*).

All in all, it became increasingly clear that the research agreement between TEAM and Pfon would be terminated prematurely. In a series of faxes, letters and e-mails exchanged between the TEAM members, Hills and Fairy and Pfon the parties discuss the problems, yet to no avail: the research co-operation between the TEAM and Pfon was terminated in October. The license agreement, which was made between Pfon and Mr. Wide personally (as the owner of the patent), would continue, but no revenue was expected from that any time soon. As a result their source of income seemed to be drying. Especially Peter and Tony felt an increasing need to search for other occupations.

7.5 Team and Venture Formation

Around May 1997, the TEAM became acquainted with Mr. Path who was interested in forming his own high-tech venture. Mr. Path was a former consultant with some entrepreneurial experience who wants to become involved in the TEAM. Within a month of their first meeting Mr. Path suggested the four men form a limited company together, with all four of them as equal shareholders. This would enable the TEAM to co-operate with Mr. Path without breaking Mr. Wide's exclusive license contract with Pfon as well as provide Mr. Path with the possibility to get his high-tech company. Despite some hesitations from the side of Tony and Peter towards bringing a fourth man aboard, it seemed that all four men were interested in the co-operation and formation of a limited company. From the letters of intent and contracts and e-mails exchanged between the TEAM and Mr. Path it becomes apparent that he is willing to provide a number of resources to the venture including financial resources, time and energy. Also, he states that he can provide the TEAM with advice on how to do

[25] An interview in the University News Paper even headed: The Sensor M is going to make it.

business (much like Hills was doing) and with access to the market. Indeed it quickly introduced the TEAM to several interesting leads. However, the four men (Mr. Path, Mr. Wide, Peter and Tony) could not reach agreement concerning the terms of the co-operation and company as becomes clear from the large number of proposed letters of intent and proposed contracts (six (somewhat) different agreement were found in the Sound Inc. archive) and reactions to these contacts: *"it is unclear to me what will happen to the income generated from the agreement between Mr. Wide and Pfon and TEAM and Pfon"; "Didn't we agree that …"; "Last time we said….now that has changed again..."; "…why do you want to receive a management fee?" (Source: faxes sent by Peter and Tony to Mr. Path between June and August 1997)*

Financial considerations resulting from the problems with Pfon seemed to be the most important reason for not being able to reach an agreement as becomes clear from the following quote: *"Pfon has let us known that in principal they will terminate the contract by September 30 ... Our problem is that if we accept your money / investment it becomes more difficult to stop, even if there is no sufficient money to pay our salary. What do we decide regarding the termination of the Sound Inc.-activities? …." (Source: fax of Tony to Mr. Path, July or August 1997)*

Yet, also the data suggest that personal differences began to come to the surface under pressure of other problems. Despite (expensive) mediation by a friendly consultant the problems mounted and resulted in an unfriendly break between Peter and Mr. Wide. *"… You made clear what your plans are: You are going to sell Sensors. You circumvent the patent, and in your eyes you're therefore do not have to pay royalties…You will meet Pfon with Hills…Also in your presentation you mentioned, that I am the inventor but that you, and not me will be responsible for selling "Sensors". I explicitly asked you not to do this…" (Source: e-mail Mr. Wide to Peter November 1997).*

From October 1997 onward Mr. Wide started to discuss the terms of co-operation with Mr. Path separately from Peter and Tony and by the end of the year they signed a letter of intent regarding their future co-operation (*sources: e-mails, and faxes DB- AK; DB – ME; archived contract-proposals*) Until the middle of January a possibility continued to exist that Tony would be involved in this co-operation. Yet, as he decided there were too many risks involved and as he had found a new job he decided to redraw as he wrote Mr. Wide in an e-mail three weeks later he *"closed the Sound Inc.-door behind him at January 16th."* Thus, in January 1998 it was finally decided that Sound Inc. would be founded with Mr. Path and Mr. Wide as equal partners (*sources: register Chamber of Commerce; archived contract December 1997*)

Mr. Path registered the firm Sound Inc. at the Chamber of Commerce early in 1998. The company was officially founded at the 15th of May of that year (*source: certificate of Chamber of Commerce*). Mr. Path would be the managing director and main decision-maker. He would focus on the business development and support of the distributors of the Sensor. Mr. Wide would be involved in this firm mainly as a technology advisor, focusing on the development of the Sensor and creating awareness and acceptance of this technology in the acoustics community. Also Mr. Wide was shareholder of the company; the two men both held 50% of the shares of Sound Inc. In an e-mail to Charles Fairy, Mr. Wide explains his motivation and ambition: "…*There is some interest, but that is purely academic. The goal therefore is to find a structure that enables a long-term attempt. This means that this attempt should not take too much time and money. From my own motivation and because (in my view) the performance of the Sensor continues to improve I want to spend the next three years in an attempt to sell / commercialise the Sensor. As we have talked before. My motivation is not to become rich; yet, I think it would be incredible if the Sensor would be available as a product. I do not want to be involved in the financial and legal issues and only focus on the technical side of the development. I have found someone to cover*

the financial and legal activities for me. I think he has a good understanding of the small possibility for success of the project. He will therefore only occupy himself (hobby-like) after office hours. I won't receive any income from these activities… (Source Mr. Wide in a letter to Charles Fairy, January 1998)

Following formation, the mission of Sound Inc. was established (and to this day is) to develop, manufacture and sell value added applications based upon the Sensor, the world's first dedicated micro-machined particle velocity sensor (*source: Chamber of Commerce, company website April 2001; December 2003*).

Both Mr. Wide and Mr. Path would work part-time for the company (*see letter Mr Wide – Fairy*). Mr. Wide finally received funding from the STW and obtained a PostDoc position at the Dutch University, and Mr. Path was involved as an owner and manager of another company called Metal Shops. Therefore, it may not be surprising that the company was very loosely organised. As one of the company's employees writes several years later: *"…Sound Inc. exists mainly virtually, meaning that the firm does not really have a home base in the sense of a store or other place to sell the products. The company mainly consists of contacts made via the Internet and trade fairs. Sales and exchange of information with respect to product information and scientific knowledge are done via the Internet. The sales activities are co-ordinated from … (where Metal Shop is located). Also through the Internet, advice is supplied to customer about the how and why of specific technologies..." (Source: Sound Inc. Internal Report #2, March 2001)*

7.6 Creating the Resource Bundle

The company did not have research and production facilities of its own and lacked other resources as well. In order to obtain access to these resources the two entrepreneurs planned to leverage their other professional occupations. Mr. Wide would use the Clean room facilities at the Beta Institute for the development and assembly of the devices while Mr. Path would use his metal-sheet company to produce and develop the necessary metal parts (*sources: interview report AK1; internal report # 1*). In this way the cost of R&D and production remained relatively low. Because the position of Mr. Wide at the Dutch University would only continue for a period of three years, they realised they would have to form alliances with the Dutch University or with another organisation in the next few years to compensate for these 'lost' access to these facilities (*source: internal report #1; interview report AK1-2*).

The need for financial resources was limited as both partners agreed not to receive an income or management fee from Sound Inc. Nevertheless, to obtain access to additional financial resources, at the start of 1998 Mr. Path explored the possibilities of obtaining venture capital from a local venture fund (*source: interview report AK1-2*). The venture capital organisation was closely located to and partially owned by the Dutch University. Although Mr. Path and Mr. Wide met with the fund manager several times, the discussions did not result in an investment being made in Sound Inc. This 'failure' may be explained by the fact that Mr. Path did not want to give up too much control of the firm, while Mr. Wide was afraid that investors would demand growth rates that were too high for his liking. During an interview Mr. Path explained that the failure to obtain venture capital was a 'pity'. Looking back it might have slowed down the development and the growth of the company to some extent. However, it was not a disaster considering that neither men was financially dependent on Sound Inc. and considering the most critical facilities could be obtained externally (*source: interview report AK1)*.

Mr. Wide and Mr. Path decided to continue using students to supply necessary the human resources, consistent with the initial development of the Sensor. These students were found in trainees from the Dutch University who worked for Sound

Inc. on both practical projects, such as the organisation of their first trade fair as well as technological issues, often in the context of Mr. Wide's PostDoc position (*interview report DB1; company website*). The largest benefit of using students according to Mr. Path was their relative low salary costs. Yet, the fact that students are willing to work at flexible hours was also very appealing considering that himself and Mr. Wide were often not available during regular office hours as a result of their official jobs (*source: interview report AK1; DB1; DT1*). To complete the initial resource base finally, the Sound Inc. had a product range, consisting of (designs and blueprints of) several products based on Sensor technology: at a trade fair in Amsterdam (March 1998) six products were presented including several new sensors and software for the sensors (*source Internal Report #2: p.13*) Even though the development and expansion of this initial resource base continued throughout the remainder of the startup process, the constellation described above seemed to be sufficient to start with.

7.7 Building the Market

By the end of 1997, thus even before Sound Inc. was initially founded, Mr. Path and Mr. Wide began their business activities. Their efforts focused on (re) establishing a large number of contacts in the business community in order to obtain orders for the products and identify distributors and possible partners in the field of product development. To this end they visited many Dutch and Belgian research institutes, companies and or professionals such as therapists. Mr. Wide or Mr. Path had previously been in contact with some of these organisations either during the initial development of the Sensor (in the case of Mr. Wide), or in previous occupations (in the case of Mr. Path). Also they sent out many mailings (by e-mail or fax) to previously unknown contacts to try and sell some sensors (*source e-mails faxes from archive, dd. November 1997- June 1998).*

According to Mr. Path, these two approaches yielded several sales orders. Also, several parties wanted to explore the possibilities of further co-operation (in the form of new product or application development). However, during the first year the success of this haphazard or opportunistic approach remained limited as Mr. Path explained during the first and second interview (*source interview report AK1 and AK2*) and as is also shown by the groups of e-mails and faxes sent out between November of 1997 and June 1998. As is made clear from amongst others an internal report (*Internal Report #1*), during these first months of 1998 a more formal investigation was undertaken regarding the design of a marketing plan to approach the market in a more structured manner.

From this report and from the archival records, it becomes apparent that the basic approach (to be) followed by Sound Inc. would be to make extensive use of conferences and trade fairs as well the Internet to promote the company. In this way they would create awareness and acceptance of their product on the one hand, and identify and contact potential counterparts (distributors, customers etc) on the other (*sources internal report #1 August 1998; e-mails and faxes dates between October 1997 and may 1998*). Also, it was determined that Mr. Wide, would continue to present the Sensor at scientific conferences in order to build acceptance from the scientific community which in turn would provide the company with the legitimacy it needed. The archival records and the company e-mails suggest that indeed the company kept to this strategy closely during the following years, and most of their time was spent on the following five activities.

1. Presentation of papers about the Sensor at scientific conferences by Mr. Wide and others
2. Presentation of the firm and the products at trade fairs
3. Development of a website
4. Proactive targeting of individual leads by fax or e-mail
5. Organisation of testing of the Sensor by universities and other not-for-profit research centres

Each of these activities is briefly described.

7.7.1 Presentation at Scientific Conferences

In order to convince the scientific community of the value of the Sensor and keep them up-to date of the most recent developments in R&D, Mr. Wide regularly presented papers at scientific conferences around the world (*source: reference list Mr. Wide*; *interview report DB1*). The funding of these trips could typically be obtained from the funds he had received from the STW. Often Mr. Wide did not produce these papers alone, but worked on them together with his colleagues at the Dutch University and at other universities. Increasingly, papers about the Sensor were also being writing by colleagues at the Dutch University and at other universities without Mr. Wide working with them on these publications (*sources: reference list Mr. Wide, company website; internet search University pages*). This resulted in a continuous stream of publications, which did not dry up, while Mr. Wide went away on an 18 month sabbatical between May of 2001 and December 2002. Just before leaving for his sabbatical Mr. Wide explains "*It helps a lot if professors like Grapestone and professor Tide publish about the Sensor. It increases your credibility enormously*." *(Source University Newspaper, April 2001).*

The archive data provides a few examples of reactions of scientists of various countries (nb. Denmark, U.S.A, Japan) to these scientific presentations. Typically these reactions consist of requests for further information on specific details and workings of the Sensor.

7.7.2 Presenting the Company at Trade fairs

In order to increase the familiarity of Sound Inc. in the business community the company presents has already presented itself on average twice a year at trade fairs organised in Europe (See Table 8). To pay for these trade fairs, a conscious decision was made to set prices at a commercial level, and one that was considered extremely high by most 'academic entrepreneurs'. The reason for this was that with the income generated in this way, the company would obtain sufficient resources to travel to as many different trade fairs as possible to promote the company further (*sources: interview report AK2-3; e-mail AK dd. April 2002; internal report #2, March 2001*).

Year	Conference	Location
1998	AES	Amsterdam (NL)
1999	AES	Muenchen (GER)
2000	AES	Paris (FR)
2001	Internoise	Nice (FR)
2002	CFA	Amsterdam (NL)
2002	DAGA	Bochum (GER)
2002	AES	Muenchen (GER)
2002	Forum Acustium	Seville (ESP)

Table 8 Overview of trade fairs visited by Sound Inc.

The trade fairs proved to be useful both for the development of the network (increasingly for catching up with known contacts) and for introducing and presenting new products and applications. In some cases, these new products were not even completely finished when presented at the trade fairs (*source: internal report #1*).

Both internal reports provided a description of the first presentation of Sound Inc. at a trade fair. Their findings provide interesting insight into the 'success' of this fair and as the trade fairs provide a good explanation of how the company was able to set up activities in a large number of countries rapidly. "…*This was the first fair visited by Sound Inc. And that was noticeable from the general organisation. We had made a rough design of what would be needed for a fair. After that we just put everything we could find in some suitcases (twice, in case of emergency). The inventory in our stand consisted mainly of the furniture we had brought along. At the first glance this looked quite unprofessional compared to the other stands. Yet, this was not that bad, considering that we were a startup of a really new technology to measure sound. …. Despite the fact that we looked like the Brady Bunch (unprepared mess), the fair was a great success. This was especially clear from the responses of the visitors and the organisers… "You have the smallest stand, yet the most visitors of the entire fair…" (Source Report #2, 2001 p .9).* Although the archival records do not allow us to determine how many contacts established at these trade fairs lead to new business activities, several references were found to the conference in later communications with external contacts. For example on June 16th a German contact replied to a fax sent by Mr. Path: ". *With pleasure I think back of our meeting at the bus stop in Amsterdam and my visit to your stand at the trade fair…I suggest that you contact … in /Muenchen and or … in Nuerenberg. You can use my name as a reference…*"

With respect to the other conference attended by Sound Inc. less information is available. Nevertheless several factors are clear:

- Each trade fair leads to a number of new contacts *"Contacts with the big names in the audio-industry have been established*". For example, the fair in Nice: ". *Proved to be a great source of contacts with well-known manufacturers of various types of measurement equipment and sensors. Sound Inc. became more well known, this time mainly in the area of measurement-technology.*") This picture is consistent with what can be seen from the faxes and e-mails referring to these meetings in the months after for instance the fairs in France. The new contacts include new customers, new distributors and people and potential partners for specific research projects.
- Conferences are increasingly used to meet face-to-face with established customers and distributors. For instance, in an internal report it is explained that at the fair in Paris in 2000, most visitors were acquaintances from previous years. Also Mr. Path discusses per e-mail a schedule for meetings with representatives during the different trade fairs with his employees prior to these fairs.

- Although most follow-up communication originates from Sound Inc., the several examples were found where new contacts took the initiative for the follow-up contact: For instance a Singaporese businessman, contacts Sound Inc. several weeks / months after the fair in Lille in order to formalise their hand-shake agreement and establish a distributor contract for the Singapore's market ("Hi, remember me…" *(Source: e-mail SP1 May 2002))*.
- A final observation that can be made with respect to the trade fairs is that all the fairs where Sound Inc. was present were located in Europe. This in contrast with the scientific conferences where Mr. Wide presented his papers. This may not be surprising considering the cost of the trade fairs and accompanying travel costs. The costs of travel to the scientific conferences were covered by the Dutch University, as they were part of Mr. Wide work as PostDoc researcher.

7.7.3 Website

The company website was considered a third important tool to gain awareness and acceptance of the company and technology and to communicate with both new and established contacts. In the internal report #1 the author explains that by "*using one-on-one communication, the offering of differentiated online services and for instance the digital evaluation of customer satisfaction, Sound Inc. will be better equipped to be customer oriented and to bind customers. Electronic business can reduce the transaction costs tremendously*." Also during a number of interviews Mr. Path has pointed to the value of the Web for a small internationally active company like Sound Inc.

It was pointed out in internal report #1 out that during the first months of 1998 the website was most frequently visited by organisations that had already known Sensor (only two hits from organisations that had not heard from Sound Inc. before.). To improve this situation efforts were made to increase the number of 'hits', a number of keywords were listed on a variety of search engines and to use portals (e.g. links at other pages). These efforts have been quite successful. The hit-rate has increased tremendously. From the statistics (see Appendix B) it becomes apparent that between August 29 2000 and March 7th 2001 almost 49000 hits from 5649 visitors were registered. Although the vast majority to the hits were Dutch, hits were registered from 49 foreign countries as well as several other international domains (e.g. .com, .mil, .org, .edu, .gov).

Besides using the Internet as a means to inform its contacts of the latest developments, from 2001 onwards the company also began to use the Internet as an interactive tool capable of two-way communication (*source: company website; interview report DT1*). At first people could only fill in a 'contact-me' sheet online after which one of the employees sent the person an e-mail and begin a 'conversation'. Through this contact-sheet people could also place requests for documentation, and or download publications about the Sensor. Such requests were obtained from students at other Dutch Universities, researchers from universities in Canada, the U.S., the U.K., Germany and Japan. Around 2002 a special, protected 'Rep-zone' is set up for the different distributors to place orders and provide information regarding their customers' special requests (*sources: company website; internal e-mails DT / THT dd December 2001- February 2002*).

7.7.4 Targeting of potential customers

Fourth, the entrepreneurs sent out a large number of e-mails to both new and established contacts (ranging from manufacturers of medical devices and physiotherapists to the marine corps and manufacturers of microphones) to inform them about the latest developments with regard to the Sensor-products and their newly formed organisation. For example Mr. Path wrote the following to Bødø and Knůd: '*Apart from professionalising our operation, we have been working on our strategy, defining the most promising markets (Source: letter 15-01-1998*)).

In the data spanning the time between November 1997 and December 1999 evidence was found of 6 external contacts that expressed their interest. For instance, a Belgian professor from Leuven wrote: *"… It goes without saying that the academic world is very interested in this development. Therefore, I would like to ask you to already send me some brochures. I don't doubt that in the future we will be able to organise a joint initiative at the University of Leuven…"*(*Source e-mail Prof. Milkmaid to Mr. Path June 16th 1998*)

A small number of Sensors were ordered in these first months including a relatively large repeat order from a large Japanese player as is clear from the e-mail discussion shown in Exhibit 1.

Exhibit 1 Example of an early sales order

From: maki@svmail.nori.co.jp To: 'Pathaa@worldonline.nl'
Subject: Samples of "SENSOR M" Date: vrijdag 8 mei 1998 14:20
Dear Mr. Path,
How are you doing?
We need more 10 samples of "SENSOR M" for estimation. Kindly advice the best price for the 10 samples
and its delivery time. If the price and delivery time are acceptable for us, we will order.
Looking foward to your prompt reply,
Kind regards,
T. Maki

From: Mr. Path Sent: Saturday, May 9, 1998 5:15 AM
To: maki Subject: Re: Samples of "SENSOR M"
Dear Mr. Maki,
we are happy that also Nori is willing to place additional orders !
We can offer: ten pieces, wirebonded, unpackaged, for NLG yyyy + 17,5 % VAT
Delivery expected within 14 days from now. Complete PV sensor, including metal housing and interface
for NLG yyyy per piece, excluding 17,5 % VAT.
Delivery expected within 14 days from now. For both options, we will include a CD ROM with all latest info
on the "Sensor M". Prices imply local banking costs for transferring the money at your expense.I
f Nori would be willing to disclose it's field of interest, we could provide you more specific know how.
Current technological and application developments include .....
Looking forward to take your second order ,
kind regards,
Alex Path

From: maki To: Mr. Path
Subject: RE: Samples of "SENSOR M" Date: dinsdag 12 mei 1998 3:35
Dear . Mr. Path
We need 10 samples of "SENSOR M" and two complete sensors , including metal housing and interface.
However, our budget is not enough for purchasing all of the above-mentioned items.
Could you give us some more discount? Our budget is US$xxx and we will immediately place an order
if the total price of your quotation would be the same or less to this budget.
Please let us know your very best price.
Looking forward to receiving your favorable reply.
Kind regards,
T Maki

From: Mr. Path Sent: Wednesday, May 13, 1998 1:48 AM
To: maki Subject: Re: Samples of "SENSOR M"
Dear Mr. MAKI,
we accept your offer to deliver as requested 10 state of the art "Sensor M"s
(wirebonded / unpackaged) + 2 PV sensors. with interface for the price of NLG xx excluding VAT, including freight.
Payment by SWIFT immediate after receipt of the goods. However, please take it we quote below our regular prices.
Shipment will take place early next week by airmail, so we expect you have the goods approximately at the
22 nd of May. If you need more application info, we are happy to provide you.
Kind regards,
A. Path

7.7.5 Testing

To increase awareness and acceptance in both the scientific and business community the company also used a strategy of providing potential customers with a set of test-Sensors that they would only have to pay for in case they wanted to keep them, after a testing period of about two to three months. This approach, which was used from the start, was based on the principle 'it see it to believe it'. This approach proved to be successful in the sense that (based on the available data) several of these 'testers' decided to buy the Sensors in the end. It is however not possible to determine whether these customers would have bought the Sensors without this testing possibility.

Besides providing interested potential customers with the possibility to test the products before deciding whether to buy, Mr. Path also approached several researchers in various parts of the world (Poland, China, Russia, U.S.A.), with the offer to donate a small number of sensors to their institutes in exchange for a paper on the Sensor to be presented at conference or trade fair as becomes clear from for instance the following e-mail. "..*Our small company is a spin out from the University from the Netherlands. We develop, manufacture and market Sensors based on M-technology. Applications vary from ... up to … measurements. We want to introduce our technology also to the Russian acoustical community, and are wondering if the Russian Acoustical Society could consider following suggestions: (1) we want to donate a set of equipment to a leading Russian Institute, provided a proposal is made that results in a reviewed paper to be published in 2003 by the latest (2) more in general, we offer 50 % discount within a framework for 25 universities around the world (3) when appreciated, we would like to present our technology e.g. at an annual meeting of the Russian Acoustical Society. … Looking forward to your comments…" (Source e-mail Mr. Path to a Russian scientist March 20th 2002)*

Pleased with the outcomes of this approach, the entrepreneurs came up with the "University Contest". The university contest was developed in 2002 to speed up the acceptance and understanding of the Sensor as is clear from the following quote taken from the company website *"Particle velocity measurements are relatively new to the acoustical world, but will eventually change engineering practices. Measurements will be made easier, more reliable and cost effective. However, it took two generations to make people understand that the earth was not a pancake anymore! We do not want to wait that long. Hence Sound Inc. invites students, universities and scientific institutions (only non profit organisations) to develop and spread application know-how based upon our particle velocity based sensors! (Source: Sound Inc. Website)"*

Under this programme, not-for-profit organisations are invited to conduct research on and write a scientific paper about the Sensor, which they could obtain at a large discount. So far, the University Contest has resulted in three research projects. As a result of these projects the company has not only been able to attract considerable attention. In addition, this university contest has also enabled the company to expand it research capacity as they could decide which projects seemed to be most interesting (for the company) and have it done by someone else. As the company states in its advertisement: the contest is a means to generate application-based knowledge.

Since the University Contest began only towards the end of the startup process, it is not yet clear what the actual results of this project are. However, it is obvious that besides adding to the familiarity of Sound Inc. and the acceptance of the Sensor, the use of testers also can be considered a form of 'outsourcing' of the R&D activities. Without having to invest in more research capacity or human resources the research potential of Sound Inc. was expanded considerably in this way. The main drawback however, is that Sound Inc. did not directly control the direction of the research. Although this adds to the credibility of the Sensor, the test researches are not always those researches that are on top of Sound Inc.'s priority list (*source: interview report AK4; KE).*

These five activities have however not been the only focus on Sound Inc. The most important of these other activities concern R&D, production, setting up a sales and distribution network, and professionalising the company and will be described briefly in the following paragraphs.

7.8 Value added activities

7.8.1 R&D

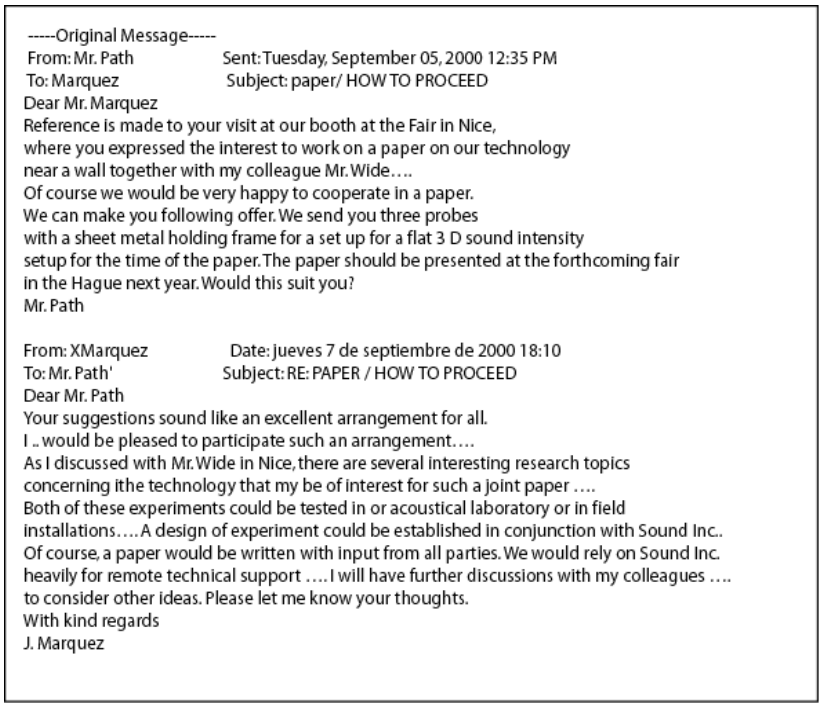
First, considering the origin of the company it may not be surprising that a large portion of the time and resources of Sound Inc. has been devoted to R&D. During the first trade fair Sound Inc. visited, the offering consisted of only 3 types of Sensor's. Between 1998 and 2001, a large variety of Sensors were developed. The data suggests that some of these Sensors, such as the "Hydrosense" or the "Megasensor" were eventually not included in the company's regular products range, despite the fact that prototypes had been presented at conferences and or trade fairs and despite that some of such sensors had been sold (*internal report #2*). From 2001 onwards, Sound Inc. developed its own dedicated software for particle velocity sensor based applications, software that should be compatible with other solutions available in the market place (*interview report DT1; e-mails DT; MS*). In the section on the opportunity I will come back to the issue of software in more detail.

Throughout the exploitation process, Mr. Wide remained the principal researcher of the company. Yet, a number of students working at the Dutch University also worked on the development of new types of Sensors, the improvement of existing Sensors and the development of software. Often these students were initially hired as trainees (*sources: interview report HB1; company website; e-mails PE; MS*).

Sound Inc. did not form any strategic alliances with other companies during the exploitation process aimed at joint product development. However, Mr. Path and Mr. Wide were both eager to co-operate with others to develop application based knowledge on the Sensor. This was achieved both by providing companies and research institutes to test the Sensors in exchange for a scientific paper. The e-mails suggest that in at least 5 cases such arrangements were made. An example of how such a co-operation is being set up is shown in the e-mail conversation displayed in Exhibit 2. The list of publications on the company website, suggests that these efforts have so far led to at least 2 conferences papers or publications.

These examples indicate that for Sound Inc., research and development can be considered an international or even global affair. However, the data suggest that the co-operation occurs on a more or less incidental (opportunistic) basis, and that as a consequence the company cannot rely on these projects for its R&D.

Exhibit 2 Example of Setting up a Joint Publication effort



-----Original Message-----
From: Mr. Path Sent: Tuesday, September 05, 2000 12:35 PM
To: Marquez Subject: paper/ HOW TO PROCEED
Dear Mr. Marquez
Reference is made to your visit at our booth at the Fair in Nice,
where you expressed the interest to work on a paper on our technology
near a wall together with my colleague Mr. Wide….
Of course we would be very happy to cooperate in a paper.
We can make you following offer. We send you three probes
with a sheet metal holding frame for a set up for a flat 3 D sound intensity
setup for the time of the paper. The paper should be presented at the forthcoming fair
in the Hague next year. Would this suit you?
Mr. Path

From: XMarquez Date: jueves 7 de septiembre de 2000 18:10
To: Mr. Path' Subject: RE: PAPER / HOW TO PROCEED
Dear Mr. Path
Your suggestions sound like an excellent arrangement for all.
I .. would be pleased to participate such an arrangement….
As I discussed with Mr. Wide in Nice, there are several interesting research topics
concerning ithe technology that my be of interest for such a joint paper ….
Both of these experiments could be tested in or acoustical laboratory or in field
installations…. A design of experiment could be established in conjunction with Sound Inc..
Of course, a paper would be written with input from all parties. We would rely on Sound Inc.
heavily for remote technical support …. I will have further discussions with my colleagues ….
to consider other ideas. Please let me know your thoughts.
With kind regards
J. Marquez

7.8.2 Production

The production of the Sensors was initially conducted and supervised by Mr. Wide. Yet, quickly Sound Inc. hired students to do this work. When Mr. Wide left for his sabbatical, one of the students, who had been involved with the company from 1998, became the 'production manager'. Production activities did not only consist of the baking of the chips in the cleanroom of the Dutch University following a standard process, but also, in many cases the customisation of the Sensors to meet the spec's of the customers. Also, the Sensors needed to be calibrated before they can be shipped. For a considerable period (at least 2001 and 2002), the calibration is done by a student working for the venture (*sources: interview report DT; company e-mails 2002*). Because, the volume remains relatively small, no need exists as yet to outsource the production of the Sensors. Also as shipment of the Sensors is relatively easy and cheap there is no need to set up production facilities in other regions. Therefore, production remains a domestic affair (*sources: interview reports AK2; DT1; internal report #1; e-mails December 2001-May 2002*).

7.8.3 Sales and Distribution

From the very beginning Mr. Path and Mr. Wide have been searching for individuals and companies to represent them and to act as agents and distributors of their products. According to Mr. Path, there are three reasons for using agents and distributors: First, agents and distributors have knowledge of the local market and they know the (potential) customers. Thus with their knowledge of the local environment they provide access to the market. Second, by using a network of agents and distributors the company does not have to make large investments in order to set up its own sales department. Third, it is common in the industry to use agents and distributors and Sound Inc. thus simply follow the normal conduct (*sources: internal report #1; interview report AK1-3, DB1*).

Since the start of the activities, Sound Inc. has been able to set up distributor agreements with over 24 companies representing Sound Inc. in as many countries. In the e-mails I found 4 different examples of Korean, German, British and French companies that incidentally acted as intermediaries between Sound Inc. and a new customer in exchange for a 25% to 35% sales commission on the catalogue prices. These arrangements are from the period between 2000 and May 2002. In this same period I further found evidence on the website and in the e-mails of more permanent arrangements and distribution contracts (*sources: company website March 2001 – June 2001; November 2002 – March 2003); faxes and e-mails June 2000 – May 2002*).

Most of these distributors are active in only one country; yet, one distributor services the entire Scandinavian market with offices in two countries (*source: Company website March 2003*) Also, all of the countries that used to be part of Yugoslavia are covered by one firm (from Austria). The U.S. market is covered by five different distributors each operating in a different state (or region). Further, from the data it seems that that at least a German and Indian company represented Sound Inc. for some time as becomes apparent from the following line: "*This young man is living in Bombay were we have a distributor…" (Source e-mail Mr. Path to all, 26-04-2002 7:04 PM.).* Once the company lists its international distributors in its website at the start of 2003, this Indian distributor is not mentioned, indicating that the agreement has been terminated in between. A list of the locations of the different distributors and the markets they cover can be found in Table 9

These observations lead to the conclusion that setting up a sales network can clearly be considered a truly global affair. Although, most of the countries covered by the distribution network are developed countries, also a number of rapidly developing countries from Asia are included as well as Brazil which according to Mr. Path is even one of the biggest markets for Sound Inc. Looking at the dates at which distributor-agreements were signed, it is clear that Sound Inc. does not follow a process of entering countries that are increasingly distant either geographically or culturally.

Location	*Coverage*
Republic of South Africa	Republic of South Africa
Singapore	Singapore
South Korea	South Korea
Japan	Japan
Taiwan ROC	Taiwan ROC
India	India
Australia	Australia
Austria	Austria, Slovenia, Croatia, Serbia
Belgium	Belgium
Czech Republic	Czech Republic, Slovakia
Sweden and Norway	Sweden, Norway, Denmark, Finland, Iceland
Germany	Germany
England	England, Ireland
Italy	Italy
Spain	Spain, Portugal
Switzerland	Switzerland
Brazil	Brazil
U.S.A.	U.S.A.

Table 9 Overview of Distributors

7.8.4 Professionalising the organisation

All of the activities described above resulted in an increasing number of customers (including several well-known multinationals) and rising sales orders. In the beginning of 2001, three years after the start of the activities it seemed the company had been able to set up a sustainable position on the market. Sales were already being generated from five different continents. Although sales volumes remained limited two students (who had previously been involved in various study projects regarding the Sensor had gotten a contract and were working for the company part-time. One of the most important reasons for hiring personnel was that Mr. Wide would leave the company from April 2001 for at least one year (sailing the world as a sabbatical leave) and that others would have to be able to provide technological information and assistance to distributors and customers (*interview report DB1; university newspaper article April 2001*). Mr. Path neither had the background knowledge nor the time to do this task independently.

Although the sabbatical leave of Mr. Wide might seem strange and 'un-entrepreneur-like', this trip has been his dream for several years[26] and he believed the company had sufficient critical mass and the products were of good enough quality to survive on its own as he explained to a reporter of the University Newspaper a few weeks before he left. As Mr. Path explained to me (*source: interview report AK2*), Mr. Wide had focused on product development rather than commercial activities anyway and that this leave of absence might even be seen as an opportunity to change the company from a technology push into a more market driven company. Also, as no new products would be developed and introduced during that period, Mr. Path considered that it would be easier to professionalise the firm in the sense that procedures would be introduced to respond more accurately to market.

[26] His dream began during a five-week holiday in Indonesia in 1994 and already in 1997 Mr. Wide remarks that he will have to keep his plans to sail around the world a bit quieter.

The e-mails indicate that this was a rather difficult process as a result of the fact that in addition to Mr. Path, the 'new employees' also devoted only part of their time to the company as both were still enrolled as students at the Dutch University. As a consequence, production activities or communication with distributors, customers and or tester was put on hold during for instance, exam weeks[27]: Such difficulties however did not restrain Mr. Path from employing other students (who had previously done their final assignments on the Sensor for the Polytechnique School at Sound Inc. and who now pursue a Masters at the Dutch University) on a part time bases during the course of 2003. The most important reason for employing students continues to be the relative low cost. However, with their youthful enthusiasm students fit the informal, innovative culture of the company. To expand the labour force even further, starting from 2003 the company also employs foreign trainees and exchange students on project basis, funded with different types of (European) student exchange subsidies. Using these schemes the company has already had a Russian and Mexican trainee (*source: company website December 2003*).

Despite the absence of (the guidance of) Mr. Wide and the use of only part-time student employees, the data suggest that in general the employees were successful in their work. In most cases e-mails from distributors, customers or other interested were responded within days or even hours and minutes with the answers they needed to hear. Also, in this period plenty of activity was recorded (in real time) with respect to the development of the website and the streamlining of the organisation. For example attempts were done to set up a more detailed (sales) administration (*source: e-mails January –April 2002*).

When Mr. Wide came back in the fall of 2002 his company was clearly more professional then when he left. Although no really new activities had been launched while he was gone (e.g. no new products were developed or important alliances were formed) the scale of the existing activities seemed to have expanded and the company was still small yet operating smoothly. He resumed his position at the Dutch University as a researcher. His role in Sound Inc. became that of a technological advisor. As before, he devoted a considerable portion of his time on "making the world familiar with the Sensors at scientific conferences and by writing papers in scientific journals. Also, when he came back he started working on the development of a new generation of Sensors such as the Scanning Probe (see Exhibit 7.3 for more information).

Between the fall of 2002 and May 2003 the activities increased further in volume and geographic scope with several new distributors added to the list. By May 2003 the company generate sales in each of the markets covered by its distributors, as well as in The Netherlands, Germany, France, Canada, China, Indonesia, India, and Russia. Furthermore, the first half of 2003 was characterised by the move of the company to a new building. This building was financed by the Beta Research Institute and provides housing, office and research facilities to a number of spin-offs, including Sound Inc. The move to the new building at the end of April marks the end of the startup process.

[27] However, according to these employees themselves it would also work the other way around, and exams were postponed at several occasions to be able to help customers or prepare for trade fairs.

7.9 Outlook towards the future

It was decided to use the move to the new premise, which was officially opened at May 1st 2003 as the cut off point for the startup process. Not only was this date very close to the six years after foundation (which was used as the artificial cut-off point following the literature) the move to the new building can also be considered a natural cut-off this with this move the company has arrived at a more professional stage of its existence. Despite the fact that everything that happened after this date is beyond the scope of this study, a short overview of the most significant events of the rest of the year is provided as this overview (taken from the Sound Inc. website) indicates that 2003 can really be considered the year of the 'big break' and holds great promises for the future. Before some discussing the global startup process in more detail in the next section, a short outlook to future is provided on the basis of some key events that took place during the course of 2003.

During the spring of 2003 the company hired two additional students from the Polytechnic, to work on the development of software products as part of their final Bachelor assignment. At the end of this assignment the men were hired to stay on as part-time employees while working on a Master's. Also, during the course of 2003 the company temporarily hired two exchange students / researchers from Mexico and Russia thereby internationalising their human resources for the first time. Recent data (website February 2004) suggests that Sound Inc. is currently trying to expand further (as five vacancies are published on the website). Further developments that took place in 2003 with respect to product development and introduction and the formation of an international alliance with a Polish professor and challenging sales orders from a leading U.S. research institute (*source: company website May 2003*).

8. Case Analysis and Results

8.1. Introduction

In this chapter I present the analysis and results of the case study. After this introductory section, I first present the data set and discuss in more detail the results of a pilot study based on the analysis of the company e-mails. After that the results of the analysis of the content, course and context of Sound Inc.'s global startup process are discussed. Next, I move on to the analysis of the data and discussion of the findings in relation to the interaction process between Sound Inc's founders and network contacts.

8.2. Description of the data

In this section the raw data used in this study will be presented along with some basic descriptives of the information contained in the data. First, a more general overview of the data is presented and second the results from my pilot study on using e-mails as a source of data are presented. After that the descriptive data from the remaining sources is presented.

8.2.1 Overview of the data sources

As explained in Chapter 6, in this study a high variety and number of data sources were used in triangulation. An overview of the entire data set is provided in Table 10

Data sources	*Description*	*Number*
Interviews	Company officials	6
	External informants	3
Websites	Company internet pages	73
	Other websites	38
Popular Press	University news papers	3
	Dutch magazines	2
	Web magazines	1
Scientific publications	Journal articles	6
	Conference papers	13
	Dissertation / Book	1
Archived documents	Faxes	234
	E-mails	87
	Contracts	16
	Memo's	21
	Web statistics	5
E-mail	E-mails	708
	Attachments	78
Physical artefacts	Photo's	36
	Datasheets	16

Table 10 Description of the data set

8.2.2 Descriptive findings from the e-mail analysis

As mentioned in Chapter 6, the e-mails collected between December 2001 and May 2001 were coded in great detail, the remaining documents were analysed in less detail making notes on observations while reading, comparing and contrasting the contents to the information found in the initial e-mails set and to each other over and over again. In the following paragraphs the findings from the e-mail analysis is presented.

As explained in the Methods chapter a large portion of the data used in this study consisted of company e-mails. Although, other authors have included e-mails in their data sets, hardly any examples can be found on how this was done or what results were achieved, the exceptions being studies focusing specifically on the use of e-mails in organisations or marketing (e.g. Pantelli, 2002). For that reason I briefly present the findings from a descriptive analysis of the company e-mails before moving to the general findings.

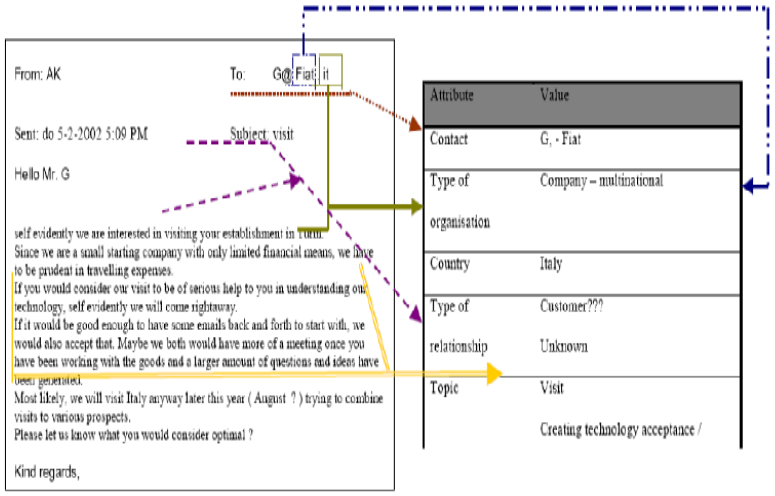
The e-mails covered a period between December 10th 2001 and May 12th 2002 and this would position them in the middle of the opportunity exploitation process. The e-mails contained very little information about the opportunity recognition and preparation process.

Most of the information used to assign the attributes was found in the body of the messages. However, the activity could sometimes be found in the subject header. The type of contact could in some cases be found in the (e-mail) address listed in the From/To fields (e.g., when a name is well known or as a result of the extension of the e-mail address such as .gov or .edu). Also the use first names or official titles could provide clues about the duration of the relationship. The country or region could sometimes be identified from the extension in the e-mail address (i.e., .nl or .uk). Besides classifying the e-mails on the basis of these attributes, we coded the e-mails liberally, as suggested by Richards & Richards (1995), to store any other information, such as contact name, origin of the e-mail (internal/external) or subtopics (book-requests) that could be of value to the research. An example of how the e-mails were coded and where the information was found is shown in Figure 11

Descriptive analysis showed that of the 708 e-mails 379 were either sent or received by Mr. Path. This might indicate that including only the e-mails sent and received by the principal entrepreneur may already provide a fairly detailed picture of the developments of the company. However, in my view the remaining, e-mails sent or received by other company officials (non-founders) provided particularly good insight into the communications leading up to and following up from technological developments and sales orders. Also in combination, the internal e-mails provided detailed information about the internal company developments and company culture.

These topics may be beyond the direct scope of the research but nevertheless provided a context and framework that helped me understand what actually happened during this stage of the global startup process. This is a clear indication that using e-mails of the entire entrepreneurial team is highly beneficial.

Figure 11 Example of e-mail coding



As shown in Table 11 a total of 708 e-mails were included in the data set. Of these e-mails 192 were classified as internal e-mails 379 e-mails were classified as external e-mails (meaning they were exchanged with an external contact). The remaining 112 e-mails were listed as mixed e-mails. These are combinations of internal and external e-mails and typically consist of a request from one company official to the next to answer a question posed by an external contact in an attached or forwarded e-mail.

Looking at the entire set of e-mails, the exchange of technological and product information is the most common topic of the external e-mails (n= 273), followed by a variety of topics in relation to sales such as orders, prices and discounts, customs arrangements and shipment and delivery (n=212). Further a relatively large number of e-mails deal with trade-fairs and or conferences (n =63), and local distribution or other types of local representation (n=38). Also, 42 e-mails were received from University officials on various issues concerning the clean-room, department meetings etc. These issues were received only because Mr. Wide (although being absent due to his sabbatical) was still listed on their mailing list. These e-mails did not provide direct information regarding the global startup process. Yet, together these e-mails do provide some insight into the relationship between the University and Sound Inc. From the external e-mails I could establish the origin of 27 external contacts: in eleven cases references were made to previous meetings at conferences or trade fairs and in sixteen e-mails it was clear that the external contact had found Sound Inc. on the Internet.

The internal e-mails deal with setting up internal and external communication systems such as a to-do list, internet-response forms, the rep-zone (n = 34), production activities such as division of tasks, creating calibration reports, (n= 28), Arrangements for visits to trade fairs (23). With respect to the mixed e-mails most of these consists of requests from one company official to another to answer a question from a (potential) customer regarding product specifications or customisation, price,

delivery times etc. (n = The mixed e-mails show clear evidence of the lack of standardized procedures and routines which are typical for new ventures.

8.3 The global startup process -content, course and context

In Chapter 5, I explained that a process like the global startup process would be described in terms of content, context and course. The content refers to the (nature of) the opportunity that is being recognised and the activities undertaken in the course of this recognition. What opportunity is discovered and what activities are being undertaken is largely dependent on the context in which the initial discovery and the subsequent development took place; vice versa the nature of the opportunity also determines in which context entrepreneurs operate in order to exploit the opportunity. The course can be described in terms of the timing of the different activities as well as the mutual (cause and effect) relationships and the start and end borders of the process. The context refers to the environment in which the process takes place and includes the micro environment like company culture, the meso environment such as the industry or community in which the activities take place, and the macro environment such as the countries or regions in which the activities take place. This framework is summarised in Table 11.

Dimension	*Elements*	*Description*
Content	Opportunity	Nature of the opportunity in terms of newness to the firm and the market, newness of the market and the product, the technology intensity and the global nature
	Activity	Lists what has been done by them in order to pursue the opportunity
Course	Timing	Lists when different activities have taken place
	Interdependency	Lists the relationships between different activities
Context	Micro	Organisational environment
	Meso	Industrial / technological environment
	Macro	Geographic / market environment

Table 11 Overview of research-dimensions

In the following paragraphs I discuss the global startup process of Sound Inc. on the basis of these dimensions. In particular I discuss how these dimensions changed during the three phases of the process. Because these dimensions are strongly related a number of aspects of the global startup process will be discussed multiple times yet with the focus of the discussion targeted on the specific dimensions.

8.3.1 Content

The content of the process can be described in terms of the (nature of the opportunity) and the activities that were undertaken to pursue this opportunity.

The opportunity. Understanding the nature of the opportunity and how it develops over time, in my opinion facilitates understanding why a specific (global) startup process develops in a certain direction. As explained in Chapter 5, an opportunity can be described as "A new means-ends relationship between goods, services, raw materials, and organising methods coming into existence as a long-term profit potential based on a recognised market position, in which a venture is competitive beyond the short run and through which a venture can offer products and services

that are attractive, durable, and timely and add value to buyers and/or end users" (Puhakka, 2002). In the case of Sound Inc. this new means-end relationship consisted of the commercialisation of sensors, measuring particle velocity that can be used by companies, research institutes and others to measure sound intensity.
In Chapter 5 I explained that the nature of an opportunity can be described in terms of five dimensions, of which the first two determine whether an opportunity is actually a real entrepreneurial opportunity.

1. Newness to the firm or the entrepreneur (ial team)
2. Newness *to* the market
3. Newness *of* the market
4. Technology intensity level
5. Geographic scope

Newness to the firm or the entrepreneurial team
Mr. Wide was still a student at the time he made his initial discovery (*source: University Newspaper, 30/01/1995*; *e-mails exchanged with Fairy January - June 1995*). As described in the previous chapter, the discovery was the result of serendipity (unsought finding). Although he had some knowledge of flow sensors from his education he had to teach himself the basics of the technological principal while working on the development of the sensor. Mr. Path had even less experience with the technology and the opportunity it provided. Even after being involved in the company for several years Mr. Path explained to me during the first interview in April 2001 that he still did not fully understand the principals behind the technology, let alone that he would be able to work on the further development of the technology.

As the company was a new startup there was no previous knowledge base from which to work. From this it can be concluded that the opportunity was new to the TEAM and to the firm, thereby fulfilling the first dimension of an entrepreneurial opportunity.

Newness to the market
The Sensor can also be considered to be new to the market: No one had ever brought a sensor to the market that measured sound using particle velocity. Yet, the idea itself was not new; Mr. Wide was just the first to discover the working principle: A few scientists and a Danish market leader had already conducted some experiments with similar types of sensors but they did not yield satisfactory results as is shown in for instance the following quote: "*In 1955 Stuart Baker searched for an acoustic sensor in order to deal with the problem of measuring acoustic intensity. He tried to achieve this with 1 hot wire This solution however resulted in a loss of directional information, which is crucial information for acoustic intensity…At least until 1991 researchers have tried to measure acoustic flows in this way [1,2]. However without satisfactory results*." (*Source e-mail Mr. Wide to STW, Fri, 1 Dec 1995)*

Newness of the market
Even though the opportunity was new to the market, the market itself was not necessarily a new market. As Mr. Wide explained to me as well as in an interview to the University Newspaper, the Sensor is actually a new product for an old market as well as a new product for a new market: On the one hand, the Sensor can be a real competitor to more traditional pressure microphones, but easier to use, at lower costs and with better results, according to Mr. Wide. On the other, applications will arise that we cannot even envision at this time (*source interview: DB1*).

Technology intensity level
Data from various sources clearly indicate that the opportunity is highly technology-intensive in nature. It was born in a lab and needed considerable scientific and engineering development before a marketable design had been created. Also, it was clear that considerable time would have to be devoted to building both awareness and acceptance in the market as was shown by the scepticism of the STW: "*its is an interesting, innovative discovery but it cannot possibly work*". Also the word: 'futuristic' was found at several places in the data (*e.g. University Newspaper 26/06/1997; Company Website dd 24/07/2002*).

Geographic Scope
The opportunity can be considered global in nature for several reasons. First, as both Mr. Wide and Mr. Path explained during the first interviews I conducted with these men, the number of potential customers in the Netherlands would simply be too small to sustain a viable and profitable company (*source: interview report DB1, AK1*). This is consistent with the type of applications identified in the Utilisation Report as presented above. It seems that the domestic market for 'hydrophony', or aerospace applications would not sustain the company for a long time. Second, as explained by the external informant, in order to build a customer base (whether domestic or international) the Sensor technology would have to be accepted by the scientific and acoustic community was the technology is very different from the industry standard: the microphone. If the Sensor was going to be a new industry standard this had to be achieved on a global scale. This suggests that global activities are necessary to start and sustain a company in this field (*source interview report KE1*). Third, as indicated by both the internal and external informants most players (e.g. Bødø & Knud, Pfon, Akoustika, Finish, Namrah) in the industry are globally active as well, and highly internationalised networks were already existing in this industry (*sources: interview reports AK1, DB1, KE1; internal report #1*).

Dimension	*Description*	*Motivation*
Newness to entrepreneur	New	Entrepreneur had no previous experience with the technology nor with entrepreneurship in general
Newness to the market	New and old	Research had been working with the technology many years before, yet this was the first time it was introduced to the market
Newness of the market	Old and new	Technology is a substitute for existing sensors but might also lead to new application
Technology intensity	High	Technology is both the most important input and output of the process
Global nature	High	Domestic market is too small to sustain the firm and globally dispersed knowledge and acceptance is required

Table 12 Nature of the Opportunity

In the internal report #1 produced in 1998, the author explicates what the actual market and target groups look like and provides an estimation of the size of the opportunity. A number of potentially interesting markets and target groups for Sound Inc were listed. Also in this report is becomes clear that in 1998 the world-market for Sensors was no larger than 600 orders annually that had to be divided amongst (at least) fifteen internationally active players. However, Sound Inc. estimated that the potential demand was much higher, if cheaper, easier to use probes, - like the Sensor- were introduced (source internal report #1).

The nature of the opportunity did not change significantly throughout the course of the startup process. However, as I described in the overview, Sound Inc. (then

Sound Inc. TEAM) had to take a sidetrack and exploit an alternative opportunity, in the form of the agreement with Pfon, in order to be able to pursue the opportunity it wanted (*source: University Newspaper article 30/01/1997; interview report DB1*). Further, when the composition of the entrepreneurial team changed (with Peter and Tony leaving and Mr. Path arriving) the nature of the opportunity did not change. However, the fax and e-mail data does suggest that when Mr. Path arrived a Mr. Wide scope of potential customer (types) was considered. Whereas before Mr. Path's arrival most communication took place with research institutes and large multinational companies, after his arrival many faxes and e-mails were sent and meetings are set up with physiotherapists, manufacturers of hearing aids etc. as well. Also, way the opportunity was going to be exploited, changed considerably when Mr. Path arrived as well as under influence of the break with Pfon (which left the nascent firm without its most prominent source of income). I will discuss these developments and their effects in more detail in the section on 'Course'.

The scope of the opportunity was further expanded during the exploitation process, when new sensors were added to the product-range. Also the company begins to develop software during the course of 2001. On the company website, they write the following about this: *"Due to the rapidly growing number of Sensor end-users, as well as their individual requirements, the need for customized "particle velocity software" features grow rapidly. The supporting software provided by Sound Inc. is based upon three pillars: (1) MATLAB compatible based open source code packages (2) dedicated plug in software packages for (almost) all front ends, (3) supporting OEM business partner's software. Due to the early stage on the technology curve, the likelihood of gaining major new insights is high. Therefore, as an additional service, Sound Inc. offers its customers free (relevant) software updates for two years after procuring the initial software package. Sound Inc. strives for open interfaces, and cooperates with other parties in the industry, such as manufacturers and software suppliers". (Source: Sound Inc. Website March 2003)*

This quote provides an indication that even at that stage, the nature of the opportunity could still be considered as new and highly innovative. The fact that the firm relies on open-source technology is an indication that the firm does not only want provide maximum flexibility for its customers but also for itself.

When Mr. Wide left the company for an eighteen month sabbatical, neither the nature, nor the scope of the opportunity changed. Only towards the end of the startup process, as it clear from the "Outlook to the Future" the company began to shift its focus slowly to nano-technology under pressure of various industry pressures.

Activities. In Chapter 5 I explained that a startup process is divided into three phases: opportunity recognition, preparation and exploitation. As described in Chapter 5, basically the opportunity recognition process can be described as consisting of the initial discovery, development of the idea, evaluation of the alternatives and the decision to exploit. The preparation phase consists of the building of the resource base, the creation of an organisation, the development of the offering and building the bridge to the market. During the exploitation phase finally the offering is sold on the market and value is created. Also during this phase the company continues to develop its organisation and resource base. Yet, I also argued that the distinctions between the different phases are not always clear-cut and that the process is not linear and or sequential. In fact, this is precisely what we observe when looking at the global startup process of Sound Inc. In the following paragraphs I will explain how the different events and activities described in the overview can be 'assigned' to the different phases of the process. Basically, I first made the following rough distinction:

- Everything up to the signing of the contract with Pfon (in December 1996) was listed as belonging to the opportunity recognition process. The reason for this was that up to reaching the agreement with Pfon it was both uncertain what the opportunity would actually look like and whether the necessary (financial) resources could be obtained to make exploitation of this opportunity (applying the Sensor as a sound intensity measure) would be feasible. Only once the contract was signed Mr. Wide and his friends could start prepare for business.
- All the events and activities that happened between this and the listing of the company at the Chamber of Commerce (in January 1998) belonging to the preparation process, as during this period most activities were targeted at assembling a resource base, creating an organisation, and identifying potential lead customers while at the same time not yet engaging in actual sales activities.
- The remainder of the process (from January 1998 to May 2003) was listed as belonging to the opportunity exploitation phase as this period was characterised by sales activities and further development of the organisation.

This classification might suggest that the process was linear and sequential after all. Therefore, I examined the activities that took place in these three different time-periods more closely. During the 'opportunity recognition process' as described above I identified nine different activities:

1. Discovery of the Sensor (initial idea)
2. Research and Development of Sensor at the lab's of the Dutch University
3. Protection of the Sensor (by having the STW obtain a patent)
4. Conducting the doctoral research
5. Interaction with scientific and business community to obtain feedback and ideas for application
6. Search for resources to enable research and development of the Sensor
7. Formation of the Sound Inc. TEAM by Mr. Wide and his friends Peter and Tony
8. Search for business partners
9. Signing the contract with Pfon

Looking at these activities I concluded that the first five activities are pure opportunity recognition-elements: discovery of the idea, development of the idea, identification of alternatives. In the overview (and the list of activities) I did not provide a description of the evaluation process and or the decision to exploit. The reason for this is that these were no conscious decisions made at a certain moment in time. Rather these were intuitive decisions that were made over a period of time and of which Mr. Wide became increasingly aware. When Mr. Wide formed the Sound Inc. TEAM, together with Peter and Tony he was already certain he wanted to exploit. In some respects the formation of the TEAM and the search for business partners can be considered as preparatory steps rather than pure opportunity recognition element. Yet, looking back it is difficult to establish whether at this moment he had already decided that the Sensor would be exploited as a sound intensity measure and thus whether the opportunity was already fully developed and recognised. Furthermore, despite the fact that Mr. Wide wanted to exploit the Sensor commercially as a sound intensity measure, it remained uncertain if this would be feasible. For that reason, the search for a business partner can be considered as pre-preparation, especially because the contract with Pfon dealt with an alternative opportunity (the use of Sensors in mobile telephony) rather than with the preparation for exploiting the Sensor as a sound intensity measure.

From this I conclude that considerable overlap exists between the opportunity recognition process and preparation and that thus a transition period can be identified at this stage in the global startup process. As was argued in relation to the entrepreneurial process, this shows that the three stages of the process are not sequentially and that the conceptualisation of the process in the three stages is somewhat artificial. Although this is typically for conceptual models, we nevertheless need to consider the transition periods when modelling the global startup process.

With respect to the preparation process, as defined above, I identified five activities and or critical events (other than the ones from the transition phase discussed in the previous paragraph):

10. Conducting research as agreed upon in Pfon contract
11. Obtaining access to facilities
12. Formation of new entrepreneurial team with Mr. Path
13. Termination of the co-operation with Pfon
14. Foundation of Sound Inc.

As described in the overview, after the contract between the TEAM and Pfon was signed, an extensive part of the time (and thus of the human resources) was devoted to conducting research activities for the Pfon-project (*sources: faxes sent by Mr. Wide and Peter to Hills and Pfon between March and September 1997*). These activities were necessary to comply with the terms of the agreement and, thus, to obtain the financial resources the TEAM needed. However, I consider these activities to belong to a necessary sidetrack because these activities do not directly lead to the exploitation of the Sensor as a sound intensity measure. Besides these research activities the TEAM also began to assemble the necessary resource base. To that end, they for instance reached an agreement with the Dutch University for the use of the research and production facilities and receiving a small salary from the Dutch University. Further, they also obtained additional resources from their mentor Hills. Further, the TEAM continued to establish and develop relationships with people in the scientific and business community as they had started to do during the opportunity recognition process. An activity or process that is also clearly related to preparation is the formation of the new entrepreneurial team with Mr. Path. This process proved to be rather difficult under the pressure of the rising problems between the TEAM and Pfon, but also as a result of personal differences and resulted in a break-up of the TEAM and the formation of a new entrepreneurial team consisting of Mr. Wide and Mr. Path. The final step in the 'preparation phase', as I defined it above, included the official foundation of the company Sound Inc. in January 1998.

Even though the company began to sell Sensors commercially after this foundation, careful evaluation of the preparation process shows, the preparation did not end at that point. In fact when we look at the activities I originally listed as belonging to the exploitation process, it is clear that a number of these activities belong to the preparation process rather than the exploitation process.

15. Meetings and mailing with and to potential lead customers and start of sales activities
16. Marketing research and development of a marketing plan
17. Presentations at trade fairs and conferences
18. Development of a sales, distribution and communication channels and networks
19. Expansion of the offering and customer base
20. Mr. Wide leaves for 18-month sabbatical.
21. Professionalisation of the organisation
22. Move to the new premises

The first activity in this list, the start of the sales activities does indeed belong to the exploitation process. Yet, the development of a marketing plan can clearly be seen as part of the preparation process (and more specifically of building the bridge to the market). The development and introduction of new types of Sensors can both be considered as part of the preparation process (developing the offering) and as part of the exploitation process (expanding the opportunity). Similarly, the setting up of a distributor network could be regarded as part of the preparation process (building the bridge to the market). However, I consider that these activities mostly belong to the exploitation process as it is directly related to sales activities. The other activities on the list are pure exploitation-elements. Mr. Wide's sabbatical leave can be seen as a breaking point in the opportunity exploitation process. Those activities that took place before his absence clearly belong to the early startup, while the activities and events that happened since are more related to professionalising the company and preparing it for the post-startup period. Table 13 lists the different activities once more classifies them on the basis of the process phases to which they belong.

#	*Activity*	*Timing*	*Process phase*
1	Discovery of technology	Oct. 1994	Opportunity recognition
2	R&D of Sensor at the labs of the Dutch university	Nov. 1994 – Sept 1996	Opportunity recognition
3	Protection of sensor (by having the STW obtain a Patent)	1995	Opportunity recognition
4	Conducting the doctoral research	Jan. 1995- Feb 1997	Opportunity recognition
5	Interaction with scientific and business community to obtain ideas for applications and feedback	Spring 1995 – fall 1996	Opportunity recognition
6	Search for resources to enable research and development for the sensor	Spring 1995 – onward	Opportunity recognition / preparation
7	Formation of the Sound. Inc. TEAM by Mr. Wide, Peter and Tony	Second half 1995	Opportunity recognition / preparation
8	Search for commercial partners	Mid 1995 – Dec 1996	Opportunity recognition / preparation
9	Contract signed with Pfon	Dec 1996	Opportunity recognition
10	Obtaining access to facilities (e.g. from Dutch University)	Beginning 1997	Preparation
11	Conducting research as agreed in Pfon contract	Jan –Aug 1997	Preparation (side track necessary to obtain resources)
12	Formation of the team with Mr. Path	May – Nov 1997	Preparation
13	End of contract with Pfon	Sep 1997	Preparation (side track results in lack of resources and support)
14	Foundation of Sound. Inc.	Jan –May 1998	Preparation
15	Marketing research and development of marketing plan	Jan – Aug 1998	Preparation
16	Meetings with and mailing to lead customers and start of sales activities	Jan 1997- mid 2000	Preparation / exploitation
17	Presentations at trade fairs	Spring 1998 – onward	Exploitation
18	Setting up sales, distributor and communication channels and networks	2000 – onward	Exploitation
19	Expansion of offering and customer base	2000 – onward	Exploitation
20	Mr wide leaves on sabbatical	Apr 2001 – Oct 2002	Exploitation
21	Professionalising the company	Apr 2001 – 2003	Exploitation
22	Company moves to new premises	May 2003	Exploitation

Table 13 Overview and Classification of Activities in the different Process Stages

8.3.2 Course

As explained described the course of the process refers to the timing of the different activities as well as the dependency between the different activities and systems. Clearly the timing of the activities is strongly related to the cause-and-effect relationships (dependency) between the different activities. In the global startup process of Sound Inc. four important data can be identified:

1. November 1994: Discovery of the Sensor
2. December 1996: Signing of contract with Pfon
3. January 1998: Foundation of Sound Inc.
4. May 2003: Move to the new premises and end of startup process

As described previously many other activities and events took place in between. In the following paragraphs I describe and discuss to what extent the timing of the different activities can be explained or seems to be accidental.

The opportunity recognition process as described took a period of about 2 years from the initial discovery in October 1994 to the decision to exploit in the end of 1996. This period may seem extensive, yet, when considering the radical innovative nature of Sensor it is not surprising (and in fact, as will be shown in the following sections the development of the opportunity did not end at all in the sense that the search for new and improved sensors, applications and markets will remain key throughout the entire (global) startup process). After all, extensive research and testing was in order before a marketable sensor was developed. Also, it took considerable time to develop a level of acceptance and awareness of the scientific and acoustic community to the extent that commercialisation would be possible. This acceptance was essential to be able to gain sufficient credibility in the eyes of potential investors, suppliers and customers. That convincing the acoustic community would be difficult is clear from the following remark made by Mr. Wide: *"…This is the biggest problem: people cannot believe that the acoustic flow is measures or people do not see why this would be necessary: sit isn't as if sound is not already being measured? Is a commonly heard remark" (source Mr. Wide in e-mail to his supervisor, November 14 1995)*

In order to determine which of the activities described above were most critical during the opportunity recognition process I counted the number of references made to each of these activities, searched for explicit references made by the entrepreneurs regarding the importance of certain activities and examined to what extent direct effects resulting from these activities could be identified. From this investigation four events / activities come to the fore. These events and effects are listed in Table 14

Cause	*Effect*	*Explanation*
Discovery took place at university	Access to facilities & supervision Access to network Access to human resources (students / trainees / Ph.D.'s) Access to examples (other spin-offs)	University positions itself as the Entrepreneurial university; other universities might not have given similar support
STW rejected request for funding	Mr. Wide has to finish Ph.D. research as soon as possible to earn an income Mr. Wide needs to find a business partner as soon as possible. Negotiations with Akoustika ended when they took too much time Mr. Wide builds up a debt at STW and Mr. Hills Mr. Wide becomes even more dependent on University for access to resources	STW argues that sensor is not new, it does not new and there is no market. As Mr. Wide is convinced this is not true, he presses on, but is in large need of financial resources from other sources
Mr. Wide meet Mr. Hills	Hills becomes TEAM mentor Access to knowledge and experience on management, commercialisation and entrepreneurship Access to financial resources Access to network Support in negotiations and dealings with Pfon	Hills has experience in commercialisation himself and as he likes the sensor a lot (and the men involved in the venture) he decides to support the venture as much as he can

Table 14 Cause-and- effect relationships for the opportunity recognition process

Although some preparatory steps had already been taken in 1995, the preparation process started in earnest at the end of 1996 when Mr. Wide was nearing the completion of his Ph.D. thesis and when an alliance had been formed with the German company Pfon. Yet, it took till the beginning of 1998 before 'full-scale' business operations actually began. In my perspective there are several reasons why this took so long.

During the first part of the preparation process Mr. Wide was planning to form the company along with his two friends Peter and Tony and it seemed that he was going to rely quite strongly on the alliance with Pfon. Clearly most time and effort was put into the research as planned under the agreement with Pfon. Despite the fact that the TEAM would also try to focus on other areas, the lack of reference to other activities such as the search for new applications or customers seems a strong indication that in fact the vast majority of their time and effort was devoted to the Pfon project. As a consequence business activities related to the actual opportunity (sound intensity measurement) did not come off the ground. In addition, to the strict demands of Pfon, the inexperience of the three men did not prove to be beneficial either. It seems they did not really know how to proceed effectively.

The start of the actual exploitation process is further delayed when problems arise within the TEAM (as a result of the problems with Pfon, the arrival of Mr. Path and mounting personal differences).

From this it can be concluded that the most critical events and activities performed during the preparation process were:

1. The co-operation and resulting problems with Pfon:
2. The arrival of Mr. Path:
3. The breach within the TEAM
4. The foundation of the limited company and the launch of the start of the commercial activities.

The different effects of these critical events are listed in Table 15

Cause	*Effect*	*Explanation*
Co-operation and problems with Pfon	All tie is devoted to research for Pfon; hardly any time is left for other commercial activities. When problems increase a lack of financial resources is ominous. Results in tensions within the TEAM and a need for the TEAM members to find other occupations.	Pfon has considerably more power that the TEAM.
Arrival of Mr. Path	More focus on other commercial activities. Results in tension within TEAM. New entrepreneurial team is formed between Mr. Wide and Mr. Path without Peter and Tony. Foundation of a limited company.	Mr. Path realises the potential value of the "Sensor M" opportunity, has more experience and a larger network to make it happen. However, he has very different ideas than the original team members resulting in tension and later a break within the team.
TEAM breaks up	Start of the commercial activities is delayed (Mr. Path wanted to start already in the summer of 1997) Co-operation with Hills seems to come to an end (seems to take the side of Peter) Opportunity to form a more balanced (yet smaller) team of Mr. Wide and Mr. Path	Problems arise when the largest source of income (from the Pfon contract) dries up and no agreement can be reached regarding the role of Mr. Path as well as their own roles in the new venture.
Foundation of company	Leads to the generation of financial resources as a result of sales activities rather than relying on loans or alliances with much more dominant partners.	Foundation of limited venture gives legitimacy of the activities to the outside world and a framework to organise the activities.

Table 15 Cause-and-effect Relationships for the Preparation Process

With respect to timing of the entry into different markets during the exploitation process I observed that the company Sound Inc. has been able to set up a large number of activities in a large number of countries with limited financial and human resources and without having its own production and or research facilities in a short period of time. I could not establish a timeline or matrix linking the separate activities performed by Sound Inc. during the opportunity recognition process, or identify specific cause-and-effect relationships in the same way this was done for the opportunity recognition process and the preparation process. This does however not mean that all activities were totally independent. Ideas generated in relation to contacts in one country were also deployed in other country. Further, the data suggests that throughout the process, the timing of the different trade fairs affect the course and timing of the other activities considerably. There are several reasons for this. First, the trade fairs have often been used to introduce new products. This meant that in the period leading up to the trade fair considerable effort was often placed on R&D. After the trade fair, the commercial activities increased, in the sense the follow-ups were made to newly established contacts or agreements. Finally, evidence is also found that existing contacts in one country introduced Sound Inc. by word of mouth to new contacts located both in the same country as well as in other countries.

In the discussion of the networking and interaction process further relationships between the different activities and actors in the opportunity recognition process will be provided.

8.3.3 Context

As argued in Chapter 5, the context in which the global startup process of Sound Inc. took place on three levels: micro (the organisational environment), meso (the industry / community) and macro (general environmental factors / the geographic scope). In the following paragraphs I will discuss how the context (at all three levels) changed over time starting with the micro-context.

Micro context

The Sensor was discovered in the laboratories of the Dutch University and the initial development of the Sensor took place at this place as well. Therefore, the Dutch University, and more specifically the research group around Michael Fairy, is considered as the original organisational environment in which the global startup process took place. This organisational context affected the global startup process considerably especially during opportunity recognition and preparation. The University has a clear policy of supporting entrepreneurship actively. In fact the university presents itself as *the Entrepreneurial University (source: university homepage)*. This explains why they continued to support Mr. Wide with access to research facilities and supervision despite a lack of resources (once the STW had rejected the proposal). Also, it explains why the University was eager enough to provide Mr. Wide with access to human resources in the form of students working on the highly uncertain Sensor project. Furthermore it may also explain why and how Mr. Wide had developed a clear market orientation, as was clear from his many interactions with the business community. Such a clear market orientation is rather uncommon amongst scientists and often prevents scientists from actually commercialising their findings. Working at the Dutch University can thus be considered as working in a context that advocates and promotes entrepreneurship.

During the transition between opportunity recognition and preparation, Mr. Wide and his friends Peter and Tony founded the Sound Inc. TEAM partnership (in Dutch v.o.f). Even though they kept working at the Dutch University, they nevertheless began to form their own organisational context, which was increasingly separate from the university context. This new organisational context can best be described as one that was still strongly focused on (scientific) R&D. The three men were also very enthusiastic and eager to start commercial activities. However, at that stage their 'organisation' lacked both a structure and strategy to enable such commercial activities on a larger scale. Due to their lack of experience the TEAM was not able to change this situation alone. Also they were obliged to devote their time mainly to working on the research for Pfon which further complicated setting up an independent market orientated organisation.

During the preparation process the organisational context changed once more. The inexperienced and research-oriented Peter and Tony left the organisation while the much more experienced and market oriented Mr. Path came aboard. With his arrival, the organisational context changed from a group of researchers that were trying to commercialise a scientific discovery, to a market oriented company that was involved in extensive R&D to market innovative products.

In the exploitation process the organisational context could best be described as highly innovative, opportunistic (in the positive sense of the word) and enthusiastic. As explained the company remained a virtual organisation throughout the remainder of the startup process, with everyone working at different locations (at the offices of their other employments and even their own living rooms) and at flexible times (often outside office hours) (*source: internal report #1; interview report AK1; DT1; internal e-mails*).

This micro-context affected the global startup process in several ways. First, when the activities still took place in the organisational context of the Dutch University, the men worked in an environment where travelling abroad, to international conferences and trade fair was normal and as q consequence Mr. Wide and his friends adopted this behaviour from the start. Second, the international orientation of the entrepreneurs further facilitated the entry into international markets: even language difficulties did not hold Mr. Wide back from signing a contract with Pfon. Third, as Mr. Path explained to me, the combination of an (internationally) experienced entrepreneur and a talented scientist resulted in a situation where the company could both develop products desired by customers all over the world, and the entrepreneurial and organisational capabilities to reach these customers.

Meso context

The meso context refers to

1. The industry or community in which the global startup process takes place
2. The rate of technological development in the industry.

Several observations can be made with respect to the meso-context in which the global startup process of Sound Inc. took place. The data show that the opportunity recognition process took place largely in a scientific context and this scientific context remained important throughout the remainder of the process. First Mr. Wide had obtained a position at the Dutch University (*source: e-mails February 1995; University Newspaper 30/01/1997*) and as a result he was surrounded by scientists while working on the (scientific) development of the Sensor everyday. Also Mr. Wide (and after his arrival also Mr. Path) realised that in order to be able to introduce the Sensor on the market, the scientific community would have to accept the Sensor and thereby provide the necessary legitimacy in the eyes of the potential customers (*source: interview reports AK1 – 2 DB1, internal report #1, #2*). Although customers might be found in a large variety of organisations ranging from environmental agencies to embassies and universities (*source internal report #1 p 45*), according to Mr. Wide and Mr. Path from the start it was envisioned a considerable portion of the early customers would be universities and other research centres who would use the sensors for scientific purposes (*source interview report A2; DB1*).

In addition to this scientific context, the industrial context was also of critical importance to the global startup process of Sound Inc. The industrial context consisted both very large, established multinational companies as well as locally operating SME's. These firms were either active as manufacturers and suppliers of acoustical instruments and / or commercial buyers of their outputs to use these as inputs in their own production or processes. The internal report #1 suggests that the business context can be characterised as being dominated by a relatively small number of dominant players (the internal report #1 lists 5 organisations by name and market share) that operated around the globe and that most major players in the industry know each other well. This report as well as the second internal report and a set of more than 25 e-mails suggests that the entire community meets several times a year at trade fairs and conferences.

Many organisations (both commercial and not-for-profit (research) in the industry were also members of international and or domestic interest groups or foundations for the exchange of knowledge and ideas. These interest groups also act as expert sounding boards for, for instance governments. Sound Inc. became a member of several of national and international societies. Yet, content analysis of the e-mails,

websites and interview reports suggests that the company is only an active member of two domestic societies (MINAC (Microsystems and Nano-technology Cluster, VOG, Association of Enterprises active in Noise Control).

In the internal report #1 an analysis is provided of the competitive environment. He states that by 1998, eight direct competitors (providers of sound intensity measurement systems) could be identified, of which Bødø and Knůd held a market share of 30%[28]. In order to deal with the competition, it is proposed to opt for a defensive rather than offensive attitude towards the competitors because this would make the competition feels less threatened. This would prevent them from blocking Sound Inc.'s market entry. Furthermore, a defensive attitude would increase the potential of forming partnerships with one or more of these competitors (Source: Internal Report #1, 1998 p. 33-39). Indeed several e-mails indicate that this defensive approach is adopted. As suggested in the report, Sound Inc. officials often point out to potential clients that "Sensor's" are complementary to other types of sensors offered by its competitors (especially those offered by Bødø and Knůd). No evidence was found that any of the competitors actively tried to obstruct Sound Inc. in its activities. Also, no evidence was found that any large important players left or entered the market since 1998.

With respect to industry standards it is clear that Sound Inc. has to comply with at least two types of global standards (1) the norms for the measurement of sound intensity as formulated originally by Bødø and Knůd and (2) the standards of the Institute of Electrical and Electronics Engineered for the (connection) of measurement hardware (source internal report #1, 1998 p 60). Also, in the e-mails evidence is found that Sound Inc. seeks to establish compatibility of its products with products offered by other companies (e.g. *"That' that now were are going to be compatible with N. he existing probes exploded when you would connect them to a N" (Source: e-mail Employee1 to 'Info' March 12th 2002*).

The rate of technological development in the industry was very high as is best illustrated with what Mr. Wide told me in the first interview: *"We found out very rapidly that in this sector it does not make any sense to file for a patent. It costs a lot of money, takes forever, and before it is actually filed, someone (we, or a competitor) has made a new discovery that makes the patent completely obsolete"(source: interview report AK1)*

The rapid rate of innovation was also shown in the quote from the company website on software: "*Due to the early stage on the technology curve, the likelihood of gaining major new insights is high."* A major consequence of this is that Sound Inc. on the one hand has devoted much time and resources in building acceptance and legitimacy. To that end, the company has to provide a considerable amount of detailed information to the public (and thus to the competition). On the other hand the company must strive to stay ahead of the competition to ensure that the technology does not become rivalled by competitors copies, or even obsolete.

This state of technology probably provides the best explanation for why Sound Inc. continued to strive for good relationships with researchers working at non-profit research institutes and labs around the world. Even when Mr. Wide left the company for his sabbatical Mr. Path and the employees made sure that contacts with researchers were continued.

Macro context

The macro context refers both to the general environmental factors and pressures that influence the global startup process and the geographic context in which this process takes place.

[28] As mentioned the entire market at that time, was estimated at about 600 units per year

Starting with the general environmental factors and pressure several remarks can be made. First, as already noted from the report #1 and as confirmed by Mr. Path in one of the e-mails, the Internet gives Sound Inc. the opportunity to communicate with its counterparts around the world. It is interesting to note that the Internet was just beginning to rise around the time Sound Inc. came into being. During the opportunity recognition process, Mr. Wide communicated with colleagues at the Dutch University through e-mail and the student team had already set up their own Internet page in 1995 (*source: University newspaper June 1997*)

With respect to the geographic context, it is clear that from the start, Sound Inc. operated in an international arena. Within months from making his discovery, Mr. Wide was introduced to the international scientific and business community through his contacts at the Dutch University and at an International Trade fair in Stockholm and later in Leuven, Belgium. As he explained in an interview with the University Newspaper, Mr. Wide had already spoken with all the major players in the acoustics industry before he defended his doctoral thesis in February of 1997. From both the archive records and the interviews it was apparent that these players came from various parts of the world including the U.S., Japan, Belgium, Sweden, and Germany. Mr. Wide realised he needed the inputs of these players both to build legitimacy and obtain ideas of application. Already at this stage, the entrepreneurs understood that eventually commercial activities would have to take place in international markets, because the Dutch market would be too small to sustain the company: Also in search for business partners, Mr. Wide did not limit himself to the domestic context. As described in the overview, Mr. Wide (and his TEAM) negotiated with a Scandinavian firm and a Central European firm before reaching an agreement with Pfon. Mr. Wide explained in the first interview that he had sought to establish partnerships with these foreign firms, rather than with a Dutch company, simply because these foreign parties would provide Mr. Wide with the best possible access to the world market. Also, these firms would potentially be interested enough in the discovery and able to invest the large financial amounts Mr. Wide was seeking to obtain. Combined these reasons suggest that going abroad at such an early stage was not regarded an unusual, but rather a natural step and as Mr. Wide explained, it was not considered as something highly complex either.

Even though most of the activities in the preparation process were conducted in the Netherlands, involving mainly Dutch actors, the context in which these activities took place can nevertheless be regarded as a highly internationalised context. First, the international alliance with Pfon affected the course of the preparation phase considerable in the sense that during the first part of the preparation process most of the time and effort was spent on the activities resulting from this partnership. Also this international partnership caused problems within the TEAM and in the sense that part of revenue that was expected at the start of the preparation process was not going to be obtained.

Also, during the preparation process the entrepreneurs continued to have contact with many commercial organisations and research institutes around the world. Through a market research at the end of the preparation process, it became even more clear just how necessary entering the global market from the start would be: From a market research it was estimated that on an annual basis only 600 sound-intensity probes were being sold around the world in 1998 (internal report #1 p 34). As explained in this report, Sound Inc. believed it could increase the total market demand by making the measurement of sound intensity cheaper and simpler. Nevertheless, the market would remain small and focusing on the domestic market alone would never be an option.

Yet, when it comes to the actual preparatory activities it must be concluded that this phase in the process was less internationalised than the opportunity recognition process: the most important actors (other than Pfon) were all Dutch as were almost all the resources assembled during the course of the preparation process. Also, neither Mr. Wide nor Mr. Path ever considered founding the company in another country nor did they consider establishing a foreign subsidiary simply because this was not necessary.

The context in which Sound Inc. operated after its official foundation did not change very much. If we look at the location of the different contacts that Sound Inc. established during the course of the exploitation process (as will be shown in more detail in section 7.6) it is apparent that already in 1998 the number and variety of countries was relatively high for such a young venture (seven different countries including Belgium, Germany, UK, Austria, USA, Japan, China). The number of countries in which contacts were established exploded between 1998 and 2001; for example during ten day in December 2001 e-mails are exchanged with contacts from Germany, Switzerland, Italy, Brazil, U.S., U.K., Australia, Belgium. E-mails from around that same period as well as information provided in an interview (interview report AK1) suggests that around that time contacts had been established in over 20 countries with more than 60 percent being regular contacts. Since then, the number of contacts in most of these countries increased, but hardly any new countries were entered. Further, it is clear that all market in which Sound Inc. is active have at least achieved a basic technological level. The company is active in several up-coming markets like China, Indonesia and Brazil but not in real third world / developing countries (like Bolivia, Nigeria or Laos). The reason is that in developing countries the acoustic and sound measurement industry is virtually non-existent.

Throughout the entire global startup process evidence was found that the entrepreneurs were not afraid of doing business internationally, despite the fact that Mr. Wide experienced some difficulties with the German language during the recognition and preparation process. A distinct international orientation and positive attitude towards global activities was apparent. Because Sound Inc. does not have foreign direct investments; the influence of the different local contexts seems to remain limited. No evidence is found in the data that the company had to deal with local legal issues or standards. When I asked one of Sound Inc.'s employees, who are responsible for customer contact about potential difficulties about doing business in such a variety of countries, he mentioned it simply was not an issue. He explained that until that time (July 2001) he had never had to deal with any problems that were due to differences in culture, legislation or business norms. Requests for customisation of products were typically based on different types of application and usage rather than cultural preference or local industry standards. Further, when talking about the topic of doing business in such a global context all informants again pointed to the facilitating role of e-mail and Internet which helped them overcome the potentially biggest problem of doing business in some many countries: different time zones and extensive need to travel.

8.4 Observations regarding the Global Startup Process

From the previous paragraphs, several issues came to the fore. First, starting global is not a conscious choice or goal in itself, rather the nature of the opportunity and the context in which it is developed determines if a global process should be global.

Second, starting global really means what it says. Right from the moment the discovery was made Mr. Wide interacted with people from many different countries

around the world. To be able to start at all he engaged in an alliance with a German company. Also the exploitation process of Sound Inc. was global from day one.

Third, both informal, upstream non-traditional forms of international business, such as the exchange of ideas, the use of international testers to expand the research capacity and the use of international trainees and exchange programs were as important to Sound Inc. as for instance setting up a distribution network or international sales.

Fourth, starting global is not considered to be a problem or even an issue by the entrepreneurial team. This is highlighted by the fact that hardly anywhere in the data explicit reference is made to the fact that activities should take place internationally, even in the marketing report. Also, very few references were found that indicate that doing business internationally was considered more problematic than doing business domestically. Four times, Mr. Wide remarks that German is not his preferred language of communication and that this might have added to his problems with Pfon. *The original contract was composed in German. Looking back I realise that my comprehension of this language was not sufficient to grasp the full implications of the agreement" (source: e-mail Mr. Wide to Pfon, March 1998).* Yet, when Mr. Path arrived, who worked in Germany for several years and who speaks German almost fluently, this was no longer a problem. Also it is questionable to what extent the problems with Pfon were actually related to the international nature of the alliance. The data suggest that communication was not hindered by distance (either with respect to time or travel costs): several meetings took place between the parties and fax and phone proved to be rapid channels of communication as well. Language might have played a minor role. However, considering, that the university lawyer and Hills helped Mr. Wide with the details of the contract (*source: faxes Hills November 1997*), it seems unlikely that the language was the actual problem. His inexperience with such matters is likely to have been a larger influence in this respect and therefore it is difficult to determine what the actual affect of the language problems has been on the opportunity recognition process (and the further development of the venture). When talking about this with Mr. Path he suggested that the most important reason for the problems resulted from the (lack of) power balance that existed between Pfon and the TEAM.

Fourth, the globalisation process did not follow a pattern of entering countries that were increasingly distant either in geographic cultural terms, nor did it proceed along a previously defined strategy or plan. Instead, the data suggests that global startup process was largely opportunity-driven and the result of entrepreneurial behaviour: Wherever the entrepreneurial TEAM identified opportunities for obtaining ideas, knowledge, other resources or wherever a market for their products could be found the company set up activities.

Finally, both domestic and international network contacts play an important role in global startup process of Sound Inc. This role can be direct and indirect and will be discussed in more detail in the following section.

8.5 Interaction during the global start-up process

Network Descriptives

In order to develop a first insight into Sound Inc.'s network I first read the set of 708 e-mails. In this set of 708 e-mails, references were found to 168 different external contacts. Of these contacts, 37 could be identified as domestic contacts of which 12 were related to the University. The 131 international contacts came from at least 37 different countries; in 5 cases the location of the contact could not be established.

Next, a pilot study was conducted based on a sample of 100 e-mails (see also Wakkee, 2003 or Appendix 5 for a detailed discussion of this pilot study). In these 100 e-mails 56 individual external contacts were identified. Next, I examined both these e-mails and the other data sources (faxes, interview reports, websites etc.) for information about these 56 contacts. It turned out that for 13 of these external contacts no further references could be found in the data. From this I concluded that these contacts probably played no significant role in the global startup process of Sound Inc. or in its network. Therefore, results from the network analysis presented below, is based on an analysis of 43 external contacts.

The results of the coding process are shown in Table 16.

These findings showed that company e-mails are indeed an excellent source of information when it comes to network analysis: information was found on each of the dimensions I wanted to include in the analysis. However, the e-mails only covered a part of the period covered in this research. Also, based on literature on informational richness theory and media use (e.g. Pantelli, 2002), it was concluded that different types of contacts and different types of messages often require the use of different media or communication channels. Therefore, to develop a more detailed understanding of the interaction process throughout the global startup process, I examined all the data again.

Following the three stages of the global startup process, I first present the most relevant contacts of Sound Inc. and classify these on the basis of the type of organisation and type of relationship. Next, I describe the origin of the different contacts and describe how the network developed during the different stages of the process. After that I will discuss what resources Sound Inc. exchanged with the different contacts and on the basis of this what role they played during the different phases of the process. The use of different communication channels will be discussed in relation to the entire process.

Attributes	*Values*	*N*
Organisation	Company	13
	Public organisation	1
	Research institutes	15
	Conference organisation	3
	Individual	1
	Unknown	1
Location	Australia	2
	Belgium	2
	Brazil	2
	China	2
	France	2
	Germany	2
	India	1
	Italy	2
	Korea	1
	Netherlands	12
	Poland	1
	Russia	2
	Spain	1
	Switzerland	1
	Turkey	1
	UK	1
	U.S.A.	7
	Unknown	1
Strength	Action set	24
	Strong tie	5
	Weak tie	15
Relationship**	(Potential) Customer	28
	Parent organisation	2
	Distributor / agent	4
	Tester	8
	Co-member in local network or pressure group	3
	Conference organizer	3
	(Potential) Research partners	6
Frequency	Daily	2
	Weekly	7
	Bi-weekly	13
	Monthly	10
	Bi monthly	8
	Once or twice per year	4
Origin	Through third parties	7
	From childhood and family	1
	Previous employment	2
	Network events	5
	Conferences and trade fairs	7
	Unsolicited contacts	8
	Internet, directories	5
	Unknown	9
Channels	Reference to Face-to-face	28
	Reference to Telephone	13
	E-mail	All
	Fax	23
	Through intermediaries	5
Stages	Opportunity recognition	3
	Preparation	7
	Opportunity exploitation	All

** Multiple relationships possible

Table 16 Results of pilot network analysis

8.5.1 Opportunity recognition

Contacts and classification.
In order to identify which contacts played a role in the opportunity recognition process I analysed the faxes and e-mails included in the archival records spanning the period between January 1995 and December 1996, the Newspaper articles, as well as the interview data covering this period. In order to analyse the network during the opportunity recognition process I first listed all the contact mentioned in the data, next I grouped all documents containing information about each of these contacts and searched these groups for information that would enable me to classify the contacts on the basis of the following attributes: type of organisation; type of relationship; location; strength; frequency of contact; antecedents, type of communication channels used, following the classifications and operational measures as described in Appendix 5 Table 5A.2.

As can be seen in Table 17, the original network includes three groups of organisations that are listed as a whole: the student TEAM, the scientific community and the business community. The reason for including these contacts as a group was twofold. First, regarding the scientific and the business community, at this stage, the individual organisations in these communities could not be identified. Second, for each of these three groups, their role as a group was significant whereas their individual contributions to the process were limited. Because hardly any individual members could be identified, it is also difficult to determine the frequency of the interaction with the (individual) members of the scientific and business community. However, the data suggests that Mr. Wide interacted regularly with different members of these communities. It seems a fair estimation to say that he communicated at least weekly with one or more members of these two communities and at times almost daily. In the archive records evidence was found of at least 7 contacts (letters, meetings, e-mails) exchanged between Mr. Wide and the STW. However, the records seemed incomplete in the sense that they indirectly referred to other communications. Therefore I conclude that over the entire opportunity recognition period Mr. Wide must have interacted at least on a bi-monthly basis with the STW. These interactions however, were not spread evenly over the entire period but clustered around the time of meetings between Mr. Wide and the STW and around the time STW took decisions regarding the patent and or funding. Regarding the interaction with Bødø and Knůd the archival records provide evidence for at least 10 communications in the form of faxes, letters and at least one meeting. Again, the content of the various letters suggests that more communication must have taken place between the start of 1995 and the end of 1996 as the letters and faxes do not seem to be consecutive. Also, in an interview Mr. Wide mentioned he met with the company several times during this period. From this I deduce that they interacted on average at least bi-monthly. The letters indicate that the communication was not clustered in one small period but spanned almost the entire opportunity recognition process. The interaction between Mr. Wide (or the other members of the team) and Mr. Hills seems to have been taken place on at least a weekly and sometimes even a daily basis estimated from the large number of faxes more than 30 faxes and references to many meetings or telephone calls in the faxes. The interaction with Akoustika seemed to begin in the early spring of 1996 and ended in September of this year. The archival records regarding the contact with Akoustika seem to be fairly complete (as I could relatively easily reconstruct what had happened) and include over 20 letters and faxes in which reference is further made to at least three different visits. From this I conclude that

Mr. Wide and Akoustika interacted on a weekly basis. Finally, the archival records also suggest that from August to December of 1996 Mr. Wide (and his TEAM) also interacted with Pfon on, on average, a bi-weekly basis.

Looking at the list of contacts it is furthermore obvious that already at this early stage in the global startup process the network was relatively diverse with respect to the types of organisations including both individuals, research institutes (multinational) companies and institutional organisations. Further, the Table shows that the network was already international in nature. Although the exact locations of the individual members of the scientific and business community could not be identified in all cases the data does suggest that they came from at least three regions: Europe, North America and Asia.

Name	*Type of organisation*	*Type of relationship*	*Location*	*Resources*	*Frequency*	*Channels*	*Strength*
Dutch university	Research institute	Parent organisation	The Netherlands	Access to research facilities Supervision, Moral support Legitimacy, Access to the network	Daily	Face-to-face; e-mail	Inner circle
Student team	Individuals	Employees / trainees	The Netherlands	Human resources	Daily	Face-to-face, e-mail, phone	Strong
Scientific community	Research institutes, laboratories	Audience	Globally dispersed	Technological information and feedback., Identification of potential partners and lead users.	No data available	Face-to-face, through intermediaries, e-mails, fax	Weak
Business community	Commercial firms, many multinational	Audience	Globally dispersed	Ideas for applications and feedback., Identification of potential partners and lead users	No data available	Face-to-face, , fax , through intermediaries	Weak
STW	Science foundation	Subsidisers	The Netherlands	Protection of technology. Advice. (funding rejected)	Bi-monthly	Face-to-face, through intermediaries, e-mails	Moderate
Bødø and Knud	Multinational company	Potential partner	Scandinavia	Feedback. Technological information	Bi-monthly	Face-to-face, through intermediaries, fax, phone	Weak
Hills	Individual	Mentor	The Netherlands	Moral support. Strategic, management and entrepreneurial advice. Access to the network	Weekly	Face-to-face, phone, fax	Inner circle
Akoustika	Multinational company	Potential partner	Central Europe	Technological information and feedback.	Weekly	Face-to-face, phone, fax, through intermediaries	Weak
Pfon	Multinational company	Alliance	Western Europe	Technological information (promise of) access financial resources. Support in obtaining patents. (promise of) access to market. (promise of) access to research capacity. Legitimacy.	Bi-weekly	Face-to-face, phone, fax, through intermediaries	strong

Table 17 Network contacts during opportunity recognition

Origin and Development. So how was Mr. Wide able to set up such a relatively large, diverse and globally dispersed network at this early stage? To determine this I examined what the origins of the different contacts were and when the relationships with the different contacts were established. For some contacts this was relatively easy to determine than for others.

t=0: Mr. Wide had already established a relationship with the Dutch University before making his discovery there, simply because he was enrolled as a student at this institute. The relationship with university forms the starting point for the network developed by Mr. Wide throughout the remainder of the process.

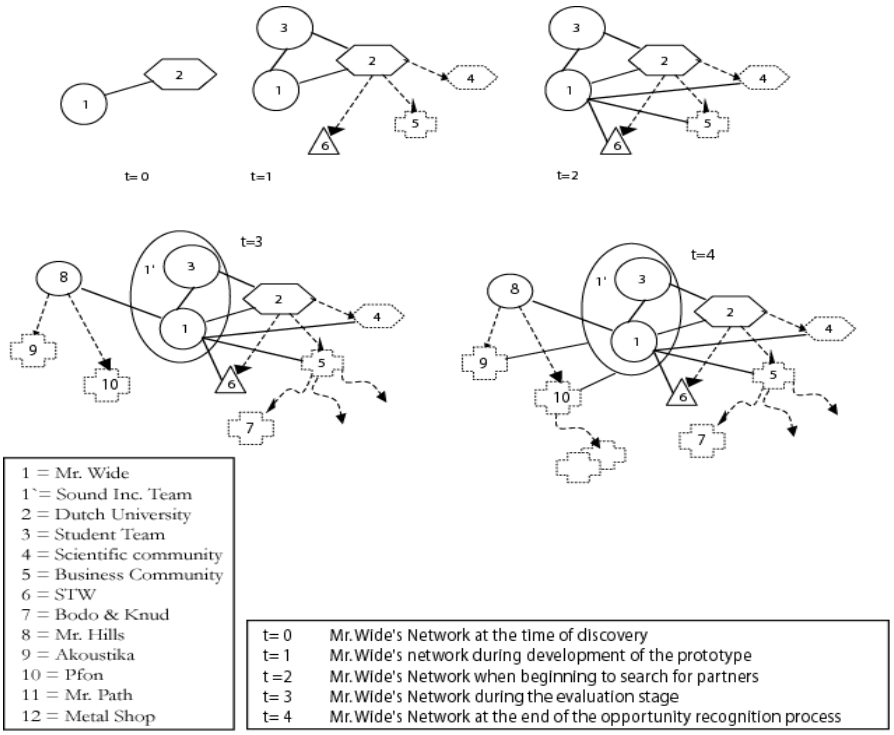
t= 1 and t=2 After Mr. Wide began his research and development activities, he set up the student Team in co-operation with his supervisor, Prof. Fairy, at the Dutch University. The data indicates that he already knew most of the students from his own study program, some others he did not know previously but were introduced by his supervisor or other people working at the Dutch University. Considering that most of the communication between Mr. Wide and the STW also listed the name Prof. Fairy, suggests that Prof. Fairy actually introduced Mr. Wide to this institution. This is not surprising considering the fact that Prof. Fairy had already been involved in many research projects that are funded or otherwise supported by the STW.

t=3 and t=4: Several months later, Mr. Wide begins to build his own network outside the network of the University. Mr. Wide states in an interview with the UT news that he has been introduced to the organisation by Mr. Hills. The fact that Hills is also present at several meetings with Akoustika and acts as an intermediary between Mr. Wide and this firm furthermore indicates that he introduced this firm as well. This notion is further confirmed by the following quote from Mr. Wide's first fax to this company: "*Tuesday Mr. Hills spoke about his pleasant co-operation with your company. This is the reason I would like to tell you about my invention in order to establish perhaps a co-operation together…*".

In addition, during this second half of the opportunity recognition process, Mr. Wide also continues to use the University as a source of new network contacts. From the data, it was not possible to determine the origin of the individual members of the scientific and business community or Hills and Bødø and Knůd. However, it seems that in most cases his supervisor and other colleagues introduced Mr. Wide to members of the scientific community. This either took place when these members visited the Dutch University (for presentations and other meetings) or at conferences (e.g. Eurosensors in Leuven and Stockholm). At these conferences Mr. Wide also managed to establish contacts himself, or through referral by previously established contacts. His introduction into the business community seemed to follow a similar Mr. Path. However, the data also suggests that when conducting the research for the Utilisation Report, Mr. Wide (and members of his student team) also approached many companies proactively. Some of these companies were already familiar to him, others were suggested again by colleagues at the Dutch University or by previously established other contacts. The contact with Bødø and Knůd seems to have originated from this Utilisation research. The data indicates that Mr. Wide originally contacted the local Dutch office and later also came into contact with the Scandinavian headquarters. In the data no reference was found to the origin of the contact with Mr. Hills.

The development of this network of contacts and the relationship between the different contacts during the different periods within the opportunity recognition process are shown in Figure 11.[29]

Figure 12 Network Developments during Opportunity Recognition



Roles in the Process. Looking at the resources provided by the different contacts as listed in Table 17, in combination with the remarks made by Mr. Wide regarding the different contacts I could determine how and to what extent they played a role in the opportunity recognition process of Sound Inc. (and the later stages of its global startup process). The influence the different contacts played in the process will be measured on two dimensions: the influence on starting in general and the influence on the global nature of the startup. In order to determine the importance of these contacts in the process stage and the internationalisation of this stage I examined

[29] The legend with explanation of the different symbols used in this figure can be found in Appendix 7.

- The number of interactions with these contacts, (role in startup)
- The multiplexity of the relationship (role in startup)
- The foreignness of the contact (role in internationalisation)
- The number of international referrals or tips (role in internationalisation)
- The explicit remarks made by the entrepreneurs regarding the role of these contacts (role in startup and internationalisation)

I weighted these with my personal interpretation and expectations derived from the literature (role in startup and internationalisation).

By providing the access to research facilities the Dutch University strongly influenced the startup process because without these facilities, it would not have been able for Mr. Wide to continue his activities (especially after the rejection from the STW regarding funding). Because officials working at the university also provided access to their international network, the Dutch University can further be regarded as having a strong direct influence on the global nature of the startup process. It also seems that the Dutch University had an indirect influence on the global nature of the startup: in the academic context it provided, international travel and co-operation is very common. This conduct provided an example for Mr. Wide and might have added to his positive attitude towards operating globally.

The student team played a much small role in the process. By conducting research and working with Mr. Wide on the development of the Sound Inc. they did facilitate startup. Yet, there is no indication that the student team affected the global nature of this process in any way. No references were found to students either introducing international contact and or stimulating Mr. Wide to take his venture internationally.

It proved difficult to establish to what extent the scientific community contributed to the startup process. Most members of the community were quite sceptical of the Sensor, which would suggest that they negatively rather than positively affected the startup process at this stage. Yet, at the same time, Mr. Wide could use their inputs in the development of the Sensor and thereby in the optimisation of the offering. This suggests that the scientific community did have an (indirect) positive effect on startup. The scientific community further had a direct positive influence on the global nature of the startup process, simply because many of the members of the community were located in different parts of the world. Interacting with these international contacts therefore was part of starting global.

The same argument holds true regarding the influence of the business community on the global nature of the startup process. Further, the business community provided Mr. Wide with ideas for application and identification of potential lead users and as a consequence this community also had an extensive influence on the startup process itself. Without their positive reactions the Sensor might not have left the laboratory.

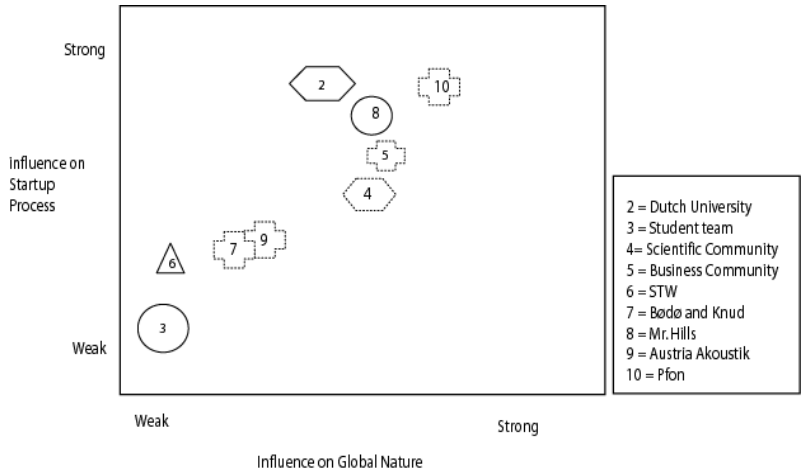
On the first sight it may seem that the STW's influence on the startup process and global nature of this process at this stage was very limited. The reason was that this organisation did not offer any of resources Mr. Wide needed, other than the protection of the technology. However, precisely by rejecting the request for funding the STW did affect the course of the opportunity recognition process as it increased the need to finish product development as soon as possible *and* find a (international) partner as soon as possible. Therefore, I conclude that the STW did have an indirect effect on the opportunity recognition process of Sound Inc.

Bødø and Knůd, Akoustika and Pfon each had affected the global nature of the opportunity recognition process simply because they were international (multinational) contacts. The first two companies further had an indirect influence on the startup

process by providing Mr. Wide with additional technological information that he could use in the development of his products. However, as he could not reach an agreement with these firms their influence remained limited at that. Pfon however had a decisive influence on the startup process. By providing financial resources it seemed to become possible for Mr. Wide and his friends Peter and Tony to commercialise the Sensor. Also, the legitimacy they gained from this deal seemed to make it easier to start.

Mr. Hills finally had both a positive effect on the startup process and on the global nature of the process. He had a positive influence on the startup process by providing Mr. Wide and his friends with advice on how to proceed and moral support to continue. He positively affected the global nature of the process by introducing them to two international contacts and stimulating them to form a partnership with (one of) these companies. The conclusions are graphically represented in Figure 12

Figure 13 Contacts and their role in the recognition process, roughly estimated



8.5.2 Preparation Process

Contacts. The relevant contacts of Sound Inc. during the preparation process are listed in Table 18 Several of the contacts established during the opportunity recognition process remained important during the preparation process. Some contacts, such as the student team, were broken off and some new were established. The data suggests that the student team as such became smaller when the students finished their studies and ceased to exist at all after Mr. Wide finished his thesis. This did however not mean that no students were involved in research projects in relation to the Sensor on a smaller scale. Yet, no data is available regarding the number of students, the nature of the projects or the frequency of interaction. It seems that their role in the preparation process was very small and therefore needs no further discussion. Also contacts with many members of the scientific and business community continued to exist but were not activated in relation to the preparation process (these contacts will be listed as 'dormant' in relation to the preparation process. No data was available regarding the number or frequency of the interaction between the Sound Inc. TEAM and these communities. The contact with Mr. Hills seemed to become even more intense during the preparation process than it had been during the recognition process. Mr. Hills continued to support the TEAM with advice,

practical assistance, as mediation between the TEAM and Pfon. Also during the preparation process Mr. Hills provided considerable funding in the form of a loan that was used to obtain (for instance) a second patent to protect the Sensor. The data indicate that the TEAM interacted at least on a weekly basis with Mr. Hills as becomes clear both from the number of faxes (n= 22) sent to him and the content of these faxes.

From the moment the contract between Pfon and Mr. Wide and Pfon and the Sound Inc. TEAM the parties were in contact once or twice a week up to the time the contract was terminated. After that time, it seemed the contact was limited to only a few more meetings to explore other options for further co-operations and issues related to the licensing agreement. Further, Akoustika was included in the list, because at least once, the TEAM, together with Pfon tried to include this firm in their co-operative project, despite the fact that earlier negotiations had not been successful. However, most likely under the influence of the rising problems between Pfon and the Sound Inc. TEAM, the data suggest that the contact was limited to one meeting only during the entire preparation process

Whereas I did not listed Peter and Tony as individual contacts in the contact list of the recognition process because they were originally members from the Student team, I decided to do include Mr. Path, as he was actually a new contact. Also for more than half the duration of the preparation process, Mr. Path was indeed an external contact, whereas Peter and Tony had been closely involved in the recognition process from the inside. The Dutch company Metal Shop became important towards the end of the preparation process. Mr. Path had taken over this firm and became its manager in order to generate an income for himself (that would allow him to devote part of his time to Sound Inc.). As described in the overview, part of the production of the components needed to manufacture the Sensors took place here. Metal Shop thus became one of Sound Inc.'s suppliers. The reason for including this supplier and no others is the personal connection in the form of Mr. Path. This connection provides an interesting example of flexible use of resources and networks. The relationship with Metal Shop only becomes effectuated during the opportunity exploitation process.

Name	*Type of organisation*	*Type of relationship*	*Location*	*Resources*	*Frequency*	*Channels*	*Strength*
2. Dutch university	Research institute	Parent organisation	The Netherlands	Access to research facilities. Supervision. Moral support. Legitimacy Access to the network.	Daily	Face-to-face, e-mail, phone	Inner circle
4. Scientific community	Research institutes, laboratories	Dormant	Globally dispersed	Ideas for applications and identification of potential lead users	No data	Face-to-face, e-mail, phone	Dormant
5. Business community	Commercial firms, many multinational	Dormant	Globally dispersed	Ideas for applications and feedback. Identification of potential partners and lead users.	No data	Face-to-face e-mail, phone, fax	Dormant
8. Hills	Individual	Mentor	The Netherlands	Financial recourses. Moral support. Strategic, management and entrepreneurial advice. Access to the network	Weekly	Face-to-face, fax, phone	Inner circle
9. Akoustika	Multinational company	Potential alliance partner	Austria	Exchange of information regarding potential co-operation.	Less than twice a year	Face-to-face, through intermediary, fax	Weak
10. Pfon	Multinational company	Alliance	Germany	Ideas for potential co-operation. Technological information . (promise of) access financial resources. Support in obtaining patents. (promise of) access to market. (promise of) access to research capacity. Legitimacy.	Weekly	Face-to-face, through intermediary, fax	Strong
11. Mr. Path	Individual	(Potential) partner	The Netherlands	Experience. Access to network. Access to some financial resources	Weekly – daily	Face-to-face, fax, e-mail, phone	Strong
12. Metal shop	Company	Supplier of raw materials and components	The Netherlands	Access to materials. Access to production facilities. Access to human resources.	No data*	Through intermediary (Path)	Activated network

* as a prospective owner of Metal Shop, Mr. Path was in frequent contact with this firm

Table 18 Network Compositions during Preparation

Origin and development. Clearly most of the contacts had already been established during the opportunity recognition process. Nevertheless several developments during the preparation process can be reported and are shown in Figure 8.4.

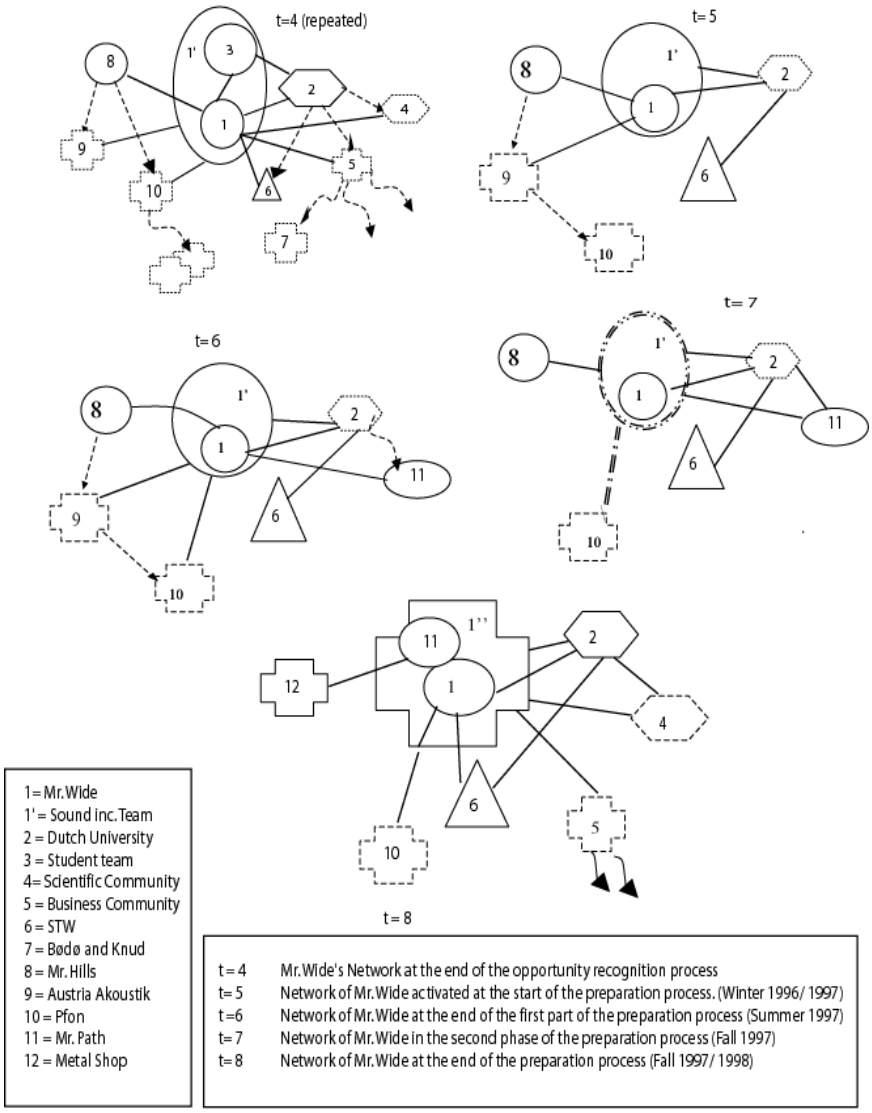
t=4, t= 5 This figure repeats the situation at the end of the opportunity recognition process in t = 4 and then shows the situation at t= 5 at the start of the preparation process without the contacts that were no longer activated and or dormant (e.g. the student team, the scientific and the business community). The activated network during the first part of the preparation process was thus much smaller than it had been.

t =6 During the later spring of 1997 the TEAM is introduced to Mr. Path by an associate professor in Marketing at the Dutch University: Mr. Path, who already had some entrepreneurial experience wanted to set up his own high-tech (science based) firm. Yet, because he did not have a product (idea) of his own, he realised he needed to find a business partner with an idea. Having studied at the Dutch University he knew the Dutch University supported scientists and entrepreneurs in commercialising research findings and therefore he contacted his old professor. This professor was aware of Mr. Wide's work on the Sensor and his attempt to set up a business to commercialise the venture as well of the problems he was experiencing with that. Therefore he suggested the men should meet leading to the first meeting and negotiations about possible co-operation.

t= 7, t =8. In the fall of the same year the problems with Pfon and within the TEAM mounted. This resulted first in the termination of the co-operation with Pfon and then in the break up of the Sound Inc. TEAM. Apparently this also results in the end of the contacts between Mr. Wide and Mr. Hills. The contact with Pfon was however not lost completely because the licensing agreement between Pfon and Mr. Wide did not come to an end (t =7). During the next few months Mr. Wide and Mr. Path sign their intent to become business partners and to found a company together. To that end, they reactivate their personal contacts with members of the scientific (Mr. Wide) and business community (Mr. Wide and Mr. Path). Furthermore, in this period Mr. Path acquires the company Metal Shop. This would provide him personally with an income and Sound Inc. with access to a (cheap) supplier. At the same time, Mr. Wide is finally able to convince the STW to providing with a research grant. As a result he obtains a position as a Post Doc researcher at the Dutch University. This provides him personally with an income and the nascent company with access to production and research facilities. This situation at the end of the preparation process is shown in Figure 13 as t= 8.[30]

[30] Again, see Appendix 7 for the description of the different symbols used in this Figure

Figure 14 Mr. Wide's network during preparation



Roles in the process. In the previous paragraphs and Table 18, it was listed what resources were provided by the different contacts during the preparation process. I determined the importance of the roles of the different contact in the (internationalisation of the) preparation process by combining this information with the information on

- The number of interactions with these contacts, (role in startup)
- The multiplexity of the relationship (role in startup)

- The foreignness of the contact (role in internationalisation)
- The number of international referrals or tips (role in internationalisation)
- The explicit remarks made by the entrepreneurs regarding the role of these contacts (role in startup and internationalisation)
- My personal interpretation and expectations derived from the literature (role in startup and internationalisation).

First, in this stage of the process, the Dutch University mainly facilitated the startup process by providing access to facilities and financial resources. Furthermore, the Dutch University was involved in the co-operation with Pfon. The data suggests both the without the Dutch University's agreement with Pfon, this firm would have never signed the contract with Mr. Wide and the TEAM, and that the problems between Pfon and Fairy also contributed (to a small extent) to the termination of the contract between Pfon and the TEAM. Other than that there is no evidence to suggest that the Dutch University in this stage of the process played a direct or indirect role in the global nature of startup process.

The scientific and business community were only reactivated towards the end of the preparation process. Their role in the preparation process or the global nature of this process was mainly indirect: without the scientific and business community – both communities were highly globalised- the later exploitation would simply not be possible the members of these communities were to become Sound Inc.'s customers, partners, etc. Although they provided ideas and in some cases acted as brokers to other members of the community, they did not provide any tangible resources or strategic advice.

By providing financial resources that enabled Mr. Wide to get a position as a Post Doc researcher at the end of the preparation process this organisation contributed to the startup of the firm is a significant way. The data does not include any reference to the STW influencing the global nature of this process, e.g. by referring or introducing Mr. Wide or the other entrepreneurs to international contacts or actively stimulating him to internationalise in any other way.

Mr. Hills continued to be an important influence on the startup of Sound Inc. at least till the fall of 1997 by providing advice and financial resources. Also he acted as an intermediary or even a mediator between the TEAM and Pfon; thereby trying to 'save' the international alliance. No data was found to suggest that during this stage Hills introduced the TEAM to other international contacts, keeping his influence on the global nature of the startup process limited.

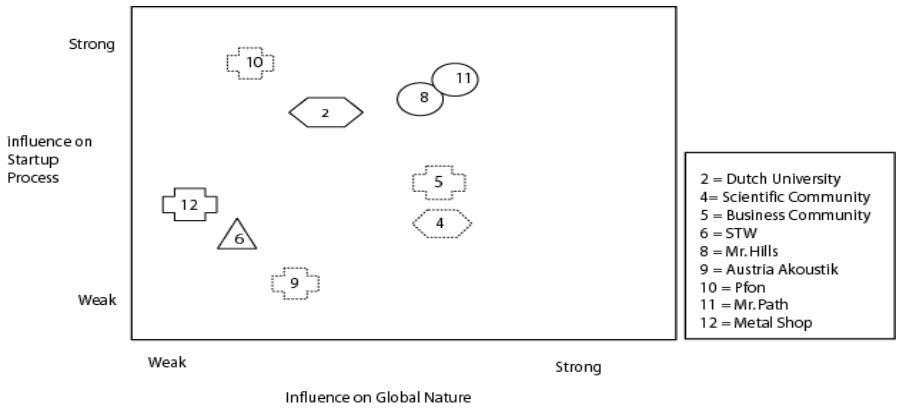
The role of Akoustika was very small. The fact that the TEAM, together with Pfon tried to include this company in their project does nothing more than suggest that they were willing to include more international partners in their project. However, because the negotiations focused on the application of the Sensor in audio and mobile telephony the company did not contribute in any way to the future exploitation of the Sensor in sound intensity applications

The role of Pfon on the other hand was extensive. As explained previously the company first facilitated preparation by providing financial resources and legitimacy, but later the company negatively influenced the preparation process by first forcing the TEAM to devote all its time on them and later by withdrawing the financial resources. As a consequence of this the start of the exploitation process was postponed and the TEAM fell apart. The company did not affect the global nature of the process in any way, other than the fact that they were an international contact itself.

Mr. Path affected both the startup process and the global nature of this process to a very large extent. With his enthusiasm, experience, skills and (international) he made it possible for Mr. Wide to begin commercial activities after all. Also, the arrival of Mr. Path made it possible for Mr. Wide to focus on what he did best, - research. Mr. Path affected the global nature of the process in a more indirect way. He had a very positive attitude towards international business and he spoke his language. Language problems as had occurred in the past with German would not happen again. The data does not indicate however that already at this stage Mr. Path brought in new international contacts. However, together with Mr. Wide he did begin to establish many new international contacts towards the end of the preparation process

Metal Shop finally played a small role in the startup process- through Mr. Path-, but none in the global nature of the venture. The Dutch Metal Shop provided Mr. Path with an income and would act as a below-market-price supplier of Sound Inc., thereby facilitating startup.

Figure 15 Contacts and their role in the preparation process, roughly estimated



8.5.3 Interaction during opportunity exploitation

Contacts and Classification. During the exploitation process the number of contacts exploded. Therefore rather than listing the contacts individually, most of them will be discussed in groups (made on the basis of their relationship with the company).

Throughout the exploitation process Dutch University remained an important contact for Sound Inc. As became clear during the preparation process, the Dutch University provided Sound Inc. with access to research and production facilities as well as an income for Mr. Wide for a period of three years. After Mr. Wide left, the company could continue using the facilities as they had previously. According to Mr. Path, however this was not so much the result of the Dutch University being eager to support the firm as well as of the indifference of most people working at the Dutch University in combination of the benevolence of some others. Also the data suggests that people working at the Dutch University acted as brokers to new (academic) contacts in several occasions. The interaction

between Sound Inc. officials and the Dutch University continued to take place on a daily basis throughout the entire remainder of the startup process. However, when Mr. Wide left most of the interaction took place at lower levels in the organisation (e.g. through the student-employees). The data suggested that Mr. Path communicated less frequently with officials at higher levels (e.g. professors and policy-makers) at Dutch University, approximately once every two to four weeks.

The individual members of the scientific and business community became increasingly known to and with Mr. Path and Mr. Wide and Sound Inc.'s other employees. From the data it seemed that within about two years after the start of the company, most relevant organisations were quite well aware of the existence of the Sensor and Sound Inc. In internal report #2 on how to organise a trade fair we see that during the first trade fair in 1998 they had achieved that the name Sound Inc. and Sensor became known in the acoustics industry. With regards to the trade fair in 1999 he remarks that there was already much more known about the Sensor and its workings. At this fair they achieved to convince the last group of people who did not yet believed in the principle and the awareness was increased further. Contacts with other big names in the audio world were established. After the fair in Paris in 2000 he concluded that previously established contacts were further developed. Of course there were still some people who had never heard of the Sensor, but that seldom happened. Most of the people who were unfamiliar with the Sensor were not professionally interested. From this it can be concluded that increasingly it were the individual members of these communities with whom Sound Inc. had set up relationships rather than with the community as a whole.

During the exploitation process the STW provided the funding not only for the Post Doc position of Mr. Wide, but also for at least two additional Ph.D. positions at the Dutch University. Although these students did not work for Sound Inc., they did conducted research on the Sensor. The knowledge generated from these researchers, was public but could nevertheless be used rapidly by the company. Also this independent research added to both the familiarity and legitimacy of the technology. Further, the STW also set up a User's committee for the Sensor technology. This Users committee consisted of researchers and professionals working in companies using the Sensor in various applications[31]. This committee act as a board of advisers regarding potentially interesting applications and needs for further research.

By organising the Users Committee, the STW added to the legitimacy of Sound Inc. in the Netherlands and also abroad. The e-mails and archival records indicate that the contacts between Sound Inc. and the STW took place every one or two months. However, the data further more suggests that the STW and Sound Inc. were kept up to date on the different projects also through intermediaries on a more regular basis, for instance through Prof. Fairy.

[31] Most of the members of the User's committee were established contacts of Mr. Wide, including Prof. Fairy, Grapestone and Tide, the R&D manager of Pfon, people from Bódó & Knůd and several local companies

ame	*Type of organisation*	*Type of relationship*	*Location*	*Resources*	*Frequency*	*Channels*	*Strength*
2. Dutch university	Research institute	Parent organisation	The Netherlands	Access to facilities. Access to human resources. Access to financial resources. Legitimacy	Daily	e-mail, face-to-face	Inner circle
4. Scientific community	Research institutes, laboratories	Source of contacts.	Globally dispersed	Source of ideas and contacts.	At least 4 times a year.	e-mail, face-to-face	Weak
5. Business community	Commercial firms, many multinational	Source of contacts.	Globally dispersed	Source of ideas and contacts.	At least 4 times a year.	e-mail, face-to-face	Weak
6. STW	Science foundation	Investor	The Netherlands	Funding, organisation of users committee.	Bi-monthly	Face-to-face, through intermediary, e-mail	Activated network
10. Pfon	Multinational company	Competitor, licensee.	Germany	Licensee for other application.	Weekly	Face-to-face, mail, e-mail	strong
12. Metal shop	Company	Supplier of raw materials and components.	The Netherlands	Components, human resources, organisational resources.	No data	Face-to-face, e-mal	Activated network
13. Testers	Research institutes	Testers.	Globally dispersed: China, Russia, Turkey, South-Korea, USA, Poland and Belgium.	Research capability. Legitimacy.	On average 6 moments of communication were identified for each tester.	e-mail, face-to-face	Activated network
14. Customers	Research institutes, companies, governmental institutions, military.	Customers.	Dispersed over 6 continents.	Access to the market., Organisational resources (sales capacity) Source of ideas for new sensors and applications.	On average 8 moments of communication were identified.	e-mail, through intermediaries, face-to-face	Mostly weak ties; some stronger if customised or repeated orders.
15. Distributors	Companies, mostly active in only one country	Distributor.	Dispersed over 6 continents.	Financial resources, ideas for new applications and sensors.	Approximately monthly + data on orders.	e-mail, rep-zome, face-to-face	Strong
16. Students	Individuals	Trainees	The Netherlands	Human resources.	Weekly to daily	Face-to-face, e-mail	Strong

Table 19 Network composition during Exploitation Origin and Development

Many contacts with members from the scientific and business community were already known at the time the company was founded officially. However, as explained previously these existing contacts had to be informed of the latest developments. Therefore, Mr. Wide and Mr. Path proactively approached many of these, as well many other organisations by means of fax or e-mail. Although the archival records from this period are not complete the existing data does suggest that in several cases this lead to tips and referrals to other potentially interesting / interested contacts. Alternatively throughout the entire exploitation process, in the e-mails very few new contacts (only 7) presented themselves that claimed they knew of the company or its products through a shared contact. Interestingly, except one, all of these were scientific contacts. Trade fairs and conferences were used to established many new contacts within these communities. It is unclear to what extent the new contacts established at these events had already heard of Sound Inc. earlier.

Whereas the marketing report made in 1998 suggests that very few contacts found Sound Inc. on web, several years later the Web-statistics show that many people visited the website. However, the statistics do not provide insight into the share of new contacts among the 5649 visitors (between August 2000 and March 2001). However, in the six 'contact-me' forms that were completed on the website, four respondents indicated they had found the company on the Internet. The (limited) data suggest that these respondents were most likely to be potentially new customers rather than testers or distributors.

Although the data on the testers is limited the data do suggest that potential testers (before the existence of the University Contest) were often met at conferences and trade fairs. At least in one case (a Belgium professor), the data suggest that a potential tester was approached after a 'tip' from an established contact (Prof. Grapestone). Also, in at least one case someone contacted by Mr. Path with a 'testing-proposal' referred him to one of his colleagues at the same or at a related research institute or laboratory.

According to Mr. Path distributors are typically found in one of two ways. The first way is to browse Internet-directories in search of potential parties. (Examples of the directories used include the search engine AltaVista, de (Dutch) Yellow Pages, ABC-online and the World pages Sic Find.) These parties are then contacted, most commonly by e-mail. After a number of communications Sound Inc. seeks to set up a meeting with the potential distributors, either at a trade fair (to save time and travel expenses) or at a specific meeting (as was done for instance with the Spanish distributor) to discuss the terms of the distributor agreement. Alternatively, Sound Inc. also found a number of distributors 'by accident' at trade fairs. Evidence of both Mr. Pathways can be found in the e-mails and faxes (see for example Exhibit 3)

Exhibit 3 Example of Establishment of Distributor Agreement

From: Xx
Subject: InterNoise: Hello from Singapore!

To: Mr. Path
Date:4 oktober 2000

Hi
I am S J Wu - remember me? The businessman from Singapore who is so fire-up to launch your products.
1). Let me refresh your memory in case you have forgotten us in your busy schedule at InterNoise.
I recalled that there was a display at your exhibition stand showing the transparent enclosure with your demostartion to measure partiele velocity. I also recalled that you have something already on hand that we can sell the fixture as a compete setup to the universities as a teaching aid to the students. I look forward to your proposal for such a student experiment with our agents discount prices at your earliest convenience.
2). As I said I am still very excited to fire-up from my launching pad in Singapore. Therefore I am waiting for your letter of appointmment so we may have the fuel to power up our sales engine. Please send your appointment letter to our mailbox: <...>
We thank you in advance and best regards to all.

XX

From: Mr. Path
Subject: Re: InterNoise: Hello from Singapore! Hello from Holland !

To: XX
Sent: October 10, 2000

Dear Mr.,
of course we remember you ! Frankly, I have been terribly busy running my daily business (sheet metal shop supplying the bouyant semiconduetor industry). Nevertheless, you might expect an appointment letter soon but it will take some time. Please be assured that we are committed to the handshake agreement we made in Nice !
Best regards,
MR. PATH

From: XX
Subject: Re: InterNoise: Hello from Singapore! Hello from Holland !

To: Mr. Path
Sent: March 09, 2001

Hello, Hello, Hello !!! ... Winter has past and into Spring. There is only Summer in Singapore. We waited extra longer and our seats are getting very hot. How is Microflown? We have a big market for Microflown. ... At least 200pcs to 1000pcs. in one order.
Can you return advise, please?
HOT regards,
xx

From: "Mr. Path"
Subject: XX REPRESENTING OUR INTERESTS IN SINGAPORE !

To: "XX"
Date: Fri, 9 Mar 2001

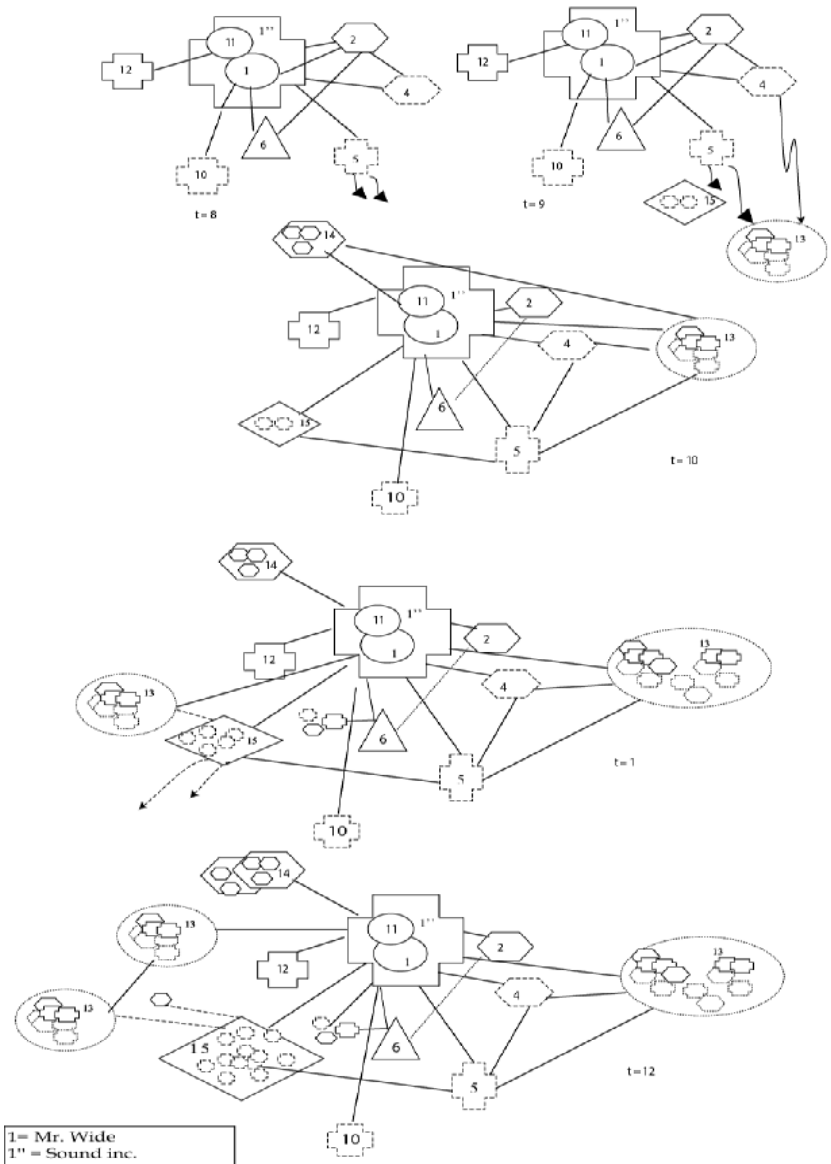
Dear Mr.,
frankly I forgot to send you the letter of appointment. will work on it next week. If you need samples our advice, let me know.. Hope we can develop some business !
...
Kind regards

According to Mr. Path, distributors in one country typically do not know distributors in another country (unless they are active in the other country themselves) and as a consequence referral by distributors is never used. Also, I found no evidence for referrals by others (e.g. Dutch University, local partners, customers). An example of how a distributor contract is established is shown in Exhibit 3. Finally, the student-trainees are found most often through personal contacts of Sound Inc.'s permanent employees with whom they often took courses at the Dutch University with before.

The network of Sound Inc. as it developed during the opportunity exploitation process is shown in Figure 15.[32]

[32] Legend provided in Appendix 7

Figure 16 Sound Inc.'s Network during Exploitation



Role in the process. The role of the different types of contacts in the exploitation process was derived from:

- The number of interactions with these contacts, (role in startup)
- The multiplexity of the relationship (role in startup)
- The foreignness of the contact (role in internationalisation)
- The number of international referrals or tips (role in internationalisation)
- The explicit remarks made by the entrepreneurs regarding the role of these contacts (role in startup and internationalisation)

I weighted these with my personal interpretation and expectations derived from the literature (role in startup and internationalisation). First, the Dutch University: Interestingly, from the nature of the resources (i.e., access to facilities, technological knowledge, human resources), I would expect that the entrepreneurs would perceive the role of the Dutch University in the exploitation process to be significant. However, according to Mr. Path the role was rather limited and indirect. He argued that the indifferences of the Dutch University and the benevolence of some individuals enabled them to use the research and production facilities (especially during Mr. Wide's absence). Also in his view the Dutch University did not help them to expand their business activities either domestically or internationally.

The role of the STW was limited to the providing of funds and organising a User's Committee. These contributions were facilitators but cannot explain the course of the exploitation process or the global nature of this process.

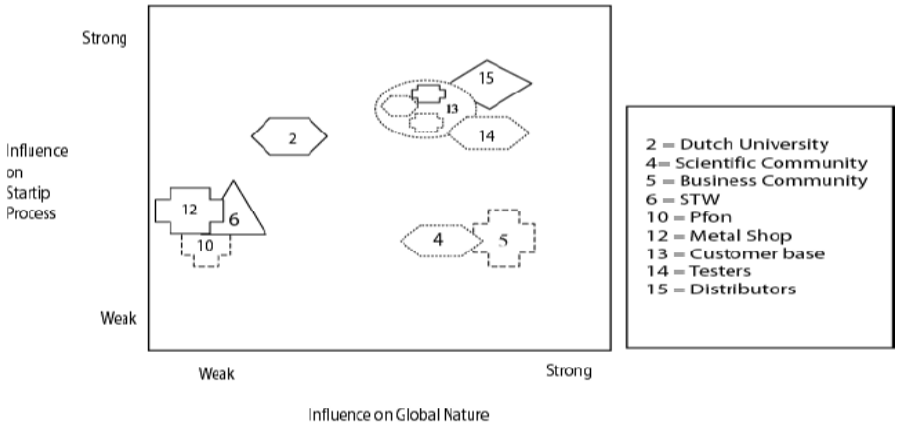
The scientific and business communities were highly globalised, and thus by interacting with members of these communities the startup process was immediately global in nature. During the exploitation process these communities were mainly a source of ideas and a source of more specific / individual contacts. These communities did not play an active role in the process itself.

The next contact, Metal Shop also only play small role in the process. By providing Sound Inc. with components and in some cases human resources below market price (or even for free) the company reduced the costs of operation for Sound Inc. They did not play any role in the global nature of the process.

The customers, testers and distributors all played an important role in the exploitation process and the global nature of this process. First, the vast majority of the organisations included in these groups were international. The customers were important in the process as sales activities generated the financial revenue that enabled the company to continue and even expand its operations. The distributors provided the company with an extensive sales organisation and access to the market as well as with knowledge of local markets. Testers finally were important because they provided the company both with legitimacy, they were a source of new sales orders and indirectly they provided the company with access to additional R&D capacity.

Finally, the students played only a very small, facilitating role in the process by providing the company with access to 'cheap' human resources. Although Mr. Path considered at least once to take on an international (Indian) student trainee during the exploitation process, the company only began hiring international exchange students and researchers after the end of the startup process in the course of 2003. Also, no evidence was found that the students provided Sound Inc. with any international leads. Also no evidence was found that these students were involved in dealings with international contacts in any other way.

Figure 17 Contacts and their role in the exploitation process, roughly estimated



Communication channels

In order to examine how the entrepreneurial team was able to set up and develop communications with contacts from different parts of the world I examined which channels or media were being used. In order to determine this, I looked at both at the number of faxes, e-mails, web-'hit', meeting reports and in addition I conducted a content analysis to identify references in these files for other types of communications. For instance I search the e-mails and faxes for references to meetings or telephone calls.

Communication during opportunity recognition. The archival records from the period between discovery and the start of the preparatory activities indicated that the entrepreneurial team was using following channels:

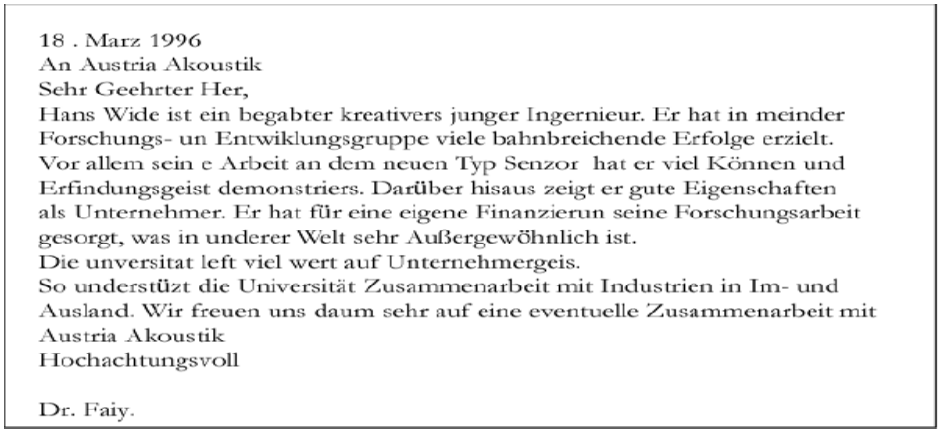
1. Face to face meetings: the records indicate that during the first few months of the opportunity recognition process, Mr. Wide personally met with and talked to a large number of new contacts in small settings. All of these meetings took place in the Netherlands and Belgium. Such 'private meetings' with foreign contacts were less frequent due to the costs associated with foreign trips or hosting foreign guests as well as to the limited need for such meetings at the time. Towards the end of the opportunity recognition process he also met with a large number of international organisations and individuals at conferences and trade fairs (e.g. in Stockholm and Leuven).
2. Use of the website: The TEAM had set up website already during 1995. However, the internal e-mails from around December – February 1998 suggest that this website was mainly used to communicate new developments and results to the international scientific community and a small number of large industrial players.

3. Fax messages: the large number of faxes included in the archived data from the period 1995- 1997 are a strong indication that the Fax was the most commonly used communication channel between TEAM and external contacts. For instance, the data set included several dozens of fax messages from and to the STW, Akoustika, Pfon, Hills and others. Far less e-mails were obtained and these were typically exchanged between Mr. Wide and other people working at the Dutch University, the STW and a small number of research institutes in the Netherlands and abroad.

Communication during preparation. The data on the preparation period show evidence of the use of the following communication channels:

1. Face to face meetings: the records show that in additional to meetings similar to the ones in the opportunity recognition process, the TEAM also met frequently with international contacts (especially Akoustika and Bødø & Knud); yet these meetings continued to be limited to those contacts with whom Mr. Wide actually negotiated actual plans for co-operation.
2. Website: The TEAM continued to update its website to publish the most recent developments. Like during the opportunity recognition process, the website was mainly targeted at the international scientific community
3. Faxes: the fax continued to play a very important role in the communication with both domestic and international counterparts during the opportunity recognition process
4. E-mails, towards the end of the preparation process, the number of e-mails sent and received with external domestic and international contacts seems to increase slowly. Although faxes are still more commonly used, the type of information exchanged in faxes and e-mails is rather similar in the stage. At this stage, e-mails are mainly used in the communication with scientists and research institutes and only seldom in the communication with other types of actors. Considering the limited Internet and e-mail penetration at this point in time, this is not very remarkable.
5. Intermediaries: finally, in a small number of cases evidence was found of the use of intermediaries in the communication with other contacts. Already, the role of Hills in the negotiations with Akoustika and Pfon was mentioned. In addition, a letter sent by Mr. Wide's professor to Akoustika, was found in which he warmly recommends Mr. Wide to this firm as shown in Exhibit 4.

Exhibit 4 Letter of recommendation



18 . Marz 1996
An Austria Akoustik
Sehr Geehrter Her,
Hans Wide ist ein begabter kreativers junger Ingernieur. Er hat in meinder Forschungs- un Entwiklungsgruppe viele bahnbreichende Erfolge erzielt. Vor allem sein e Arbeit an dem neuen Typ Senzor hat er viel Können und Erfindungsgeist demonstriers. Darüber hisaus zeigt er gute Eigenschaften als Unternehmer. Er hat für eine eigene Finanzierun seine Forschungsarbeit gesorgt, was in underer Welt sehr Außergewöhnlich ist.
Die unversitat left viel wert auf Unternehmergeis.
So understüzt die Universität Zusammenarbeit mit Industrien in Im- und Ausland. Wir freuen uns daum sehr auf eine eventuelle Zusammenarbeit mit Austria Akoustik
Hochachtungsvoll

Dr. Faiy.

Communication during opportunity exploitation process. During the exploitation process the basically same type of channels were used as during the recognition and preparation process. However, some changes in the use of these channels could be observed:

1. Face to face meetings: face-to-face meetings with international contacts became more common during this stage. This is not surprising because on the one hand the company started to develop more strong relationships (e.g. with international distributors), needed to provide the required service for its bigger customers (e.g. an Italian customer wanted the firm to send someone to help them get started) and that the company had generated more financial resources to pay for such travel. Nevertheless, the entrepreneurial team tried to minimise international travel and arrange for many meetings with both new and established contacts during the many trade fairs Sound Inc. visited to save both time and money. The importance of these trade fairs is shown by the following example: In internal report #1 it is reported that at this fair, 95 contacts were established during this four-day conference (internal Report #1, 1998: 44). An analysis of these new contacts is shown in Table 20. These included both known contacts that were informed of recent developments (TEAM dissolved, company founded by Mr. Wide and Mr. Path) and new contacts met for the first time. An analysis of these contacts was found in internal report #1 and is reproduced below to obtain a better idea these contacts and their areas of interest were. The archival records and the e-mails provide evidence of at least 12 meetings at the premises of a new or established contact. For instance, in May of 2002 Mr. Path and several employees make a visit to Spain to meet with their local distributor as well as with several other researchers and companies. Three visits of contacts to the Sound Inc. offices were also reported including one of an Indian firm looking to represent Sound Inc. from Bombay. Table 20 Analysis of interests of contacts met at AES (from Internal Report #1: 46)

Type of organisation	Audio microphone	Sound intensity	Particle velocity	3d sound intensity	Hearing device	Array measurement	Impendation tube	Impendation	Low frequency	Vibration impulse	Impulse response	Speech recognition	Electronics	Consumer	Not specified	Total
Audio equipment	13	4	2	2	2	1	1	-	1	1	-	1	1	1	7	37
Consultancy	2	4	-	2	1	2	1	2	1	-	-	-	-	-	2	17
University	-	3	1	1	-	1	1	2	1	-	-	-	-	-	2	11
Microphone manufacturer	5	-	2	-	1	-	-	-	-	-	-	-	-	-	-	8
Broadcasting	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Computer systems	-	-	1	1	-	-	-	-	-	-	1	-	-	-	1	3
Acoustic consultants	-	2	-	-	-	-	-	-	1	-	-	-	-	-	1	4
Sales organisation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
Laboratory	-	2	-	1	-	-	-	1	-	-	-	-	-	-	1	5
Press	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Hearing Technique	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2
(film) studio	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Concert hall	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Speaker manufacturer	-	1	-	-	-	1	1	-	-	-	-	--	-	-	-	3
Gas technology	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Environmental services	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Multi media equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Embassy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Unknown	-	3	-	-	-	-	1	-	-	-	-	-	-	-	3	7
Total	23	20	7	6	6	5	5	5	5	1	1	1	1	1	27	114

Table 20 Application / Market matrix (source Internal Report 1)

2. Website: whereas during the previous stages, the website was mainly a scientific site, at the early stages of exploitation, a new website was developed to cater the new commercial needs and reach potential partners, distributors, testers and customers around the world. As I observed since April 2001 the website is kept up-to-date regularly. At least once a month changes are being made. These may be minor (adding a new distributor to the list or mentioning a visit to a trade fair) or more extensive such as the additional of the REP-zone. That the website was an important method to communicate with the world outside was clear from the statistics[33]: between August 29th, 2000 and March 7th 2001 almost 49000 hits from 5649 visitors were registered. Although the vast majority to the hits were Dutch, hits were registered from 49

[33] See appendix 7

foreign countries as well as several other international domains (e.g., .com, .mil, .org, .edu, .gov).

3. Faxes: the reduced number of faxes sent and received between January 1998 and May 2001 indicates that this medium was not as important as before. Yet, in many e-mails regarding sales orders, references are made to faxes that are sent or have to be send to place a sales orders. The fax continued to play a very important role in the communication with both domestic and international counterparts during the opportunity recognition process
4. E-mails, the large number of e-mails sent and received by company officials as well as remarks made by the entrepreneurs indicate that during the opportunity exploitation process, e-mail was by far the most commonly used and the most important communication channel for Sound. Inc.

8.6 Observations regarding the interaction process

From the previous paragraphs a number of observations stand out. First, the data shows that throughout the global startup process, the entrepreneurs interacted with a Mr. Wide variety of individuals and organisations including research institutes, companies, science foundations, governmental organisations, and umbrella organisations.

Second, the contacts are located in different parts of the world, both in highly developed economic countries but also in rapidly developing markets like China, Brazil, Indonesia and South Africa.

Third, a shift can be seen with respect to the way new contacts are established. During the opportunity recognition process most contacts were established through direct or indirect brokerage by members of the Dutch University. Network development remains limited during the first part of the preparation process but picks up again after the arrival of Mr. Path. During the exploitation process, proactive and independent network building becomes more important than using existing network contacts to expand the network Nevertheless, in several cases the entrepreneurs did refer to the lasting relationship with the Dutch University and the MESA+ research institute in communications to new contacts. Although Mr. Path argued this was not done purposefully, I gather this link with a world-renounced research institute nevertheless added to the credibility of the (less-known) company.

For this network building, the use of Internet, conferences and trade fairs have proven to be most efficient and effective. Nevertheless, word of mouth advertisements and tips provided by existing contacts are also found to lead to the establishments of several new contacts. The e-mails and archival records suggested that such leads were typically country- specific (so established contacts from Britain, lead to new contacts from Britain). No evidence was found that activities in one country directly or indirectly lead to activities in another through network contacts.

In this chapter the findings of the Starting Global, the Case of Sound Inc. have been presented along the lines of the research framework developed in Chapter 5. From this case study it is apparent that the startup process of this firm, from the initial discovery of the Sensor until the move of the company to the new building, has really been a Global Startup process.

PART 4. REACHING CLOSURE

9. Discussion

9.1. Introduction

As stated in the introduction of this thesis, the purpose of my study was to gain insight into the global startup phenomenon by describing what a global startup actually is and what the global startup process looks like and how networking affects this process. In this chapter I will discuss the findings on a theoretical level.

First, I discuss the findings and propositions of the exploratory research into the global startup concept. To that end I evaluate the relevance and adequacy of the propositions formulated in Chapter 3 on the basis of previous theoretical insights and on the basis of the findings from the longitudinal case study. After that, I discuss the findings from the longitudinal case study with respect to the global startup process, the interaction process and the usefulness of the Entrepreneurship-in-Networks perspective when studying the global startup phenomenon. From this discussion a second set of propositions is formulated to complement the propositions formulated about the Global Startup concept in Chapter 3.

9.2 The Global Startup Concept

In chapters 2 and 3 of this thesis the global startup concept was explored. From an analysis of the existing descriptions and definitions in previous literature and an exploratory investigation of a series of case studies I derived twelve propositions (replicated from Table 4).

#	*Proposition*
1	The startup process and the globalisation process of a global startup process are highly integrated and cannot be seen in isolation
2	Global Startups begin in international activities even before the start of the actual operations
3	Global Startups engage in international activities in pursuit of opportunities instead of achieving a competitive advantage directly
4	Global Startups are involved in a wide range of formal and informal value-added activities across national border
5	Global Startups use a variety of network entry modes
6	Global Startups are active in a wide number of regions of the world
7	Global Startups internationalise their activities following the presence of opportunities rather than following a pattern of increasing physical and cultural distance
8	Global Startup firms are not necessarily high growth companies in terms of number of employees
9	Global Startup firms are characterised by relatively high levels of entrepreneurial orientation
10	Global startup firms are typically founded by internationally skilled and confident entrepreneurs
11	Global startups often rely on the relationship with strong partners; this may be commercial partners or research institutes
12	Global startups are embedded in international networks from the start

Table 21 Overview of propositions on global startup concept (replicated from Table 4)

From these propositions a picture of global startups emerged as entrepreneurial ventures involved in the pursuit of (highly innovative technological) opportunities across national borders using multiple network entry modes to create value around the world. Because the proposed characteristics and description were grounded in entrepreneurship theory rather than international business theory it was expected that the description would apply much better to startups, even at very early stages in the entrepreneurial process, than previous descriptions and definitions.

Several of the characteristics listed in Table 21 are in fact inherent in the nature of global startups and therefore, they are part of the definition of what a global startup is. The 'propositions' about these characteristics are not empirically testable but their truth is established by general acceptance and therefore these are not really propositions. This notion

seems to apply in particular to propositions 1, 3, 4, 6, and 12 (see Table 21). These five characteristics will be included in a qualitative definition of the concept global startup. Some of these characteristics have already been included in earlier definitions (notably wide range of formal and informal value-added activities; wide number of regions) while the other characteristics (integration of startup and internationalisation, pursuit of opportunities, and embeddedness in global networks) have not yet been used and therefore still need to gain general acceptance. Also these characteristics have been used in the selection of the longitudinal case study (see chapter 6). The other characteristics can be tested empirically and can therefore be considered as real propositions; these include proposition 7, 8, 9, 10 and 11. In the longitudinal case study these propositions will be explored further, but no large scale testing will be conducted in this study. With respect to characteristics 2 and 5 the argument could go either way. We could consider the notion that internationalisations begins before the start of the actual business activities as well as the idea the global startups use a variety of network entry modes both as testable propositions and as part of the definition. Further discussion within the research community may be necessary to determine where to go on this.

In the longitudinal case study on Sound Inc., the list of Global Startup-characteristics was used to evaluate the global nature of the venture at each of the three stages of the entrepreneurial process: opportunity recognition, preparation and exploitation. From this exercise several comments can be made. First, on the basis of the characteristics it is clear that Sound Inc. is a global startup from the very start. This may seem rather straightforward as I selected the company on the basis of this characteristic. However, when I selected the case, the firm was already involved in the opportunity exploitation stage. Although I knew part of its history from the exploratory investigation, I had not yet applied the list of global startup characteristics to the venture in its opportunity recognition stage. Because even in this first stage the venture scores positive on almost all dimensions, we can conclude that as a tool, the list of characteristics can be used in all the stages of the process and not only to the exploitation phase, like with the born global concept (25% export sales after starting international activities in three years). This makes the domain in which the list of descriptive characteristics can be used wider than that of the other concepts. As I only applied the descriptive characteristics only to one firm, further research would be necessary to establish the usefulness of the concept in other firms. Sound Inc. 'scored positive' on each of the characteristics in all three phases. This may lead to the conclusion that this firm is a radical manifestation of the global startup phenomenon and that the findings reported on its global startup process are also an extreme example and may not apply in to all global startups a like. Other firms may score positive on fewer characteristics (in some stages) but still be considered a global startup. This suggests that some of the characteristics included in the list are not really part of the definition but rather are testable hypotheses regarding the behaviour of such firms. For instance the notion of growth (proposition 8) will not be included in a real definition, as this is not a distinguishing characteristic of global startup firms. Further research is now being undertaken to come up with a more narrow and precise definition. Despite these limitations, for this research the following qualitative description will be used to understand what type of firms is being investigated:

"A global startup is a highly entrepreneurial firm that, literally from day one, is involved in a variety of international activities around the world. This is done because these companies proactively pursue opportunities wherever in world they arise because resources, partners, and customers are located there. Global startups seem to be able to combine technology and innovation with a clear understanding of market needs. Whereas many high-tech firms are research-oriented, global startups are also market oriented. Because they often operate in such radically innovative industries creating awareness of their technology, products and applications is much more important to these companies than establishing a competitive advantage. The entrepreneurial nature of global startups is

also reflected in the dominant position of the entrepreneurial team. Even if the founders have no formal education, training and or working experience, they have developed a global vision and feel confident enough to operate in the global arena. Often global startups rely on partnerships with established organisations such as research institutes or venture capitalists. Such relationships may be dangerous to the development of the firms but nevertheless help these firms to overcome some of the major problems associated with both startup and internationalisation, namely lack of resources, reputation and organisation. Further, global startups are often involved in a variety of alliances with other firms to compensate for their small size, lack of experience and / or to avoid growth."

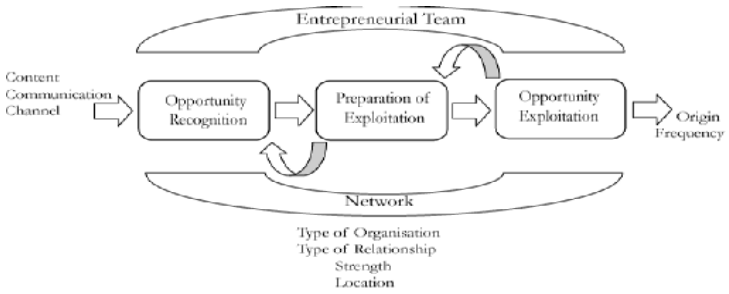
Interestingly the list of characteristics can be used to describe the content and direction of global startup process and not just the concept. For instance, by describing the location of the activities in the different phases the development of the global diversity becomes apparent and the type of value-added activities and network entry modes describe the scope of the globalisation and its development over time. The Sound Inc. case showed for instance that the traditional incremental process model of internationalisation clearly does not apply at all and also which international activities are undertaken where and at what time.

9.3 The Global Startup Process

In the first part of this thesis, I argued that, as the name implies, the startup process and the globalisation process of a global startup firm are highly integrated and cannot be seen in separation. Further I suggested that the global startup process is described in terms of three phases: Opportunity Recognition, Preparation and Exploitation & Value Creation. I presented process graphically in Figure 9 and this model is replicated in Figure 17. Following the first argumentation each of the three phases would have a strong international or even global component. In addition to discussing the separate phases, I also discuss observations I made regarding the global startup process as a whole.

Because the findings reported in the previous chapter are based on a single case study it is very well possible that many of the reported findings are case-specific. In this chapter I discuss which findings are indeed case specific and to what extent the findings are theoretically generalisable

Figure 18 Research Framework (replicated from Figure 9)



9.3.1. Observations on the Opportunity Recognition Process

Starting with the opportunity recognition process previous research suggests that this phase starts with the discovery of an initial idea. This discovery may be the result of deliberate search from the side of an aspiring nascent entrepreneur or caused by serendipity (Vesper 1989). After that, the initial idea is further refined by the entrepreneur, in interaction with the network, to determine both the feasibility and desirability of the opportunity to the entrepreneur and the market and to develop a more elaborate business opportunity.

For Sound Inc., the discovery of the initial idea was clearly the result of serendipity: the sensor was discovered by accident while a student (without aspirations of becoming an entrepreneur) was working on his Master's research. Then over the next few years, the 'discoverer' Mr. Wide worked on the development of his sensor. This development both consisted of technological development (e.g. the creation of a working prototype), product development (e.g. the generation (of ideas for) actual applications and marketable products) and market development (e.g. building awareness and acceptance as well as defining lead users and customer groups). Each of these areas needs to be developed, - regardless of the nature of the opportunity that is being pursuit. Yet, the extent and direction of development needed is strongly dependent on the nature of the opportunity and especially the underlying technology. Because many global startups, like Sound Inc. operate in niche markets (McDougall, Shane & Oviatt, 1994, Madsen & Servais, 1997), it may be difficult to obtain all the information and knowledge necessary in this development process domestically, simply because this (technological) knowledge and information will be held by individuals and organisations that are globally dispersed (e.g. Fontes & Coombs, 1997).

From this, I deduce that for many global startups already the opportunity recognition process is highly internationalised, even when the opportunity is not found abroad, as was for instance the case with Heartware International, or when the entrepreneurial team is not composed of different nationalities, such as in the Logitech case. In each of these cases the thinking-through-talking process leading to the recognition of the opportunity as described by De Koning (1999) took place in a global context. This observation led to the formulation of the following propositions:

P13a: The opportunity recognition process of a high tech global startup takes place in a global context

P13b. The opportunity recognition process of high tech global startups involves informal and or formal exchange processes across national borders

P13c: In high-tech global startups, obtaining knowledge on technological issues and potential applications through informal exchange processes is often the first type of international activity of a global startup

P13d In many high tech global startups, internationalisation precedes actual company foundation.

A significant portion of the entrepreneurs' time and efforts during the opportunity recognition process was devoted to creating an initial awareness and acceptance of the technology. The founders of Sound Inc. had to overcome the initial scepticism they faced with regards to their technology and its commercial value. This may seem as a case specific feature: not every global startup will have to deal with this issue to the extent Sound Inc. had. However, many global startups are based on highly innovative technologies, and therefore many global startups are likely to have to deal with building awareness and acceptance both before and during the launch of the firm. The reason for this is that radically new technologies often have

to compete with existing technological standards. A standard is a set of specifications adhered to either informally or as the result of a formal agreement (e.g. Rycroft & Kash, 2002). As such standards or regimes are often global, it is not surprising that the process of establishing awareness and acceptance should involve creating favourable attitudes towards the new technology of industrial and scientific (opinion) leaders around the world because, as suggested by Rogers (1995) and Trevino, Lengel, and Daft (1987), a person's willingness to adopt a new technology is to a large extent influenced by the way important people in the network evaluated and or use the new technology. In that light, the partnership which was formed Sound Inc. with global market leader Pfon as well as the ventures strong link to the Dutch University and the famous Beta Institute seemed to be a large step in establishing the technology as a globally accepted standard. Only when opinion leaders and or sufficient numbers of potential users accept the technology further pursuit of the opportunity will be feasible. This leads to the following propositions

P14a: Due to the global nature of technology, global startups need to build awareness and acceptance of their technology products and services to users and opinion leaders around the world.

P14b Building awareness and acceptance begins early in the global startup process, either in the preparation phase but if possible already in the opportunity recognition process.

The alliance with Pfon as well as the contracts between the TEAM and the Beta Research Institute that were established during the opportunity recognition stage and later between Mr. Wide and Beta Research Institute and the ownership of Metal Shop by Mr. Path are sidetracks in the global startup process. By pursuing these alternative opportunities parallel to the real opportunity (namely the exploitation of the Sensor for sound intensity measures) the entrepreneurs obtained the necessary resources. This use of alternative opportunities is shown graphically in Figure 18.

Figure 19 Pursuit of Alternative Opportunities

Although this approach may at the first sight seem to be case specific, its merits will also apply to other nascent global startups. The reason for that is that all nascent firms need to be creative in building their resource base under the constraints posed by lack of initial resources, legitimacy and time. For instance, studies on startups in the Biotech (e.g. Bullock, 1983, Van Der Sijde, Bliek & Groen, 2003) point to the use of consultancy or contract research as a means to generate sufficient financial means to pursue the actual opportunity (such as long term drug development and or software development). It should be noted that this use of alternative or

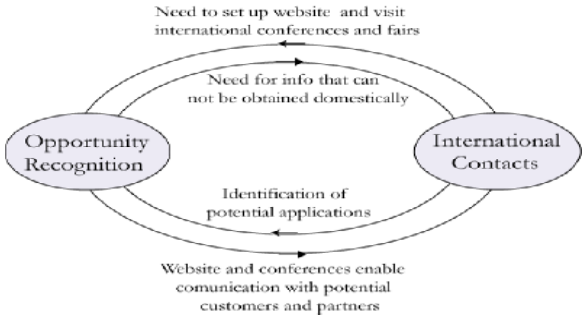
sidetrack opportunities may not be limited to Global startups but for high-tech startup in general. From this, the following proposition is derived

P15: (Global) startups often need to take sidetracks and pursue alternative opportunities to enable the pursuit of the actual opportunity in order to deal with resource-needs

It should be noted that in some cases it might very well prove that the sidetrack actually provides a much better opportunity for the firm than the original opportunity. Therefore, the entrepreneur may decide to pursue this alternative opportunity instead. As a consequence we may only be able to determine whether a sidetrack really was a sidetrack ex-post.

The opportunity recognition process of Sound Inc. further provides a very good example of what I meant with the statement that for global startups the startup process and the internationalisation process cannot be seen in isolation: Without including international contacts and obtaining their information in the opportunity development process it would simply not have been possible for Mr. Wide to continue his venture. Vice versa, in order to meet with the international contacts he had to set up specific activities such as a website, and visit international conferences and trade-fairs already during the opportunity recognition process. In later stages of the process both these activities (making a website and visiting conferences) made it easier to communicate with a large number of potential customers, distributors, and other partners. These examples of the relationships between the opportunity recognition- and the internationalisation process are depicted in Figure 19. As this is in line with proposition 1, no new proposition needs to be formulated regarding the integration of the startup and globalisation process.

Figure 20 Relationship between Internationalisation and Opportunity Recognition



From the reported findings as well as from the discussion of the opportunity recognition process, it is obvious that already before a definitive decision was made to establish a company to commercialise the sensor-technology, the venture was heading in a global direction as is also shown from the 'Global Startup Classification shown in Table 22. This table is derived from the global startup dimensions identified in Chapter 3. As is apparent from this table, even before a company was established the Sound Inc. project scored medium or high on all of the applicable dimensions. The conclusion that the project was indeed global from the very start confirms the expectation formulated in the introductory chapter of this thesis. It suggests that in order to understand the global startup process, researchers need to expand their investigation beyond the official foundation of the firm. Indeed this case indicates that the context and course of the opportunity recognition process of a firm may indeed explain why and how a firm becomes involved in international activities this early in its life.

Characteristic	Opportunity recognition	Preparation	Opportunity Exploitation
Integration of startup and internationalisation	Startup requires international activities and vice versa	Need for resources drives internationalisation, while international ideas drive further development	International ideas, resources, partners, customers reinforce the need for each other
Internationalisation before start of business	Search for partners, ideas for application	n.a.	n.a.
Pursuit of opportunities	Opportunity is global, global startup is vital	Opportunity is global, global startup is vital	Opportunity is global, global startup is vital
Wide range of activities	Search for ideas, financial resources, partners	Search for resources, partners	Sourcing, R&D (testers), marketing, distribution, sales, trainees etc
Wide range of entry modes	Mainly direct (solicited), some through intermediaries	Direct (solicited), intermediaries	Direct solicited/ unsolicited, agents (distributors), intermediaries,
Wide range of regions	Europe, Japan	Europe, U.S.A., Asia	35 countries, 6 contitinents
Pattern based on opportunities rather than distance	See Japan	See Asia and U.S.A	Activities limited to technology developed or developing countries
Limited growth focus	No interest in growth	No interest in growth	Limited interest in controlled growth
High levels of EO	Innovation, proactiveness	Innovation, proactiveness, risk taking	Innovation, proactiveness, risk taking, competitive aggressiveness
Skilled and confident entrepreneurs	Students are used to international travel and speak foreign languages	International activities never seen as problematic or even challenging	Experience in one entrepreneur and skill and confidence in both
Strong partners	University	University and Pfon	University
Embedded in international network	Via university introduced in global network	Development of international network	Development in international network

Table 212 Global nature of Sound Inc.

9.3.2 Observations on the Preparation Process

During the preparation phase entrepreneurs begin to make observable commitments that enable them to exploit the opportunity they recognised (Van Der Veen & Wakkee, 2004). In the following paragraphs I discuss the most remarkable issues observed in this phase of the global startup process.

The formation of the team as it took place during the preparation process was a domestic affair as it only included Dutch actors / entrepreneurs. Also the team-issues did not affect the course or the global nature of the remainder of the startup process. What happened in the Sound Inc. case was highly case specific. Yet, looking back what happened was not surprising considering the lack of experience of the original three entrepreneurs. Although beyond the focus of this research, I will come back to this issue in the next chapter when discussing needs for further research as I consider that the experiences of Mr. Wide and his TEAM can be informative to other entrepreneurs as well.

Startups that are based on highly innovative technologies will operate in truly extreme contexts where technology challenges are often on the edge of scientific possibility, but with the available resources are relatively scarce (Julien, 1995) As a consequence international sourcing of knowledge may be required (Fontes & Coombs, 1997). In order to build the resource base, both

the TEAM and later Mr. Wide and Mr. Path adopted creative, entrepreneurial methods. Rather than trying to obtain financial resources to be able to buy / control the other necessary resources such as facilities, human resources, the entrepreneurs tried –and succeeded- to gain access to resources owned and controlled by other parties. For instance they arranged for obtaining access to the clean-room facilities at the Research Institute and they decided to arrange the production capacity available in Mr. Path's other firm Metal Shop. The gaining of access to rather than ownership of resources and facilities has been reported by other authors as well in relation to new ventures. (e.g. Brush et.al2001). Typical for global startups here is the fact that not only access to resources from domestic providers is obtained both also from foreign providers. I will discuss this issue in more detail in the section on networking. Yet, not before formulating the following proposition.

P16a: Resources needed by a global startup often are located internationally as well as domestically

P16b: Global startups need to gain access (rather than control) to the use of resources, using creative and entrepreneurial methods.

9.3.3 Observations on the Opportunity Exploitation process

Looking back at the first six years of exploitation, several points come to the fore. The exploitation process of Sound Inc. was characterised by high levels of globalisation both with respect to the location of the activities, the wide range of activities and the entry modes used. Regarding the location of the activities, two observations can be made. First, the location of the activities seems to be determined by the location of opportunities rather than by (decreasing) geographic or cultural distance. For instance, one of the first international activities after the foundation of the firm was to seek establish a sales order from a large Japanese company and distributor arrangements were established with Brazilian and Singaporese distributors before setting up such contracts in for instance the UK, Germany and France. The Sound Inc. case study shows that, despite the high level of technology, the activities were not limited to countries that are traditionally considered as the leading technological countries. A number of upcoming or newly developing countries, such as Brazil, India, China or Russia proved to be important markets both regarding sales, sources of human resources and or external 'testing' or R&D activities. Similar findings had previously been reported by Autio and Sapienza (2000) as well as by early works in the field (e.g. Rennie, 1993, Ray, 1989 etc.). This picture of opportunity-based internationalisation process instead of an incremental stage process is in line with proposition 6: The globalisation process of global startup firms follows the presence of opportunities rather than increasing geographic and cultural distance. Therefore, no need exists to formulate an additional proposition.

Regarding the nature of the international activities several observations can be made as well. Whereas the exchange processes during the opportunity recognition process and preparation process were mainly linked to the exchange of knowledge and information, and to a lesser extent to establishing access to resources, in this stage other types of exchanges are added. These include both traditional activities such as sales and distribution across national borders but also less common activities such as the 'outsourcing' of testing (R&D) activities. As stated previously, the rather informal approach used by Sound Inc. may be dangerous was the firm cannot control either the direction or the outcome of the research conducted by its external testers. Yet, the (potential) positive effects on the legitimacy and the relative low costs of this approach in combination with the flexibility and virtual increase of R&D capacity seem to outweigh the potential negative effects. Other startups, whether domestic, international or global may benefit from similar creative types of (international) activities while researchers in

the field of internationalisation may learn from the Sound Inc. case that including less traditional cross border activities may have to be included in their analysis to develop a more complete picture of (international) company development. These findings provide confirmation of proposition 4, which suggests that a range of both formal and informal value added activities are performed across national borders. Especially the informal activities (those activities for which no money is exchanged or below market prices are demanded) suggest that networking is of critical importance in the global startup process.

The global nature of Sound Inc.'s opportunity exploitation process is hardly surprising considering the global nature of the recognition and preparation processes. However, the findings are clear sign that Sound Inc. has been able to reach the 'global potential' it displayed before. Not all ventures with global potential will be able to reach this potential: many may fail. They may either terminate altogether as happened in the case of Heartware International (McDougall et al., 1995; Oviatt et al., 1995). Alternatively, some firms may also remain domestic or international (e.g. European) in nature or limit their international activities to only one or two value added activities as seemed to be the case with for instance NedClad (see chapter 3). The issue of network entry methods will be discussed in more detail in the section on networking. Also, related to the course of the opportunity exploitation process, the relationships between the various (international) activities will be discussed in more detail in the section on networking. The markets on which Sound Inc. is active is highly internationalised in geographical terms in the sense that most important player in the market are globally active. Also the size of the domestic market would simply be too small to sustain a domestic venture (even at startup).

The sabbatical leave of the original founder, Mr. Wide for a period of 18 months may cause some surprise or even scepticism. It may not seem very entrepreneurial to start a company and then leave it behind, while still involved in building a sustainable position. However, the Sound Inc. case it may be argued that the professionalisation of the firm was facilitated by his absence. The reason for this was that rather than continuing to bring new and improved products to the market the company could focus on its market position and become more demand driven. In previous work on high-tech startups (e.g. Burgel & Murray, 2000 or Oakey et al., 1988) the technology push orientation of high-tech ventures is often detrimental to their further development. Although only one case was examined, this does lead to the notion that sending the principal researcher or discoverer away for some time during the initial years of exploitation is actually a wise thing to do. This leads to the following proposition:

P17a: A high-tech global startup must attempt to become a market driven company to build a sustainable position

P17b: Temporary absence of the principal scientist or innovator may be a beneficial strategy in developing a market driven company.

9.3.4 General Observations on the Global Startup Process

A number of observations and points for discussion refer to the entire global startup process. Following the remarks of Madsen and Servais (1997) who argued that the investigation of international new ventures should extent beyond their inception, I expected that a large part of the explanation of why and how firms start global would be found in this early stage. From the case study I conclude that this was in fact the situation. Not only did the opportunity development process provide insight into why Sound Inc. had to start global, namely to obtain resources and sell its outputs on a level that could not be achieved domestically or even on a European scale. By looking at these early stages clues were also found as to how this was

achieved, namely by using first the Dutch University and Mr Hills' network and by being submerged in a context where international activities were considered normal.

P18a: The (global / technological) nature of the opportunity determines the course of the global startup process to a large extent.

P18b: The global startup process is characterised by similar types of activities as the domestic startup process.

P18c. The global startup process is different from the domestic startup process mainly in term of the location of the activities.

Next, from the very start the venture could be characterised as having a strong entrepreneurial orientation (Miller & Friesen, 1984, Covin & Slevin, 1988, 1989, Lumpkin & Dess, 1996). As a scientific construct entrepreneurial orientation is used to measure historic behaviour, and therefore it can best be used in relation to established ventures (Brown, Davidsson & Wiklund, 2001) and is less applicable to startups. The construct has been applied several times in the context of internationalisation. For instance Barringer, Macy & Wortman (1996) linked entrepreneurial orientation to export planning and performance. Knight (2000) and Harveston (2000) both linked the construct to (established) born globals and found these had significantly higher levels of entrepreneurial orientation than gradual globalisers. The case description shows that the underlying ideas of the construct apply particularly well to the firm. Clearly innovation, risk taking, proactiveness were key in the venture from day one. Based on the exploratory cases a proposition was already formulated regarding the high level of entrepreneurial orientation of global startups.

Another observation that can be made from the reported findings on the entire global startup process was that being internationally active was not a big deal to the entrepreneurs; rather it seemed like the natural, or perhaps even the only way. One explanation for this would be that the scientific and business communities in which he operated were both highly internationalised as well. Thus international operations were the norm to which Mr. Wide easily adapted. Entrepreneurs founding a global startup with a similar (scientific) background can be expected to have a similar attitude towards Internationalisation. However, it seems likely that Mr. Wide's personality also explained why he became involved in international operations. Traveling abroad was nothing new to him. Soon after he made his initial discovery he went for several-weeks trip to Indonesia and already he was planning for a sailing trip around the world as will be discussed later in this chapter. Already a large number of authors (Harveston, 2000, McDougall, Shane & Oviatt, 1994) have suggested that international experience is important. As stated by Oviatt and McDougall (1995) to be global one must first think global. As argued previously in relation to proposition 9, this global vision may stem from real hands-on international experience or experience in working in an international environment at home. The observation of Saarenketo (2002) that to the founders of an international new venture the world is seen as one big market and no real distinction is made between domestic and global operations fits the situation of Sound Inc. very well. The lack of distinction may also explain why the entrepreneurs do not consider international activities to be more problematic than other (new) activities. Also, the remark made by Rasmussen, Madsen and Evangelista (2000) that internationalisation is not a goal in itself, but rather a means to an end applies particularly well to the case study.

This case study shows that the international experience does not have to be hands-on international working or travel experience but can also include being active in an international environment in your own country or traveling abroad for your domestic employer. Since Mr. Wide had no hands-on international experience in a specific country it cannot be determined to

what extent a relationship exists between working in a specific country and setting up activities in this country. Jumping ahead in the global startup process, no relationship was found to Mr. Path' experience in Germany and setting up business activities in this country. Also, no evidence was found that he used specific network contacts he had already set up in Germany to set up business activities in this country or in other countries. Therefore, no relationship could be established between the internationalisation process and previous experience of the entrepreneurial team. These observations indicate that attitude may be as important as actual country specific experience and information. This suggests that researchers need to take a much broader perspective on the role of experience that has so far been common.

P19a: The global nature of the startup process is not considered a problematic issue or problematic by the entrepreneurial team

P19b: The founders of global startup firms consider the global nature of their startup process as the logical course of action in pursuing their opportunities

9.4 Networking and the Global Startup Process

It is evident from the description is that networking has played a critical role throughout the entire global startup process. In the following paragraphs I discuss how the networking process between the entrepreneurial team and its network contacts took place during the global startup process.

A significant portion of the effort of the team during the opportunity recognition process is devoted to development of the initial idea into a real and exploitable entrepreneurial opportunity. As argued by e.g. De Koning, (1999), Singh, Hills Hybels and Lumpkin (1999) and Julien (1995) this is largely a social process. According to De Koning 'thinking through talking' is an important part of this development process. She found that in this process especially weak ties were involved, as these are the best source of new information. In the Sound Inc. case we have indeed seen that Mr. Wide used such thinking through talking mainly to identify and 'test' potential applications for his invention. As mentioned, the people to whom they talked (at conferences, fairs, and the Dutch University) came from all over the world. This enabled him to identify potential applications that could be commercialised globally and that would meet global standards and usages.

Many authors (e.g. McDougall, Shane & Oviatt, 1994, Eisenhardt & Schoonhoven, 1996) have stated that to overcome their lack of resources and legitimacy at the time of startup, (global) startups often rely on partnerships with other (established) organisations. Throughout the global startup process of Sound Inc. we have seen that the entrepreneurs have tried to compensate for their lack of resources by gaining access to the resources of other parties in their network often in the form of facilities and capacity. From the Dutch University they obtained access to research and production facilities as well as access to 'cheap but highly skilled and flexible labour' in the form of students. From Pfon they obtained financial resources, legitimacy and access to technological knowledge. From Metal Shop, access to (the production of) components was obtained. Finally, from the testers around the world, Sound Inc. obtained access to knowledge, but also achieved expansion of its own research capacity. Also throughout the startup process the entrepreneurs have been able to obtain alternative sources of personal incomes: first the TEAM obtained an income from the activities performed for Pfon and also a small personal income from the Beta institute. Later, Mr. Wide obtained an income from the Beta Institute, while Mr. Path earned a living by owning and managing Metal Shop. By doing so, the entrepreneurs have reduced the need to obtain large sums of money to obtain their own resources. This approach is an excellent example of networking by a startup.

Next, when Mr. Wide began searching for a business partner (to obtain financial resources and access to the market) he did so internationally. All three of the parties he negotiated with were foreign companies. The reason for this is simply that these were the most dominant players on the world market and would therefore offer the best opportunity for introducing the Sensor quickly on the market. Would there have been such a dominant player in the Netherlands, Mr. Wide would have also negotiated with this player, yet that simply was not an option. In a small country like the Netherlands it would have been pure chance to find such a dominant player in such a highly specialised niche. To Mr. Wide the negotiations with the foreign partners were not considered exceptionally difficult or very different from what they would have been with a Dutch partner, besides some minor language difficulties. He later 'blames' these language difficulties as part of the problem with the contract yet as argued in the previous chapter, it seems unlikely that it were really language problems that were at the heart of these problems. Instead the problems seemed to be more strongly related to the lack of power balance between the huge German multinational and the small startup. Similar problems might have arisen would a partnership have been formed between a Dutch multinational and Sound Inc. In previous research on international new ventures very little attention has been devoted to the issue of strategic alliances. The Heartware International case from McDougall and her colleagues (McDougall et; al. 1995; Oviatt et al., 1995) forms an exception. As presented in Chapter 3, they describe the rise and fall of an American global startup that relied heavily on its partnership with a Dutch university. Although the university had no commercial benefit by breaking the alliance, the change of decision-makers nevertheless had this result. Similar to the alliance between Sound Inc. and Pfon, no evidence was found that the difference in location or cultural differences were at the heart of the termination of the contract.

P20a: Strategic alliances between a global startup and a foreign large established (multinational) firm experience similar difficulties as alliances formed domestically

P20b: Differences in resource strength experience and power rather than differences resulting from different nationalities (culture, language, legislation etc) are the main source of conflict in strategic alliances formed between global startups and foreign large, established firms.

With respect to networking, it is clear that especially Mr. Wide sought to build a network by proactively approaching potential counterparts (research partners, lead customers etc) and makes active use of the network he had already established (during earlier stages of the process). Mr. Wide used both his supervisor at the Dutch University and a men like Mr. Hills to be introduced to potentially interesting partners both domestically and abroad. From this, two conclusions can be drawn. First, strong ties (and especially members of the inner circle) are critical in the development of the international network during the early stages of the global startup process. These strong ties are particularly important, as the number of weak ties from which the entrepreneurs can obtain information is relatively small in the earliest stages of company development. Yet, at the same time we could see that Mr. Wide began to develop his network of weak ties from a very early stage by setting up meetings with potentially relevant knowledge providers or opinion makers and built his network rapidly. Also Mr. Path put in considerable time and effort to built his and the company's network from the moment he became involved in the business.

Next, domestic contacts as well as international contacts are important for setting up an international network. In relation to the role of domestic contacts some authors have pointed to the importance of industrial districts. The theory of industrial district suggests that in local informal networks a collective international knowledge capital develops that helps the entrepreneurs in this district to enter international markets and to overcome their lack of

resources (Zucchella, 2002). Although during the opportunity recognition process Mr. Wide and his TEAM had already established some contacts in the local network there was no evidence of a real industrial cluster in the region and of Sound Inc. using this cluster as a vehicle for building its international network and or activities. The fact that the entrepreneurs did not have an international network in place when they began the venture shows confirms the findings reported previously by Madsen, Servais & Rasmussen (2000). These authors found, contrary to popular believe that entrepreneurs already have international contacts or networks when they found a global startup.

Regarding the composition of the network, the case studied showed that at least Sound Inc. had been able to establish a network consisting of a high variety of types of organisations. The share of research institutes and commercial companies was more or less equal in number also these two types of organisations played more or less similar roles. Both the research institutes and the companies provided Sound Inc. with knowledge; yet research institutes provided more basic, general scientific knowledge whereas the companies mainly provided information regarding applications and specific user needs. Also Sound Inc.'s customer base included both research institutes and companies. Other types of organisations included Science Foundations, which acted as subsidisers and scientific advisers, public organisations (e.g. military, marine, police etc) that were mainly customers. Although the company was a member of several sector organisations / interest groups these organisations did not play an active role in the global startup process. Similarly even though the entrepreneurs had some contacts with financial institutions (e.g. their house bank, and temporary with a venture capital fund manager) these organisations did not play an active role in the global startup process. This may seem remarkable considering that high-tech ventures are often considered have high (financial) investment requirements. However, as argued previously, Sound Inc. was able to access resources (e.g. facilities, human resources etc) owned by others. This acted as a substitute for resources owned by the company itself. As a result, the need for financial resources provided by financial institutions remained limited in this case. Although this approach proved satisfactory for Sound Inc., other global startups might not be able to use other organisations' resources or have different requirements and they may therefore be more dependent on establishing a strong relationship with financial institutions. Also, other entrepreneurs may be more focused on growth or have fewer considerations against sharing control of the company with for instance a venture capitalist or angel. Considering that venture capitalists or angels may have extensive international networks and or stress the firm to press forward such organisations could potentially have a strong influence on the course, content and or even the context of the global startup process. In this way these types of organisations played a role both upstream and downstream on the value-chain.

This discussion may suggest that an analysis of the network structure and the (founder of) global startup's position in the network could provide further insight into the global startup process. In the next chapter I will come back to this issue when discussing the needs for further research. This observation may seem very straightforward. What is important however, is the fact that establishing contacts and relationships with such a variety of organisations can be very difficult and not every entrepreneur will be able to do so. Especially in the context of high-tech entrepreneurship it has been suggested frequently (e.g. Burgel & Murray, 2000; Jones-Evans, 1995) that scientific entrepreneurs may have difficulty in establishing contacts with market-based organisations. Alternatively, entrepreneurs with a management background may have difficulty communication with and thus establishing relationships with scientists. Creating multi-background entrepreneurial team may therefore be advisable in the light of network building and development.

Further, from the case study it seems that some type of organisations and relationships may be interchangeable. For instance, Sound Inc.'s need for establishing a relationship with an investor was reduced tremendously by its relationships with Pfon, the Dutch University and

Metal Shop, which provided the venture with access to resources and facilities. Although more research is needed to establish the extent to which this notion can be generalised, entrepreneurs may nevertheless be aware of this potential to use different types of organisations and relationships to obtain the same goals via different paths.

P21a: Global Startups have to interact with a high variety of organisations throughout the global startup process including research institutes, science foundations, multinational companies etc.

P21b: A global startup process does not require an international network to be in place prior to the discovery of an opportunity.

P21c: A global startup needs to build a global network early in the global startup process.

P21d: Both domestic and international contacts are important in setting up international activities

Looking at the development of the network over time a number of issues become clear. First, throughout the global startup process the relationship with the Dutch University remained strong and intact. Further, the network grew rapidly and across national borders even within the first year of the discovery. Literature on entrepreneurial networking suggests that one of the most important functions of established network contacts is to help the firm in identifying and established new contacts e.g. through referral (e.g. Birley, 1985; Aldrich & Zimmer, 1986; Hoang & Antoncic, 2001). Especially in the opportunity recognition process several examples were found of one contact referring the entrepreneurs to a third organisation (new contact) or even acting as a real intermediary between the entrepreneurs and the new contact as we saw in several cases done by Prof. Fairy and by Mr. Hills. In later stages of the global startup process we see far less of such examples of referral. Therefore, a direct relationship between different activities in the same of different countries can hardly ever be established. This suggests that when it comes to the development of the network, the entrepreneurial team relied more on building the network proactively and independently than on using its existing network contacts (e.g. as intermediaries) to establish relationships with new contacts.

P22a: During opportunity recognition global startups mainly use existing contacts to identify and establish relationships with new domestic and international contacts

P22b: During later stages of the global startup process proactive behaviour from the entrepreneurial team rather than the use of intermediaries or brokers leads to the identification and establishment of new contacts.

Regarding the content of the interaction between the entrepreneurial team and its network, it the case study further showed that the exchange of knowledge and information remained one of the most important types of resources to be exchanged both in the early and late phases of the process. Considering that (technological) knowledge is at the heart of Sound Inc.'s opportunity it is not surprising to find that the nature of the exchanged knowledge was also most often technological in nature. Despite some exceptions (e.g. Mr. Path enquiry regarding the military sector in Singapore), far less knowledge was exchanged regarding specific markets or countries between the entrepreneurial team and its external contacts. It must be noted however, that despite the relatively lack of observed exchange of market knowledge between the entrepreneurial team and the external network, looking at the case study data, I did not get

the impression that Sound Inc. lacked a market orientation. Rather, it seemed that such issues were more often discussed informally during conferences or trade fairs or in other face-to-face meetings and / or was developed in house by search for information on the Internet than by discussing this issue by the observable e-mails and faxes. At this stage we cannot determine whether the greater volume of technological and less volume of market information is a case-specific feature or if this tendency to exchange mainly technological knowledge and less market specific knowledge is common for global startups.

Regarding the communication channels used the case study clearly showed the importance of modern technologies like e-mail and Internet. This may seem like a rather straightforward observation. Yet, even though many authors have suggested that the arrival of these technologies is an important driver of the global startup phenomenon, this case study actually proved the validity of this claim on the basis of empirical evidence. As became clear both from the content analysis of the e-mails and from several statements made by Mr. Path without e-mail the firm would never have been able to continue frequent communication with its customers, distributors, testers and other contacts. Without the use of the Internet, the entrepreneurs would not have been able to on the one hand advertise the firm and its products to potential (so far unknown) contacts and on the other identify potential new contacts no matter where they are located. From this the following proposition is derived:

P23a The more global the startup process, the more the entrepreneurial team will use e-mail and Internet

P23b. The use of e-mail and Internet during the global startup process reduces the need to travel abroad extensively (saving time and money)

P23c. The use of e-mail and Internet during the global startup process enables companies overcome differences in time zones when communicating with foreign counterparts

P23d. The use of e-mail and Internet enables the entrepreneurial team to identify potential new contacts, to make the company visible for identification by potential new contacts and to communicate with new and established contacts

Despite the importance of e-mail and Internet, this was clearly not only channel used for communication between the entrepreneurial team and its network. As shown in the previous chapter, the use of international conferences and trade fairs proved to be a valuable strategy to communicate with new and established contacts from around the world. This communication may be mass or indirect communication in the form of presentations of papers and exhibition of the products to the general audience. Also, these events serve as a means to have personal meetings (often even pre-arranged) with individual contacts to discuss both general and specific issues. In the following paragraphs I discuss how the networking process between the entrepreneurial team and its network contacts took place during the global startup process

P24a. The use of international trade fairs and conferences is a valuable strategy for global startups

P24b. The use of international trade fairs and conferences provides global startups with an opportunity to present itself to new and established contacts from around the world

P24c The use of international trade fairs and conferences enables global startups to build a global network quickly.

Regarding future research in this area, this conclusion shows how important it indeed it to expand the analysis beyond the formal point of business formation as was already suggested by Madsen and Servais (1997) but to this date seldom done. Similarly the Sound Inc. case shows how important it is to include both 'formal' and 'informal' types of international business activities in the analysis.

In the following chapter the findings and discussions from the both the exploratory research into the Global Startup concept and the descriptive research on the Global Startup Process and the role of Networking during this Global Startup Process are integrated into Conclusions and Implications.

10 Conclusions and Implications

10.1 Introduction

The purpose of this research was to develop theory with respect to global startup firms. Specifically, I attempted to create a better understanding of the concept Global Startup and the Global Startup process. Throughout this investigation an entrepreneurship-in-networks perspective has been adopted. The main reason for this was that from the start of this investigation, I considered global startups to be perfect examples of entrepreneurial ventures. Furthermore, as entrepreneurship theory has been developed specifically in the context of new ventures, the entrepreneurial perspective seems to fit these companies better than the more commonly used international management perspective. The network element in my approach stems from a conviction that entrepreneurial phenomena do not take place in isolation, but rather in a network context. Even though, people have the potential to make free choices, every individual and organisation is embedded in its environment and is directed, facilitated and constrained by this environment. With these fundamental assumptions in mind, the following four research questions were addressed:

1. What is a global startup (firm)?
2. How can we describe the content, context, and course of action by which a global startup firm comes into existence?

3a. With what type of contacts does the entrepreneurial team interact throughout the global startup process?

3b. What is the content of the interaction process between the entrepreneurial team and the different network contacts throughout the global startup process?

3c. How does the interaction between the entrepreneurial team and the network contacts develop throughout the global startup process with respect to
   - Origin
   - Frequency of interaction
   - Communication channel

4. To what extent is a model based on entrepreneurship in networks
   - suitable for describing, gaining insight and understanding the global startup process,
   - provide points of reference for further research into the global startup phenomenon
   - provide guidelines for practitioners involved in supporting global startups

In this chapter I provide an answer to these research questions. Also I describe how these answers contribute to theory and practice of international entrepreneurship-in-networks.

10. 2 Conclusions

In the following paragraphs I present the conclusions with respect to each of the four research questions as well as to the underlying more fundamental question: How can some firms start global, while most do and can not do this?

10.2.1 What is a Global Startup?

The first research question addressed in this study involves the concept of the global startup (firm). Whereas in most studies explaining why a specific definition is adopted is adequate, I regarded that that would not suffice here. The reason for that is that considerable differences exist between the previously used definitions and that none of these definitions provided an accurate and precise image of the companies under investigation. Further, simply adopting a definition does not enable researchers to develop a 'feel' for the type of organisations he or she is investigating. Reading about these companies as well as talking to the founders of such firms will result in a better grasp of the topic.

From an analysis of the existing descriptions and definitions in previous literature and an exploratory investigation of a series of case studies I derived twelve propositions (see Tables 4 and 21). Combining these propositions with my other observations I derived at the first major conclusion of this research

Conclusion 1

A global startup is a firm that literally from day one, is involved in a variety of international activities around the world. This is done because these companies proactively pursue opportunities wherever in world they arise because resources, partners, and customers are located there. Global startups seem to be able to combine technology and innovation with a clear understanding of market needs. Whereas many high-tech firms are research-oriented, global startups are also market oriented. Because they often operate in such radically innovative industries creating awareness of their technology, products and applications is much more important to these companies than establishing a competitive advantage. The entrepreneurial nature of global startups is also reflected in the dominant position of the entrepreneurial team. Even if the founders have no formal education, training and or working experience, they have developed a global vision and feel confident enough to operate in the global arena. Often global startups rely on partnerships with established organisations such as research institutes or venture capitalists. Such relationships may be dangerous to the development of the firms, but nevertheless help these firms to overcome some of the major problems associated with both startup and internationalisation, namely lack of resources, reputation and organisation. Further, global startups are often involved in a variety of alliances with other firms to compensate for their small size, lack of experience and / or to avoid growth.

This description clearly is highly qualitative in nature; it cannot be used as an operational measure in order to identify global startup firms from a large population of firms. However, it does provide a basic insight in what a global startup actually is. In this sense it serves four purposes. It provided me with a starting point and initial understanding of the phenomenon before moving on the core of this study. It provides the reader, whether familiar with the research topic or not, with a basic understanding of the phenomenon and with how I looked at the phenomenon in this thesis. Third, it provides other researchers in the field with a more detailed and entrepreneurship-driven description of the phenomenon and definition of these companies than existed to date. By deriving the description from case studies, the description reflects the complex realities faced by the founders of such firms much better than most definitions that have been formulated to date. The description enables researchers to identify companies for their case studies. Similarly, it enables managers of startup-support programs like

the Global Start project with a basic 'tool' to identify and or select firms to be included in their support schemes. By applying the list of characteristics to the Sound Inc. case in each of the three phases of the startup process, I have shown that the tool can be used to determine whether a firm is a global startup even in the earliest stages of existence

10.2.2 The Global Startup Process

After having established what we are actually talking about when talking about global startups, I continued with the second research question: How can we model the global startup process. In order to provide an answer to this question, I conducted a longitudinal case study based on a single-case study method and involving a wide range of data-types. The findings of this case study were presented in chapter 7 and 8 and discussed in chapter 9. Also in Chapter 9 I formulated a series of propositions with respect to the global startup process. These propositions are summarised in Table 23.

#	*Propositions*
P13a 13b	The opportunity recognition process of a high tech global startup takes place in a global context
13c	The opportunity recognition process of high tech global startups involves informal and or formal exchange processes across national borders
13d	In high-tech global startups, obtaining knowledge on technological issues and potential applications through informal exchange processes is often the first type of international activity of a global startup
	In many high tech global startups, internationalisation precedes actual company foundation.
P14a	Because of the global nature of technology global startups need to build awareness and acceptance of their technology products and services to users and opinion leaders around the world.
P14b	Building awareness and acceptance begins early in the global startup process, either in the preparation phase but if possible already in the opportunity recognition process. .
P15	(Global) startups often need to take sidetracks and pursue alternative opportunities to enable the pursuit of the actual opportunity in order to deal with resource-needs
P16a	Like all startups, global startups experience a lack of resources
P16b P16c	Resources needed by a global startup often are located internationally as well as domestically
	Global startups need to gain access (rather than control) to the use of resources rather using creative and entrepreneurial methods.
P17a	A high-tech global startup must attempt to become a market driven company to build a sustainable position
P17b	Temporary absence of the principal scientist or innovator may be a beneficial strategy in developing a market-driven company.
P18a	The (global / technological) nature of the opportunity determines the course and context of the global startup process to a large extent.
P18b	The global startup process is characterised by similar types of activities as the domestic startup process.
P18c	The global startup process is different from the domestic startup process mainly in term of the location of the activities and the macro context in which the activities take place.
P19a	The global nature of the startup process is not considered an issue or problematic by the entrepreneurial team
P19b	The founders of global startup firms consider the global nature of their startup process as the logical course of action in pursuing their opportunities

Table 23 Propositions regarding the global startup process

From these propositions I conclude that when comparing the global startup process to a more traditional domestic startup process it seems that no fundamental differences exist with respect to the basic phases of the entrepreneurial process. Like a domestic startup a global startup progresses from the discovery of an initial idea, development of the idea into a business opportunity, taking the preparatory steps to be able to exploit the opportunity and create value.

In fact, the founders of global startups might even suggest there is no real difference other than the fact that they are global and interact with people from around the world, but that is 'simply' the result of the nature of their opportunity. To the founder of a domestic startup the difference may seem very real. This suggests that there is a real attitude difference between the founders of global and domestic startups. Clearly, the biggest difference between the global startup process and the more common global startup process lies in the context in which the process takes place and the location of the activities that are being undertaken and contacts with whom the entrepreneurial team interacts

The (technological) nature of the opportunity dictates for a large part what activities have to be performed and also in what meso and macro context these are performed. Consequently the startup process and globalisation process are highly integrated: The startup process will not continue if the activities would be limited to domestic activities and the range of global activities increase with the course of the startup process.

These conclusions may suggest that studying the global startup process does not offer additional insights into the field of entrepreneurship research. Yet, the fact that, in essence, the content and the course of the global startup process are not very different from the more traditional domestic startup does however not mean that that global startups are not a worthy or interesting topic for research. The very fact that global startup firms are able to progress through the entrepreneurial process in such a complex context makes them interesting examples of entrepreneurial ventures and thus they can teach us a lot about entrepreneurship and the entrepreneurial process. However, because the (technological) nature of the opportunity it seems that investigation these firms along the lines of research on high-tech entrepreneurship may offer a better entrance than studying them along the lines of globalisation. This brings me to the second major conclusion of this research:

Conclusion 2:
Because the high tech global startup process is basically an entrepreneurial process, which is not considered to be very different from other startup process by the founders of such firms, entrepreneurship theories are most suitable for studying the global startup phenomenon, much more than internationalisation or strategic management theories.

10.2.3 The Interaction Process

The next question, what does the interaction process between the entrepreneurial team and the network during the global startup process look like was also addressed through the longitudinal case study. The proposition on this topic are shown in
Table 24.

#	*Propositions regarding the interaction process*
P20a	Strategic alliances between a global startup and a foreign large established (multinational) firm experience similar difficulties as alliances formed domestically
P20b	Differences in resource strength experience and power rather than differences resulting from different nationalities (culture, language, legislation etc) are the main source of conflict in strategic alliances formed between global startups and foreign large, established firms.
P21a	Global Startups have to interact with a high variety of organisations throughout the global startup process including research institutes, science foundations, multinational companies etc.
P21b	A global startup process does not require an international network to be in place prior to the discovery of an opportunity.
P21c	A global startup needs to build a global network early in the global startup process.
P21d	Both domestic and international contacts are important in setting up international activities
P22a	During opportunity recognition global startups use existing contacts to identify and establish relationships with new domestic and international contacts
P22b	During later stages of the global startup process proactive behaviour from the entrepreneurial team rather than the use of intermediaries or brokers leads to the identification and establishment of new contacts.
P23a	The use of e-mail and Internet during the global startup process reduces the need to travel abroad extensively (saving time and money)
P23b	The use of e-mail and Internet during the global startup process enables companies overcome differences in time zones when communicating with foreign counterparts
P24a	The use of international trade fairs and conferences is a valuable strategy for global startups
P24b	The use of international trade fairs and conferences provides global startups with an opportunity to present itself to new and established contacts from around the world
P24c	The use of international trade fairs and conferences enables global startups to build a global network quickly.

Table 24 Propositions regarding the interaction process

First, I examined with what type of contacts does the entrepreneurial team interact throughout the global startup process. From the case study I concluded that global startup interact with a large variety of organisations. In the case we have seen commercial firms (both locally active and multinational), research institutes (both at universities and commercial institutes like TNO), science foundations, individuals, umbrella, public organisations and to a lesser extent financial organisations (like banks and venture capitalists). Interestingly, most of the types of organisations play a role in each of the different stages of the global startup process. However, the roles played by these different types of organisations changes and/or some specific relationships may alter and become more (or less) multiplex. These organisations played different role in the process as their relationship with Sound Inc. was diverse as well. Some types of organisations had multiple types of relationships with the firm. For instance, multinational firms could providers of resources customers, competitors, R&D partners etc. Similarly university research institutes could be knowledge suppliers, customers, sources of human resources, testers etc. Sometimes these roles were multiplex and united in one specific organisation in other cases, a research institute only bought sensors while another only provided new ideas. From this case study we cannot determine the extent to which these types of organisations will always have similar roles in the global startup process. In fact it can be argued that the roles of some type of contacts can be substituted for that of others. For instance, because Sound inc. could use research and production facilities at the University and at Metal Shop there was limited need to obtain venture capital from a fund and set up these facilities in-house. Alternatively, if the entrepreneurs had been able to acquire venture capital the firm

might have been able to rent its own office space or some of the required research and production facilities[34], which might have reduced the dependency of Sound Inc. on the University.

Regarding the location of the contact, I already mentioned that the location of the activities (and thus of the organisations with whom the entrepreneurial team engages in exchange relationships with) is largely determined by the location of opportunities rather than by the location of existing contacts. Further, we see that the location of the different contacts, both those with whom the firm engages in formal exchanges and those with whom only informal exchanges take place are really globally dispersed. As mentioned in the discussion contacts are located both advanced countries and recently developing countries such as Brazil, India, Russia etc. Thus, the nature of the opportunity will determine to what extent these markets will be covered but does show that global really means global. It shows that startups should not only try to concentrate on the well known markets but that interesting contacts and exchange relationships may also be established in less obvious corners of the world.

Looking at the strength of the different relationships, we see that throughout the global startup process the strongest ties are indeed established with contacts that are relatively close to home. In the case of Sound Inc., the first strong tie was naturally established with the University where the discovery was made. Second the mentorship relation with Mr. Hills was also a domestic relationship. The alliance with Pfon was international but nevertheless the distance between the parties was still relatively close. Weaker ties were quickly established with organisations and individuals across the world. Although it may not seem surprising that strong ties are established closer to home further research is necessary to determine the relationship between proximity and tie strength in global startup firms. Second, I examined the content of the interaction process between the entrepreneurial team and the different network contacts throughout the global startup process. From the findings it is clear that in the first stage information and knowledge is the most important type of resource to be exchanged between the entrepreneurial team and its network closely followed by access to facilities (and financial resources). Only during the exploitation process we could see the exchange of products, access to the market (distributors) and R&D capacity. Interestingly, the content of the exchange is not very different from what is common in a traditional (domestic) startup. Not surprisingly, we do see that resources that the more immobile resources such as production facilities are, the closer to home they are obtained. However, as can be seen with the testing activities we also saw that the entrepreneurial team does not feel limited to 'resource-suppliers' that are close, even when the resources involved are complex. This leads to the conclusion that proximity may be preferred but that the existence of opportunities is decisive.

Finally I investigated how the interaction between the entrepreneurial team and its network developed over time. To the end I first looked at the origins of the contacts. I found that basically new contacts are found in three ways. First, by referral from an established contact (brokerage), second at conferences or trade fairs, third (from about 1998 onwards) through the Internet. Each of these three means is used both to identify and to initiate the contact. Also each of the three methods are used both when the global startup initiated the contact or when the new contact approaches the firm. This finding clearly shows to the importance of both network and ICT in building a global network.

Especially the conferences, trade fairs and the Internet, are key in explaining the frequency of interaction between the entrepreneurial team and its counterparts. By using conferences and trade fairs to meet face to face with a large number of established and new contacts from around the world about three times a year, the costs and time of travel can remain limited, thereby helping startups to overcome their lack of resources, while establishing warm relationships with its counterparts. Similarly, Internet and e-mail was used to interact whenever necessary with counterparts around the world. With some contacts only one or two e-mails

[34] Clearly it would never have been possible for the firm to set up its own clean-room

were exchange, while with others, dozens of e-mails were exchanged in a period of only a week when dealing with a specific issue like product specifications or overdue bills. Whereas fax-messages, which were used most frequently to communicate with Pfon and Mr. Hills during the recognition and preparation phases would seem similar to the e-mail messages. Yet, as a result of its informal nature (references) e-mails were sent more easily and thus it lead to the exchange of new information to both new and established contacts which would not have been exchanged using other channels of communication.

The above indicates that as expected the role of networking in the global startup process was very important: first the network provided the entrepreneurial team with tangible and intangible resources to pursue the opportunity, second it provided the entrepreneurial team with information about new and additional opportunities, and third it provided the entrepreneurial team with access to new contacts with whom to establish exchange relationships (e.g. sales) as well. In this respect the role of networking in the global startup process is very similar to that in a domestic startup process. The most important differences are:

- The location of the contacts,
- Meetings are often postponed till the next planned conference or trade fair
- E-mail and internet are the most important channels of communication
- Entrepreneurs must be competent to communicate in foreign languages (when English is not the native tongue)

However, it must be noted that the role of networking is somewhat different from what I expected before starting this investigation. I expected that the location of the activities would be largely affected by the location of established contacts (as a result of information, referrals and direct co-operation). However, the case study showed that the different international activities were not related by or to specific external contacts. The Sound Inc. case has shown that the nature of the opportunity provides probably the best explanation of why a firm needs to start global. Also, the nature of the opportunity explains to a considerable extent what type of activities is pursued internationally and where these activities take place.

The entrepreneurial- opportunistic- behaviour of the entrepreneurial explains how it is possible for a firm to set up these activities. Building a network proactively proved to be more important than using the existing network as brokers to expand the network. Previously established liaisons could hinder the course of global startup process. Nevertheless, the basic assumption that entrepreneurial processes like the global startup process, take place in networks and that entrepreneurs are strongly embedded in their context is confirmed by this study. Combining these observations I arrive a the third overall conclusion of this research

Conclusion 3:

Proactive building of the network by the entrepreneurial team proves to be a more effective means of network building than using established contacts as brokers and intermediaries to potential new contacts. In order to achieve a global startup, entrepreneurial teams need to use Internet, e-mails and conference and trade fairs. These tools or communication channels allow the team and the firm to identify potential new contacts, be visible and expose itself so that it can be identified by new contacts and communicate with new and established contacts. By using these channels a global startup can, to a large extent, overcome to costs, differences in time zones and distance involved in doing business globally from the start.

10.2.4 Networking and the Global Startup Process

The final research question concerns a reflective question regarding the value of using an entrepreneurship in networks perspective in the study on global startups. In particularly I wanted to know to what extent this perspective is:

a. Suitable for describing, gaining insight and understanding the global startup process,
b. Provide points of reference for further research into the global startup phenomenon
c. Provide guidelines for practitioners involved in supporting global startups

On the basis of the exploratory cases, the longitudinal case study and the discussion of the findings it can be concluded that the perspective is indeed valuable. We have seen that the entrepreneurial process model applies very well to the global startup process with respect to both the three phases (opportunity recognition, preparation and exploitation) and the actors involved in the process. From the findings it can be concluded that founders of global startups are embedded in their context and interact with a large number of external contacts. Especially the longitudinal case study has shown that opportunities, which are at the heart of entrepreneurship, are the driving force behind the global startup process and these opportunities determine for a large part where the business activities take place. Also, we have seen that entrepreneurial orientation in the entrepreneurial team and the venture are important in understanding the content, course and even context of the startup process. At the same time, we see that networking to obtain information and access (rather than possession and control) to resources explain for a large part why startups engage in international activities and what form these activities take. Also, this creative use of the network explains for a great deal how it is possible for a new venture to engage in global activities: by overcoming resource constraints and obtaining information regarding opportunities to be pursued. As will be argued in more detail in the section on contribution and needs for further research, the combination of opportunities, entrepreneurial orientation and entrepreneurial network offers a range of new research topics and areas of interest. Also, practical guidelines derived from the entrepreneurship in networks perspective will be discussed in the following section.

10.3 Limitations of the study

Like any study, this study on global startups has its limitations with respect to scope and method. In the following paragraphs I will discuss the limitations of this investigation and argue how I attempted to compensate from these limitations or how they could be compensated in further research.

10.3.1 Limitations with respect to method

This study consisted of three parts; first based on a review of existing literature and an exploratory investigation of 5 existing and 5 new case studies I sought for and formulated a working definition of the concept global startup. Next based on a literature review a research framework was developed to guide the Case Study presented in discussed in Part three. The adopted method had several limitations. I first describe the methodological limitations of the exploratory study and then move on to the limitations of the longitudinal case study.

Regarding the exploratory cases it can be noted that the selection of the new cases was based on several criteria that were based on my views on what a global startup would look like (e.g. activities in multiple countries, various types of international activities). This selection bias results in a situation where the cases fulfil my original ideas. Yet, by also including existing cases, - firms which are considered to be global startups by others, the effects of this selection bias remained limited. Further, the level of detail of the exploratory case studies is limited, both

as a result of the exploratory nature of the investigation and as a result of the limited amount and variety of sources of data I gathered on each of the companies. Nevertheless, the cases all add to my understanding of what these firms are really like by giving insight in the other dimensions of the phenomenon such as their entrepreneurial behaviour, their focus on innovation and their dependency on partnerships with external organisation.

With respect to the longitudinal case study some limitations are also identified. First, the case study spans a period of almost 10 years. Although this extensive period enables us to see patterns develop over time, clearly the level of detail one can report is reduced by the timeframe.

As with all qualitative research, a danger may result from the researcher's subjective interpretation of the data. This subjective interpretation may affect the reliability of the findings and conclusions. To reduce this danger, I considered the use of several techniques such as the use of external rators and coding the data my self at several instances. I decided not to use external rators mainly because it would take too much documents to be coded before they would be able to establish an understanding of the data because the individual documents (faxes, e-mails) contained too little information. Instead I did discuss some examples of the e-mail discussion with other researchers to see if my interpretations of the sections seemed sensible. Also, I continued looking through the data and coded samples of the e-mails several times. Further, the reports were sent to the informants at several stages of this research to confirm factual data and the accuracy of my interpretations.

Despite the fact that some interviews were conducted at the start of the longitudinal case study, most of the data used in this study consisted of materials that were not created for the purpose of this research such as the (real-time) e-mails, archived e-mails, faxes and reports. The major benefit of this approach was that I did not have to bother the entrepreneurs and their employees too much. Using this method of data collection and analysis may however have limited the depth of feedback that was received.

The findings and conclusions presented in this dissertation are based on literature review, the outcomes from the exploratory cases and longitudinal case study of a knowledge intensive global startup. The research strategy was to seek theoretical rather than statistical generalisability. To this end, I confronted my findings with existing theory, which I tried to expand. I concluded that theoretically, the findings and conclusions should be generalisable to other high-tech global startups. Nevertheless, the next step should be to seek prove of generalisability across other high-tech global startups through multiple case studies and large-scale surveys. Further, the generalisability of the findings and conclusions in medium and low-tech sectors of industry may be limited. Although I expect that low-tech global startups also rely on network partners, I expect that the global startup process in such companies take a different path. For instance, R&D activities will be less important for these firms. Also, whereas high-tech companies often compete on niche markets or even newly created markets the basis of competition for such firms is very different than for firm that operate in more stable markets where competition may be based on low prices. Furthermore, sourcing activities of low-tech firms may focus on tangible resources, whereas high-tech firms may require intangible knowledge-based resources. This in turn might also affect in which countries the international activities take place. Whereas high-tech firms seem to be active mainly in highly developed markets, low-tech global startups might set up (production-related) activities in less developed countries where factor prices are relatively low. Finally, one note must be made with regards to the use of software to prepare, code and analyse the company e-mails. The program I used could not cope with the high volume of documents, despite the small size of the individual documents. As a consequence, I had to create several independents databases rather than one large. This makes it more difficult for other researchers to audit and verify my findings and conclusions.

10.3.2 Limitations with respect to scope

In a study like this it is essential to formulate clear and precise research questions and answer these in detail. As a consequence, it is not possible to address many related issues that come to the fore during the research. This poses some limitations to the scope of the study. The scope of the study is further confined by a number of choices made by the researcher with respect to the scope itself. In this research the scope was limited by the choice to focus on high-tech startup and neglect of low and medium tech startups.

My description a global startup, based on a review of the literature and the exploratory case studies, is highly qualitative in nature. I did not attempt to formulate a precise operational measure to identify global startups in a wider population of firms. Therefore, my descriptive definition cannot be used directly in large-scale surveys. A second limitation of the exploratory cases concerns the age of the firms. The case studies were based on companies that were still young (with the exception of Logitech and Sci Tex) but nevertheless already established at the time of investigation. The reason for this was that I wanted to develop an understanding of what a global startup actually is and what it means to start global. If we want to be able to support global startups from the earliest possible moment, it would be better to look at the characteristics of nascent ventures instead so that it becomes possible to identify these firms at the earliest possible moment.

Regarding the study of the global startup process a number scope-based limitations are also identified. In this study I examined this process from an entrepreneurship in network perspective and devoted particular attention to the role of the interaction process on the global start. Although acknowledging the driving role of the entrepreneurial team, I did not examine the background and experience of the entrepreneurs in detail, and thereby I might have neglected an important explanatory variable. Also, I decided to focus on the global startup process rather than the further development of global (startup) firms. However, a future follow-up study is considered to examine how Sound Inc. is doing now or in several years from now.

10.4 Contributions and Needs for Further Research

In order to have any value, a research should make a contribution to theory and or practice. In this study, my focus was to make a strong contribution to the theory of international entrepreneurship. The reason for this was that in my view previous research did not provide sufficient insight into the phenomenon. Because of the relatively young nature of the field, this is not surprising. Developing theoretical insights are necessary before we can support such ventures and formulate policies and or recommendations to managers of global startups. Nevertheless, this research does make a contribution to practice as well. Besides making a contribution to the knowledge and understanding of the global startup process and the role of the network in this process, a number of specific questions came to mind in the last few years, months and even weeks. In fact, the outcomes of this study point to many different areas for further research. Some of these questions result from the methods used in this study; others arise directly from the outcomes of my investigation.

10.4.1. Theory

With this research, I contributed to the development of the theory on global startups and international entrepreneurship as well as to theory of entrepreneurship in general. These contributions apply both to the knowledge on these fields as well as to the methods that could be used to study these phenomena further.

This study is the first to investigate the entire startup process of a global startup. By looking at the process from the discovery of the initial idea until the development of an established

globally operating company, this research has shown that for some firms, startup and internationalisation cannot be separated. Also, this research has shown that traditional types of international business, like sales and international manufacturing subsidiaries only explain part of the process. In my research, I have shown that in order to be able to sell products internationally, entrepreneurs must engage in a wide variety of formal and informal exchange processes across national borders or involving actors from different countries.

Regarding the description of what a global startup firm actually, it would be interesting to translate the highly qualitative definition to a more formal definition and operational measure that can be used to identify global startups in a population of firms. Within the framework of the Global Start project[35], we will initiate such an investigation. We will first translate each of the dimensions (propositions) into operational measures and testing these first on a group of previously identified group of global startups in each of the 8 participating countries. After that we will use the instrument on a large group of firms to identify the global startups after which we can then determine (using qualitative, shallow case studies) whether the classification (and thus our operational measurement instrument) was indeed accurate.

This study further revealed the strong influence of the nature of the opportunity on the global startup process regarding content, context and course of this process. By showing how much the general model of the entrepreneurial process actually applies to the field of global startups, I have expanded the field of entrepreneurship and the pursuit of opportunities itself. Examining the role of this opportunity in more detail would lead to a better understanding of the global startup phenomenon. In order to investigate the role of the opportunity in more detail both longitudinal case studies and large-scale surveys can be adopted.

Also, in this study I have shown how entrepreneurs are able to build a network consisting of many different types of organisations and a variety of relationships. The case study showed how important network contacts are for a startup firm when obtaining access to ideas, knowledge, facilities, human resources and contacts that enable the firm to actually begin commercial operations. At the same time, my research has shown that relying on existing network contacts can be dangerous. External contacts may have different agenda's and too much power over the startup company, as was shown from the alliance between the Sound Inc. TEAM and Pfon, and thereby endanger the development of the firm. Also, referrals or brokage relationships may be limited. The founders of a global startup have to behave very entrepreneurial even opportunistic – in the positive sense of the word- to build their network across the globe and thereby set up global operations. Next, in many publications on international new ventures, the authors have pointed to the facilitating role of innovations in communication technology in explaining the rise of such firms. The study actually proves how much this is really the case, and shows how entrepreneurs such Internet and e-mail to communicate with their contacts around the world. Further, the list of proposed Global Startup dimensions (descriptive statistics) can be used by researchers to identify potential global startups to be involved in research projects. In order to use these dimensions in quantitative studies attempts are now being made to reformulate these dimensions in more operational and quantitative measures.

In particular, the research showed that the measures I originally used for the resources exchanged between the entrepreneurial team and its network, based on the conceptualisation of Brush et al. (2001) proved far from complete. Already during the pilot study it became apparent that besides raw materials, financial capital, technology, human resources, organisational resources and social resources, resources such as reputation, legitimacy and power provide to be important resources in the startup process. Although these resources belong to the social resources in the sense that they exist within the relationships between two or more actors, the findings nevertheless show that a more detailed and theoretically sound resource classification

[35] Global Start is a European project involving 8 research institutes and universities from 6 different European countries in which best practices in supporting nascent global startups are established, and tools are developed to stimulate and support global startups

needs to be used. The four-S capital constellation to which I referred in chapter 5 (e.g. Groen, 2003; Kirwan, 2004) may be able to provide such a framework.

As mentioned, the findings of this study are not only relevant for the field of international entrepreneurship but to entrepreneurship in general. For instance, as argued in the previous chapter, the formation of the entrepreneurial team in the Sound Inc. case was rather problematic, yet did not affect the course of the global startup process significantly. I also stated that the formation vicissitudes could at least partially be explained from the lack of experience of Mr. Wide and his two friends Tony and Peter when it came to management or entrepreneurship. Because many high-tech firms and especially academic spin-offs based on scientific discoveries, are being founded by former scientists) further research into team formation of scientific entrepreneurs will increase our insight into the dynamics and problems of this issue and may help future entrepreneurs in forming their entrepreneurial teams. Similarly, as mentioned the findings related to the alliance between Sound Inc. and Pfon are not specific to international alliances but are insightful with respect to alliance between startups and established multinationals in general.

In addition, the conclusion that entrepreneurial orientation and networking are driving forces behind the (global) startup process opens the door to a new topic of research. So far the entrepreneurial orientation construct has not include an element of networking. A possible reason for this may be that entrepreneurial orientation builds on the strength of the individual entrepreneur and its innovativeness, proactive ness and risk-taking behaviour vis-à-vis its environment rather than its position within its environment. This study has shown that proactive and creative use of the network can actually be regarded as an example of entrepreneurial behaviour and entrepreneurial orientation. This suggests that expanding or complementing the concept of entrepreneurial orientation with a network element could offer a better understanding of entrepreneurial behaviour.

However, many topics in relation to the global startup process are yet to be explored. For instance, the role of the entrepreneurs in the process is in need for further investigation. In the Sound Inc. case the global startup process started with the discovery of a technological principal by an inexperienced researcher. Although his behaviour from the start can be described as highly entrepreneurial, it nevertheless took the arrival of an experienced businessmen and entrepreneur to give shape to the commercial activities of the nascent firm. Both case studies and surveys can be used to examine the how the background of different entrepreneurs and (compositions of) entrepreneurial team effect the global startup process.

Also, this research did not examine the success of global startups at a later stage in their development. The reason for that was simply because my interest was in their startup process rather their future development. However, it would be interesting to follow firms over an even longer period that I did here. To do so researchers may include longitudinal case studies or annual surveys in their method.

This research was based on a case study method focusing on high-tech startups and in particular on a university spin-off. As discussed the context in which an opportunity is created determines for a large extent the course of global startup process. Therefore, it would be interesting to determine to what extent difference in the global startup and networking process can be observed between different types of startups: university spin-offs versus company spin-offs versus independent startups. Also, examining differences between high-tech and low-tech global startups with respect to the content, context and course of their global startup and networking process will provide additional insight into the phenomenon. Further, examining failed and terminated global startup projects would also add to our understanding. Focusing on failure however does require that researchers try to identify potential global startups as soon after the discovery of the initial idea as possible. In order to find such cases, research departments (both at universities and companies), incubator centres or business angels could be contacted and involved in such research efforts.

10.4.2 Methodology

Outside the theoretical scope of this research, some recommendations concerning methodology l have to be made. In this research, I adopted a new and exciting source of data: company e-mails. My experiences showed that preparing and analysing e-mails was time consuming. Also validity checks, like re-coding by multiple researchers, proved difficult because a very large number of e-mails had to be worked through before information became apparent. Finally, existing software packages proved not be ready for using e-mails as a source data without significant manual manipulation (cutting and pasting the e-mails to reduce the number of documents). Nevertheless, the use of e-mails in entrepreneurship research provided to be highly valuable. The information contained in the e-mails proved to be very rich and revealing and without them, I would not have been able to yield the result I did and without having to 'disturb' my informants too much. During the analysis it became clear that the informal nature of some e-mail conversations made tacit knowledge more explicit Groen and Nooteboom (1998) call this intellectual 'mid-wivery'. Reading the company e-mails was like listening to telephone conversations or witnessing face-to-face conversations. Consequently analysing company e-mails proved to have characteristics similar to direct observation. Subtle meanings became clearer as the analysis of the e-mails proceeded, thereby increasing the researcher's insight into the phenomenon under investigation. The results of my study show that using e-mails of a source of data is highly valuable. This shows that not only the entrepreneurs can benefit from technological developments like e-mail and Internet, but we as researchers can benefit from these innovations as well. Therefore, I would recommend researchers to add company-e-mails as a qualitative source of data in their case studies whenever they can. To optimise the reliability of the e-mail analysis using multiple researchers working in teams or separately would be advisable.

Conclusion 4
From the research it can be concluded that using company e-mails in qualitative research on entrepreneurship provides a valuable in and insightful approach in combination with other approaches that are more commonly used in qualitative research.

The choice for adopting a case study method was based on the aspiration to develop a detailed and rich understanding of what it means to be a global startup firm and to start global. Also, in my view the state of the field at the start of this research required a case study method rather than a (longitudinal) survey. Although yielding internal validity, a case study does not allow us to generalise the conclusions on statistical basis. Therefore, testing the propositions using a large scale, and if possible multiple-country, survey would be the next step. Such quantitative studies could further examine the exact role of specific partners in the network. For instance, I wonder to what extent roles played by different types of partners can be taken over by others. Sound Inc. was able to develop a strong research positions they could use the labs of the University and could direct some of the researches of the Ph.D. students working at the Beta Institutes. If they would not have had this close relationship it might have been more difficult to achieve the level of performance as they did now. Yet, if the company had decided to attract venture capital earlier on in their existence the presence of financial capital might have enable the firm to set up its own research facilities to gain a more independent position in that respect.

10.4.3 Teaching

This study has shown that the mindset of the entrepreneurial team is very important in building a global startup. The case studies show that entrepreneurs may not always have to have hands-on international experience, but that they do need to feel comfortable in doing business in international contexts. They need to obtain skills that enable them to look at the world as a borderless place and engage in interaction with people and organisations from different cultural and political settings. In educating the next generation of entrepreneurs, teachers and trainers should attempt to focus on these issues and include elements that enable future entrepreneurs to deal with these issues. Language skills seem to be one of the most obvious areas for including and a skills training package for such entrepreneurs. Although, it seems that English is the most important language for doing business across the globe, this may not be the only language future entrepreneurs may need to master. In addition to language cultural sensitivity, development of a sense of major institutional frameworks and organisations in different regions or countries may also have to be included. Traineeships and role-plays may be beneficial tools in this respect.

10.4.4 Policy-making

This research has several implications for policy. First, this research has shown that starting global is much more about entrepreneurship than about rapid international sales activities. This means that if policy makers want to support global startups export marketing schemes are not sufficient. The findings of this study show that informing and educating (potential) entrepreneurs about the use of various traditional and less traditional cross-border activities (including the use of foreign exchange students and researchers or the use of foreign testers) may enable entrepreneurs to overcome their usual resource constraints and could help them think outside the usual patterns of international business so they can start to be really entrepreneurial.

Further, they should use global startups as examples to show that international activities need not be more difficult than starting a domestically operating firm. Starting global can be fun. However, this research has also shown that the opportunity determines for a large part whether a firm should start global in the first place. It seems that if the opportunity requires a global start, the start will be global or else the venture will be terminated, alternatively stimulating or even suggesting an entrepreneur to start global when it is not necessary seems to make little sense.

On a more practical level the some of the findings can be used as tools in policy making or in support programs. The dimensions of the global startup firm can be used to identify early on which firms are at least potential global startups and may be considered for inclusion in specific support programs. Already they will be used in the European GlobalStart project.

10.4.5 Management and Entrepreneurship

The Sound Inc. case provides a large number of examples of how entrepreneurs can organise their venture so that a global startup is possible. First, the use of an up-to-date, interactive website enables a global startup firm to communicate and interact with its counterparts around the world, regardless of differences in time zones. Second, visiting conferences and trade fairs enables startups to present the company, introduce new products and services and to and meet with a large number of new and established contacts at the same time. Despite the relatively high costs of such events, this proved to be a good method to increase awareness and acceptance of the company and its products and expand and develop the company's network at the same time. Third, the development of an extensive international network of distributors and ('incidental') agents enables a startup to build a customer base around the world swiftly and

without having to set up an extensive sales-organisation in-house. Also, it enables the company to benefit from the country-specific knowledge and networks of these individuals and or organisation and thus from their information about local opportunities.

Further, the use of external testers of the products is beneficial to startups in several ways. To begin with, it enables the entrepreneurial team and the venture to build legitimacy. If unrelated not-for-profit organisations work with and promote the company's products (e.g. in presentations and papers) this will convince others of the quality of these products, much more than when the company itself promotes the products. Also, the possibility for commercial as well as research or governmental organisation to test products before deciding on buying the products reduces the risks for the potential customers and will therefore increase the likelihood of attracting new buyers. Finally, the use of external testers results in a virtual increase of the R&D capacity of the firm. It should be noted however, the company cannot and should not try to determine the focus and direction of the testing research done externally too much as this would reduce the company's legitimacy rather than increase it.

The use of students, both as permanent (part-time) employees and as trainees working on specific topics and projects keeps the costs of human resources limited, increases flexibility and strengthens the relationship with universities and colleges. In the case of Sound Inc. the flexibility (in working hours) was especially important because the entrepreneurs themselves also worked at different times, often outside office hours because both of them had other occupations during the day. This suggests that this would be a case specific advantage. However, the flexible working hours also enables firms to respond rapidly, sometimes within the hour, to requests (by fax, e-mail) from contacts around the world. With regards to the relationship to the university it should be noted that most of the contacts maintained by the student-employees took place a lower levels in the organisation, e.g. to PhD. students. Nevertheless, these social contacts were sometimes very valuable. For example, one of Sound Inc.'s employees obtained some valuable information about one of their competitors through a Russian Ph.D. student working on an assignment for the competitor, while having some drinks after work. Also, the students often had direct access to the latest knowledge developed at the university. Regarding the rapid globalisation the case study shows that having a positive, perhaps even carefree, attitude towards international activities is essential. The fact that Sound Inc. was conducting business around the globe was simply inevitable as a result of the product the company offered. Nevertheless, the founders, Mr. Wide and Mr. Path, spoke about opportunities, possibilities and chances rather than problems and treats in relation to international business. Although changing a previously developed attitude or mindset may be difficult the case study nevertheless shows that believing that a global startup is both possible and 'fun' clearly facilitates the process. In relation to having a positive attitude, speaking multiple languages (German as well as English and some French besides Dutch) proved very necessary for Sound Inc. and will also be essential for other global startups. Founders of global startups should therefore seek to develop such skills for themselves and their employees

A final recommendation derived from the case study involves the sabbatical leave of the company's principal scientist and co-founder. Although at first, I was sceptical about the effects of this leave on the company's development and external appearance. However, his leave provided the company with an opportunity to professionalise and change from a technology push company to a market driven firm. The continuous introduction of new products hinders the transition and the physical distance or temporary removal the engine of the production innovation process for some time may by be a solution. Therefore, startups that are struggling with this change process may want to consider such an approach as well. It should be noted however, that the return of the principal researcher at a later stage would be necessary to begin the next round of innovation when the company is up for it. If he (or she) does not return to the venture, the innovative capacity of the firm may be endangered.

Ingrid Wakkee, September 2004

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APPENDICES

Appendix 1 Case studies in the Literature

Author, year	*Identity*	*Rich & Revealing?*	*Location*	*Industry*
Andersson & Wictor, 2003	Not revealed	+	Sweden / Germany	Medical
Arenius, 2002	Not revealed / aliases: Quicksilver Platinum Silicon Oxygen	+	Finland	Software products and services
Lummaa, 2002 Autio, Lummaa & Arenius, 2002	More magic Smartner information Systems VLS WCL	+	Finland	Mobile payment Mobile data access High speed modems Mobile commerce applications
Coviello & Munro, 1995	Not revealed	+	New Zealand	Software
Deo Sharma & Blomstermo, 2002	Helax IAR Systems	+ +	Sweden Sweden	Radiotherapy ICT / Chips
Jolly et al., 1992	Logitech Technophone Conner Peripherals Lasa Industry	+ 	USA + Switzerland +Italy USA USA + Europe USA	Computer desk top aids Mobile phones Computer peripherals ASIC's
Knight, Bell & McNaughton, 2002	Not revealed	-	New Zealand	Seafood
Oviatt & McDougall, 1995	Ecofluid Eesof Heartware International Investment Group IXI Ltd Momenta Oasis Oxford Instruments Spea Techmar Jones Technomed Wave Systems	+/- +/- + (Oviatt et al.) +/- +/- +/- (see Gupta) +/- +/- +/- +/- +/-	Czech Republic Germany USA USA UK USA UK UK Germany USA France USA 	Waste water treatment Software Medical devices Consultancy Software Pen-based computers Management services Instruments / sensors / measures Software Water treatment Medical Devices Sensors / measurement
Oviatt et al., 1994; McDougall et al., 1994a, 1994b	Heartware Int.	++	USA	Medical devices
Rasmussen et al., 2001	Not revealed	+ + + + +	Denmark Denmark Denmark Australia Australia	Furniture Medical Devices Software Medical Devices Fishing (production systems)
Ray (1989; 1995)	Camarao Brasiliensis Sci Tex Femcare Signatronics APA publications	+ + + + +	Brazil Israel UK Singapore Singapore	Schrimp culture Micro systems Medical Devices Electronics Travel book publishing

Roberts & Senturia, 1996	Not revealed (sample size = 20)	+/-	USA	Software and computer peripherals
Sasi & Gabrielsson, 2002	Small Planet Mad Onion	+/-	Finland	ICT
Simoes & Dominghos, 2001; Dominguinhos, 2002	Altitiude Software Calzeus ChipIdea Critical Software	+ + + +	Portugal Portugal Portugal Portugal	Sotware footwear Micro chips Software
Yli-Renko & Autio, 2002	AutoOptics FireTech EnviroHeat ProdSystems Telectron	+ + + + +	Finland	Micro systems (optronics) fire protection systems Eco power generation technology Construction Contract electronics manufacturer

Table 1A.1 Overview of Case studies in the literature

Appendix 2 Case Study Protocol Exploratory Cases

Purpose of exploratory cases:
Develop a rich qualitative description of the global startup concept to answer the first research question of this thesis:

What is a global startup?

Case study selection:
5 existing cases from the literature (see appendix 1 for an overview) selected on the basis of four criteria:

- Real identified to allow for gathering additional information
- Rich and Revealing descriptions
- From different locations of the world
- From different industries

4 new cases selected on the basis of five criteria

- Easy access through the network
- Access to several data sources
- From at least two countries
- Representing high-tech industries
- Representing different industries

In total I conducted initial interview with 8 Dutch firms and 3 Spanish firms. Three Dutch and two Spanish firms were not interested in being involved in research or were not active on global markets. A fourth Dutch firm was Sound Inc., the firm on which the longitudinal case study was conducted. It was decided not to include this firm in the report of the exploratory study for two reasons: first, the company wanted to keep its identity anonymous as the information about their firm reported in the case study chapter was too detailed and touched upon their personal lives to a high level. Since the other firm's identity was revealed there would be an unbalance. Second, all information about this firm would be included in the longitudinal case study anyway, therefore it would more sense to focus on the other four ventures.

Sources of Data
Even though the cases were mainly exploratory a basic level of triangulation was deemed necessary. With regards to the existing case studies, I believed more recent data would be necessary to put the original study in to context. Also because the original case studies were created to answer or exemplify different research questions, the information needed to answer the research question at hand was not always reported in the case study report. Therefore additional data would be necessary.

With regards to the new cases, I did not simply want to build my report solely on what the entrepreneurs told me. Therefore, I tried to obtain at least one additional source of data as shown in the table below

Case	*Original publication*	*Interview*	*Website*	*Business / marketing plan*	*Brochures / reports*
Ecofluid	X		X		
Logitech	X		X		X
Heartware	X				
Sci Tex	X		X		
ChipIdea	X		X		
Micronit		X	X	X	
NedClad		X	X	X	X
Lionix		X	X		X
Illice Biotech		X	X		X

Table 3 Data Sources for Exploratory Cases

Case Study Questions

From the literature review I obtained a list of dimensions of the global startup (and related) concept(s) as were used in the literature. These included:

1. Scope
2. Intensity
3. Time to entry
4. Company age
5. Purpose of internationalization
6. Global diversity
7. Technology intensity
8. Company size

On the basis of a discussion and the data from case studies I examined to what extent each of these dimensions were actually relevant in describing the global startup concept. This yielded a new list of dimensions:

1. Time to entry
2. Purpose
3. Scope
4. Global Diversity
5. Entrepreneurial Nature
6. Role of the Entrepreneur
7. Role of the Network

Each case was then evaluated on the basis of these dimensions using the following questions:

- Time to entry: how many months / years after the venture was founded did formal or informal international activities begin?
- What was the purpose of the international activities? (lack of domestic markets, need for international resources, need for international partners, pursuit of opportunities, or combinations)
- Scope what type of international business activities have been performed by the venture since its inception until January 2004 and what network entry modes have been used by the ventures to establish international networks (1: sourcing, R&D, production, marketing, sales, after sales service and support, informal knowledge exchange; 2: use of intermediaries, unsolicited contacts, proactive approach of new contacts through internet, or other channels)
- Global diversity: in which regions or continents has the firm set up activities or network contacts (Europe, North America, Asia, Middle East, Australia, Africa, Latin America)

- Entrepreneurial nature: to what extent can the ventures activities be described as risk-taking, innovative and proactive (no, limited, medium, strong)
- Role of the entrepreneur: how strong is the entrepreneur and to what extent does the entrepreneurial team have actual international experience, confidence and or skills (no, limited, medium, strong)
- Role of the network: to what extent has the company been dependent on or more strong partners for its startup or survival and for entering new international activities or markets? (no, limited, medium, strong)

The findings are reported in Chapter 3 and an overview is shown in Table 3.2 in the dissertation.

Guide for the case study report
After describing the purpose and methodology used in the case study, all cases are briefly introduced starting with the existing cases. After that a cross-case discussion is provided drawing on exemplary data obtained from the different cases. It should be noted that not all of the information revealed in the discussion has been reported in the introduction of these cases.

Quality considerations:

Multiple data sources were used for triangulation. Two other researchers have reviewed the case materials and helped writing a conference paper based on the exploratory research. Further the original authors of the existing case studies as well as the founders of the case-ventures obtained a copy of the report and were asked to review and send their comments to enhance validity.

Appendix 3 Case Study Protocol Sound Inc. Case

Purpose:
To describe the global startup process of Sound Inc. as well as the interaction process during the global startup process in such a way that a model of the global startup process comes to light as well as the role of the network in this process.

Method:
This case study is based on the case study method as described by Yin (1994). Multiple data sources and methods of analysis were used to achieve triangulation.

Research process:
The research process is summarized in Table A3.1

Step	*Action*	*This Study*
Case Selection	Formulation of Criteria	• The firm was founded no more than 3 years at the time of the start of the investigation to ensure it would reach the end of its startup process towards the end of the research. • The firm already showed clear signs of global activity at the start of the investigation • The firm seemed to have been able to establish a sustainable position in the market, despite its young age, to minimize the change of company failure and termination during the course of the investigation[36]
	Gaining Access	Contact was established initially by telephone and e-mail in which I introduced myself, mentioned the names of two joint network contacts and explained they believed Sound Inc. would serve as an interesting case study. After that I briefly explained the purpose of the study and asked for an introductory meeting. I had introductory meetings with both founders separately, starting with Mr. Path. During these meetings I explained the purpose of my study and its status (it was in the very early stages) in more detail.
	Making arrangements for data collection	With Mr. Path I agreed that I would meet with him on several occasions and would further be updated by telephone. During the meeting with Mr. Wide, he came up with the idea to give me access to their e-mails so I could keep up to date on a daily basis. This reduced the need for meetings and telephone calls considerably. The company was willing to give me access for three reasons, first they had considerable experience with doing research themselves and were often hiring students to work on specific assignments therefore they did not consider my request as being strange or obtrusive, second they trusted my contact persons, third at the time they (and especially Mr. Wide) saw my research and resulting publications as a way to attract more attention to their firm.
	Contracts	The entrepreneurs did not believe a contract would be necessary, they trusted I would show all reports and publications on their firm to them first to obtain their approval, comments or rejections.
	Third parties / privacy	We did not discuss how to deal with privacy of third parties at the time, however, even before the decision was made to keep the identity of Sound Inc. hidden I decided to hide the identity of all commercial contacts
Sources of Data	Multiple sources enable triangulation and enhances validity	Interviews with company officials and discussions about the company with external informants Internet pages (company pages + pages found through browsers and search engines) E-mails + attachments Faxes Internal reports Information for Register of Chamber of Commerce Photo's Press releases + news papers and magazine articles+ Scientific publication

[36] Although company failure can be extremely insightful and revealing, the purpose was to describe a startup process that would lead into the next steps in business development (growth and or maturity)

Data Collection	Real Time – Post Date	Post Date Decreases Impression Management From Side Of Decision Maker; Real Time Reduces Chance Of Pre-Selection And Enables 'Gradual' Analysis Some data, e.g. the majority of the company e-mails, the company websites, some interview data were collected in real time, other data was collected post date
	Time Frame	Whereas typically interviews are the most important source of data, which is then complemented and contrasted with other (documentation-based) sources, written sources like, e-mails, faxes, and internet pages were the most important source of data. These sources proved to be very rich and enabled me to conduct research in a way which was not time-consuming at all for the company officials. Also, as these data were not produced for the purpose of this study, perceived social desirable behavior
Preparation	Using Software	Use of software will facility and reduce the time needed for analysing the data. As I will se both automated coding and manual coding and review of the documentation it won't be a problem to stay close to the data. It is not my intension to quantify the data completely. Combinations of quantitative data and qualitative interpretation will allow for increasing validity, reliability and general richness of the study.
	Creating Data Base:	I decided to use Nvivo based on advice from the institute's Methodologist • Evaluating relevance of documents based on first review of the material. For instance scientific publications on the Sensor were not included in the database but kept in a separate file as they would not provide information that could help solve the research questions but only supplied technical information. With regards to the e-mails all Spam and personal messages wee removed. • Individual documents were loaded into the database, linking non rtf or txt files with the Databit tool • Housekeeping (proofing for obvious language errors, identifying chains of send-reply-forward e-mails by color coding, clarify uncertainties, add first impression and notes to the text; Resolve Language Problems 'Difficult Words') • Creating Sets And Subsets
Analysis	Inductive – Deductive	Combination of inductive and deductive reasoning, building on previous theory but at the same time staying open to all other potentially relevant information and alternative explanations. I tried to search for themes in the data but because of the many double e-mails this could not be done automatically but had to be conducted manually to come up with additional codes (attributes and values) in addition to the ones identified from the theory.
	Coding	Automatic And Manual Coding Of documents and document sets and groups, filling out the attribute tables
	Reconstruct processes	Creating time lines of activities Model network compositions and behaviour over time Create logical and theoretical links between the data and the theory and come up with various explanations

Sources of Data
In the case study triangulation was sought through the use of multiple sources of data. Table 10 (repeated below) shows which types and what number of data sources were included in the investigation.

Data sources	*Description*	*Number*
Interviews	Company officials	6
	External informants	3
Websites	Company internet pages	73
	Other websites	38
Popular Press	University news papers	3
	Dutch magazines	2
	Web magazines	1
Scientific publications	Journal articles	6
	Conference papers	13
	Dissertation / Book	1
Archived documents	Faxes	234
	E-mails	87
	Contracts	16
	Memo's	21
	Web statistics	5
E-mail	E-mails	708
	Attachments	78
Physical artefacts	Photo's	36
	Datasheets	16

Table 10 repeated

Data Selection
The data was collected at several moments during the case study. The timing of data collection as well as the periods covered by the data was showed in Figure 10. For each of the informants, an informant data-sheet was completed (see appendix 4 for an example).

Guide for the case study report:
First an extensive chronological overview of the global startup process of Sound Inc. is provided. After that, this process is analysed with regards to the content of the process ie. The nature of the opportunity and the type of activities; the course of the process ie. The timing and coherence of the activities; the context in which the process takes place. Although the original plan was to reveal the names of the company and the individuals involved in the process, the entrepreneurs asked me to make the report anonymous as it contained too many personal details. To hide their identity I used fake names for all the organisations and individuals (except for the science foundation) and changed the location of a few important players, as their real location might reveal their identity as well.

Quality considerations
Multiple data sources were used for triangulation. Two other researchers have reviewed the case materials and helped writing a conference paper based on the exploratory research. Further the original authors of the existing case studies as well as the founders of the case-ventures obtained a copy of the report and were asked to review and send their comments to enhance validity. In the Table 7 (page 90), I summarised to what extent and how the quality considerations of Miles and Huberman (1994).

Appendix 4 Informant Data Sheet (example)

Personal information

First Name:	Alex
Family Name:	Path*
Gender:	Male
Year of Birth:	1962
Nationality:	Dutch

Experience:

Education:	Master Degrees in Business Administration and Mechanical Engineering
Work:	Several engineering and management positions, consultancy, founder and owner manager of Metal Shop* and Sound Inc*

Informant and Sound Inc.

Relationship to Sound Inc.:	Founder and general manager
Involved since:	Met Mr. Wide (the other founder) in May of 1997 after being introduced to him by a Associate Professor at the Dutch University. Signed a partnership agreement with Mr. Wide in December of 1997 and founded Sound Inc in 1998

Information provided:
Considerable information about the history of the firm, its strategy and goals as well about the relationship with the Dutch University.

Number of contacts with informant:
10

Dates of contact with informant:
March 2001 (e-mail)
March 2001 (interview)
May 2001 (interview)
October 2001 (interview)
January 2002 (interview)
March 2003 (e-mail)
June 2003 (e-mail)
June 2004 (3x e-mail)

Topics discussed with informant:
Company history; company goals, company culture; internationalisation; networks
Proofing of preliminary reports and publications

Appendix 5 Attributes and Values

Attributes	*Description*	*Values*	*Remarks*
Type	Type of Data Source	Interview report Company E-mail Fax Internal Report Contracts and other archived documentation Company Website Other websites News paper and magazine articles Other	
Creator	By whom was the document originally produced	Researcher Entrepreneurs Other company officials External contacts	Documents (report) was created by me e.g. in the form of an interview report or Mr. Wide or Mr. Path originally produced this document (e..g the e-mail, fax etc) A company employee or trainee produced this document (e.g. e-mail, wiebsite or internal report This document (fax, e-mail, contract) was produced originally by an external contact of Sound Inc.
Time	Time of creation of document	Will be listed as specific as possible ranging from the month and year (e.g. some of the archived faxes) to the exact minute of the exact day (e.g. the company e-mails)	
Topic	Topic discussed in document[37]	Discovery of the idea, Thinking through talking Decision to exploit Resource acquisition R&D Manufacturing Marketing Sales After sales service Internal organisation Co-operation Technical information Other	Initial classification based on description of the generic model of the entrepreneurial process (Van Der Veen & Wakkee, 2004) as well as on the basis of occurrence of topic-value in the original data source.
Contacts	Contacts mentioned in data source	Name of person and / or organisation	
Links	Document is linked to other documents	Lists the reference or connection to other documents (e.g the other e-mails or faxes sent to, by or about this person; and / or all documents referring to the same topic)	Links are established after all documents are analysed, using automated searches (on contact name and / or topic value) in Nvivo

Table 5A.1 Document Attributes

[37] Multiple values possible

Attributes	*Description*	*Values*	*Remarks*
Activity	Business Activities related to the opportunity	Developing ideas, Sourcing of resources from domestic or foreign suppliers directly or through intermediary	Classification based on Jones (2001); Knudsen & Madsen (2003)
	Formation of the organisation	Foundation of the company Formation of the team Creation of internal communication systems	Classification based on pilot study results
	R&D activity	Independent R&D activities Inward R&D: contract in R&D or licence in technology Outward R&D: licence out technology or contract out R&D	Classification based on Jones (2001).
	Production	independent production performed domestically or abroad inward production: technical service or consultancy or contract in manufacture Outward production: Contract out manufacture or	Classification based on Jones (2001)
	Marketing & Distribution	Technical service or consultancy Presenting the firm and its products at conferences and trade fairs domestically or abroad Presenting the firm and its products through a company website	Classification based on pilot study results
	Sales	Direct approach of domestic or foreign counterparts (direct mail, telephone calls) Creation of promotional materials	Classification based on Jones (2001); Knudsen & Madsen (2003) Classification based on Jones (2001)
	After sales service	Domestic or foreign sales directly or through intermediaries Management or marketing service or consultancy performed domestically or abroad for domestic or foreign clients Follow up contacts Additional product information Application support Modification of sold products	Classification based on pilot study results
Time	Moment of start of Business Activity	Month/ year	Most authors (e.g. Autio & Sapienza, 1999; Jones, 2001) use number of years rather than months (is not accurate enough if investigating the startup process)
Contacts	Contact(s) involved in Business Activity	Name person and or organisation	
Location	Location(s) where Business Activity takes place	Country name	Countries rather than continents are listed to develop a more detailed picture

Table 5A. 2 Business Activity Attributes

Attributes	*Description*	*Values*	*Operationalisation*	*Source*
Name	Contact name	Name person and organisation	Name	
Organisation	Type of Organisation	(multinational)Company / industry	For profit manufacturing or (non-consultancy) service organisation	e.g. Groen (1994)
			consultancy	e.g. Groen (1994)
		consultancy	Universities, other non-profit and	e.g. Groen (1994)
		government (al organisation)	commercial research institutes and	e.g. Groen, (1994)
		research institutes	laboratories	e.g. Groen (1994)
		financial organisation	Bank, venture capitalist, business angel	From pilot study
		science foundation	National and international science foundation	Groen (1994); Sansez & Perez (1998)
		regional institutions	Chamber of commerce, business associations, innovation centers, trainings institutions	
Location	Location of contact	Country name	Country namr	
Strength	Strength of Relationship	Inner circle	Contacts with whom the entrepreneurs communicate with on almost a daily basis and	De Koning, 1999**
		Action Set	to whom they turn to for advice and support\	Tie strength is typically measured as a combination of affection, frequency of communication and multiplexity of the relationship (e.g. Granovetter, 1973)
			Contacts with whom the entrepreneurs communicate with on a frequent basis in relation to a specific topic or field of business;	
		Strong tie	members of the action set can come from the network of strong ties (these are usually part	
		Weak tie	of multiple action sets simultaneously) or the network of weak ties	
			Contacts with whom the entrepreneurs communicate with on a frequent (at least once every two months) basis and / or with whom they have a multiplex relationship	
			Contacts with whom the entrepreneurs usually communicate with on an infrequent basis (less than 6 times a year) and / or with whom they have a singular relationship	
Relationship	Type of Relationship	Customer	SI sells products to this organisation	Groen, (1994); Hakanson & Snehota (1995)
		Supplier	SI buys resources from this organisation	
		Parent organisation	SI is a spin-off from this organisation	Groen (1994); Hakanson & Snehota (1995)
		Investor	SI has obtained financial resources from this organisation in exchange for part of the profit / revenue	
		Partner	SI has a contract or formal or informal agreement with this organisation to co-operate in a specific area (e.g. joint research project)	
		Distributor	This organisations represents SI in a specific market to sell its products in exchange for a fee	
		Tester	This organisation gets SI's products for free of for a discounted price and conducts application-based tests with these products and produces a (scientific) paper about these tests to be presented at a conference or trade-fair	From pilot study
		Mentor	This organisation (individual) voluntary supports the entrepreneurs morally and with advice, may also open its network to the entrepreneurs	Groen (1994)
		Competitor	This organisation competes in the same industry / markets with similar or substituting products	Groen (1994)
		Accournant / consultant	This organisation performs the financial accounting for SI and / or acts as an organisation or management consultant	
Content	Type of Resources Exchanged	Raw materials	Non-technological components, materials	Adapted from Brush et al., (2002)
		Financial resources	Access to money either through investments or loans	
		Technology	Knowledge about (the location and application of) new technology, blue-prints, licenses, or conducts R&D activities for or together with the firm	
		Human resources	Manual or intellectual labor	
		Organisational resources	Knowledge concerning the formation of the organisation, access to office facilities, managerial support or consultancy	
		Network resources	Information about, referral and introduction to new network contacts or mediation between contacts during negotiations or conflict	
		Internationalisation resources	Information about institutional, legal, cultural issues in international markets	

Topics	Number of topics discussed with this contact	Market, clients and competition Technology and development process Co-operation with partners Organisation, legal, finance Personnel, accommodation and equipment Finance Product specification Sales Marketing, communication channels Distribution	Which of these 11 topics were discussed with this contact (keyword and synonym search in Nvivo)	Adapted from Scholten et al., 2004
Multiplexity	Combination of the number of different types of resources exchanged and topics discussed	1 or 2 3-5 6- 10 11 – 15 16-20	# of resources + # of topics	Adapted from Scholten et al., 2004
Frequency	Frequency of Contacts	Daily Weekly Bi-weekly Monthly Bi monthly Once or twice per year One time contact	Number of communications between SI and contact that can be identified in the different sources of information.	
Duration	Duration of the relationship	Less than one month 1 to 6 months 6 to 12 months 12 to 36 months (1 to 3 years) 36 to 120 months (3 to 10 years) more than 120 months (10 years)	Measured as the number of months a relationship exists	Adapted from Scholten et al. 2004
Origin	Origin of Contact	Through third parties From childhood and family Previous employment Network events Conferences and tradefairs Unsolicited contacts Internet, directories Other	SI has been introduced to this organisation / individual by a previously established contact SI entrepreneurs know this organisation / individual through family ties, because they grew up in the same neighborhood or went to school together SI entrepreneurs know the organisation / individual through previous employment e.g because they were colleagues, superiors, other people in staff units or because they did business with each other SI entrepreneurs met this organisation / individual at a (local) network event (e.g. organized by the chamber of commerce or science park SI entrepreneurs met this organisation / individual at a conference or tradefair SI was approached by this organisation / individual e.g. by phone or (e)mail SI entrepreneurs know this firm after finding it as a result of a search on the Internet or in other directories (e.g. phone book or yellow pages) SI (entrepreneurs) know this organisation / individual through another way then the ones listed above. Contact has an other origin than the ones listed above	Granovetter (1973) Scholten et al., 2004 From pilot study

Channels	Communication channels used for contact	Face-to-face, Video conferencing Telephone instant messaging / chat	Oral media provides opportunities for immediate feedback	Sproull & Kiesler, (1986) Zmud (1990) Haythornthwaite (1996)
		e-mail fax letters memos and reports	Written media, with opportunities for immediate feedback Written media with opportunities for rapid or postponed feedback	
		indirectly via websites, publications and presentations	Written media without opportunities for rapid feedback	From pilot study!
		through intermediaries	Indirect media with control over the message conveyed	Zmud (1990)
		other (e.g. tours and visits; on-line data base, decision support systems, computer generated reports)	Indirect media, with little control over the message conveyed	
Stages	Stages of the process in which the contact plays a role	Opportunity recognition:	entrepreneurs have idea to start company but not yet started the preparations for company foundation	Greve (1995); Van Der Veen and Wakkee (2004)
		Preparation:	entrepreneurs are in the process of planning and starting a business but have not yet began sales activities	
		Opportunity exploitation:	entrepreneurs are in the early stages of running the new business	
Influence in Startup	Influence of contact on startup process of Sound Inc.	Ranges from weak to strong	Based on four measures - Frequency of contact (strength) - Multiplexity of the relationship (strength) - Explicit remarks made by the entrepreneurs - Subjective rating and cross-comparison of different contacts	New construct, inspired by Granovetter, 1973; De Koning, 1999
Influence on Global	Influence of contact on global nature of Sound Inc.'s startup process	Ranges from weak to strong	Based on five measures: - contact is international itself - number of international contact introduced by this organisation - number of international opportunities pointed to by this contact - Explicit remarks made by the entrepreneurs - Subjective rating and cross-comparison of different contacts	New construct, inspired by Granovetter, 1973; Coviello & Munro, 1995

Table 5A.3

** Tie strength has been measured in a very large number of ways. To show a few of this I include a table created by Scholten et al. 2004

Authors	Level of analysis	Subject of analysis	Indicators
Batjargal, 2003	Individual	Entrepreneurs in Russia	Friendship domain for strong ties and acquaintance domain for weak ties
McEvily & Zahreer, 1999	Individual	Acquisition of competitive capabilities	Based on the mean frequency per month with alter and geographic dispersion of the alter
Aldrich et al. 1996	Individual	Gender differences for obtaining business assistance	Based on strangers, family members or business associates
Hansen, 1999	Intra-firm	Sharing knowledge amongst business units	Average frequency and closeness of R&D managers measured on a 7-point Likert scale
Tsai and Ghoshal, 1998	Intra-firm	Resource exchange between alliance partners	Time spent and the closeness with the alter
Rowley etl a.l 2000	Inter-firm	Steel and semiconductor industries	Strong resource commitment and frequent interaction for strong ties, versus weak resource commitment and sporadic interaction for weak ties
Rindfleisch & Moorman, 2001	Inter-firm	Acquisition and utilisation of information in new product alliances	Reciprocal services and mutual closeness measured on a 7-point Likert scale
Mitsuhashi 2003	Inter-firm	Alliance performance	Strength indicator: stranger, acquaintance, good friend, very close friend Length of interaction measured on a 6-point scale Frequency measured on a 7 point scale

Table 5A.4 Examples of measures to determine tie strength from Scholten et al., 2004

Appendix 6 Using e-mails as a source of data

GLOBAL STARTUPS, EVIDENCE FROM COMPANY E-MAILS?[38]

Ingrid Wakkee

INTRODUCTION[39]

Global startups are companies that from inception seek to pursue opportunities wherever in the world they arise, using resources and selling outputs in an unlimited number of countries (Wakkee and Harveston, 2003). While most companies internationalise only after they are established in domestic markets, internationalisation and the startup process are integrated, almost inseparable for global startups. Earlier studies (e.g., McDougall, Shane and Oviatt, 1994; Bloodgood, Sapienza and Almeida, 1996) suggest that the Internet and e-mail are important drivers of the global startup phenomenon. Since these technologies are used frequently by global startups, we expect that e-mail content may offer valuable insight into the global startup process. This paper examines the value of e-mail messages as a source of data qualitative research to address three research questions:

1. To what extent are the activities of the company globalised?
2. What strategy does the company use to globalise its activities?
3. What is the role of the network in the global startup process?

To determine the value of the e-mail content, we will not only look at the richness of the information contained in the e-mails, but will also discuss the usefulness of this approach in terms of practicality and validity.

WHY USE E-MAILS?

Several factors made influenced the decision to examine the value of e-mails in qualitative research. First, e-mail is a warm and personal medium, carrying rich information (Panteli 2001; Walther 1996). Second, e-mail promotes the speedy exchange of information that, would not have been exchanged without it with both known and unknown individuals (Sproull and Kiesler, 1986). Third, e-mail communication is spontaneous and informal and therefore provides unbiased and reliable source of data. Another reason according to Bell and Loane (2002) is that follow-up interviews can be more targeted if preliminary sources of data have been analysed before thereby demanding less time from busy entrepreneurs and increasing their willingness to participate. A fifth reason involves the ability of e-mail to span the global business environment. Global startups frequently communicate, through email rather than through more traditional communication media with external contacts around the world that live and work in different time zones. We expect that significant information about the global startup process is contained in company emails. Consequently, the study of e-mail messages specifically applies to the context of the global startup phenomenon. Finally, the company offered to provide access to the e-mails on their own accord.

RESEARCH METHOD

CASE SELECTION

The e-mails investigated in this study were obtained from Sound Inc., a spin-off from A Dutch University, founded in 1998 by a university researcher and a former business consultant. Sound Inc.'s core technological competence is a sound measuring sensor discovered in 1994 and further developed in a Ph.D. research project. The firm seeks to develop, manufacture and sell value-added applications based upon this technology. Currently, Sound Inc. is the only provider of these sensors. Its main competitors are producers of traditional microphones in the global marketplace. The privately owned company currently has four employees. The company has a head office in Z** and a production facility in E** – both in The Netherlands.

Sound Inc. was selected to participate in the study for a number of reasons. First, it is a global startup. Therefore, according to Sound Inc.'s founder, Internet and e-mail are critical tools to communicate with the external world and consequently used frequently. Second, because the founders and employees work at different locations (often even from their home offices) they usually communicate through e-mail. This

[38] Paper presented at the 6th McGill Conference on International Entrepreneurship

[39] The author wants to thank the managing directors of Sound Inc. for providing her with access to their company e-mails and their comments on this paper. Further, she wants to express her gratitude to the known and unknown reviewers of this paper. Your comments proved very useful in completing the final version of this paper.

form of communication has kept the company flexible and startup cost low. Third, as Sound Inc. is a spin-off from the university where this research was performed, entry was facilitated, and an initial level of trust existed through a common background. Further, as the firm uses R&D facilities of the University, it is possible to obtain information through knowledgeable external informants working at the University at a later stage. Finally, as mentioned above Sound Inc. offered access to their e-mails.

DATA COLLECTION AND PREPARATION

The e-mails included all messages sent or received from the general e-mail address (info@soundinc.com) between December 2001 and May 2002. Although the employees and 'functions' (sales, production, etc) have their own e-mail address, all 'sent' or 'received' business related e-mails are sent (automatically) as a copy to this address. This use of the info@soundinc.com is extraordinary as info-addresses are usually for general inquiries only. When an e-mail was sent or received, a copy was sent automatically to the personal mailbox of the researcher. Therefore, the data was collected real time. In total more than 800 e-mails were collected in this manner.

Before the actual analysis could begin, several preparatory steps had to be taken. First, personal, non-company related messages, spam (impersonal, unrequested, commercial messages) and e-mails received from the university department's general mailing list (e.g. cleanroom announcements) were deleted upon receipt. Next, from the 511 remaining e-mails a random sample of 100 messages was drawn to be used in the analysis. We decided to use a sample to represent the entire set of e-mails. The 100 e-mails were then loaded in the QSR Nvivo database one at a time. QSR Nvivo is a software package for qualitative data analysis that allows for creating and editing primary or secondary data to its exploration, organisation and linking as well as the searching, modeling, and theorising of an emerging analysis (Kelle and Laurie, 1995, Barry, 1998, Jemmott, 2002). Next, Typing errors were corrected to allow for predefined coding, translations of unfamiliar words (the e-mails were written in Dutch, German and English) were included, and different messages in one e-mail (e.g. reply or forwarded messages that include the original message) were indicated in different colors.

MEASURES AND ANALYSIS

The method we used to examine the content of the e-mails was to assign ***attributes.*** An attribute is a named generic property (e.g., Age, Marital Status) that the researcher can give to documents. Each document (e-mail) was given a specific ***value*** for the attribute (e.g., 49, single). The attributes used in this investigation are related to the ***dimensions*** of (A) nature of the global activities, (B) the globalisation strategy, and (C) the role of the network in the global startup process. For the nature of the global activities, we built on the work of Wakkee and Harveston (2003). They state that a global startup: From inception, (1). seeks to recognise and exploit opportunities (Global opportunity), (2.) from the combination of resources and the sale of outputs (Global scope), and (3.) in multiple regions around the world (Global diversity). With respect to the globalisation strategy we examined (1) what the company does to establish international activities. To incorporate a process perspective in the globalisation strategy (2) the timing of the international activities and (3) relationship between the different international activities were included as well. Regarding the role of the network in this globalisation process, two dimensions were examined: (1) network development and (2) network use in this globalisation process. Eight attributes were developed to provide information about one or more of these eight dimensions. As shown in Table 1, the X's indicate which attributes (in the first column) provide information on the dimensions (in the first row) and the research questions (in the second row).

Dimension	**Research questions**					
	Global nature of the firm			Globalisation strategy	Role of the network	
	Global opportunity	Global scope	Global diversity	Strategy	Network development	Network use
Activity type	X	X	X	X	X	X
Contact type				X	X	X
Relationship type		X		X	X	X
Origin					X	X
Duration					X	X
Region			X			
Timing				X		
Interdependence				X		

Table 1 Attribute matrix

The **activity** attribute refers to the business-related activity discussed in the email, for instance 'research and development' or 'conference and trade-fairs'. (The complete list of values can be found in Table 3) The activity attribute can provide information on each of the dimensions and is relevant in answering all three of

the research questions. The **type of contact** refers to the type of organisation with whom the company officials communicate for instance 'company', 'university' or 'financial institution'. This message attribute provides information on the globalisation strategy and development of the network. Consequently this attribute helps to answer the second and third research question. The **type of relationship** refers to the 'role' a specific contact plays for the firm, for instance 'customer', 'consultant', or distributor. The type of relationship can provide information about the global scope, the globalisation strategy, the development and the use of the network and therefore contributes to the answering of each of the research questions. The **origin of the relationship** refers to the way the company and the external contact first came into contact. Examples of the origin can be 'conferences and trade fairs', or referral by third parties/intermediaries. This message attribute can provide insight into the globalisation strategy, network development and network use. Consequently this attribute is important to answer the research questions about the globalisation strategy and the role of the network in the global startup process. The **duration of the relationship** refers to how long the company has been in contact with the external contact. Three values were included: first contact, new contact and, established contact. The duration of the relationship provides information on the network development and the network use and therefore assists in understanding the role of the network in the global startup process. The **region** refers to the geographic location where the contact originates for instance Middle East, Asia or the Netherlands. The region provides information about the global diversity and answers the first research question concerning the global nature of the company. The **timing of the international activities** refers to the moment that specific international activities are started. Timing gives information about the globalisation strategy followed by the company. Finally, the **relationship between the international activities** refers to the link between different activities pursued internationally. For instance, is a sale in China the result of promotional activities at a research conference in the USA? In this way, this attribute provides information on the globalisation strategy followed by the company. Both the timing and relationship between the activities are simply listed 'clear' and 'unclear'.

Most of the information used to assign the attributes was found in the body of the messages. However, the activity could sometimes be found in the subject header. The type of contact could in some cases be found in the (e-mail) address listed in the From/To fields (e.g., when a name is well known or as a result of the extension of the e-mail address such as .gov or .edu). Also the use first names or official titles could provide clues about the duration of the relationship. The country or region could sometimes be identified from the extension in the e-mail address (i.e., .nl or .uk). Besides classifying the e-mails on the basis of these attributes, we coded the e-mails liberally, as suggested by Richards & Richards (1995), to store any other information, such as contact name, origin of the e-mail (internal/external) or subtopics (bookrequests) that could be of value to the research.

FINDINGS

DESCRIPTIVES

The sample of e-mails consists of 100 messages sent and received between December 15, 2001 and May 8, 2002. Table 2 provides a summary of the descriptive information found in the e-mails. Of the 45 external individuals whom e-mails are exchanged with, only ten are domestic contacts. Our sample mostly contains a single e-mail per contact yet many of the e-mails contain up to eight earlier messages. A number of the e-mails had attachments that provided additional information to answer our research questions. For instance, one attached Internet page provided considerable information about contacts met at a conference and with whom other e-mails were exchanged at a later stage.

Topic	Descriptives		
Sample origin	Total = 100 of which		
	External = 46 (25 sent; 21 received)		Internal = 30
	UT = 7		Mixed = 19
Attachments	Total number of e-mails with attachments = 21		
	Total number of attachments = 42 of which		
	.doc = 7	.pdf = 3	.jpeg / .mpeg = 6
	.gif = 8	.ppt = 3	other = 35
External contacts	Total = 45		
	Domestic = 10	Foreign = 35	

Table 2 Sample Descriptives

Due to space restraints the findings of the analysis are summarised in Table 3. In many cases, especially if an e-mail was exchanged between company officials, the attributes proved to be 'Not Applicable', as these e-mails contained information on internal affairs only and provided no information on international activities or the network. However as shown in Table 3 most e-mails could be classified on the basis of several of the attributes. We present the findings on the basis of the research questions.

The global nature of the company

To determine the global nature of Sound Inc.'s activities, we examined what type of activities were discussed in the e-mails, with or about what type of contacts the emails were exchanged, and in which region these contacts were located. We found that the e-mails were rich in information about the global nature of the activities. In the e-mail sample, reference is made to at least 18 foreign countries. The activities performed in these countries range from simply having business contacts, to presenting the company at conferences and trade fairs, and to creating market awareness by inviting foreign universities to research on, test, and publish on the technology. Also, it seems that Sound Inc.'s distributor network is expanding globally. Interestingly, a down-stream focus was apparent in the e-mails: most of the emails exchanged with externals concerned sales or marketing activities. Very few emails were exchanged with or about providers of resources both domestically and internationally. For instance, one e-mail refers to the use of European subsidy programs (e.g., ESF) for funding research activities, but no direct contact with these financiers was found. Also, we found that the flow of technical information exchanged with externals was generally one-way (from the company to the external contacts). Sound Inc. does not seem to make use of consultants or other external advisors.

The globalisation strategy

To find evidence of the globalisation strategy adopted by Microflown, we analysed five message attributes: activity, type of contact, type of relationship, timing and relationship between international activities. The e-mails provided interesting clues to Sound Inc.'s strategy to establish a global position. Because Sound Inc. is highly innovative, raising awareness and understanding of the new technology, and building market acceptance, universities were invited to conduct research in exchange for scientific publications. This also strategy leads to the creation of advocates of Sound Inc. around the world. Further, content analysis shows that Sound Inc. proactively tries to build a network and a customer base by promoting their sensors and some of the applications at trade fairs and scientific conferences either by participating in these events alone or by using representatives. In the e-mail sample, we found evidence that these fairs and conferences were good methods for building and/or establishing new contacts with potential customers and interested researchers, as with several of these new contacts e-mails are exchanged at a later time. In addition, Sound Inc. has set up a network of representatives and distributors, with local knowledge, around the world to build a global customer base. Finally, Sound Inc. allows potential customers to test the sensors for a period of two months before they have to decide whether or not they'll buy. It proved to be much more difficult to establish the timing of the different activities and the relationship, if it exists, between the different activities pursued internationally. Almost 50% of the external contacts were determined to be the first contact. Yet, in only a small number of e-mails was evidence found of actual business activities started as a result of these contacts. Only a small number of e-mails indicated actual reference to Sound Inc.'s other activities. For example, four new contacts (potential testers and customers) were found that stemmed from a conference Sound Inc. had attended. However, we could not establish if testing of the Sound Inc. by external researchers led to actual R&D co-operation.

The role of the network

To determine what role the network plays in Sound Inc.'s global startup process, we examined the following message attributes: activity, type of contact and type of relationship, and the origin and duration of the relationship. The role of the network, and particularly the role of the University (from which Sound Inc. originally spun off), was not as clear from the e-mails as we expected. From the sample of 100 e-mails, only five were exchanged with employees of the University. Furthermore, only one of these e-mails referred to the use of university facilities (in this case, computer systems) by Sound Inc. Yet, we did find evidence that the University plays a significant role. We also found several examples of the company using its liaison with the University as a marketing tool. The University is involved in the Nanotechnology network to which Sound Inc also belongs. Finally, one e-mail indicated that Sound Inc. and the University jointly applied for funding of the research by the ESF indicating some network use. From the e-mails we were not able to identify any other particularly important network contacts that specifically helped Sound Inc. establish international activities. For instance, only a small number of all contacts seem to have developed as a result of referral by intermediating parties. Also we could not determine if Sound Inc. is involved in any strategic alliances for R&D or production. Further evidence of the role of the network in the global startup process (e.g., the use of researchers to create market awareness and the use of distributors to build a customer base) is already discussed in relation to the globalisation strategy.

Activity	Contact type	Relationship type	Relationship origin

	Value	Freq.	Value	Freq.	Value	Freq.	Value	Freq.
1	Internal	15	Company	41	Supplier	3	Directory	7
2	Sourcing	3	University	14	Knowledge provider	6	Direct mail	0
3	R&D	15	Governmental	6	Investor	0	Conference	9
4	Production	1	Sector org	1	Consultant	0	Network event	3
5	Marketing	12	Financial	0	Distributor	6	Prev. employment	0
6	Sales	31			Customer	30	Childhood	0
7	After sales	4			Competitor	1	Intermediary	3
8	Networking	5			Advocate	8	University	5
9	Competition	1			Other	4	Unknown	48
10	Conferences	5			Unknown	15		

	Relationship duration		Region		Timing		Interdependence	
	Value	Freq.	Value	Freq.	Value	Freq.	Value	Freq.
1	First	14	NL	18	Clear	33	Clear	20
2	New	15	Europe	29	Unclear		Unclear	30
3	Established	33	NAFTA	9	Not applicable	40	Not applicable	40
4	unknown	8	South America	4				
5	Not applicable	35	Africa	0				
6			Middle East					
7			Asia					
8			Australia					
9			Unknown					
10			Not Applicable					

Table 3 External e-mail attributes and values

NB. Frequencies do not add up to 100 due to discussion of multiple topics and or involvement of multiple contacts in e-mail (chains)

DISCUSSION AND LIMITATIONS

From our findings several issues come to the fore. E-mails exchanged between Sound Inc. officials did not help us answer the research questions directly but they did provide a context that helped us understand some of our observations. Many of these e-mails contain questions or requests to deal with practical problems or situations in a rather ad hoc nature. For instance, two months after an e-mail was received from an external contact, one of the founders asked the employees if a response was ever given. Such e-mails show that Sound Inc. was still in its infancy at the time these e-mails were sent. Other internal e-mails provide indirect evidence of Sound Inc.'s global nature For instance the fact such a young company is present at may of international conferences and trade-fairs shows indirectly that it has a global vision and is targeting a global market from inception.

We found that the external e-mails provided very rich information. Even though we could not assign each attribute and their values to the e-mails and the research questions could not be answered in detail, we feel that our understanding of Sound Inc.'s globalisation process improved considerably. Also, an idea of what the future might bring can be drawn from the findings,. For instance, the strategy followed by Sound Inc. became clear from analysing the e-mails. It seems very successful and promising for further development. Although, no evidence was found to confirm it, we expect that the strategy of using foreign researchers to create market acceptance could (in time) also result in an inflow of scientific information and new product or application ideas from these testing universities back into the company. This might lead to joint research and development projects with these research institutes.

We also experienced that the casual nature of some e-mail conversations made tacit knowledge more explicit. Groen and Nooteboom (2000) called this intellectual midwivery. Reading the company e-mails was like listening in on telephone conversations or witnessing face-to-face conversations. Consequently analysing company e-mails proved to have characteristics similar to direct observation: subtle meanings became more clear as the analysis of the e-mails proceeded, thereby increasing the researcher's insight into the phenomenon under investigation. We expect therefore that follow-up interviews with the company officials can be more targeted and need only focus on confirming findings and filling in some details. It is expected that the approach taken in this research will actually facilitate a new round of in-depth interviews with company officials, as they need not invade significantly on their valuable time.

The fact that in some areas (e.g., relationship between various activities, role of the network) we could not find as much information we had expected, might be related both to the timeframe and the sample size of the study. The research findings are based on a sample of e-mails collected over a period of about six months when Sound Inc .was already operating for three years. Consequently, some of Sound Inc. external contacts were already established at the start of the data collection period. In many cases we could not establish when or how these contacts were initiated and how they had developed so far. Also the period of six months might be too short to find how some new contacts develop and be limited in understanding how the new contacts can contribute to Sound Inc.'s development and globalisation process. The small sample size of 100 e-mails might offer a further explanation for the shortness of findings in some areas. A first

review of the remaining 411 e-mails makes us suspect using a larger data set would lead to much better results. In this case all business-related e-mails were sent through the info@soundinc.com address and none were hidden from either company officials or the researchers, since as the founder indicated: 'Sound Inc. is a completely transparent company'. However, researchers using e-mails should keep in mind that some e-mails are kept secretive and will not be included in their data-set.

As shown by Sproull and Kiesler (1986), much of the information obtained from the e-mails would not have been found in other sources. The communication between company officials and external contacts proved to be so rich that we believe many details formed a picture that would not have come to light through other sources of information. Therefore e-mail messages are not just a means to confirm other sources of data (for which the analysis of documentation is often used); rather, they are a new source of information for researchers. Nevertheless, it is clear that company e-mails only provide a part of the picture and need to be investigated in relation with other types of data. This is also in line with recommendations from for instance Yin (1994), who suggests the use of multiple sources to achieve triangulation. Our e-mail analysis should and will be combined with more traditional sources of data.

One of the drawbacks of qualitative analysis based on company e-mails is the time consummation. Perhaps the most time intensive portion was the preparation of e-mails. Each had to be prepared separately. Every e-mail was analysed at least two times as information contained in other e-mails improved the understanding of thee information contained in the e-mails investigated previously. Yet, we feel that the actual content analysis did not take more time than would have been the case for other textual sources of information. Also, the richness of the information contained in the e-mails after the preparatory work was done, confirmed that the e-mails were so rich in content that they may be re-used in other studies to examine different research questions.

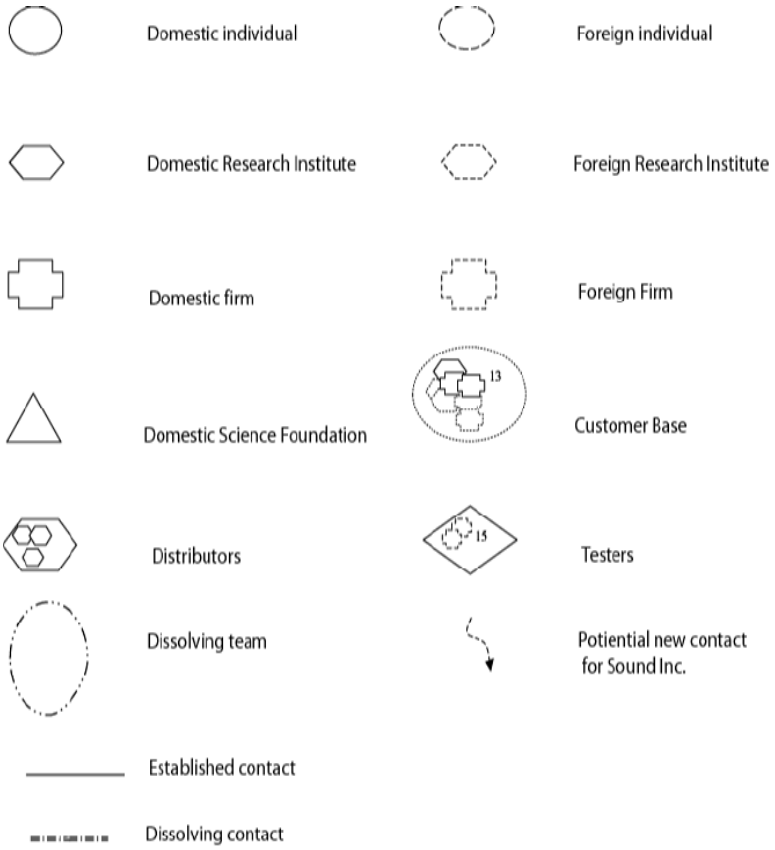
To determine the validity of the findings, a preliminary report of the findings was sent to company officials. We asked them to evaluate to what extent they recognised their company in the report and to provide us with comments and suggestions. The company officials responded with a short reply that provided additional information in some areas. They emphasized that the role of the University of Twente appeared to be less dominant than we interpreted above. The founder also indicated that Sound Inc. did not really use the University's name to gain acceptance. They also clarified that the use of the University's facilities was limited to access to researchers and some equipment. However with these minor changes, the founder and other company officials did generally agree with the interpretations and findings of this study. Another limitation of the study is that a single researcher conducted the coding of the attributes. Therefore, the findings reported in this paper are the result of interpretations of a single individual which may explain the discrepancy between the findings of the researcher and the comments of the entrepreneur with respect to the role of the University. In the future, efforts will be made to include a second researcher in the coding process to improve the validity of the findings.

CONCLUSIONS AND NEED FOR FURTHER RESEARCH

This paper presented the findings of a study, which examined the value of incorporating company e-mails in qualitative research. We applied this research question to the context of global startups. Specifically we investigated to what extent analysing company e-mails enabled us to answer three questions: (1) To what extent are the activities of the company globalised?, (2) What strategy does the company adopt to globalise its activities?, and (3) What is the role of the network in this global startup process? Also we considered if the use of e-mails is practical in terms of time and effort needed to yield results and if the results are sufficiently valid to justify the time and effort invested in the research. Given the richness of the information in our findings and discussion, we conclude that the expectation that company e-mails are a relevant, important source of qualitative data when studying the development of global startups was confirmed to a great extent. Further research incorporating other data sources like interviews and documentation is necessary and should be conducted to obtain a more detailed and more reliable picture of the global startup process of the company under investigation. Also, the analysis is based a sample of e-mails from one firm in one industry. Future research should incorporate multiple companies and multiple sectors of industry into the analysis to better understand the value of e-mails as a source of data in qualitative research. Despite the limitations discussed above, we feel that the investigation of company e-mails is highly useful in case study research in general and not limited to the study of internationalisation processes.

NB references can be obtained from the author

Appendix 7 Legenda for Network Models



Appendix 8 Web Statistics

Variable	Finding
Time period	August 29 2000 to March 07 2001 (191 days)
Hits	48978
Total visiting users	5649
Average Hits per user	8,67
Average users per day	29,58
Average hits per day	256,43
Number of sites each user has approximately visited	1,99
Hits on page	13448
Hits on files	5080
Hits on images	27345

Biography

Ingrid Wakkee was born on May 29th 1977 in Breda. After attending a local gymnasium, where she graduated in 1995, Ingrid moved to Maastricht. At the University of Maastricht she obtained a Master's of International Business Studies in 2000. As part of her master's Ingrid worked and lived in Slovenia for six months. After she obtained her degree, she enrolled as a full time PhD. student at the University of Twente at the department of Marketing, Strategy and Entrepreneurship. In 2001 she became part of NIKOS, the Dutch Institute of Knowledge Intensive Entrepreneurship. After her defence Ingrid will continue to work for NIKOS as an assistant professor. In her research she will continue the study of global startups, high tech entrepreneurship and innovation journeys. Ingrid and her partner live in Nijmegen.