Peculiarities of Software Development Start-ups as Professional Service Firms

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Abstract

Over the last decades management and organization researchers have paid quite a lot of attention to the rise of knowledge intensive companies and society's shift to a knowledge economy in general. Some researchers have noted that professional service companies will become "even more prominent in the economies the world over" (Greenwood, Deephouse & Li 2007: 4). At the core of knowledge intensive companies is this "little something" - esoteric knowledge - that although cannot be touched by hand, if used correctly, will turn into something powerful. However, the nature and distinction of professional service firms (PSFs) is still blurry. Which kinds of companies belong to this category and which do not? The existing theory and taxonomy of PSFs needs to be the subject of further empirical testing. Since a lot of the former literature has focused on the "classical" examples of PSFs, it is now essential to analyse some less studied industries.

On the other hand, it is clear that the IT sector and knowledge intensity are strongly tied to each other. Every year numerous new IT companies are established and a lot of hopes and finance is put into those. However, although knowledge also forms the core of the competitiveness of many IT start-ups, no relevant literature studying these types of companies from the perspective of knowledge intensive firms exists. This is necessary as attention to the employee side of start-ups may help to expand the understanding of start-ups and help them to overcome their challenges. For the organization sociological standpoint it is important to get a deeper understanding of software development companies and find out their position among other professional service firms.

With this thesis in mind, I propose to highlight some aspects of IT start-ups, take a look at them as professional service companies and compare these empirical findings with the existing theory and typology of PSFs. An important analytical aim of this thesis is clarification of concepts – mainly the concept of professional service firms, but to a smaller extent also the concept of start-up companies. Therefore, much of the purpose of the chosen research methodology and the thesis in its entirety is such a clarification.

This study has four research questions:

1. Which are the main organizational and/or managerial characteristics of an IT start-up?
2. To what extent do the organizational peculiarities of IT start-ups arise from their knowledge intensity and to what extent from their specific start-up context?
3. By which aspects are IT start-ups similar to and different from other types of professional service firms?
4. How suitable is the existing theory and taxonomy of professional service firms to describing start-ups in the software development industry?

I approached the topic qualitatively, through a comparative case study. I combined secondary data on two cases - two IT start-ups - with interviews conducted with their founders, CEOs and knowledge workers. Empirical findings are seen through the lenses of former research on start-up companies and professional service firms. By doing that, the thesis analyses the suitability of the theory and taxonomy of professional service firms developed by Nordenflycht (2010) to describe professional service start-ups in the software development industry.

As a result of the study, I propose a three layer model which integrates influences and knowledge from the start-up world and industry side with peculiarities and knowledge coming from the worker side. I argue that start-ups in the software development sector can be seen as professional service firms and these are characterized by some common PSF peculiarities, challenges and organizational responses. On the other hand, many aspects that are found to characterize classic PSFs are missing in the case of start-ups in the software development industry. These are professionalization, an opaque quality problem, muted competition, trusteeship norms and organizational slack. This clear distinction of classic PSFs from other kinds of PSFs, and at the same time strong knowledge intensity within these firms, is proof of the need for taxonomy of PSFs. But, when comparing these features with the existing taxonomy of PSFs, these firms would not suit directly either of the categories. Therefore, I suggest that an additional category that includes these types of companies and reflects their peculiarities would be needed.

Thanks

One milestone has now been reached. For me it was a very interesting process and I can truly say that I enjoyed every aspect of it. What I liked the most was you, my helpful new acquaintances, good old supporters and inspiring conversation partners - it was a pleasure working with you.

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Helen Eikla
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1. Introduction

1.1 Overview

The current thesis about software development start-ups as professional service firms consists of five main chapters. First it gives an introduction to the theme through presenting the cases, the potential significance of the topic, research questions and limitations. It further gives an overview of related literature and research design and methodology through describing and reasoning both the general approaches behind this study, as well as the selection of particular cases, participants**,** data gathering and analysis methods. The section ends by raising the issues concerning research quality, ethics and the influence of my personal background. In Chapter 4 I present the main findings from my field work categorized and summarized in tables. These findings are further developed and discussed, as well as seen through the lenses of existing theories in Chapter 5. The thesis ends with a quick look at the main issues and suggestions for future research.

1.2 Short description of cases

In this thesis I approach the research questions through two cases: two start-up companies operating in the IT industry.

The first of them, Fraktal, was established in 2007 in Estonia. It is a web design and software studio, and until 2011 its main field of activity was developing and marketing a web-based software service named Edicy. However, in addition to that the company has been offering webpage design, programming and consulting services. Until 2011 Edicy was a web service brand developed and supported by the Fraktal team, but in October 2011 Fraktal divided into two separate companies - Fraktal OÜ and Edicy OÜ. Although the core human resource of these companies continues the same, since January 2012 these teams have moved to become more separate from each other. The main field of activity for Edicy is now developing and marketing Edicy. Today the two companies together employ 14 employees, mainly web developers and designers, and 4-6 of them work full time on the Edicy side.

Edicy is global service that aims to provide simple and beautiful website building for small- and medium-sized enterprises around the world. Its main competitive edge is being a

multilingual website builder, which means companies around the world can build a website by themselves, using their own mother tongue (as opposed to the many mostly English-based website builders on the market). As of January 2012 Edicy is available in 16 different languages, it has 300 000 signups, 10 000 active users and 900 paying customers worldwide, and its monthly revenue is $14,000. The aim of Edicy is to reach an annual revenue of $10 000 000 in five years and to get 100 000 paying customers.

My second case in this study is **ZeroTurnaround**. It was established in 2007 in Estonia as a spin-off company from an international software company. It became juridically independent in 2009. Currently the firm employs 59 persons and two of its offices are situated in Estonia, one in Prague and one in Boston, U.S. ZeroTurnaround is a software company that is improving the everyday work of Java developers by offering them two services: JRebel and LiveRebel. JRebel is a Java virtual machine-plugin that makes the work of Java programmers more efficient and reduces programming installation time, thereby decreasing production costs by 16%. LiveRebel is a Java server management tool, designed for making automated, instant updates to Java applications in production without server downtime.

Within only a couple of years, JRebel is now used by more than 18 000 customers in over 65 countries. In 2010, the company's revenue was approximately $850 000 and its growth compared to 2009 was 760%. ZeroTurnaround has experienced 2-4 times growth year on year, for the past 4 years since it was founded. Its customers include many global financial services providers, e.g., the Bank of America, as well as American Airlines, Lufthansa, LinkedIn, HP, Siemens, Logica, Kayak, Oracle, IBM and more. Its largest markets are Europe and the U.S.

Although somewhat different, both of these companies are examples of start-up companies. In the current thesis I will focus on these two companies as cases worth studying in detail.

1.3 Potential societal significance

Fast development of technology during the last decades is a phenomenon that has been an important factor behind social change and thus, been much talked about. The Internet has sped up the process of globalization,, creating a whole new reality, possibilities and challenges for us to handle. The decline of the industrial sector in many countries is directly related to the increase in the service and technology sector, and it is assumed that this tendency will continue in the future. In the information technology industry companies compete fiercely for brilliant ideas, knowing that only the very best of them are rewarded with global success and enormous financial benefits. It is a paradox that the greatest financial outcome and popularity is related to projects that we cannot touch physically (Google, Facebook, Skype, Angry Birds etc.), but that nevertheless influence to a large extent our everyday life, communication and attitudes.

On the other hand, over recent decades another phenomenon has become widely discussed in the global setting. Starting in the early 1970s with Daniel Bell's prophecy of the post-industrial society where theoretical knowledge plays a substantial role (Bell 1976), management and organization researchers have paid much attention to the rise of knowledge intensive companies and society's shift to a knowledge economy in general. Scientific knowledge is considered as the engine of much of the dynamics of economic activity (McGrath 1994: 17). Information is seen to have taken a central position in society and modern society is characterized by knowledge accumulation: generating, collecting, processing and transforming information is now a fundamental source for productivity and power (Thompson & McHugh 2002: 150). Knowledge intensive companies stand in the middle of these phenomena and as some researchers have noted, professional service companies will become "even more prominent in the economies the world over" (Greenwood, Deephouse & Li 2007: 4). Drucker believes that the productivity of knowledge and knowledge workers (as the core employees of the knowledge industry) will become the decisive competitive factor in the developed world, forcing managers to adopt radically new management practices (McGrath 1999: 15). Just as it is in the case of the greatest success stories in the IT industry, at the core of knowledge intensive companies is this "little something" - esoteric knowledge - that although cannot be touched by hand, if used correctly, will turn into something powerful.. This makes the analysis and understanding of knowledge intensive companies crucial for the modern knowledge-oriented society.

As we can see, the IT sector and knowledge intensity are strongly tied to each other. Every year numerous new technology companies are established that are based on some kind of specific knowledge. Most of them hope to become the next conqueror of the world. Some of them are called "start-up companies" as they share a certain nature and they can be characterized by some common peculiarities. Also the much spoken category of knowledge intensive companies can be divided into smaller parts and described by some common characteristics. However, considering the last term, the situation is a bit more complicated and needs further attention and investigation from organization researchers.

1.4 Potential sociological significance

Technology start-ups are often studied with regard to their finance and other elements which are seen as the most important features while establishing an IT start-up company. Although knowledge forms the basis of the competitiveness of many IT start-ups, I did not manage to find any relevant literature about studying these types of companies from the perspective of knowledge intensive firms. Does the attention to the employee side of start-ups expand the understanding of start-ups and help them to overcome their challenges? Is there anything to learn for start-ups from the existing studies of knowledge intensive organizations?

However, the nature and distinction of professional service firms is still quite blurry. Which kinds of companies belong to this category and which do not? As Nordeflycht (2010) has noted, the theory and taxonomy of PSFs needs to be the subject of further empirical testing. It gives us reasons to believe that the theory does not yet cover all the important aspects of PSFs and in addition, to the named peculiarities and managerial challenges there may be further features characteristic to these types of firms. Nordenflycht expresses the need for looking at the intra-industrial variations and to test if organizations that belong to one common category on paper stand close to each other in reality as well. Since a lot of the former literature has focused on the "classical" examples of PSFs, it is now essential to analyse some less studied industries. According to his research on the field, software development has been mentioned as professional service companies in only four cases of the total of 22 (Nordenflycht 2007: 41). However, as pure knowledge firms, this type of

organization is at the core of Nordenflycht's model of professional service firms, which is created based on their different asset intensities (Nordenflycht 2007).

So, considering these shortcomings, it would be sociologically interesting and also needed in practice to connect these two bodies of knowledge. For the organization sociological standpoint it is important to get a deeper understanding of software development companies and find out their position among other professional service firms (PSFs). More narrowly - do software development start-ups qualify as knowledge intensive PSFs and can they be compared to other PSFs? Is it thus possible to extrapolate the knowledge collected on other PSFs to cover these types of companies?

With this thesis in mind, I propose to highlight IT start-ups, take a look at them as professional service companies and compare these empirical findings with the existing theory and typology of PSFs.

1.5 Framework and general research questions

An important analytical aim of this thesis is clarification of concepts – the concept of professional service firms and start-up companies. Therefore, much of the purpose of the chosen research methodology (comparative case study) and the thesis in its entirety is such a clarification.

Although it is possible to analyse knowledge intensity and challenges/possibilities tied to this also on a societal, macro level through the views of the new information society or knowledge economy, I have chosen to focus on the meso perspective by studying the topic from the industry and organizational angle. The focus of the current thesis is clarification of concepts and I approach it by mapping peculiarities associated with knowledge intensive professional service start-ups in the software development industry. That means I am interested in analysing two cases – two certain types of companies - in the light of former studies, concepts and typologies of professional service firms and start-ups.

This study has four research questions:

1. *Which are the main organizational and/or managerial characteristics of an IT start-up?*

2. *To what extent do the organizational peculiarities of IT start-ups arise from their knowledge intensity and to what extent from their specific start-up context?*

3. *By which aspects are IT start-ups similar to and different from other types of professional service firms?*

4. How suitable is the existing theory and taxonomy of professional service firms to describing start-ups in the software development industry?

Since former studies have indicated various aspects related to PSFs and start-up firms, I explore these two companies to find out if these aspects are relevant for the current cases. These findings from earlier studies are, for example, knowledge intensity, low capital intensity, cat herding, opaque quality, informal leadership processes, up-or-out system, lack of external ownership, tailor-made output, etc. I will inductively map the common characteristics and challenges using my studied cases, and then compare these findings with the existing body of knowledge, both on the PSF and start-up side.

The aim of the last two questions is to analyse empirical findings in the light of the theory of PSFs, as well as to test some aspects of the theory on the data from software industry start-ups. Answers to these research questions show whether IT start-ups can be seen as knowledge intensive professional service firms and provide a basis for clarification of the main concepts.

1.6 Limitations

The main limitations of this thesis are on the methodology side, as the topic is approached qualitatively through two case studies. This removes the possibility of covering many examples in the field and means generalizing the empirical findings to all of these types of firms. On the one hand, there are already many studies which have viewed start-ups and

professional service firms by describing narrow case studies, on the other hand, the qualitative approach is the common practice in this field. However, the generalizability issue is mitigated by aiming to create wide categories and codes that allow for further quantitative testing in the future.

Another issue is relying largely on qualitative interviews, while a lot of relevant information can also be collected through observation and other research techniques. Again, this problem is widely spread in qualitative research, it being referred as a part of the "interview society" (Silverman 2004: 239). It poses a false belief that participants' thoughts, words and actions are in accordance with each other. In the current case, this issue is especially relevant in questioning participants about their autonomy, organizational structure and culture. These phenomena may have been better understood by (participant) observation in their everyday work. However, my general purpose was the clarification of concepts instead of getting a rich understanding of the details of the culture and specific exercise of power in their everyday working life. Aiming to get a deeper understanding of these topics would be an interesting research issue for future qualitative studies in the field.

2. Review of related literature

2.1 Defining start-up firms

In the specialist literature, start-ups, often also called new ventures or newly founded technology-based firms (NTBFs), are approached through different perspectives. First and most commonly start-ups are seen as merely the first stage(s) in a company development process. According to this, every company is at first a start-up company until it grows and becomes a large, complex organization.

Luger and Koo (2005: 19) present this type of view. They propose an all-encompassing definition of start-up as a business, describing the phenomenon as something that is both **new** ("it did not exist before a given time period"); **active** ("it starts hiring at least one paid employee during the given time period") and **independent** ("which is neither a subsidiary nor a branch of an existing firm"). However, defining the term using such a wide basis excludes other features that may be distinctively characteristic to start-up companies. In addition, this definition does not provide a clear frame to the term for two reasons. First, although the time factor is one of the key elements in this definition, a certain time period needed for evaluating a firm's newness is not set, which leaves this aspect open to one's own interpretations. Considering the rapid growth of many international high-tech start-ups on the one hand, and on the other hand the slower start-up stages of small local firms or home-based businesses without any paid employees, the time of a company's establishment may not be the best comparable measure. Second, defining a firm's activeness using at least one hired employee and not by its income, visible trading activities or other indicators, is not grounded enough in their study. Thus, in general, due to a lack of reasoning in the choice of these measures, I find this definition too wide to be adopted without thorough considerations.

An alternative approach to start-ups focuses on start-ups being essentially different from the orthodox view. Ries in "The Lean Start-up" defines start-up as "(…) a human institution designed to deliver a new product or service under conditions of extreme uncertainty" (Ries 2011: 27). First, this involves the "**human institution**" aspect explaining that institution-building activities like hiring, coordinating and creating a certain organizational culture belong to successful start-ups, and the value such a company creates lies rather in its people

and organization than in the product. With this last interpretation I find this approach close to knowledge intensive companies and knowledge workers who are seen as the core asset in certain types of (professional service) firms.

The criteria of "**newness**" means that the main purpose of a start-up is to uncover a new source of value for its customers and at the same time the company cares about the impact of its work on these customers. This does not necessarily mean innovation in the product dimension, but the newness may be expressed in repurposing an existing technology for new use; unlocking value by a new business model; approaching new segments of customers; or doing it at a new location.

One of the most important and distinguishing parts of this definition is the **context** in which start-ups operate. Different from other starting companies whose level of risk and uncertainty can be measured and a specific "risk premium" calculated beforehand, start-ups are seen operating in situations where risks are unknown. These risks do not necessarily have to be large in reality, but the fact that they cannot be modelled gives the start-ups a specific nature and challenges. By that, Ries excludes small businesses that can be financed with bank loans from the category of start-ups, making the definition applicable to a much smaller group of new businesses. However, the main benefit of such an approach lies in the essentially new way of thinking about start-ups.

Mäkelä and Ruokolainen offer a definition of start-ups that is a little similar to the one given by Ries, as it too raises the issue of uncertainty in the high technology market. They note that:

> start-up technology companies are often research and development intensive companies that plan to capitalize on their knowledge after a breakthrough in the R&D work. Due to the volatility of the high technology market, achieving a breakthrough can be far from easy (Mäkelä & Ruokolainen 2007: 187).

This coincides with the approach of Ries, since empirical testing ("validated learning") is at the core of the lean start-up method. Nevertheless, inspired by the lean manufacturing philosophy originated in Japan, the lean start-up approach sets out five principles that move the understanding of start-ups to a different point than it has been in conventional thinking. These principles are as follows (Ries 2011: 8-9):

a) entrepreneurs are everywhere. This moves the current understanding of start-up entrepreneurs away from the stereotype of a youth establishing the next multi-million dollar company like Facebook or Google from a garage. Any entrepreneur belonging under the given definition of a start-up is a start-up, regardless of its size, age, sector or industry.

> It (*the definition*) says nothing about the size of the company, the industry, or the sector of the economy. Anyone who is creating a new product or business under conditions of extreme uncertainty is an entrepreneur whether he or she knows it or not and whether working in a government agency, a venture-backed company, a non-profit, or a decidedly for-profit company with financial investors. (…) Thus, when I use the term entrepreneur, I am referring to the whole startup ecosystem regardless of company size, sector, or stage of development (Ries 2011: 26-27, my own addition);

b) entrepreneurship is management. This means a start-up as an institution needs a management designed especially for handling the extreme uncertainty of the environment;

c) validated learning. The purpose of a start-up is seen to learn, how to build a sustainable business, not only to make products, provide services or earn money. Therefore, it is important to validate the learning scientifically, by continuous testing and experimenting with each element of the entrepreneur's vision;

d) build-measure-learn. The main activity of a start-up is seen to turn ideas into products, measure how customers respond and then learn whether to pivot or persevere. All successful start-up processes should accelerate this feedback loop;

e) innovation accounting. A new kind of accounting is required that helps to measure progress, set up milestones and prioritize work. This is necessary both to improve entrepreneurial outcomes and hold innovators accountable.

This perspective of start-ups provided by Ries is yet new and although these thoughts have already well disseminated in the international start-up community, specialist literature mainly focuses on the issue through the classical approach first described. In the management literature, a lot of studies are available on how to be a successful start-up, how to launch new

ventures, etc. Publications in this topic have largely concerned themselves with the following subcategories:

- internationalization, global or local nature of start-ups (e.g., Johnson 2001; Gorg & Strobl 2002; Fryges 2008; Andersson & Hellerstedt 2009);
- fundraising, venture capitalists and financing (Bürgel 1999; Colombo & Grilli 2005; Heino 2006; Colombo & Grilli 2007; Markova & Petkovska-Mircevska 2009; Ahmed & Cozzarin 2009; Korosteleva & Mickiewicz 2011);
- success factors of start-ups (Reid & Smith 2000; Feindt, Jeffcoate & Chappell 2002; van Gelderen, Thurik & Bosma 2005; Backes-Gellner & Werner 2007);
- influence of start-ups to external systems/institutions and macro level (Mata 1996b; Fritsch 1997; Gries & Naude 2009);
- gender issues related to start-ups (Verheul & Thurik 2001; Baron, Hannan, Hsu et al. 2007; Coleman & Robb 2009; Verheul, Carree & Thurik 2009);
- issues related to start-up size (Mata 1996a; Santarelli 1998; Audretsch, Santarelli & Vivarelli 1999; Gorg & Strobl 2002; Colombo & Grilli 2005);
- characteristics of start-up founders (Reynolds 1997; Colombo & Delmastro 2001; Harada, 2003; Koellinger, Minniti & Schade 2007).

As the present study focuses on the peculiarities of international start-ups researched empirically through case studies, I will further highlight some of the aspects that have previously been found when describing international start-ups.

2.2 Characteristics of international start-ups

Scholars of organization science have used multiple terms to signify the phenomenon of international high-technology start-up companies, calling these "international start-ups", "infant multinationals", "born globals" and "international new ventures" (Bürgel 1999). Oviatt and McDougall give a definition of an international new venture as a type of firm that "(…) from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries" and note that "these start-ups often raise capital, manufacture, and sell products on several continents, particularly in advanced

technology industries where many established competitors are already global" (Oviatt & McDougall 1994: 49, 29).

Thus, this approach refers to their international origin and focuses on the age of firms when they become international, instead of their size. In addition, according to this, being international does not require foreign direct investment, which means that this type of firm is concerned with value added, not assets owned (Oviatt & McDougall 1994: 31). A definition of an international start-up offered by Johnson, influenced greatly from this, sees it as "a new venture that exhibits an innate propensity to engage in a meaningful level of international business activity at or near inception, with the intent of achieving strategic competitive advantage" (Johnson 2001: 16).

Based on existing case studies in the field, Oviatt and McDougall (1994) conclude that these firms are seen to form due, to a great extent, to the changed international environment. In other words, global forces are strongly promoting the development of international start-ups. Now internationally experienced and alert entrepreneurs are able to link resources from multiple countries to meet the demand of inherently international markets. This is a result of the increased speed, quality and efficiency of international transportation and communication, as well as homogenization of many markets in distant countries.

A lot of studies have focused on finding the distinguishing features of international start-ups by approaching the topic both through case studies as well as quantitatively. The description of characteristics is wide, describing particular international new ventures and covering different sides of start-ups. Summarizing all these findings leads to an insight rich in smaller and bigger elements, although this may not necessarily mean better understanding of the nature of this phenomenon. Without a common theoretical framework or typology it may be rather confusing. To give an overview of the very different aspects associated with international start-ups, I will further list some scholars and their contributions to the topic.

Bürgel (1999) in his doctoral thesis researched case studies of international start-ups and concluded that the main characteristics international start-up firms are described by the following:

- bold and proactive moves into foreign markets;

- initiated international activities almost from inception;
- entered several markets simultaneously;
- founded by individuals with extensive international and industry experience;
- founders had "international vision";
- offer standardized products and products incorporating leading-edge technology;
- high degree of technological differentiation is met by a certain demand regardless of national boundaries;
- in terms of market entry modes, a minority used arrangements requiring direct investment;
- direct exporting and foreign sales via third parties being their most popular entry modes (Bürgel 1999: 25).

Bürgel and Murray complement this list by adding some other distinguishing features based on quantitative studies:

- preferred entry modes of technology-based start-ups are characterized by relatively low resource commitment;
- their entry modes are directed toward commercialization rather than foreign production;
- tendency to enter several foreign markets within a short time-span;
- characterized by rapid and sometimes resource-intensive market entries into different countries;
- some extreme cases perform different activities along their value chains in different countries (Bürgel & Murray 2000: 35-36).

However, funding is one of the main challenges related to these companies. Many of these firms experience negative cash flows during their first years and to cover their initial expenses on development and R&D, and to finance their growth, they may be forced into foreign markets. The lack of necessary human and financial resources prevents them from successfully commercializing their products by themselves (Bürgel & Murray 2000: 36). This requires them to search for external financing, although the uncertainty and risks associated with this type of firm makes it problematic. Moore (1994) showed that among high technology small firms, those with the most sophisticated technologies are most likely to

report continual financial constraints on the development of their business. They are perceived more risky than small firms in general, which is usually explained by various factors:

- these firms are usually founded by scientists who are seen to lack managerial and entrepreneurial skills;
- due to novel product/service it is difficult to assess the marketplace;
- shorter life-span of the high-tech products/services compared to conventional sectors;
- as financing is usually required for R&D activities at the pre-product age, in case of these firms in addition to the general uncertainty of the market, it cannot be assured that the research will lead to a product within a reasonable timeframe or ever (Moore 1994: 197).

Nevertheless, in spite of the named difficulties, these start-ups often operate in many countries on different continents and some firms effectively create subsidiaries simultaneously in several countries (Bürgel 1999).

Johnson (2001) in his doctoral thesis, based on existing studies of international start-up companies, created a common international start-up profile, which characterizes the phenomenon in three aspects: its distinguishing features, strategies and success factors (see Table 1 below). This provides a detailed insight into the nature of start-ups by combining a good selection of previous research in this field and classifying it for a better overview. On the other hand, summarizing these findings in such a table does not offer a comparison of the extent of these features being associated with international start-ups. Some of the named characteristics occur with almost every international start-up (e.g., international vision that creates a basis for operating internationally) while other features are less commonly found (e.g., wide international experience of the founder(s) or top management team). However, this does not diminish the value of the detailed overview provided by Johnson (2001).

In addition, the same study aimed to identify firm-specific success factors for small high technology international start-ups and to find features correlated to higher levels of performance. Critical success factors were found to be:

- the international commitment of start-up founders;

- having entrepreneurial and goal driven internal organizational behaviour;
- applying customer-driven product design;
- having unique and innovative products;
- engaging in continuous innovation;
- targeting similar customer segments worldwide (Johnson 2001).

In addition, his study explains the highly international nature of this type of firm by the international vision of the founder(s), the desire to be an international market leader, the identification of a specific international opportunity and the international and competitive nature of the firm's industry.

Table 1. *Characteristics, challenges, strategies and success factors of international start-ups, based on former research in the field.*

CHARACTERISTICS	
Type of Organization	being new venture; international at or near inception
Size	generally small
Scope and Initial Country Market Selection Factors	conducting business worldwide in large and leading industry markets
Foreign Value Chain Activities and Factors Influencing Their Establishment	foreign-based organizational activities to establish a local presence in key industry markets and to provide enhanced regional sales and service support
Structure	minimal internalization; utilization of alternative governance structures including strategic alliances and networks
Marketplace	world; geocentric mind-set; international vision
Industry	generally high technology industries, but also found in low technology and service industries
Products	innovation oriented; narrow product lines; international niche markets
Competitive Advantage	unique intangible asset; often unique technological knowledge or superior processes
Experience	extensive founder / top management team industry and international experience
RISKS / CHALLENGES	
Risks	Continuance / financial risk stemming from newness / small size / limited resources; political / macroeconomic / foreign exchange risk; alliance partner opportunism / asset expropriation; single product dependence
STRATEGIES	
Founding Strategies	instil an international vision throughout the organization; hire managers with extensive international experience and strong international business networks
Product / Service Strategies	unique, high quality products or services; innovative technology and product design; patent technology; superior processes; product rides on industry change or shift; niche within an industry in transition; product

	differentiation; standardized product; minimal product adaptation; compete on quality and value; competitive process; continuous innovation; follow-on products; closely linked product/service extensions
Distribution / Marketing Strategies	target homogeneous market segments worldwide; broad market coverage; service of numerous customers in diverse market segments; develop and control multiple distribution channels; minimal marketing mix adaption; develop a high level of market/product visibility; emphasize customer satisfaction
Entry Strategies	aggressive foreign market entry; enter numerous international markets on a grand scale; broad and rapid market access; international co-operative alliances; utilization of alternative / hybrid governance structures such as strategic alliances and networks; secure outside financial and production resources; first mover / early entry; early success in lead markets; pre-empt competition; selective international investments (foreign direct investment); minimal internalization; negate long-term dependence on alliances; focus on core competencies; learning experience for subsequent market entry; flexibility and rapid response employment; tightly networked international organization.
SUCCESS FACTORS	
Founder	International / global vision; foreign commitment; managerial experience; planning / managing markets; business / social networks
Organization	Close / tight co-ordination; strategic alliances / co-operative ventures
Product and Marketing Strategy	Quality / unique / innovative products; continuous innovation; niche markets; aggressive market entry; first mover.

Source: Johnson 2001: 95, 101-102, 109, 135.

One possible way to organize and systematically use these findings of different start-up features is offered by Oviatt and McDougall (1994) (see Figure 1 below). According to the relationship between the number of value chain activities co-ordinated across countries and the number of countries involved in the operations, they divide international new ventures into four types: **export/import start-up** (few activities in few countries), **multinational trader** (few activities in many countries), **geographically focused start-up** (many activities in few countries) and **global start-up** (many activities in many countries). Each of these types has specific organizational features, strategies and success factors. The last one, global start-up, is seen as the most difficult start-up to develop as both geographic and activity coordination is required (Oviatt & McDougall 1994: 60). "It is the most radical manifestation of the international new venture because it derives significant competitive advantage from extensive coordination among multiple organizational activities, the locations which are geographically unlimited" (Oviatt & McDougall 1994: 59).

In contrast, multinational traders are "moving goods from nations where they are to nations where they are demanded" as they "serve an array of countries and are constantly scanning

for trading opportunities where their networks are established or where they can quickly be set up". However, direct investment in any country is typically kept to a minimum (Oviatt & McDougall 1994: 58). Nevertheless, mixed types of these may occur and new ventures may change their initial type during their development.

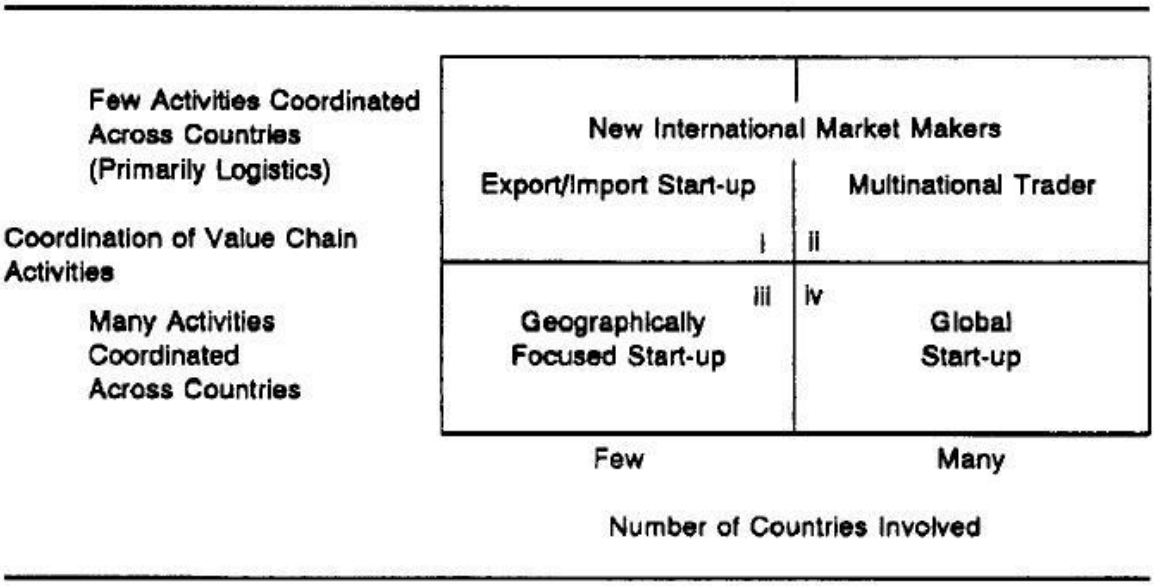

Figure 1. *Types of International New Ventures*. Source: Oviatt & McDougall 1994: 59.

Although much emphasis is put on analysing the internalization strategies and stages of new ventures, and the validity of existing internalization and multinational enterprise theories is questioned, in the current thesis I will not discuss these in detail. I will continue with the overview of the nature of professional service firms (PSFs) and the theory of PSFs developed by Nordenflycht (2010).

2.3 Defining professional service firms

Different from the definition of start-up companies, the situation with the other main term is more complicated. Although as much has been written about knowledge intensive organizations as has been written about start-ups, no common and clear definition of this term has evolved. In the specialist literature several terms like "knowledge intensive firms" (KIFs), "knowledge-based organizations", "knowledge creating companies", "professional service firms" are in parallel usage. All of these refer to a group of professionals providing services to clients. Thus, it is usual to define knowledge intensive organizations through naming their specific properties or giving examples of this type of company. Some researchers mean that

consulting firms are the most typical knowledge intensive firms, while other examples of these can be law firms, auditor's offices, computer service companies, advertising agencies, different research laboratories, etc.

The term "knowledge intensive companies" usually means companies that sell knowledge - their only "product" is to process and disseminate information. Their product is "non-standardized, creative, strongly dependent of the individual and complexly problem-solving" (Sveiby & Risling 1987: 17). Among scholars there is consensus about the idea that knowledge is deeply embodied in these definitions. For example, Hill and Neely (1988) describe a professional service firm as one where the client is significantly dependent on the provider to define the problem and give appropriate advice (Lu 2005). This refers to the superior knowledge or expertise of a professional service firm. Wilson (1972) on the other hand states that professional services are:

> designed to improve the purchasing organization's performance or well-being and to reduce uncertainty by the application of skills derived from a formal and recognised body of knowledge, which may be interdisciplinary, and which provides criteria for the assessment of the results of the application of the service (Lu 2005: 13).

Some scholars have focused on identifying the nature and different types of knowledge in these organizations (for example, Nonaka 2007). Other scholars have discussed about the principal provider of the professional services (for example, Løwendahl 2000; Despres & Hiltrop 1995; Lu 2005). In general, the ambiguity of the definition of professional service firms is seen to be coming from the ambiguity of the term professional in the former literature (Nordenflycht 2010). However, in this current thesis I will not describe these discussions in detail.

In general one could look at the term "knowledge intensive company" more or less widely. Quite a few different typologies have been created around this term. One possibility is to "narrowly categorise knowledge intensive firms as professional service firms staffed by highly qualified experts who engage in esoteric problem solving to provide tailored services to corporate clients" or just suggest that all organizations are to some extent knowledge intensive (McGrath 1999: 3).

I will focus on one type of knowledge intensive organization that is a knowledge intensive professional service firm (PSF). It is often seen as a primary example of knowledge intensive companies. PSFs are found to have four principal characteristics:

> (1) professional services are knowledge intensive in nature;
> (2) professional services are delivered by professionals/knowledge workers; but,
> (3) professional services are nonetheless co-produced between the knowledge worker and the client and,
> (4) the majority of construction professional services are provided by small firms (Lu 2005: 15).

However, until the last couple of years, organization sociology has been lacking one clear definition of professional service firms (PSF) and this has led to several problems. Empirical research has often been limited as in the studies too much emphasis has put on analysis of the "classical" examples of PSFs with the intension to generalize the results to all kinds of PSFs. In addition to that,

> the lack of boundary conditions for the term PSF means that we cannot actually test existing theories about how PSFs are distinctive, since we cannot specify to which types of firms any proposed theory should apply. Should theories developed while studying law firms also apply to ad agencies, hospitals, or R&D labs? And if ad agencies, hospitals, or R&D labs are organized in a different fashion than law firms, does this mean that they are not PSFs, or does it mean that the organization of law firms is less paradigmatic than is often assumed? (Nordenflycht 2010: 155).

Discussion about the nature of PSFs has become an actual topic in recent management and organization research. Andrew von Nordenflycht (2010) has created a theory and taxonomy of professional service firms, which is suggested by him for further empirical testing. Based on his overview of the cited examples of professional service firms in recent PSF-related literature, professional service firms are usually characterized by the following properties: they are human capital intensive, knowledge intensive, capital non-intensive, profession-intensive, having a customized and intangible output, employee ownership, workforce of professionals, the nature of output is (expert/advisory) service rather than product, opaque quality is hard to evaluate, employees demand for autonomy, etc. (Nordenflycht 2007: 42). "Classical" examples of professional service firms named in the literature are accounting and law firms, as well as management consulting, engineer consulting/design, advertising agencies and architecture (Nordenflycht 2010: 156).

However, despite the confusion around this term, Nordenflycht has not offered any single definition for professional knowledge intensive service firms. He avoids doing that by saying:

> Such a dichotomous definition (*PSF versus non-PSF*) poses several problems. It excludes some fields that rank highly as examples of PSFs (...) but that are very weakly professionalized, such as management consulting, which would give the definition poor face validity. And such a restrictive definition would render PSF research ineffective in offering insights into managing knowledge intensity, since findings might stem from low capital intensity or a professionalized workforce instead (Nordenflycht 2010: 157, with my addition).

Instead of this, Nordenflycht attempts to solve the problem of the lacking PSF definition by presenting a theory about the multiple sources of PSF peculiarities and their managerial and organizational implications. He focuses on three central phenomena - knowledge intensity, low capital intensity and professional workforce - and presents a taxonomy of four types of knowledge intensive companies, each of these associated with different types of challenges and organizational responses. I will give a more detailed overview of this in subchapter 2.4.

Thus, a clear and single definition of professional service firms is still missing. Instead, it is suggested to think in terms of degrees of professional service intensity that is based on the presence of these three main characteristics. The study in hand is based on the mentioned peculiarities and taxonomy of Nordenflycht, testing their validity in the discussion chapter.

2.4 Theory and taxonomy of professional service firms

As noted earlier, Nordenflycht identified three distinctive features common to professional service firms, which are knowledge intensity, low capital intensity and professionalized workforce. These were chosen "because they can be well defined, they are commonly noted as distinctive characteristics (...), and they have been linked in the literature (...) to distinctive managerial challenges or organizational outcomes" (Nordenflycht 2010: 159).

1) Knowledge Intensity

Professional service firms are knowledge intensive as the production of their output relies on a substantial body of complex knowledge. In this category, only knowledge embodied in individuals is taken into account, while other types of knowledge like the ones situated in

routines, equipment and products, are left out. The reasoning behind this says that this approach suits well to the context of PSFs and it is coherent to the definition other scholars commonly have in mind while labelling PSFs as knowledge intensive. In addition, the other approach is seen as misleading as it widens the category too much (and may thus lead to difficulties in creating a limited and distinctive category). However, Nordenflycht does not specify the types of knowledge located in people, which form this substantial body of complex knowledge as noted in the definition. Being a PSF means that "the firm relies on an intellectually skilled workforce, not just among its executive or support functions (e.g., R&D), but also among its "frontline workers" (Nordenflycht 2010: 159).

This peculiarity is seen to lead to two managerial challenges: cat herding and opaque quality.

A) **Cat herding** refers to a situation where managers have difficulties retaining and directing employees due to their strong human capital, e.g., a complex knowledge essential for a company's successful operations. This puts the employees in a good bargaining position, "(…) since their skills are scarce and, in many instances, transferable across firms" (Nordenflycht 2010: 160). Thus, these employees are seen as hard to direct as highly skilled professionals often have strong preferences for autonomy, which is combined with their distaste for direction, supervision and formal organizational processes (Nordenflycht 2010: 160).

Nordenflycht identifies two possible solutions to overcome this managerial challenge. The first one is the usage of alternative compensation mechanisms like contingent and/or deferred compensation (e.g., commission-based pay and performance bonuses, equity stakes, stock options, restricted stock grants, pensions). In other words, these are compensation solutions that in traditional firms are usually reserved for senior managers. The other solution would be to provide enough autonomy for these employees just as they prefer it. This could be done, for example, by greater decentralization of decision making and greater participation of employees in firm-level decisions informally in the organizational structure. The third answer to the cat herding challenge could be to provide more informality in organizational processes. This includes fewer formal rules, looser reporting routines and rotating management positions among senior employees (Nordenflycht 2010: 161).

B) **Opaque quality** as a managerial challenge coming from knowledge intensity is a situation "(…) where the quality of an expert's output is hard for nonexperts (i.e., customers) to evaluate, even after the output is produced and delivered" (Nordenflycht 2010: 161). This happens due to lack of expertise on the customer side, which on the other hand is a reason why the customer has turned to the knowledge intensive company in the first place. Thus, this situation raises the need to signal quality. That is seen to be done by bonding (creating penalties for producing lousy quality, e.g., liability partnership where partners monitor each other; distributing profits equally among employee owners); developing and holding a good reputation; creating a trustworthy appearance (to the company's employees as well as to customers) and employing ethical codes (which is also related to professionalization).

2) Low capital intensity

The second main attribute that characterizes professional service firms is low capital intensity, i.e., "a firm's production does not involve significant amounts of nonhuman assets, such as inventory, factories and equipment, and even intangible nonhuman assets like patents and copyrights" (Nordenflycht 2010: 162). This peculiarity increases employee bargaining power and thus cat herding challenges for the management because:

a) if production does not require much capital, employees' skills become even more important;
b) employees' outside options increase since they can more easily start up their own firms;
c) without non-human capital to specialize to, there is less likelihood of generating firm-specific human capital, which would reduce employee mobility (Nordenflycht 2010: 162).

On the other hand, low capital intensity is seen as reducing the need for raising investment funds which is considered as a positive aspect in the light of often conflicting interests of outside investors and inside actors of the companies.

3) Professionalized workforce

In this aspect, Nordenflycht bases his theory on the widely accepted main characteristics of the term "profession" which are a particular **knowledge base** (covered by the category of

knowledge intensity described earlier); **regulation and control of that knowledge base** and its application and **ideology**.

The last feature, ideology, is associated both with professional codes of ethics and less explicit norms of behaviour for professionals. One of the main professional norms is the strong preference for autonomy (and because of that professionalization also amplifies the wish for autonomy and the managerial cat herding challenge). The other professional norm is called conflict of interest, altruistic service or trusteeship. This lies at the core of professional codes of ethics and means that professionals have a responsibility to protect the interests of clients/society. On the other hand, this responsibility sometimes conflicts with the economic interests of investors and other parties. Thus, a danger for this norm is having (commercially orientated) non-professionals among the owners or governance of PSFs. A solution to the risks coming from this is not to allow persons with only commercial interests to hold these positions or to organize as a non-profit organization.

The main hypotheses regarding a professionalized workforce are:

- **greater professionalization of a firm's workforce affects the intensity with which a firm employs alternative incentive mechanisms**, both because it amplifies the cat herding challenge and because it mutes competition, which allows adoption of more alternative incentive mechanisms with less regard to any added inefficiencies;
- **greater professionalization of a firm's workforce may decrease the level of commercial and/or outside ownership** because of the trusteeship norm;
- **it increases the level of organizational slack** as firms are able to survive without operating at high levels of efficiency (Nordenflycht 2010: 164).

All these three peculiarities described here (knowledge intensity, low capital intensity and professionalized workforce) are seen to have overlapping and distinctive effects, and all of those increase the cat herding challenge. On the other hand, ideology and self-regulation are not inevitable outcomes of knowledge intensity, and the opaque quality challenge is not always attempted to be solved by high professionalization levels. This has led Nordenflycht to the need to create a typology of professional service firms, based on the existence of these peculiarities, challenges, opportunities and organizational responses, which I will now present in detail.

Table 2. *A taxonomy and theory of knowledge-intensive firms.*

	Characteristics			Challenges & Opportunities					Organizational Responses			
Category (with Examples)	Knowledge Intensity	Low Capital Intensity	Professionalized Workforce	Cat Herding	Opaque Quality	*No Investor Protections*	Trusteeship Norm	*Muted Competition*	Alternative Compensation	Autonomy & Informality	No Outside Ownership	Slack
Technology Developers												
Biotech	X			√	√				√	√		
R&D labs												
Neo-PSFs												
Consulting	X	X		√√	√	√			√√	√√√	√	
Advertising												
Professional Campuses												
Hospitals	X		X	√√	√		√	√	√√	√√√	√	√
Classic PSFs (or Regulated PSFs)												
Law	X	X	X	√√√	√	√	√	√	√√√	√√√√	√√	√
Accounting												
Architecture												

Source: Nordenflycht 2010: 166.

Table 2 gives an overview of the taxonomy of knowledge intensive firms, their characteristics and implications. Nordenflycht has listed four categories of firms, providing some examples of each of them and marked with crosses and checks the presence and predicted intensity of such peculiarities, challenges/opportunities and organizational responses in these categories. However, Nordenflycht has not clearly defined the meaning of a different number of checks in this context, claiming that it could mean more widespread use of a certain mechanism (e.g., contingent compensation offered to a broader set of the workforce), as well as greater magnitude of a mechanism (e.g., contingent compensation representing a larger percentage of total compensation) or it could imply a shift from one type of mechanism to another (e.g., from end-of-year bonuses to equity-based compensation) (Nordenflycht 2010: 167). He identifies the need for further testing in this area.

As the table indicates, the first category of knowledge intensive firms is **Technology Developers** and examples of those given in the taxonomy are biotech firms and R&D labs. (On the other hand, an earlier work of Nordenflycht has categorized packaged software firms as pure knowledge firms in a different group than bio-techs and software firms belonging in the same subgroup with law firms (see Appendix Y and Z; Nordenflycht 2007: 43-44). In the current table the main examples in the Technology Developers' category are firms whose workforces are composed of engineers or scientists and that require significant investment in equipment or significant up-front capital to fund development of new products (Nordenflycht 2010: 165). Technology Developers are seen as representing a combination of quite a few characteristics: they involve knowledge intensity, but cannot be characterized by other main

peculiarities in focus. These types of firms display the lowest share of professional service intensity, although they face the challenge of cat herding and opaque quality.

The next category presented in this typology is **Neo-PSFs**, which is similar to the Technology Developers characterized by non-professionalization or weak professionalization, but has low capital intensity and no outside ownership/investor protections. This category is seen to include management consultancies and ad agencies. The label Neo-PSFs is chosen to "(…) capture the PSF literature's shift of emphasis (relative to the professions literature) from professionalism to knowledge intensity more broadly" (Nordenflycht 2010: 165).

Classic PSFs (like law and accounting firms) are seen to have all the characteristics in the focus of this theory and **Professional Campuses** (like hospitals) differ only slightly from those by being more capital intensive than Classic PSFs.

Thus, the theory and typology developed by Nordenflycht (2010) indicates that all PSFs share the characteristic named "knowledge intensity", but they may vary based on the degree of capital intensity and professionalized workforce. In addition, due to different peculiarities associated with PSF categories, different challenges, opportunities and organizational responses come along with these studied peculiarities. However, the taxonomy and its categories are left open for further empirical testing and it is advised for future conceptual research to analyse additional dimensions with which to differentiate further among professional service firms.

2.5 Critique towards the theory and taxonomy of professional service firms

Zardkoohi, Bierman, Panina and Chakrabarty (2011) argue against several points in the theory and taxonomy of Nordenflycht. They believe the proper question is not how to define a PSF, but how a given service becomes optimally organized. Referring to many exceptions, even in the category of classical PSFs, they find it problematic to define PSFs in a context that is in constant change. Alternatively, they propose that it would be more effective to examine how a distinct group of firms becomes optimally organized as contexts change (Zardkoohi et al. 2011: 184).

They focus on the peculiarities, challenges and organizational responses indicated by Nordenflycht through the lens of **context**. As a result of that, they first argue that the cat-like behaviour of professionals depends on "(...) how easily they can be replaced by the employer (i.e., how competitive the labour market is for their expertise) and/or (...) whether the task and its contexts require an autonomous or decentralized decision-making structure" (Zardkoohi et al. 2011: 181). This means, in a competitive market, professionals who display cat-like behaviour can easily lose their job, but on the other hand, the firm can replace such employees without any difficulties. In addition, transferability of human capital makes it possible for the companies to employ from competitors. For employees there is a limit to job switching, because of their reputation for such cat-like behaviour and even if the job switching succeeds, it will result in an employee's own over time work. Thus, contrary to Nordenflycht's point, Zardkoohi et al. **do not see cat herding problems arising due to complex knowledge, but lack of competition in the job market**. In addition, the scholars **do not believe in such retaining difficulties of professionals** as indicated by Nordenflycht (Zardkoohi et al. 2011: 181, 183).

For the third, Zardkoohi et al. **tie the decentralized decision making and autonomy at work to the aspect of context**. Different from Nordenflycht who explains these as organizational responses to professionals who strongly prefer autonomy and who are thus provided with this kind of incentive for retaining reasons, Zardkoohi et al. find this rather as an "(…) efficient organizational response to the decentralized nature of information held by professionals" (Zardkoohi et al. 2011: 181). Thus, they make a distinction between the terms of cat herding and independence. Referring to university professors in the lecture theatre, lawyers in the courtroom and surgeons in the operating room - all of them are led by their own initiative with no regard for administrative superiors.

For the fourth, Zardkoohi et al. **argue against "unlimited liability partnership" as an effective method to address the challenge of opaque quality**. They indicate that in the U.S. and Europe most traditional PSFs are organized as limited liability partnerships in order to prevent cross-liabilities when faced with lawsuits and not to signal quality. Due to the large size of many companies in this category, assuming liability by each partner is too costly and impractical due to often great geographical diversification. It would create an unnecessary risk for each partner. An additional factor influencing effective monitoring is the free-rider

problem which comes from the fact that if one puts effort into monitoring other partners' work, she has to bear the costs arising from this, but the benefits of her behaviour will also spread to every other partner in the company (Zardkoohi et al. 2011: 181-182).

Further, different from Nordenflycht's argument, who sees **contingent and deferred compensation systems** as one solution to the cat herding challenge, Zardkoohi et al. find it **instead coming from high monitoring costs**. "(...) high monitoring costs are the main explanation for the adoption of such compensation systems, where each partner's compensation is contingent on his or her performance only" (Zardkoohi et al. 2011: 182). Hence, again the context is seen as playing a crucial role in this aspect.

Zardkoohi et al. also disagree with Nordenflycht in two aspects related to the low capital intensity. Nordenflycht states that low capital intensity further amplifies the challenge of retaining professionals and the cat herding problem. Nordenflycht further claims that "low capital intensity gives the firm the opportunity to avoid outside investors as monitors so that the firm has the freedom to adopt efficient measures of alternative compensation, employee autonomy, and informality" (Zardkoohi et al. 2011: 183). In addition, he refers to conflicting interests of outside investors and professionals in the company, finding that keeping commercially oriented actors away from firm ownership or governance minimizes possible risks to the trusteeship norm. Zardkoohi et al. argue against these statements. First, they find the **fear of losing professionals irrelevant in the context where competition allows replacing professionals who act like independent cats**. Second, corporate governance literature does **not support the idea of outside investors objecting effectively working organizational measures**. On the contrary, scholars refer to the evidence of law firms (as the classical example of PSFs) that have turned into "corporate form" with stocks traded on the open market (Zardkoohi et al. 2011: 181-183).

Hence, the context-based view of the theory explained in this section provides a somewhat different yet valuable understanding of the possible reasons behind the peculiarities of PSFs. However, the typology and three core peculiarities of PSFs have not been contested.

2.6 Support from other scholars on peculiarities associated with professional service firms

Former literature on professional service firms and knowledge intensive companies has approached the described peculiarities a bit differently from Nordenflycht and pointed out some other peculiarities of these types of companies that are not reflected in the theory developed by Nordenflycht (2010). I will now give a short overview of a selection of these, however, I begin by naming the three characteristics that were intentionally excluded from the theory and typology by Nordenflycht. These are:

1. **"intangible output"** that is often used to characterize PSFs, but the term is seen as too hard to pin down or not very useful;
2. **"customized output"** as applying the expertise to each client's special situation. However, this term has nothing new to offer that is not covered by the term knowledge intensity;
3. **"serving of business clients"** rather than individuals is characteristic, but is not clearly tied to distinct organizational outcomes (Nordenflycht 2010: 165).

Some other formerly mentioned peculiarities, challenges and opportunities of PSFs fall into the same categories as the ones created by Nordenflycht, thus supporting his analysis. These are:

1. **"knowledge intensity"**. Starbuck (1992) advises to weight company's emphasis on esoteric expertise instead of widely shared knowledge, in order to find out if the company is a knowledge intensive company (Starbuck 1992: 716). He claims that exceptional and valuable expertise must dominate commonplace knowledge and this type of expertise has to make an important contribution to the company, so that the firm could be categorized as knowledge intensive. Seen from the other side, knowledge is different from a flow of information and should not be confused with this. One possibility to identify knowledge workers is to set criteria of formal education and expertise equivalent to a PhD, and to identify knowledge intensive firms as ones where such experts constitute at least one third of the workforce;

"distinctive competencies and reflecting the context". Related to the knowledge intensity, Starbuck has noted that competitive edge of very successful firms comes from their exploitation of peculiarities.

> A modal firm in a competitive industry makes low profits, and it does not survive long. High profits and long survival come from monopolistic competition. Monopolistic competition arises from firms' developing distinctive competencies and mirroring their environments' unusual needs and capabilities (Starbuck 1992: 721);

2. **"cat herding challenge**". Knowledge workers are seen as distinguishable from manual workers by carrying the means of production in themselves in the form of knowledge and thus they are able to move, working one place to another, taking the knowledge with them. Their skills are considered not "transaction-specific" and they themselves "are unlikely to suffer productivity losses when they move to another organization" (Groysberg & Lee 2008: 1123-1124). In addition, due to their tight contact with customers who tend to be loyal to the knowledge workers, another risk for the company is that in the case of leaving, customers will move with the knowledge worker (Groysberg & Lee 2008: 1123-1124);

"**recruitment and retention issues**". These are considered complicated as the compensation packages are already very high in the case of knowledge workers; these employees are seen as highly intrinsically motivated and the job market for top experts is wide and increasing. Traditional governance structures do not sit well with profession's ethical and normative codes and the pursuit of economic profit; in addition, knowledge workers are not willing to give away their autonomy. "PSFs also have unique challenges because of their core concern with knowledge and expertise and the nature of their relationships with clients" (Suddaby 2008: 990);

"value of extraordinary performers for the company". In knowledge intensive companies, the productivity and thus value of top performers exceeds many times their colleagues, and therefore they cannot be replaced by a large number of poorer performers or non-human assets. On the other hand, these workers are remarkably more visible in the labour market than others and they gain disproportionally more attention from competitors, clients and media. This attention is complemented by their

higher mobility and therefore, desirability to competitors (Groysberg and Lee, 2008: 1125-1126);

3. "**opaque quality**". Starbuck refers to the non-controllable quality of expert work by its clients. He explains that clients cannot judge expert advice or reports only on substance; they do not know what would have happened if they had not followed the advice given to them or they may not understand what the experts are saying. Therefore, experts' ways of speaking, usage of impressive statistical computations, their appearance, data quality, logic in their analyses, self-confidence etc. are then crucial signals of quality (Starbuck 1992: 731).

4. **"informal leadership".** Knowledge intensive firms are seen as downplaying formal structures and hierarchies, replacing their roles with social norms and incentives. A reason behind this is considered to be the wish for autonomy of knowledge workers; another reason is considered to be these workers' many years in formal (higher) education and the values that have come from this. In addition, experts work independently because their projects involve just a few people. Knowledge intensive firms need fluidity and ambiguity in order to respond to the market situation, and therefore, matrix structures and sketchy organization charts are common (Starbuck 1992: 730).

Thus, several scholars have described earlier the characteristics and challenges of PSFs chosen by Nordenflycht in his theory. However, in some aspects their approach has been slightly different, hence providing an addition to the theoretical background of this thesis. Further, I will continue by giving an overview of the methodology and empirical findings of the study in hand, and return to these issues described in this chapter in the discussion.

3. Design and methodology

In the following section I give an overview of the design and methodological issues related to the study in hand. First, I reflect upon the overall approach of my research project and the rationale behind it. Further, I explain in detail the selection of cases and informants, and data gathering and analysis methods. This section ends with quality issues: trustworthiness, personal biography influencing interpretations of this study and ethical reflections.

3.1 Overall approach and rationale

In the present study I have chosen to approach the thematics qualitatively. I find the term "qualitative research" is best defined by Denzin and Lincoln who claim that:

> Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including fieldnotes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (Creswell 2006: 36).

It is suggested to consider using qualitative methods among other reasons when an issue or problem needs to be explored; we need a complex, detailed understanding of the issue; to understand the contexts or settings in which the participants address a problem or issue; develop theories when partial or inadequate theories exist and so on (Creswell 2006: 39-41).

This decision to approach the thematics qualitatively is grounded in my research objective. In order to get a relevant, naturalistic understanding about a certain type of organization, qualitative methods are a good choice. My aim is to gain insight from the actors in IT start-up companies - a field that is not covered by earlier studies. It is essential to hear the voices of the actors to see the rationale behind their actions and understand their values and organizational culture that is different from other, more traditional, companies. In addition, only partial theories exist about software development companies (not start-ups) as professional service firms and therefore, a complex exploration of these organizations

through qualitative methods is needed. Mapping the peculiarities of these firms based on the small amount of existing literature would also be possible using the quantitative approach, though this would only fasten these companies to a certain narrow category in the existing typology without trying to get the whole picture and adapting the theory to their actual characteristics. It would be an easy way out, but certainly not the best decision in the case of this research aim.

However, the qualitative paradigm can be used in different ways and it is therefore important to decide whether or not to use a specific qualitative approach (e.g., phenomenology, narrative research, grounded theory etc.). I have chosen to investigate the topic through the case study approach.

Case study research is defined as involving "the study of an issue explored through one or more cases within a bounded system" or more specifically as:

> a qualitative approach in which the investigator explores a bounded system (…) or multiple bounded systems (…) over time, through detailed, in-depth data collection involving multiple sources of information (…), and reports a case description and case-based themes (Creswell 2006: 73).

Some researchers think of the case study as merely a choice of what is to be studied, others look at it more widely and stress that a case study is not a method, but a research strategy that should be defined in terms of its theoretical orientation. Emphasis is put on understanding processes in, and with, their contexts and it is thus essential for a case study researcher to develop plausible theoretical frameworks that provide both sense of the particular circumstances in focus and of more general aspects of interest and relevance (Cassell & Symon 2004: 326). By using an open and flexible approach in the interviews, I wanted to understand the nature of my studied companies and their everyday processes within their context. This influencing context could be either the specific start-up context, IT sector, PSF-context or for some issues the organizational context itself as well. For doing this, I looked at the empirical findings through the existing body of knowledge about PSFs and start-ups.

My choice in favour of case study research is in accordance with former organizational studies. It also gives the possibility to study a small number of cases in detail, by employing different data sources and methods - whatever is valuable to develop as good an

understanding of the case as possible (Silverman 2004 :126). Viewed more narrowly, I use the collective case study approach, by selecting one issue and analysing two case studies in the light of this topic. In my case this is clarification of concepts done by analysing chosen cases in the light of the former body of knowledge in this field.

I have decided to focus relatively straightforwardly on the topics of this study. It could be labelled as a rather functionalist perspective, being less related with the sides of interpretivism and constructivism. However, this does not mean that I am trying to avoid possible patterns hidden in the data and to see everything only "as it is". The idea is to take the actor's point of view and thus both to look at the processes through the eyes of participants and then to develop these views into greater categories and abstracts. "At some point we ask, "Did we get the story "right"?", knowing that there are no "right" stories, only multiple stories" (Creswell 2006: 44). When approaching the research focus qualitatively, this was one of the main beliefs I held in my mind.

3.2 Selection of the cases and informants

Further on I will explain reasoning behind the selection of cases and participants. As Becker describes it:

> sampling is a major problem for any kind of research. We can't study every case of whatever we're interested in, nor should we want to. Every scientific enterprise tries to find out something that will apply to everything of a certain kind by studying a few examples, the results of the study being, as we say "generalizable" to all members of that class of stuff. We need the sample to persuade people that we know something about the whole class (Becker 1998: 67).

In this study I have chosen to take a look at the research objectives through two cases. This decision has been a compromise between generalizability, possible depth of the data and the capacity of this project in terms of time and other resources. "The study of more than one case dilutes the overall analysis; the more cases an individual studies, the less the depth in any single case" (Creswell 2006: 76). Therefore, it is important to take a look at the sampling issue as something that is grounded in the theory and thus purposive. "The issue should be couched in terms of the generalizability of cases to theoretical propositions rather than to

populations or universes" (Silverman 2004: 130). In the current study I have tried to search for organizations where the issues I aim to study are most likely to occur.

Boundaries for my cases are set by the field of activity (the software development industry), age (legal age not older than 10 years), number of employees (more than five but less than 100 persons) and the fact that in the public sphere they were cited as examples of start-up companies. I planned to study successful start-ups that have gone through the very first stages of development, have stable income and employ a few more workers than the initial founders. I am aware that it is not necessary to study only successful examples of one phenomenon to get a full understanding of it, rather the opposite, and I was considering involving a start-up company that has failed in this industry. This may have given a different insight into the challenges faced by these types of companies, however, this would have increased the focus of my thesis outside the planned boundaries and therefore, this extension would suit better in another research project. In addition to this expansion it would be interesting, although outside of my present limits, for a larger project to take account the macro level (country, society, global environment) and the peculiarities and challenges influencing IT start-ups from this view point; also the theoretical background of informationalism and other related concepts. In that case it would be necessary to interview the representatives of national start-up programmes, umbrella organizations of start-ups and other actors in this field, however, this is an aspect I have put aside on purpose.

It is advised to be flexible towards research focus and be prepared to change it when needed:

> Each stage of the research work will result in challenging a project's focus and lead to some re-evaluation (....) Too strong a focus early on may lead to you ignoring what actually are more important issues than the ones you have chosen. Too weak a focus results in following up each side issue as it emerges and not getting anywhere! (Silverman 2004: 91)

This was the actual case for my project as well. At first the purpose of this study was to research software development companies as professional service firms, as categorized in Nordenflycht's model (2010). After the first interviews in my first case, I realized the topic should be better defined, as this case seemed to have some peculiarities and challenges due to its specific start-up nature. This made me to change my focus, explore the literature about start-up companies and find the second case that would suit this extra criterion.

I approached the first case through my personal network, as a family member of mine had co-operated with an owner of an IT start-up company. I used e-mail to introduce myself, my research project and the practical information related to this, and to invite his company to participate in this study. E-mail was chosen as it allows giving more information at once than a phone call which I consider more suitable for urgent issues. It does not require quick and short answers, rather provides a bit more time to think it through and come back to the issue later. In addition, many of the organizations in this industry are physically spread around the world (also in different time zones), which makes it more difficult to get in touch with them by other means.

My first contact took some days to answer and then asked for exact information about the time needed from him. After this he quickly agreed to take part in this research. However, although it seemed logical to get in touch with the possible case companies via e-mail and I beforehand thought this medium is very commonly used in the information technology industry, after some first experiences I realized that some challenges relate to this. In the search for the next possible cases, I experienced that quite often no response followed either my invitation by e-mail or the second reminder using the same medium. I then contacted one possible interviewee through on-line chat conversation on Skype as he lived on another continent and heard that he had not even read the information I had sent. He explained this by saying he receives more than 400 e-mails per day and thus has no time to read everything. Another possible interviewee did answer my appeal, but noted that I should not write such a long e-mail as he has no time to read this.

This was an interesting discovery for me, since I had written only the pure basics needed in order to get the informed consent. I assume this reflects a different e-mail culture among the field specialists compared to persons working in other industries. E-mails are not much read or done so very quickly and the focus of communication has moved to some other mediums (e.g., Skype chat or calls). A reason behind this may be the nature of start-up companies that require (especially at the beginning) high workloads from its founders, since on the one hand a team of a few is supposed to cover all important tasks in the organization and on the other, huge progress in terms of cash flow and other essential measures is expected. Therefore, to secure easier access to the field, for future research projects I would suggest approaching this sector, at least in addition to e-mails, by some other mediums as well.

Altogether I turned to seven IT companies from which two agreed to participate in the study; one explained their refusal with organizational restructuring, uncertainty and high stress levels among employees; one already had some students with their on-going research projects in the company; one refused due to lack of time; one did not answer to my appeals for more than half a month and then wrote that he is not the right person in the company to decide that kind of matter and from one company I never heard anything. After getting quite a few refusals and being under some time pressure myself, I decided to change my tactics a little. I decided to focus on start-ups instead of all software development firms. As the start-up community in Estonia is rather small and nearly everyone knows everyone, I asked for referrals from the founder of my first case. He kindly gave me a short list of the most successful start-up companies I could use in this project. This time I started my invitation e-mail with his referral and this tactics worked - the company agreed to co-operate with me. Thus, I am of the opinion that this may be a good way to contact possible cases in other closed communities as well.

As the research purpose assumes a wider understanding of the particular company, its challenges, issues related to leadership, job market, investor relationships etc., keeping the focus on insights from managers and founders is therefore important. On the other hand, it is necessary to hear the voices of "knowledge workers" as well, as they are situated at the core of knowledge intensive firms and thus, also in my study. A second opinion, a reflection of the issues raised and characterized by managers/founders is needed. In the study in hand I conducted interviews with company managers/founders and "key persons" from the knowledge workers that were mentioned during the interviews with managers/owners as extra valuable persons for the firm or those with long-term experience in the company. This seems to be a slightly subjective evaluation and raises the question of whether managers may have referred those employees as persons who would give me the information the managers would like them to give. However, as both of the companies employed fewer than 50 persons, the choice is not that wide and is even more narrowed by the different positions and working experience, so that it was quite clear to me why certain persons were recommended. In addition, I could myself choose the employees I would like to talk to; the final decision on possible interviewees was made by me. I decided to leave out those persons who do not work in knowledge intensive positions (e.g., customer service providers). Furthermore, not all

possible interviewees agreed to participate in the study (two of them ignored my invitations), which decreased even more the influence of managers on the data collected from employees.

In the current study I conducted semi-structured interviews with key informants from each firm. I intended to interview company founders, CEOs and a sample of knowledge workers (software developers, designers etc.). In total I had nine interviews. In Fraktal/Edicy I ended up with five interviews: three interviews with the company's founders and at the same time knowledge workers, and two interviews with pure knowledge workers. In ZeroTurnaround I conducted four interviews: one with the company's founder and CEO, one with the founder and knowledge worker, and two with pure knowledge workers. The interviews lasted from 40 minutes to two hours.

One reason behind the number of interviews was the objective of the current thesis which is clarification of concepts. Critical testing and supplementing of the existing definition and typology of PSFs is important for several reasons. It develops the general body of knowledge about professional service firms; forms a basis for future research on PSFs by clarifying the borders of this phenomenon and tries to solve the generalizability issue and helps to move forward to a definition that covers all main aspects of PSFs or in finding an alternative to this. On the other hand, clarification of concepts contributes to the knowledge about start-ups. It shows to what extent the characteristics commonly related to PSFs exist in this kind of company and creates a basis for integrating this PSF-related side into the research and analysis of start-ups in the future. Thus, the clarification is important for both schools of thought. According to the categorization of the case studies, my study could be characterized as an instrumental case study, "in which a case is examined mainly to provide insight into an issue or to revise a generalization. Although the case selected is studied in depth, the main focus is on something else" (Silverman 2004: 127). Comparative case study gives a sufficient overview of the main characteristics by these concepts, gives the opportunity to find the aspects that are common by both cases and allows comparing these findings with formerly indicated peculiarities. It allows forming a model to categorize peculiarities and challenges that are tied to these firms, which helps to clarify the nature of these concepts, without the aim to cover all aspects and map even the smallest details of the cases. Thus, much of the purpose of the chosen research methodology (comparative case study), methods and the thesis in its entirety is such a clarification.

Another reason behind the number of conducted interviews was the small size and recent or on-going fast growth of these companies. Edicy started its quick growth at the beginning of 2012, but during the interviewing period it employed 4-6 persons working on the Edicy side. One of them did not want to participate in the study. ZeroTurnaround employed approximately 50 persons by the beginning of the interviewing period, but most of them had not had a long history within the firm. Since 2011 the company has significantly grown every quarter (first from 9 to 18 employees, then to 35 to 47, until the end of research period to 59 employees). An important percentage of its workforce is sales persons, administrative employees, managers and others not applicable for my interviews. From its 59 employees, 21 are engineers and 38 other occupations. Both of these aspects limit the number of possible interviews. However, the reasoning behind the number of interviews was to keep conducting interviews as long as no significant new information occurs (data saturation point) and this principle was fully complied with. Together with the secondary data I obtained a versatile understanding of the main issues through these cases.

3.3 Data-gathering methods

Data was gathered in two ways: through qualitative interviews and secondary data available in the public sphere. It might have been possible to find answers to the research questions through observation and analysis of documentary, as interviews in general are essential when wanting to get and understand the insight of actors in the field. However, the chosen methods have given me a very good insight of the thematics.

3.3.1 Secondary data

The importance of collecting prior knowledge is emphasized by the scholars, because it has a tendency to become a part of researcher's subjectivity. Therefore, it should be treated critically.

> Reviewing literature before entering the field is critical. It gives you prior knowledge (….) The more one knows about what is known about the part of world being explored, the better. Little may be known or understood without that. The knowledge gained in the review becomes part of one's subjectivity and should, like all knowledge, be treated critically (Graue & Walch 1998: 92).

Before conducting interviews I did some desk research about the particular company by using media publications, company homepages, weblogs, financial reports, Facebook pages, video interviews, etc. In addition I asked the company CEO or contact person to send me all kinds of information about the firm that could provide me with a good understanding of it, and by this, save their valuable time during the interviews. Where it was possible, I tried the main product of the companies to understand the different features of it. I coded and categorized the collected secondary data and drew a flow chart of this information. Secondary data formed the first understanding of peculiarities and challenges related to these companies.

3.3.2 Interviews

"The purpose of a qualitative research interview (...) (is) obtaining qualitative descriptions of the life world of the subject with respect to interpretation of their meaning" (Kvale 1996: 124, my addition). Qualitative semi-structured interview is characterized by having some suggested questions and aims to have a sequence of themes to be covered, although at the same time the researcher remains open to changes of sequence and forms of questions, intending to follow up the answers and stories told by the subjects (Kvale 1996: 124).

Kvale also describes the various dimensions that characterize interviews, these are interview structure; openness of purpose; emphasis on exploration versus hypothesis testing; description versus interpretation and intellectual-emotional dimension (Kvale 1996: 126-127). According to the first dimension - interview structure – the conducted interviews were quite open as specific themes were in focus, but I did not hold a predetermined sequence and formulation of questions. I tried to use a lot of follow-ups and other probing techniques in order to have a natural, conversation-like interview that would be interesting for the interviewees as well, especially as they expressed being under significant time pressure, but nevertheless agreed to give me the interview. In addition, as I did not do observations in the companies, this open structure enabled getting the closest picture of "how things work" in the case company; whereas using a tight structure would have been too artificial. To be able to probe successfully, I drew mindmaps based on the obtained information on paper while interviewing - this helped me with keeping an eye on the logic during the interview, covering

every aspect I was planning to and at the same time writing down the aspects I wanted to get to know more about.

With regard to openness of purpose, I chose to adopt a roundabout approach with rather indirect questions for the same reason as for using an open interview structure. This provided more inductiveness and a wider picture of the company than I would have obtained by setting strict boundaries. In the scale of exploration versus hypothesis testing I would place myself in the middle, aiming to explore the topics inductively, but at the same time holding in my mind some hypotheses coming from prior knowledge about these companies and the specialist literature. However, concerning the dimension of description versus interpretation, I tried to mainly get detailed descriptions of the investigated phenomena, with rather less emphasis on interpreting these together with the subject. This decision came purely from the angle of my research questions. On the scale of intellectuality-emotionality, my conducted interviews could be characterized as rather rational logical discourses where I, together with the subject, tried to analytically clarify the phenomena in focus.

Prior to first interviews with my subjects I pre-tested my interview guide on a family member who is a CEO of a professional service firm in another industry. Doing this gave me the first impression of the interviews, made me correct some questions that did not sound good and let me evaluate the approximate time spent on each thematic group of questions. I conducted interviews with participants using Skype video call. That means, although we were located physically in different countries, I could see and hear the interviewees in real time and vice versa. Skype was chosen because it is one of the main communication tools used by such IT firms which my informants were very used to. In addition, it was chosen because of my residence abroad during the field work period. Since time pressure was often mentioned by the CEOs and some knowledge workers, video call enabled me to save their valuable time because there was no need to make appointments to meet requiring being at a certain time in a common place. My interviewees could start a video call independently from their physical location - one of them was at home, another in their office or at other places indoors. The advantages of Skype over other communication tools are the wide awareness of it among Estonians, good accessibility and globally free calling. This is an actual advantage for companies situated across the world. On the other hand, by conducting interviews via Skype, I did not have a chance to walk around their companies and observe, which may have given me some kind of extra information about the cases (e.g., what kind of routines they have, how

do they communicate with each other, how is leadership conducted and perceived by employees, etc.). However, since their offices are around the world, including on other continents, I would not have been able to observe the working life in each company anyway. In the current situation, nevertheless, it was a good solution for getting a natural insight into my participants' working life, as every informant could stay in their safe and familiar environment while talking about the same environment. During the interviews, some participants showed me around the office through the camera, so that I could perceive their working environment without actually disturbing them.

I did not perceive any discouraging factors coming from interviews being conducted via Skype apart from the fact that it was not as easy to interrupt the other party while talking as it is in a face-to-face situation. Interruption would have taken place with a short delay so that it would break the normal conversation unexpectedly, as otherwise one usually waits for a short pause to ask a new question. In a case like that I usually let the person finish his reasoning. In general, after a short briefing, I started interviewing by asking some wider, introductory questions about the company and their tasks in it. Sometimes I had to ask questions when I believed I already knew the answer and the answers often surprised me. This taught me to assume nothing and to always ask the questions needed to understand the point of view of my informants.

I audio recorded all interviews so that I could listen to these afterwards, transcribe and begin data analysis.

3.4 Data analysis procedures

Data analysis begun with transcription; approximately 85% of the interviews were transcribed. I decided not to transcribe all the data I collected as my research purpose was not to reveal any hidden meanings behind what was said or in general to take an interpretivist perspective. Further, I applied a coding process that works from the data to a larger theoretical model. I continued the work with thematic analysis by coding sentences/ideas from the interviews and then grouping them into categories. "Through its theoretical freedom, thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex, account of data" (Braun & Clarke 2006: 78). This method

suited my purposes well. I followed the advice from Creswell who notes that "qualitative researchers build their patterns, categories, and themes from the "bottom-up", by organizing the data into increasingly more abstract units of information" (Creswell 2006: 38). Therefore, in the analysis I tried to remove myself from the former (desk) research findings and typologies, and to be as inductive as possible. However, some prior knowledge about the PSFs learned from literature influenced the analysis to some extent. Nevertheless, I did not code the interviews by research questions created before looking at the data, but instead, as the definition of inductive approach assumes, the exact research questions emerged from the data during the coding process (Braun & Clarke 2006). I used a realistic epistemological point of view, assuming a simple one-way relationship between the language, experiences and meanings of utterances. Therefore, I created categories on the semantic level by defining their meanings rather concretely and superficially.

Miles and Huberman find that instead of using text, conceptual frameworks are best done graphically, as it is beneficial for the analysis to have the whole framework on a single page (Silverman 2004: 86). To get a good overview and understanding of the data, categories emerging from it and the relations between these, I created a flow chart. I attempted to develop a complex picture of the issue under study, by holding onto pieces of information that at first glance were not direct answers to my research questions; instead I put these aside and came back to these later on, to see how they fitted in to the overall picture. I aimed to employ the "rigorous approach" which means that:

> (...) extensive data collection in the field occurs, or when the researcher conducts multiple levels of data analysis, from the narrow codes or themes to broader interrelated themes to more abstract dimensions. Rigor means, too, that the researcher validates the accuracy of the account using one or more of the procedures for validation, such as member checking, triangulating sources of data, or using peer or external auditors of the accounts (Creswell 2006: 46).

For validation I used the help of some of my interviewees. I present a more detailed description of validation and its related issues in the next subchapter.

I conducted data analysis at the same time as gathering data, which means I transcribed and did the initial coding of the material right after each interview. This led to a situation where each interview was at least partly influenced by the former ones and in the upcoming interviews I could ask specific questions about the areas where I did not gain a full

understanding. Although this approach is widely common in grounded theory studies, I found it helpful in my case studies as well.

3.5 Trustworthiness

This section examines the validation and reliability of the results from my case studies.

> By validity, I mean truth: interpreted as the extent to which an account accurately represents the social phenomena to which it refers (…) Reliability refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions. (Silverman 2004: 210)

I will first focus on the most often used means of validation, which are construct validity, external validity and internal validity, and then describe other methods employed for ensuring research quality and reliability. By construct validity it is meant "the establishment of correct operational measures for the concepts being studied"; by external validity "the possibility of extrapolating the results obtained from a sample to other elements, under different conditions of time and place" and by internal validity "ensuring the relevance and internal coherence of the results in line with the researcher's stated objectives" (Lu 2005: 92).

For ensuring **construct validity** I have collected data from multiple sources. I interviewed company founders and CEOs to get a broader picture of the organization and its history, and knowledge workers such as engineers, designers and programmers to get an understanding of their role, motivation and perception of the everyday working life in the organization. This gave me a two-sided view of the case. In addition, I put much effort into collecting and analysing the secondary data available in the public sphere, so this widened my knowledge about the studied companies and general industrial/start-up peculiarities.

To ensure **external validity** I employed an explicit research design by explaining the sampling strategy, data analysis procedures and providing an interview guide. This allows other researchers to conduct a study using the same methods and principles as I did, to either confirm or challenge my findings. For ensuring **internal validity** I was flexible in my research objectives during the study. As I approached the topic inductively during the interviews and coding processes, I was free to any change the direction of the whole thesis. This means that my exact research questions and findings evolved together, being interrelated

and influenced by each other.

In general, an important prerequisite for validity is **treating all data** that has been collected. I decided to approach my data inductively and then to categorize every aspect that occurred through data collection. This means also coding those data where at first I could not see a direct relation to my research aims or former findings in the field. The meaning and role of these codes became clear later in the analysis. Some examples of this are the codes like "physical working environment" and "plurality of roles of key workers".

To ensure that I had understood and communicated the main issues related to the studied cases in the same way that they had come from the companies, I used **respondent validation**. I went back to some of my subjects with the initial findings and asked for their feedback. In one case it worked fine, I got the extra information that I asked for and comments about my empirical findings. In the other case I did not receive feedback. As a result of that, only findings about one company were reviewed and specified. I decided to send the material for validation to the companies' founders and CEOs as they are the main representatives of the company with the widest understanding of the firm, and also most responsible for securing a proper image of the firm. However, in the case of ZeroTurnaround the validation took place via another person who is responsible for communication in the company. I see this as a benefit because she organized the needed feedback in the given timeframe, something that would have been much less likely due to the tight schedule of the company's CEO.

However, respondent validation is not the sole or best choice for increasing thesis validity. As Fielding and Fielding argue:

> there is no reason to assume that members have privileged status as commentators on their actions (...) such feedback cannot be taken as direct validation or refutation of the observer's inferences. Rather such processes of so-called "validation" should be treated as yet another source of data and insight (Silverman 2004: 212).

This is partly why I asked for only the empirical findings section and case description to be reviewed, not the discussion chapter. In reviewing the empirical findings chapter, only the facts need to be corrected (e.g., the working time requirement in the company which was a specified aspect in the review) and it does not require prior theoretical knowledge. In addition, valid empirical findings form a basis for the analytical discussion.

Another source for validity is applying the **refutability principle** which means that "we must overcome the temptation to jump to easy conclusions just because there is some evidence that seems to lead in an interesting direction. Instead, we must subject this evidence to every possible test" (Silverman 2004: 213). This principle can be well upheld by deploying the constant comparative method and "(…) inspecting and comparing all the data fragments that arise in a single case" (Silverman 2004: 214).

In my thesis I employed an approach that is usually characteristic in grounded theory – I transcribed, coded and analysed my data right after each interview. I tested my findings from one interview in the next one, to be sure that these findings belong to a common pattern and are not just a deviation from the others. In addition, I constantly tested my research questions. At one stage I doubted if my studied cases represent professional service firms as in both of them the participants talked about their products and not services. To test the suitability of my cases with my research questions, I compared the material collected from media, interviews and personal contacts with their "product" to the definition of "a service" and its specific characteristics. This testing confirmed that by doubts were unfounded and the outcome of these companies is service in its nature.

One aspect that was in accordance with former research and seemed to lead to an easy conclusion was tied to financial resources. In the case of Edicy, a tight budget occurred as a limiting factor in development and organizational growth. This finding was supported by earlier studies on start-ups. On the other hand, it did not apply to ZeroTurnaround, money was not mentioned as an issue nor was it confirmed to be when I directly asked about it. Rather the opposite, ZeroTurnaround had sufficient income from sales right from their establishment. Thus, a tight financial budget cannot be seen as a common industrial or start-up specific barrier, although an obvious solution to lack of money – using outside investors – occurred in both cases. It became clear that investors were not involved only for financial reasons, but also, almost to the same extent, for the benefit of using them as mentors. Thus, the need for mentors and investors, and their knowledge and contacts in the area, is a common characteristic for these cases, not simply the lack of money among new start-ups. Without comparative testing of the cases and comparing my empirical material with the secondary data, I would have not come to this result. Thus, I perceived the **analysis of deviant cases** (even when only two cases are studied) as an important validation strategy. I

conducted similar testing for several findings in my data.

I aimed to strengthen the **reliability** issue by creating low-inference descriptors – detailed data presentations that communicate to the reader the conversation between informant and researcher. Different from laconic summaries of data created by the researcher, this provides both a deeper understanding of the conversation and the context of the informant's words, and thus gives the reader the opportunity to decide for herself whether or not the words belong to a certain category.

3.6 Personal biography

As a qualitative researcher I reflect upon my personal background, experiences and attitudes related to the subjects, believing that to a certain extent these shape the research findings and interpretations.

Prior to the current study I was rather a stranger in the start-up world. However, in a small society like Estonia, being active in the business sector and in addition, coming up with innovative ideas or products, easily gets the public attention through media channels. Even those business interested people who have not been particularly interested in technology firms or start-ups recognize at least the most popular companies in this field, having read about them in the newspapers, weblogs, seen them on TV being nominated for the Entrepreneurship Awards or heard about them presenting at some kind of conference. I had superficial prior knowledge about Edicy through having seen their product and knowing that a family member of mine has done some co-operation with its founder/CEO. This family member had a positive attitude towards this company and therefore suggested it to me and also communicated this positive image to me. With ZeroTurnaround I had had even less contact than with Edicy. I had seen them on the Entrepreneurship Awards 2011 and they had been suggested by some friends as an interesting company to get to know better. Although I had minimal knowledge about them, I held an open and positive attitude towards the firm.

On the other hand, the area of knowledge intensive companies, professional service firms and entrepreneurship is not strange to me. For the last seven years I have been working in the

advertising and marketing research industry as a co-founder and board member of a small research company. For this reason I have been interested in sociology of organizations and particularly knowledge intensive firms through the theoretical lens and former studies, and also gained practical experiences in these issues in my everyday working life. I am familiar with the challenges of founding and developing a company in tight financial frames and on the basis of the enthusiasm of the founders; familiar with the periods when everybody in the company has to work 24/7 and endlessly prove themselves; familiar with the joint thrill that finally comes from success and the general freedom that comes with entrepreneurship (although some might say it is freedom to work all the time, instead of from 9 to 5). In addition, my research subjects are approximately the same age as me and although I did not express my stance during the research, they seemed to have values close to mine. I interviewed them from personal interest as much as from the need for data material and I admired their experiences. Both the choice of which questions to address and how I interpreted situations are influenced by these experiences. Although I presented myself as a sociology student and not as an entrepreneur (and made efforts to keep this self-definition during the whole study), and did not develop a conversation with the research subjects based on my own beliefs/experiences, I am of the opinion that this background has ensured that I have better understanding of the studied topics.

3.7 Ethics

Taking the ethical issues seriously is an important factor in the present study. As the empirical work for the thesis is based on using qualitative research methods in closed systems - privately owned companies in a highly competitive field - some sensitive information may be revealed that may be valuable for parties outside the companies. In addition, I interviewed managers, owners and employees, thus gaining insight from actors from different power levels and with possibly conflicting interests. Securing confidentiality and information safety is therefore essential.

I provided the necessary information about my research project, its aim, methods and practical sides first when negotiating about getting the access to the companies through the owners. As I arranged interviews with other subjects inside the organizations by myself, I provided information about my project to each respondent by e-mail and further on in person

at the beginning of the interviews. Each respondent had the opportunity to decide if he/she wished to participate in the study, even if the leader/owner of the company had already agreed that the firm would be a case in my project. Two participants used their freedom not to participate by not responding either to my introductory e-mail with the invitation for interviews or the reminder. In addition, two companies did not respond to my e-mails during a longer period and I interpreted this as a lack of interest in participating in this study. One representative of an organization refused to participate due to lack of time, another due to several on-going student research projects in the company at the same time and one due to huge restructuring processes and thus high stress levels among the employees. I respected these decisions.

At the beginning of each interview I asked for permission to record our conversations by explaining the practical reasons behind it. No one was against that. I explained to each respondent that these recordings will be used personally by me only for data analysis in this present study. After transcribing the interviews I replaced respondent names with codes, wrote the code meanings on a piece of paper and deleted the recordings. In addition to this I registered my research project with *Datatilsynet* as this project involves personal information that could be either directly or indirectly associated with individuals in the studied companies.

At every step of this research I handled the collected information confidentially, by avoiding information leaks to third parties and any other possible harm that could arise from my involvement. However, once a manager asked me to "tell me if any of my employees say anything bad about us (the owners/managers)". I perceived this as a joke and responded respectfully, without any intension to do so in reality. When interviewing the second case, I tried to approach the participants as a blank slate, without showing any former knowledge about the industry collected through previous interviews, although in reality I had already analysed all the collected information.

As knowledge is a collective good and the researcher has an obligation to return the research results to the participants, I promised the participants a chance to review and correct the findings about their company before finally completing the report. In addition, I intended to send them this thesis once it is finished.

However, considering ethics, I found the most challenging aspect was getting the potential participants and cases to agree to participate in this study. It was difficult to find a balance between my purpose to get a good selection of cases in a limited timeframe and at the same time receiving no answers from my potential participants for quite a long period of time. On the one side it was important for me to get an answer, either yes or no, in order to get on with my search and empirical work, but trying to contact the subjects by different mediums would be perceived as too much pressure and put the feeling of voluntariness at risk. In this case maybe a more direct contact, either by phone or face-to-face would be more effective and reduce this ethical problem.

My second concern is about using on-line mediums in the research process. Different from off-line, e.g., face-to-face studies, in my case the researcher had weaker control over the usage of data by the other party. Computer mediated research gives an opportunity for the interviewee to record the material as well as the researcher and in that case the researcher cannot assure how this material is further used. In addition, by having a virtual contact, I could not be sure that the environment in which conversations took place was safe on the interviewee side; that he would not be overheard, influenced or disturbed. Nevertheless, this seemed not to be an issue for my current study as the participants spoke openly and neither did anyone interrupt our conversations.

4. Empirical findings

The purpose of this section is to provide a good insight into the two cases empirically studied for the thesis. This chapter focuses on organizational characteristics that have inductively appeared from the field work and I will explain these in more depth by trying to find an answer to the following question: "What essential similarities and differences exist between these two cases when viewing their organizational peculiarities and managerial challenges?**"**

The chapter is divided into 13 parts after the main thematical categories that arose from the field work. Mapped and described **characteristics** are: knowledge workers and their motivation; organizational routines; physical working environment; investors, financing and mentors; plurality of roles of the key workers; low capital intensity; employee shares and company's structure and culture.

Further on I will give an overview of the main **managerial challenges** coming from these peculiarities, which are: fast growth; employee bargaining power; low predictability in the IT industry and issues related to job market situation and recruiting. This section ends with a summarizing table of the main categories covered in this chapter.

4.1 Knowledge workers and their motivation

The output of both companies is based on knowledge work that is done by key knowledge workers and supported by other employees. In **Edicy** these key workers are the company founders (with design and development backgrounds) and employed key designers and developers. They have the highest profitability for the company in the financial sense, a long history within the firm and replacing them would be a serious loss for the company. They are distinguishable from others (called "specialists") by some rare skills that the company benefits from. Here are some examples of this ('I' marks 'the informant' and 'R' marks 'the researcher'):

> R: What is the thing that makes Edicy competitive with others in this market? Or what is the thing that forms a basis for your success as a company, team, organization?

I: There are different small things that can be probably taken together with the term. Most of these can be taken together with the term "multi talents". If you take a look at <name> who is our main developer (…) He has a very good eye on things. He is strong on the user and design side which is extraordinary among developers. For the second, his horizon of web technologies and ... I don't know, the whole technology world, is a bit… He is a bit more interested on things, he runs tests, plays through the ideas, cares about things, is passionate, puts more effort in than other developers do. He is not just a developer.

***

I: Another person whom I would highlight is <name>, who has been in our team almost since the beginning and who has coded the whole of Edicy's front end. (…) He is the one who takes the design created by <name> and works on it so that it is able to communicate with the back end created by <name>. He puts these two pieces like together.

R: Mhmh..

I: And, I'll say that… I have seen the work of other companies and their quality, and I believe that he is one of the most talented people in these areas in Estonia. He has made Edicy into a kind of product that does not only work well, but is very comfortable. He is the type of guy whom you can say that I'd like to get this kind of thing, and he gets it done. He doesn't say that it can't be done or it is impossible.

In **ZeroTurnaround** key workers are the company founders (with engineering backgrounds) and key engineers on the product side, but also various directors and chiefs. Although engineers may seem the most obvious example of the category of "knowledge workers" since the company operates in the high technology industry by offering a technical product; directors and chiefs have played, and are still playing, an essential role in taking responsibility for and managing the other important sides of the firm which have made the company successful. These are e.g. marketing and sales – the sides that generate income, require special knowledge, skills and understanding the global market, but would be difficult to handle alone for the founders with a deeply technical background. The company has put much effort in finding top performers to these areas and establishing a marketing and sales office in Boston, U.S., is seen as one tipping point for the firm. However, I categorize only engineers as knowledge workers in this case, because the role of sales, marketing and other employees (although they are seen as very important for the firm) is not directly related to producing knowledge intensive services.

As the company operates in the global market, it has an international team and purposefully seeks very good experts from all over the world. All of its knowledge workers are

characterized by a specific valuable knowledge for the company that is based on wide previous experience in the industry. In general the most valuable workers are seen as those who have enthusiasm combined with knowledge and experience; who worry about their work and cannot sleep until a problem that occurs is solved. On the engineering side, being a key worker means having a long history in the company (since the product code has not changed very much and his knowledge is continually rooted in these products); being deeply interested and skilled in this profession for many years already; having good qualifications (preferably M.A. level or being a doctoral student) and being suited to the geeky culture of the firm. In addition to the role of these key workers, the founder and CEO of the company is characterized as very ambitious, which allows me to define him as one important success factor of the company.

What these cases have **in common** is that their key workers often have a consultant role within the company in addition to their other tasks, due to their wider or deeper knowledge in the area than other employees. They like autonomy and a certain amount of freedom in their everyday operations. They know their value and how hard it is to find good experts like themselves in the job market. Thus, their motivation to work for exactly this type of firm is essential. However, in some aspects factors that motivate them are similar in both cases, although the organizational differences are reflected in the employee motivation as well.

Knowledge workers in both companies are strongly influenced by their belief in their company's breakthrough and global success. In addition, through the products, these knowledge workers see the impact of their work on a big audience worldwide. As they know their value in the job market, they choose to get involved in projects that offer them possibility for challenges and self-actualization. However, the belief in the company's success poses a risk: since the IT industry is unpredictable, the much hoped success may not occur as soon as expected. Thus, leaning too much on this expectation may lead to motivation collapse.

The difference between the cases occurs mainly due to the firm size: in a small company like **Edicy** a great motivator is the strong emotional connection with the product (the feel of "our own product") and the relatively bigger role of each employee in such a small team, compared to other bigger companies. In addition, the company itself is a motivator with its close and informal culture. These motivations were expressed, for example, as follows:

R: I mean, in case of Edicy, is there any difference with competitors in how some processes are conducted? ... For example, maybe leadership is better than in the case of others or the team is distinguishable in some aspects from others?

I: Yes, I think that's true. I think the main reason is that as we are very, very small – we have, compared to our competitors, you know, sometimes a ten or twenty times smaller team.

R: Mhmh

I: We have like… We can say we have ten persons, but on a daily basis only five of them works with these things. And if five persons have built up this kind of thing, then ... It means also that if some change or update is needed, this team of five members can very, very easily and quickly get it done. Without the need to push it through some kind of long chain. As we have a horizontal team, it's possible to get all kinds of change done very fast, even with only one evening.

R: Mhmm…

I: And another thing is that as this team is very, very small, then we all feel that… We do not just work in a firm named Edicy OÜ, but this is like our product as well. We are proud of it, we have created it with our own hands and a lot of time into this. That means we have a totally different attitude towards it than if I worked in any kind of big company (…) I don't know if I then would have such a great respect for the product and if I'd myself personally want to do anything for it. But since we have a small team and the product is very important for us, then this has a very good impact on the working culture. This is expressed in every small detail. If <name> works with the code and there is something to do that takes two hours, then he does it in these two hours. He does not search for any half-an-hour shortcuts to save time. It's a matter of honour for all of us that the product turns out fine.

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I: We compete with plenty of other companies who offer similar circumstances. Some of them have more potential, some have more finances. Working by us does absolutely not compete with… Working by us is better than by our competitors, better than in big developing farms. Your existence or non-existence does not affect anything in those in the big picture. We have a small organization, the impact of each person is huge. There are many start-ups like us, but the bonus is that we already have very many users. And that's not all. Our environment is safe. Not totally risk-free, but with low risk. We don't have loans, depts. Considering cash flow we are on the positive side (…)

Although much bigger than Edicy, **ZeroTurnaround** also sets itself in opposition to the big programming firms ("code factories"). In the case of ZeroTurnaround, a professional team and organizational culture that creates the identification of employees as belonging to a common distinguishable group of geeks is what drives their motivation as well as other

aspects. In addition, as the technical employees of the firm have to operate with very different tasks from web to desktop applications, command-line tools, web pages, databases and mobile applications, variation at work is guaranteed and this avoids the job getting boring. Since one of the greatest risks in the case of knowledge workers is that their need for self-actualization is unsatisfied, this diversity of tasks and challenges motivates them to stay in the company. The strong ownership feeling towards the company's products, as it is in Edicy, is in ZeroTurnaround to some extent replaced by the enjoyment of the process. The work is perceived as a hobby that requires constant efforts. However, working in a challenging and fascinating industry with likeable products is a great motivator for the employees as well.

Hence, although the companies are different from each other in many respects, they both involve knowledge workers who are intrinsically motivated by the chance of self-actualization, hope for great success of the company and the idea of giving something good to the world through their everyday work. The main variation of these workers and their motivation between the two cases comes from the difference in firm size and thus, also culture.

4.2 Organizational routines

Although the size of these companies is different and their products are also clearly different from each other, their organizational routines are to a large extent very similar. Neither of them has established very strict routines that follow some prescriptions. In principle, both of them may be characterized by the usage of an agile approach in software development, which in general means valuing individuals and interactions, delivering working software, customer collaboration and responding to change (Sutherland 2010). The agile approach is not a narrow method, rather an umbrella that covers different methods like Scrum, Lean, Crystal, FDD, DSDM and eXtreme programming. In Edicy a specific Scrum-methodology is used, but in ZeroTurnaround processes in the company do not follow such a certain framework. In that it is left up to team leaders to decide how to approach the problems and tasks that occur, and whether or not a specific method suits a situation. However, the general starting point to the software development is similar in both companies and this creates comparable everyday routines.

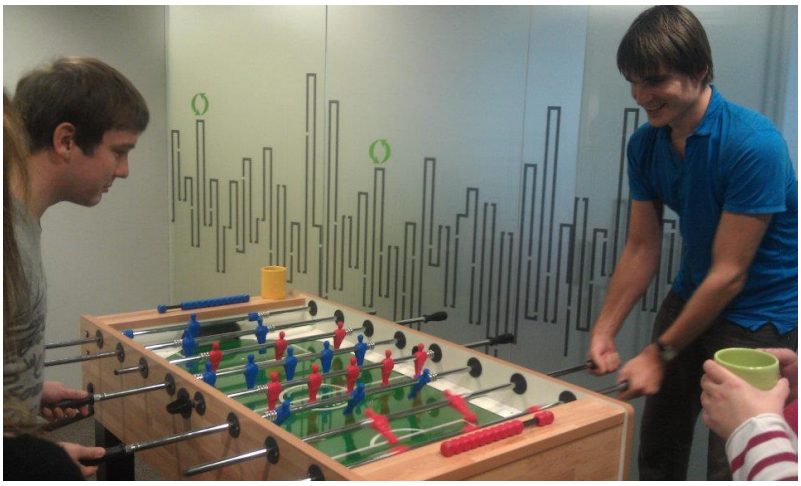
Both of the companies are opposed to onerous bureaucracy. They hold as few as possible formal meetings. In Edicy, project team meetings take place every two weeks (following the Scrum-methodology, the new product cycle starts after two weeks and ends with presenting a new release or update) and the team is kept on course by Monday morning meet-ups. In ZeroTurnaround the main meetings take place once a week and they are separate for the directors, engineering leadership and marketing leadership. Twice a week short meetings about products take place in order to synchronize the action of team members. Most of the communication in these companies takes place *ad hoc*, face-to-face or using online video conferencing tools (Skype or GoToMeeting).

Both of the companies have a somewhat flexible attitude towards working time. In **Edicy**, it is recommended to work from 9am to 6pm and to be present in the office. If everything is done, working from other places is also allowed, but coming to the office is recommended. Working from a distance is seen as less effective and tied to several other expenses, and the company does not have any successful examples of homeworking. In **ZeroTurnaround**, knowledge employees have "half-free" working hours, which means that they are mostly present in the office from 10:30-11am to 4-5pm, but during other times of the day, employees decide themselves how structure their working hours. It is accepted to come and leave the office later than others and *vice versa*. This "social agreement" is not officially stated, but is due to meetings that usually take place between 11 am and 5 pm. Due to the U.S. office and market sometimes employees also have to work in the evenings (e.g., to conduct demos) and in this case the worker adjusts his working time accordingly. Employees work from home for family reasons, sickness, jet lag or if they need to concentrate more and to get something specific done. Working from home is mostly used as a part of a working day: before noon employees work from the office and if something needs to get done later in the evening, they go home and continue working from there.

Thus, the general approach to the functional organizational processes is the same in both companies, but smaller differences occur in the specific arrangements.

4.3 Physical working environment

ZeroTurnaround has four offices – two in Estonia, one in Prague and one in Boston. As the engineering department (which is also their biggest office) is situated in Estonia, I will focus on the peculiarities of this office, assuming that it influences to some extent their everyday organizational life. Their office could be characterized by two main aspects.



In the picture: ZeroTurnaround's employees in their office.

First, it is transparent because of a lot of glass walls and sliding doors. This creates the feeling of openness and accessibility as there is no place to "hide" from others. All workers sit side-by-side and are visible to each other, without any separate closed offices for leaders or owners. Second, the office has a homely design, with sofas and bag-chairs for relaxing, and various entertainment tools like Xbox, table football, etc. A good kitchen is an additional feature that is often used by employees to cook and bake, and that is not a common element in many workplaces. Due to these conditions, workers perceive their office as a cosy place where they like to spend their time after work as well. One informant described it through the following example:

> I: What is very nice is that when I once wanted to show our office to my acquaintances... I was trying to figure out how to disarm it, when we noticed that it already was disarmed. We then went in and saw a guy working. After a while he came to the kitchen to bake something (he lives in a student dorm). Then, after this, somebody came to watch movies on the screens, since he didn't have such a big screen at home. And then another co-worker came to play Guitar Hero. The office was full of people, they want to come here in their free time too.

Edicy has two offices, both of them in Estonia. As they approach one of these as their main office (and because the other one is still very new), I will also focus on this single office. They too have an open plan office where everyone is visible to each other and working side-by-side together in one room. The office has a kitchen for the employees and a separate meeting room with bag chairs and glass walls. Different to ZeroTurnaround, the company has not provided so many entertainment tools and no specific wish for this was expressed through interviews either. In general their office reflects their horizontal structure and openness in communication and everyday work.

In the picture: Edicy's office.

4.4 Low capital intensity

As both of the studied companies operate in the global IT market with products that are based on a specific knowledge, their main source of capital is people and the intellectual property created by them. Their "product" is intangible, being software on computers and thus it does not require specific costs in materials, real estate or other physical elements. On the other hand, it is a well scalable business, where the profit grows independently from costs: the company's income does not depend directly on the amount of money, time or materials invested into the company. If production were to stop, sales would not disappear at once.

Low capital intensity is also reflected in the investment side. It is rather easy to start a company in this industry as strong financial capital is not a prerequisite. On the other hand, the product development stage takes a lot of money, so one has to believe in the product potential in order to take the risk. It is possible to diminish the costs by growing organically and developing using an initially small team of founders, although this often means high work-loads.

4.5 Plurality of roles of the key workers

For both companies the early years involved high workloads and long working hours, exceeding the normal working week. This has come about due to the small teams and the specific culture, which is often characteristic of start-ups. As ZeroTurnaround grew bigger, its beliefs and habits changed. Now it is believed that creativity is more valuable than the hours put into the work. For Edicy, high workloads characterized the firm during its first years and the need for this has also been reduced. Nevertheless, to some extent this still is present, being a part of the firm's culture. Due to its small size and flexibility it is possible for the team to implement changes to the product and to undertake tasks very quickly. This means that working overtime is sometimes necessary and this is seen as rather as a positive sign. Edicy is remarkably smaller in size than ZeroTurnaround, on the other hand, it is the lack of financial opportunities that has meant that it has not been possible to hire enough and the best people to do the jobs. In addition it is the wish of its CEO to hold the company small and flexible (and thus employees with multiple roles).

> I: I believe in small organizations, fast movement, internal motivation, generalists, multi-talents, internal strength. My dream team is like me, where everything is horizontal, everybody is equal. 20 persons in maximum, and no great leader and teacher exist. Everybody is a great leader and teacher.

In Edicy, the founders describe themselves as multi-talents who manage to handle all kinds of tasks and roles. They have several different roles, as they cannot focus on only one aspect. They describe themselves as generalists (as opposed to specialists like others in the company), who in principle could cover all the necessary tasks by themselves. This means a fast start at the beginning, as the company did not have to spend money on hiring people for

the tasks that could done by the founders themselves. A negative result is lack of focus on the important aspects, as too many operational tasks take most of one's time. Multiple roles are caused also by non-automatic technical solutions which require a "hands-on" approach from the technical side workers. This involves some risks, e.g., all the knowledge of the technical systems is held by one person:

> I: One thing that defines my current job is that I am the only one who knows how this system is working. We do not have more people who have a complex understanding of it. If I get hit by a bus, then others will put a lot effort in to get a picture of it. We have done it in four years in a rush and it is not wholly documented. A big part of the work is still in my head.

However, the company has started a restructuring process this year, hiring new people on the Edicy side, establishing an additional office, moving its main office to bigger rooms and trying to delegate former operational tasks of the CEO to other employees. Compared to the very first years, the working hours and habits have now become more calm and stable.

4.6 Financing, investors and mentors

Both of the studied companies are tied to investors, although now they also manage to cover their expenses without them. Investors' money has secured them a faster start at the beginning and provided them with some specific knowledge that has been important for making the right decisions. None of the founders had strong entrepreneurial education or experience, so the advice from external investors and mentors has been of great assistance.

Edicy has taken investors' money partly due to a trend which was prevalent among start-ups back then: it was advised to raise and spend as much investment as possible. Now they believe that they can manage without it as well. An essential advantage of investors has been their advice to raise the perspective beyond a local market, which has led to the global multilingual nature of Edicy as it is today. However, their relationships with investors have not been without difficulties and several challenges have arisen. Conflicts of interests have occurred in disagreements about which way to go and how, as well as with regard to concrete actions. In the recession times, when a lot of companies went bankrupt, investors asked for their money back and therefore, the company had to move from a the global service Edicy to the Fraktal side, to do tailor-made design projects and increase the money flow. Thus,

investor's actions were not in accordance with the strategy and hopes of the company leaders, who kept in mind the long-term interests of the company. In addition, a conflict of interest also underlies the different aims of investors and employees: the former wish to earn as much dividends as possible, while the latter want to get as high a salary as possible.

ZeroTurnaround has got a rather smaller amount of investments compared to other start-ups in general. At the beginning its initial mother company invested 200 000 euro in the firm and an additional 100 000 euro came from a national foundation. After a while, a U.S. venture capital firm bought a majority stake of the company. Although in their industry capital invested into companies is not big, the competition in the market is fierce.

ZeroTurnaround has favoured rather organic growth and plans to do this in the future as well. Due to a strong business model, most of its money has come from sales, right from the beginning. As typically in the first year 100% of a firm's income goes to marketing, ZeroTurnaround was different: only a quarter of its money went to marketing, the rest was left for supporting other operations in the company. Thus, the main benefits from investors were their advice, connections and possibilities for networking, and help with building up an office. No conflict of interest has been perceived - they have a common interest which is to grow the firm as fast as possible. In addition, the common purpose is to sell more software, build software with better quality and to gain even more market share. However, conflict of interests may occur if the company does not perform as well as expected. Although company earnings are big enough and no financial support from investors is needed, a reason for raising money in the future may be if the company wanted to buy another firm.

Separate from the need for money, the need for advice from experienced mentors can be seen. Both of the companies expressed a clear need for this, noting that it makes the starting years much easier. As ZeroTurnaround was initially part of a bigger software development firm, they supported the ZeroTurnaround team with the necessary advice and environment. This "incubator" was comfortable for the team who could then focus on the product side.

> R: When establishing a company, how important do you feel it is to have a mentor or advisor in making the right decisions or going the right way?
>
> I: I think it's extremely important. It makes things easier.

R: Mhmh…Was it important to you? And in which way then?

I: At different life stages you look up to different people. (…) From the company's perspective, you need people to whom you can go and ask things, because you don't know everything and it's easier to learn from other people's mistakes – both considering time and money. (…) We have received support from our initial mother firm, in the aspects that people with development and technical background usually do not know. (…) If we hadn't got it from there, we would have got it from some other source – I do not know where. But you just have to communicate with people and use their help.

Hence, it is stressed that one has to find mentors or investors who are really willing to work with the company – not just those whose name sounds good or who provide enough money. In addition to investors, the company has a Product Advisory Board (PAB) which consists of five advisors on the product development side. They are used to provide honest feedback, act as a community representative and help to increase adoption. The firm meets with the PAB once a quarter.

Similarly to ZeroTurnaround, **Edicy** also has an Advisory Board (AB) as mentors. It consists of three persons and communication with them happens almost on a daily basis. Their main help has been their advice on how to raise the perspective, although they provide feedback and their opinions on other aspects as well. In both companies, these advisors are sometimes listened to and sometimes ignored – their advice is not taken uncritically as the only truth, rather put in the context of other opinions and factors.

4.7 Company's structure

The structure of **Edicy** is characterized by the term "organic leadership", that in the current case to a great extent means leaderless leadership. This is an approach that emphasizes the lack of hierarchy and formal leadership in the company. Everything is meant to be based on consensus and free will, without any certain leaders or even project managers, although in decision making the final word usually goes to the two founders.

I: I am myself such a charismatic type, and I don't bother doing things by the book. I don't bother with taking everything organic out of life and getting clinical. I don't know anything about "the leadership". Maybe I do have here some room for improvement, but instead of reading thick textbooks, I operate using my own gut feeling.

In the division of tasks or decision making, nothing is imposed upon anybody – those who feel like wanting to take the responsibility step up and volunteer to do it. Often this division comes on the basis on the character and skills of different employees. This principle is also used in the individual work of employees:

> R: What does it mean – horizontal structure – for you? In the meaning of leadership for example?
>
> I: No leadership.
>
> R: Something has to be lead, or isn't it so?
>
> I: If you are a one-man company, whom do you lead then? Nobody. In a four-man company you don't lead anybody either. Everything happens on the basis of consensus, and... I understand where you're going with that. With 14 persons [counted Edicy and Fraktal together] roles and communication chains distinguish from each other so that different levels occur. In a team with less than 10 members we don't have such levels yet, I was not a leader but rather like an older colleague. This perceived difference has started to come now when I realize that I move higher and further away from others. (…)
>
> R: What about making decisions in the company? When everybody is equal around you?
>
> I: In decision making responsibility is taken by those who want to take it. These develop dependent of each person's character and abilities. If there's a meeting (...) then people either move along or take initiative. And there's no formerly established system about who may take the initiative.
>
> R: Is it possible that no problems are related to this order, that everything goes so smoothly?
>
> I: If everybody was like me we'd have one problem: if two persons stepped up at the same time.
>
> ***
>
> I: With us, everybody comes to work according to their conscience. And they do whatever they want to do. If they prefer to be on Facebook all day long, then let them be there. I'm glad we don't have these kinds of people. I try not to get involved in this process at all. I am ready to help them if they need it, but I don't want to dictate in any way how they must do their job. I get my feedback by seeing how they are feeling and on the other side, I take a look at the financial metrics.

However, although the company's structure is seen to be to a great extent horizontal (at least up until this research, now however, with 14 and more employees some hierarchy elements

have started emerge), the founders usually take the responsibility for final decisions upon themselves. One of them has the final word on the design and business side, the other on the technical side. All other employees are horizontally under them, aligning with their opinions. Due to the small size of the firm, most of the communication and leading happens through ad hoc contacts, personally by CEOs. This means the possibility to carry out changes in tasks, products, etc. very quickly, provides flexibility in decisions and allows for rapid adjusting within the firm.

In **ZeroTurnaround**, the company is seen as having a "hybrid structure". Similarly to Edicy, this means no strict hierarchy set for everyday communication processes, but however, a clear hierarchy is established in the division of responsibility. Three levels of hierarchy exist, but different teams are well integrated and collaborating - developers collaborate with marketing to provide a basis for marketing communication, write weblog posts, conduct demos together with sales people, etc. It is well understood who is responsible for what:

> The CEO is responsible for the whole company (…), directors are responsible for their divisions; product managers are responsible for their products; team leaders are responsible for their teams. Everything has its defined owner. Company owners are responsible for ensuring everybody is collaborating, knowing the vision, doing things right and in the right order.

This means that divided responsibility is used in the case of problems as well - if an employee does something wrong, he has to take the responsibility for it and so too does his manager. However, the looser structure has its strengths and challenges: increased autonomy results in increased creativity of employees, but for the leader it means less control over them.

The company's structure is not visually remarkable in its everyday life - all team members are sitting and working together in the same room. In the meetings, the hierarchy becomes a bit more obvious (nevertheless, logical argumentation is what counts, although experts in a certain domain are heard more than others), as well as in the amount of traveling and the chance of organizing others' work. Similarly to Edicy, the company is characterized by easy access to leaders and no standardized ways of executing management. Rather the opposite is considered important: the skill of reacting to the specific situation and finding a solution when a problem arises, by adapting the situation and people.

4.8 Company's culture

Organizational culture is one aspect that clearly distinguishes these two cases. The main thing that these companies have in common is their confrontation attitude towards bureaucracy. However, besides this, these cases tend to be clearly different from each other.

The culture in **Edicy** is strongly associated with the fact that its workers have mainly come from **a network of friends**. It is quite a closed system which is characterized by strong ties between people and a relatively long history together. There are very few persons who have been hired directly. Some employees know each other from school, others from a previous workplace. This peculiarity has resulted in trust between co-workers and a good specialization among them, as everybody is familiar with each other's strengths and weaknesses.

> R: Do you have some kind of problems related to this? Maybe you can't say everything you need to a friend because of your relationship and so on?
>
> I: At the beginning of a relationship you don't want to speak badly of people. But if you have worked together for 4-5 years, you get a rational understanding that sometimes you may criticize others, no one takes it personally. Of course, the fact that we get along well, creates some other nuances, but in the big picture it is a benefit. If we didn't trust each other so much, I think a lot of things would remain untold. You'd feel like: why should I raise this problem? Let it be, I don't care. I just come to the office in the morning and leave it in the evening, but to worry about if everything is 100% fine – this is not my problem.

These relationships are one strong basis for motivation to work in Edicy. Due to a small team and leader's specific approach to leadership, no visual chain of command exists and knowledge workers are provided with much autonomy. However, this friendship-based relationship does not mean many informal activities after working hours. Sometimes the company arranges common dinners, another tradition is to rent a cottage house outside the town and arrange trips there, combining working and entertainment/relaxing. In general it doesn't happen very often - it seems like they get enough from communicating and working side-by-side so that no one presumes that they should spend time together after work as well.

In the picture: Edicy team working outside the office.

The company's culture is influenced by its employees as well as its leaders. The culture of Edicy is mediated by its CEO who has taken the communicator's role in the company. He is the one who motivates when needed and tries to solve problems that appear in the communication processes.

> I: If we face a motivation crisis, then of course it has its effect on its founders as well. They have invested even more time and money into this company. They have to look in the mirror as well. But he [CEO] has always been the first person who comes and talks about the reasons why we do it. We have not had such a thing that we collect the team together and say that we have done a very good job. It usually happens through smaller, personal contacts.

However, this type of culture that consists of a network of friends poses a challenge - it is difficult to hire new employees into such a closed system. On the one hand it sets higher standards to its possible employees as they have to suit the existing group of friends in order to get hired or keep their job. In addition, it may be hard for those new employees to adapt to the situation as informal events are not usual in the company. Otherwise these would make it easier to get familiar with co-workers, adapt to their jokes and ways of communication. First hiring and after a while letting the employee go has happened in the company several times; although the reason behind this has not always been the lack of adaption by newcomers.

In **ZeroTurnaround** the organization's culture could be characterized by three main aspects: collaboration culture, geek culture and learning culture. **Collaboration culture** is expressed

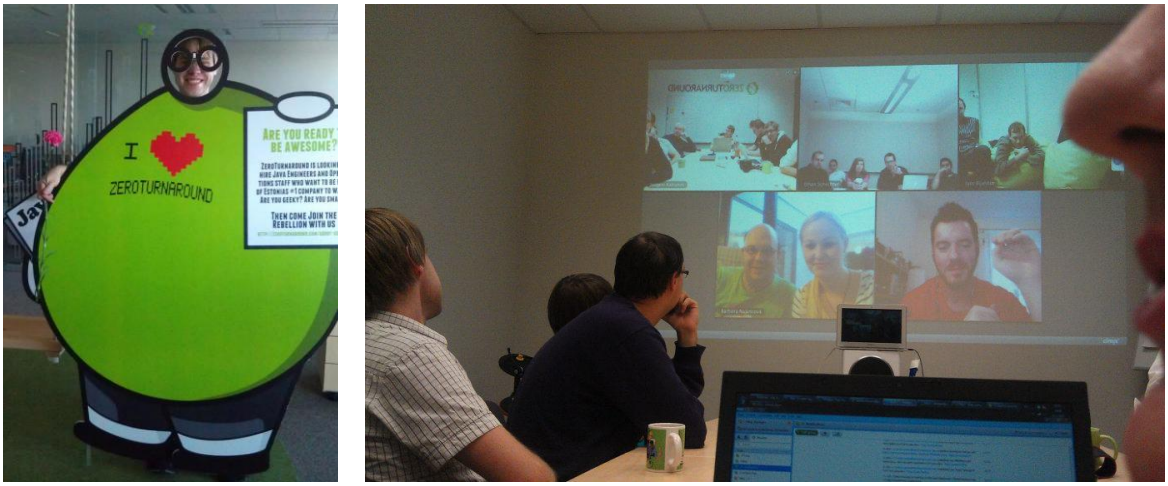
in the work processes, meaning that marketing and engineering collaborate closely, and product development and engineering are one common unit of the company.

> I: We do things very differently from others, we have such a strong collaboration culture. In a big organization collaboration does not exist very often. With us, people collaborate – for example, marketing and engineering collaborate. In a big company you are responsible for nothing; with us, everybody is responsible for quite a big part. It can be done only when you have a very good team and you can trust them, they don't mess it up. We have such a team and it suits us well.

The other peculiarity that characterizes their organization's culture is **geekiness**. Being a geek has a positive meaning for them and it unites the company's (technical) employees into a coherent group with its specific identity and ways of behaviour. It may be expressed by a specific appearance (e.g.,wearing a funny hat at work); by logical thinking (therefore matching also well with the nature of engineers); inside jokes (where everything is related to programming); hobbies (playing computer games, board games), etc.

> I: The geek culture is expressed in big glasses and backpacks (….) It is rather a lifestyle, way of thinking and speaking. We have jokes like, for example, if you didn't sleep well last night and you come to work with eyes yet half-closed, then one could say: "Didn't you boot up correctly? You have to do a restart".
>
> R: (smirks) Mhmh.
>
> I: Or if you look outside the window and see an elderly person who can't cross the road, then you may say: "Look, she has some kind of a bug inside." You try to associate everything with programming and always approach everything logically. For geeks, it is very hard to communicate with people who do not think logically.

Being a geek and thus fitting into the company's culture is seen as a prerequisite when hiring new people and it is actively promoted in everyday working life. Informal events after work (parties, playing board games together, etc.), once a week ordering lunch to the office and eating together with the whole team and hosting visitors from abroad at least once a month – these activities are supported by familiar and humorous everyday communication. The role of leaders and founders is important here as well – company founders themselves are geeky, fun and hardworking, and thus they are an influence on the company's culture.



In the pictures: a stand of ZeroTurnaround (on the left) and their team meeting.

The third characteristic of ZeroTurnaround is its **learning culture**. Constant learning and self-development is obligatory for those working in the company as the tasks vary quite a lot and persons need to be able to complete them. Ability and readiness for learning is searched for in the job interviews (it is asked both quite directly and secured through hiring employees with a university degree). One informant described it this way:

> I: Learning, developing yourself is "a must". It doesn't mean that you have to read books in the evenings and to study. At work every day you see plenty of things you have not had any contact with before. Compared to the "code factories" where you receive a stack of papers that has been written by an analyst, 10 pages of Word doc – we do not have that kind of thing. With us, you get told: "Study, write it yourself". Others will look it through, say that "it is better to be done this way" etc. Then you think, research, use Google, see what comes out. Most things are those you haven't done before.
>
> R: On the other side, it is less comfortable this way?
>
> I: (chuckle) You cannot rest on your laurels. It helps to keep your mind sharp.

In addition to this, participation on specific conferences all around the world happens on a regular basis – company representatives participate in these at least once a month. On the one side, presenting products at the conferences is a strategic marketing approach for the company. On the other side, the company representatives can gather new information, learn new things and sometimes also give a presentation by themselves. The company's CEO has been speaking at prestigious Java conferences for over five years and published papers. The company itself has established an annual international Java conference.

However, although the organizational culture has an essential meaning for the identity of ZeroTurnaround, **preserving the current culture** during and after the rapid growth of the organization is perceived as a challenge. In addition, although the company has offices on different continents, it is perceived to be necessary to hold onto the culture throughout the whole company. A solution used to handle this logistical problem is much traveling and trying to get the team together as much as possible.

Thus, Edicy and ZeroTurnaround have both shown a distinguishable, yet different, organizational culture. Both of these are characterized by open and familiar communication, no hierarchy on the communication side and great accessibility of leaders. The culture of Edicy seems to have naturally grown from their everyday communication and co-working, being thus well suited to a small team such as theirs. In ZeroTurnaround, the culture has different facets (geek culture, collaboration culture and learning culture) and thus requires more concrete actions to hold onto it. At the same time its culture is coherent to the identity of their employees and products.

4.9 Employee ownership

In both companies, some employees are motivated and retained by offering them company shares. As both of the firms are start-ups, which are hoped to grow rapidly in value, owning these shares involves a possibility of generating a lot of money in the future. However, as the firms have not yet reached their target level, this has not yet materialised.

In **Edicy**, employees have a rather symbolic number of shares at the moment, which were all given at once during the recession. These were given instead of one month's salary, when investors decided not to extend their investment and asked for their money back. Although the shares were first meant to be divided some years later, a deal was done with the employees to reduce their salary by 25% for four months and to complement this with company shares. This was a huge motivator during these times and in general seen as fair – the employees see a straight relation between the results of their own work and the company's value. In addition, instead of hiring new people, it seemed better to lock valuable employees into the firm. However, as the rapid growth did not happen as soon as expected, the motivational effect of these shares diminished. As the firm is small, these do not mean

increased power in strategic decision making either. Different from the beginning, the employees do not believe in such a huge growth during the next couple of years that would make them very rich. As no financial benefits are coming from the shares right now, owning these does not affect employee behaviour at the moment.

In **ZeroTurnaround**, company shares were divided among only a few of people and as the firm has now over 50 employees, most of them are not the company owners. The division of shares was used in order to lock valuable employees into the firm and to prevent them becoming demotivated and looking around for a new employer. The division of shares happens according to a matrix based on responsibility taken by the potential candidate. The person who is eligible for this should be at a certain level within the company, a team leader or a higher position, e.g., being responsible for five or more persons or have an equal level of responsibility for a product. There are individual exceptional reasons for giving company shares, such as if an important person leaving would cause chaos in the firm.

However, similarly to Edicy, the time for high profits is yet to come and having shares motivates employees to help others in the company, and to monitor others' work somewhat more, ensuring good quality through peer control.

4.10 Fast growth as a challenge

Growing big is seen as an organizational challenge in both companies. Although one of them has five employees and the other over 50, both of them are to some extent afraid of the change that comes with growing bigger. In **Edicy**, this is seen as a challenge mainly for employee motivation:

> I: One thing, that may reduce our competitive advantage in the market is growth. When the organization grows, the role of each person diminishes. (…) They don't get anything done, it's sad to see how a product is continually at the same low quality as it was years ago. People quit in groups, because in spite of the high salary, they have no impact on anything. The system is so stuck that it needs a huge powerful shake. But in organizations like Microsoft or Google, no such shakes occur. Employees have forgotten their own ability to affect anything. (…) In such big organizations you need the success of the whole in order to compensate for the pointlessness of a small person. In these large organizations about two important things happen per year, but they employ tens of thousands of people. Not everybody gets an opportunity to work with something important.

In addition, a different kind of leadership may be needed when the organization exceeds the boundaries of a small company.

ZeroTurnaround has experienced a fast growth over recent years (two til four times per year). Also they believe that a lot of things, like communication and organizational culture, usually get worse during this growth. Keeping the current organizational culture requires effort and planned activities, but it is seen as an important feature of this company. The second main challenge is finding a suitable workforce to support the growth. In addition, the transition period from one size to another may involve some inefficiencies due to the unequal proportion of workers already existing and the new workers hired to support these. I will explain the topics related to the workforce and hiring in more depth in the next subchapter.

Third, a challenge associated with growth is the need for removing insecurity and spreading risks by building up a new successful product. Launching proper second and third products would mean that the team really knows what it is doing; the successful debut with the first product may have been just good luck.

The fourth challenge is a direct managerial challenge. It means creating new analytics that adjust to the growth situation and give a good understanding of income and outgoings. This is necessary as a basis for other managerial decisions and adjusting the company's wider strategy.

Thus, growing poses some important challenges for the companies. In both cases, growth is seen as something desired, but on the other hand risky for the organization. In the larger company, several new challenges have arisen with growth, which are not yet a reality for Edicy.

4.11 Job market situation and hiring as a challenge

Both studied IT companies are established and situated (at least with their main office) in Estonia. This means their local job market is very narrow. The core of it consists of the

graduates from the country's biggest university which offers, among others courses, an education in IT.

Edicy has recruited locally. One reason for this is that the company is not attractive to the world's best professionals. Due to financial restrictions it has not been possible to hire from abroad and to get as good employees as the existing ones (or even better).

> R: One task of a company's leader is to put together a good team.
>
> I: Yes.
>
> R: How have you done this? What kind of characteristics and criteria show that "this person suits our team"?
>
> I: Taking a look at the team, it consists mostly of persons I have worked with before and those who I have seen can do it, others have dropped out. Based on this I could say that we aren't very good hirers. We have rather tried to go flat against… We have taken people who are good enough to do something, but we haven't searched for the best in the world. We have hired in the financial frames that we have, those who will definitely do the job we need. But it works this way. (…) How one should hire, this is quite different in the case of limited and unlimited finances. (…) We take in this frame that our monthly turnover is 11000 euro and if we'd hire people from this category [experts from U.S.], then we'd lack half of the gross salary. (…) We have not figured out how to hire in such a small organization as we are.

On the other hand, top professionals in the global job market do not find Edicy challenging for their resume. In addition to lack of finances, the company does not have a strong belief in working from a distance – this is seen as creating communication and trust problems. All this has led to a lack of good employees. In a small job market like Estonia, it is difficult to find good professionals (designers, developers, etc.), as a lot of big companies are also hiring at the same time. On the one hand, this bottleneck means work overloads for existing employees and a barrier for developing as quickly as they would want to. On the other hand, a slower development tempo means less personal sacrifices from the employee side.

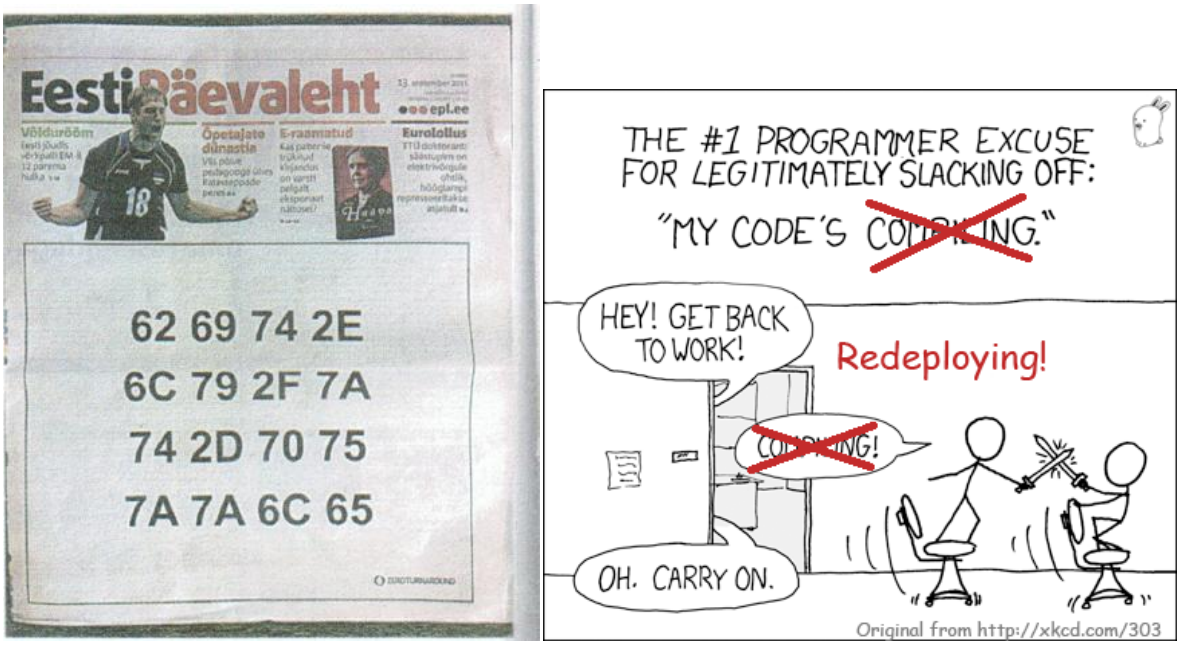
ZeroTurnaround hires engineers from Estonia (Eastern Europe is also planned for the future) and sales and marketing from Boston (and then from the rest of the U.S.). Due to the strong education system and a suitable entrepreneurial culture that is similar to the U.S., they are satisfied with their hired engineers. Although they lack the special knowledge and experience that the work in ZeroTurnaround requires (as work in this company is different

from the work in other companies due to the specific product), some training within the firm solves these problems.

Most of its engineers are seen as experts or very good in their area. Only a few of its employees are at bachelor degree level, others hold a master degree in informatics and 5 of its employees are doctoral students. In this respect the company is distinguishable from Edicy. ZeroTurnaround requires its employees to have a higher education and this is for several reasons:

- learning is very important, but most people who have not studied at university are not motivated to study by themselves, to learn new things. They search for people who are interested in learning;
- problems that the company solves are technically very difficult, therefore, they would like not necessarily the best, but very good employees - the ones who do a predictably good job;
- having a degree from university indicates one's interest towards the profession.

In addition to the formal prerequisites, its employees have to be wise, experienced and enthusiastic, and be able to complete tasks on time. Lately, the company has recruited some experienced workers to balance the young age of the company's founders and workers. This aim to hire very good professionals was reflected in its hiring campaign in 2011, where developers were asked to solve a series of riddles as part of the job application process (see the pictures below).



In the pictures: a special type of job advertisement published by ZeroTurnaround in a newspaper. After solving the programming riddle (on the left), programmers were guided to the next riddle (on the right) and so on.

Due to these high prerequisites set for candidates, it is difficult for the company to hire a sufficient workforce on the engineering side. The growth of good engineers from the universities is too small and slow, and several competitors are already recruiting in the same job market. The company cannot recruit students from the university at the moment, partly because of a lack of persons who would be able to train them. An important reason here is the high demands on Java developers. To solve technically very difficult Java problems, a university degree is not enough; a candidate has to have 2-3 years of prior individual, in depth experience with these issues. This is not something one can directly teach to an employee, however, recruiting from universities may be needed in the next couple of years.

The other alternative to the workforce problem would be to hire engineers from other countries (e.g., Boston, U.S.). A barrier would be different time zones and its influence on team communication (e.g., having a maximum of two hours of common working time). It could work in the case of different teams working on different projects, a competent independent team and a strong team leader present there.

Thus, comparing the challenge of finding quality workforce for Edicy and ZeroTurnaround, for Edicy, low financial possibilities is the main barrier to hiring top experts, but this is not

the case for ZeroTurnaround. For them, the growth of engineers from universities is too slow and soon they will need more experts in this area than the university can "produce". However, both of the companies are sceptical about hiring technical workers from abroad, although this may have to be a reality for ZeroTurnaround in the very near future.

4.12 Employee bargaining power as a challenge

Although high employee bargaining power is not seen as the main challenge for managers, some signs of it were still recognizable. In **Edicy**, knowledge workers expressed their clear preference for autonomy and informal leadership as a motivator for staying with the firm:

> R: As I understand it, the main thing that motivates you to work at Edicy is self-realization, self-expression and doing something big?
>
> I: That's correct. The salary… It may be important when you are entering the job market and you can't even imagine that a job can be anything more than just the salary. It comes with time. When you see how things are done in other companies, when you hear what kind of clients they have, how's their management, working style, then…
>
> R: Mhmh..
>
> I: I myself have learned to value my freedom to do the job just the way I like it. These are small things that matter. If I compare it with some of our competitors in Estonia, then our style – that in the morning I may open Skype and say at our team conversation "hey, I will work from home this morning", and I don't have to explain it or bring a medical certificate or anything – this is actually a very, very rare thing in Estonia. On the personal level, this is enormous freedom. It would be very difficult for me to go to work in another company just because I got paid 1000-2000 EEK (or 100-200 euros) more there. This autonomy, that working in Edicy or Fraktal is giving me, is hard to measure in money.

In **ZeroTurnaround**, key workers with strong previous experience in the industry are seen as having stronger bargaining power than others, just as they already know their value. Their *curriculum vitae* is the aspect that signals their quality, the company is willing to invest in them and thus, they can ask more money or bargain over other conditions. However, on the engineering side, there is no fear of key engineers leaving the company and starting their own business nor that competitors will tempt their key workers away. The main threat for knowledge workers (who are seen as intrinsically motivated) is that they may lose their interest towards their job or company and are therefore willing to move on.

4.13 Low predictability in the IT industry as a challenge

Low predictability in the IT industry is seen as a challenge, mentioned by ZeroTurnaround. Entering a new market or launching a new product is not predictable and it requires continuous change in strategies and plans. Everything is unsecure: if one can put the plans into practice, if the chosen direction is right and if it is possible to execute at the right tempo and at the right level of quality. However, it is necessary to launch new products in addition to the first and main one to disperse risks, in case the market becomes full or a new technology replaces the former ones. On the same time, it is difficult to build up the second and third products to be as successful as the first. The company leaders have a lot of ideas here, but as the development stage is expensive, it is possible to invest only in a few of them; therefore, the right choice has to be made in this unsecure environment.

The following tables summarize all the studied peculiarities and managerial challenges in these cases.

Table 3. *Organizational/industrial characteristics of the studied cases*.

ORGANIZATIONAL / INDUSTRIAL CHARACTERISTICS	**CASE 1**	**CASE 2**
Knowledge workers	Founders, designers, developers	Founders, engineers
Motivation of knowledge workers	• Self-actualization • Influencing a big audience • Belief in company's breakthrough • Emotional connection to the product • Importance of each employee in a small firm	• Self-actualization • Influencing a big audience • Belief in company's breakthrough • Work as hobby • Various tasks and challenges at work • Good team and organizational culture as a source of motivation

Routines	• Online video conferencing as an important communication tool • Deviations from working 9am-6pm allowed Presence in the office strongly recommended • Project team meetings every two weeks • Team update meetings once a week • Ad hoc communication and conversations with the CEO almost every day • A specific agile approach in product development: Scrum-methodology	• Online video conferencing as an important communication tool • "half free" working hours • Possibility for partial working from home • Standard meetings once a week for directors, engineering and marketing leadership • Short product meetings two times a week • Ad hoc communication
Physical working environment	• Open space office, everybody is visible and together in one room • Bag chairs, kitchen	• Transparent office, open space, glass walls and sliding doors No place to "hide", everybody is visible to everyone • Homely office with sofas, bagchairs and entertainment tools • Kitchen in the office that is used for baking and cooking by employees • Office as a place where employees like to spend time after work as well
Plurality of roles of the key persons	• Founders see themselves as multi-talents • Multiple roles caused to non-automatic technical solutions and being a small firm	• During the first years high workloads and working hours exceeding the normal working week due to the small team • Change of beliefs and habits when company grew
Financing, investors and mentors	• A trend among start-ups to raise and spend as much investment as possible • Investment helped to get a quick start • Conflicts about strategy with investors • Conflict of interests between investors and employees • Investors' actions were not in accordance with long-term interests of the company	• Relatively small investments from venture capitalists and other parties • Organic growth: due to a strong business model, most of the money has come from sales • Investors help in building an office and networking • No conflict of interest is perceived • Reasons for raising money in the future when the company plans to

		buy another firm
	• Advisory Board (AB) as mentors consisting of three persons • Communication with them almost on a daily basis • Mentors helped to raise the perspective higher	• Product Advisory Board (PAB) consists of five advisors on product development • Meetings with PAB once a quarter, honest feedback and input from them, but not a source for finding a vision • Company was established in an incubator, much support from the mother company at the beginning
Low capital intensity	• Main source of capital is people and the intellectual property created by them • Well scalable business - profit grows independently from costs, income does not depend 1:1 on the amount of money, time or materials put into the company	
Employee ownership	• Shares as a means of locking valuable employees into the firm • Symbolic size of shares • No increased power in strategic decision making • No financial benefits coming from these • No belief in fast and big growth in the next couple of years • Giving shares instead of salary, all at once • Motivation through seeing the relation between one's own work results and company's value • Challenge is to measure one's impact to the whole	• Shares as a source of locking valuable employees into the firm • Dividing shares according to a matrix based on responsibility • Having shares increases peer control
Company's culture	• "Closed system", workers coming from a network of friends • Trust between workers, good specialization as everyone is familiar with others' strengths and weaknesses	• **Collaboration culture,** marketing and engineering collaborate in the work processes • **A strong geek culture** • Familiar communication, good accessibility of leaders • Informal events after work • Preserving the culture in a global

	• Strong internal motivation for working together • No visual chain of command • Providing autonomy to knowledge workers • Difficult for newcomers to adapt to the existing group of friends • No informal meetings with colleagues after work	company perceived as a challenge • **Learning culture,** obligatory learning and self-development • Participating in international conferences • Hosting an IT conference • Presenting the products at the conferences as a marketing approach
Company's structure	• **Organic leadership** culture that emphasizes no hierarchy and no formal leadership in the company • Organization culture described as everything based on consensus and free will • **Horizontal team structure** • Founders have stronger decision making power than others • Possibility to carry out changes very quickly and flexibility in decisions, rapid adjusting capability • Personal ad hoc approach to employees by CEO • Familiar communication, good accessibility of the leaders	• **Hybrid structure** with no strict hierarchy in communication, clear hierarchy in responsibility • Increased autonomy and creativity for employers • Less control over employees • Visually unremarkable structure • Hierarchy is revealed in the meetings, the organizing of others' work, amount of traveling opportunities • In the meetings logical argumentation counts • Easy access to leaders • No standardized ways of executing management/leadership; rather adapting to the situation • No visual difference between leaders and employees

Table 4. *Managerial challenges of the studied cases*.

MANAGERIAL CHALLENGES	CASE 1	CASE 2
Fast growth as challenge	• A different kind of leadership may be needed • Decrease of motivation on the employee side	• Fast growth, 2-4 times per year • Belief that things (communication, org. culture, etc.) get worse with growth • Lack of workforce • Inefficiency in the transition period • Difficult to build up a new predictable product • Difficult to get an understanding of

		income and outgoings, and to adjust the analytics needed for the growth situation
Employee bargaining power	• Preference of autonomy by the key employees	• Key workers with strong previous experience in the industry have strong bargaining power • Small risk that key engineers will start their own business • No fear for competitors to head hunt key engineers • Risk of the job getting boring for some employees
Job market and recruiting	• Recruits locally • The company is not attractive challenge for best professionals • Employees are "good enough" • Lack of good professionals in a small country • Strict budget for hiring from abroad • No belief in working from distance	• Recruits globally from Europe and the U.S. • Engineers recruited locally • High prerequisites combined with in-firm training • Recruiting experienced workers to balance the young age of company's founders and workers • Too slow growth and output of engineers from the local universities • No possibility of recruiting students • Scepticism towards long distance working in engineering
Low predictability in the IT sector		• Low predictability in launching a new product, seizing a new market etc. • Need for launching new products to disperse risks • Continuous change in strategies is required

5. Discussion

In order to discuss the phenomena at hand, I first provide a short summary of the main differences between these cases. Then I explain why my chosen cases are examples of (international) start-ups, propose a three layer model to discuss their characteristics and show how these cases are related to the distinctive category of professional service firms. Further on I compare my results with the existing taxonomy of PSFs and address some issues raised in criticism against the theory of PSFs.

As the previous chapter indicated, the studied cases could be characterized by many different peculiarities and challenges; some of these can be tied directly to certain factors behind them, others seem to have rather indirect connections. When trying to summarize the differences between these two cases succinctly, the distinguishing element would be their main service as the basis for the company's success in the market. ZeroTurnaround has a strong niche market product which is technically sophisticated and therefore harder for competitors to imitate. Due to this, they managed to start selling the product internationally straight from the beginning and their operation costs were covered by sales. Because of this and their strong product, they had the opportunity to build up a competitive international team, sales department in Boston, etc. In addition to this, their organizational culture is a distinguishing starting point, although in general in both cases the founders believe in informality and opposition to bureaucracy. ZeroTurnaround has moved to a hierarchical organizational structure due to the larger number of employees. Edicy differs from ZeroTurnaround by establishing a product in a market that is already filled with many competitors, although others are mainly providing their service in English not in German, French, Spanish, Norwegian and other less common languages as Edicy does. Nevertheless, for Edicy it is harder to stand out among competitors. In addition, developing the product has taken time and resources, and the lack of strong and continual investor support had to be replaced by earning money for the development with Fraktal. Due to this, Edicy has had a somewhat slower start and is not yet present in other markets with its sales and marketing. However, the company has started a rapid growth period since the beginning of 2012.

However, although at slightly different development stages, both of the studied cases represent start-up companies with their specific peculiarities and challenges arising from their common wider context. I hereby rely on the non-orthodox view of start-ups which does

not believe that being a start-up marks just the first development stage by each company. I support the alternative definition by Ries, who defines start-up as "a human institution designed to deliver a new product or service under conditions of extreme uncertainty" (Ries 2011: 27) and that is for several reasons. First, the orthodox definition by Luger and Koo (2005) excludes subsidiaries and branches of existing firms from the start-up category. I've found the opposite evidence for this: ZeroTurnaround was initially a branch of an international software company, yet, based on its activities back then, it has now evolved into a successful example of a start-up. According to Ries start-ups can be found inside bigger companies as well. "Anyone who is creating a new product or business under conditions of extreme uncertainty is an entrepreneur whether he or she knows it or not and whether working in a government agency, a venture-backed company, a nonprofit, or a decidedly for-profit company with financial investors" (Ries 2011: 27). Second, the human institution element in the definition provided by Ries means that the value such a company creates lies in its people and organization rather than in the product. This last interpretation I find closer to knowledge intensive companies and knowledge workers who are seen as the core asset in certain types of (professional service) firms. In addition, as I will show further, I have found evidence for knowledge intensity in my cases. Third, my findings support the existence of the core element in this definition – the extreme environmental uncertainty. **For these three reasons I argue that the non-orthodox view of start-ups is well suited to the nature of software development start-ups.**

Both the cases in focus are international start-ups, as their nature is consistent with the international start-up definition, meaning "a new venture that exhibits an innate propensity to engage in a meaningful level of international business activity at or near inception, with the intent of achieving strategic competitive advantage" (Johnson 2001: 16). Both of these companies had an international vision and displayed actions towards this right from their inception. Nevertheless, the studied cases lacked prior wide international experience of the founders, and in addition, one of them is founded by high technology scientists, which according to former research is perceived as a risk for the company's management (Moore 1994; Johnson 2001). These potential challenges are solved in ZeroTurnaround through hiring from outside to create an internationally experienced management team and constant learning on the company founders' side.

To further explain the international start-up nature of the studied cases, I will reflect upon it through the distinction of international new ventures, offered by Oviatt and McDougall (1994). According to this, both of these cases are somewhere between the categories of multinational traders and global start-ups, though belonging more to the first one. Multinational traders are perceived as the most difficult type of start-ups as both geographic and activity coordination is required (Oviatt & McDougall 1994: 60). This means these firms are "moving goods from nations where they are to nations where they are demanded. (...) Direct investment in any country is typically kept a minimum" (Oviatt & McDougall 1994: 58). In the case of Edicy, the service is provided from Estonia, although its customers are spread all over the world and a certain amount of marketing is conducted in other countries as well. In the case of ZeroTurnaround, engineering and development is done in Estonia, although marketing support comes from Prague and sales from Boston. Nevertheless, as the job market for engineers is limited in such a small country, moving a part of the product development side to other countries may become a reality in the future and thus, the company will move more towards becoming a global start-up. In addition to this, these companies are already now orientated to the global market. This is done because of the need for these products is similar worldwide; global orientation would allow rapid growth and higher revenue, and their competitors are also acting globally. However, it is questionable if the companies will become pure global start-ups in the future: in the case of such software development services, no long value chain of activities is needed and therefore, acting parallel on the production side in several countries is not indispensable. Although these cases cannot be defined as pure global start-ups or pure multinational traders, **it is clear that these belong in the general category of international start-ups.**

As the current empirical findings revealed, the two cases in focus can be described by various characteristics. In order to systematize these characteristics and to show their relations with former studies on start-ups and professional service firms, I will present a model that consists of three layers: general industrial, start-up and other context specific peculiarities; organization specific peculiarities, and employee specific peculiarities (Figure 2 below).

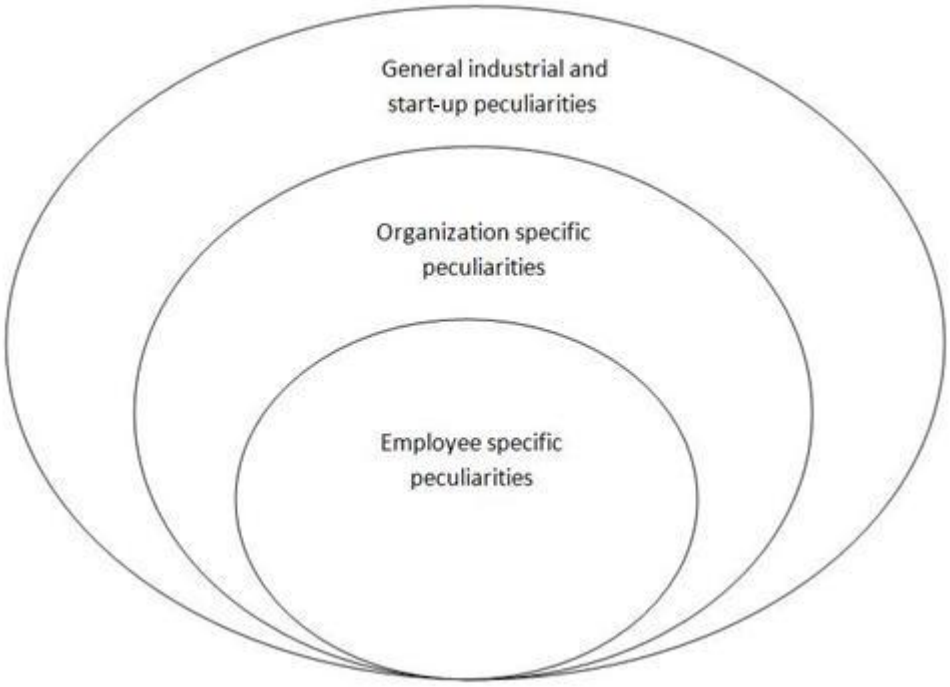


Figure 2. *A three layer model of software development start-ups.*

1) The widest category that surrounds the other, more specific, peculiarities is called **"General industrial, start-up and other context specific peculiarities".** This category reflects the environment for high tech start-up companies, with the specific characteristics and challenges that these organizations have to face. Based on my cases, this category involves notions like low predictability in the IT sector, usage of investors and mentors, fast growth and low capital intensity. Along with others, these peculiarities are found to be common to start-ups in previous studies and they have occurred in my empirical findings as well.

Low predictability in the IT sector is marked as a common challenge for start-ups in general; it is even seen as a core of the definition of start-up firms, as presented by Ries (2011). As start-up companies operate in a field that is extremely uncertain, their risks cannot be calculated beforehand, their future is not predictive and therefore, totally different ways of operation and management have to be employed. For these reasons, these firms do not qualify for bank loans and they have to find other external financing, which leads to the usage of venture capitalists, angel investors and other investment sources (Ries 2011). This observation is supported by my findings – low predictability in the industry and the involvement of investors is a reality in both cases.

Although it is believed that investors are financially not indispensable – it may be possible to finance the company by sales straight from the beginning and thus, avoid dependence upon external actors, even though this may mean a slower start for the firm - their role as mentors is perceived as essential. Using mentors for industry and business advice, and their connections for networking, is another way to manage the uncertainty. Mentors do not have to be tied to the firms through company shares, although in my cases they mostly are; they may be found, for example, among former partners as well. However, in former studies, I found this aspect had received not enough attention.

Another peculiarity in this category is the fast growth that is expected from start-up companies. Although a lot of effort is put into the chance to grow, both of my cases expressed a certain fear for this and its effects on the organization. This peculiarity is characteristic of the successful start-ups for several reasons. First, it is related to the uncertainty and usage of investors' money, which leads to high expectations on performance from the investors' side. Second, fast growth often comes from the firm's internationalization strategy. As Bürgel and Murray note, these firms have "a tendency to enter several foreign markets within a short time-span" (Bürgel & Murray 2000: 35-36). These bold moves either lead to fast growth of the company, or, in the case of incorrect decisions, fast decline. Another factor behind this is the "international vision" of start-up founders, which promotes rapid growth and which is found distinctive to international start-ups in general (Bürgel 1999). Thus, this peculiarity characterizes start-ups in general and therefore, to some extent it influences these organizations in spite of their internal ways of behaviour.

Low capital intensity is a common characteristic by start-ups in the software development sector. In this area, it is the intellectual capital that creates the competitive advantage for firms, not non-human assets like factories, inventory, patents, etc. Although this aspect is closely related to the importance, bargaining power and management of key employees (thus, the third layer on the scheme, named "Employee specific peculiarities"), this peculiarity is that wide and unchangeable by these firms, that it affects their behaviour as a background factor.

Former studies on start-ups, especially small high technology start-ups, have found other distinguishable characteristics that could also be placed in the category of "General industrial

and start-up peculiarities". These can be, for example, the international origin of these firms, which is tied to the international commitment of start-up founders (Oviatt & McDougall 1994), need for customer-driven product design (Johnson 2001), etc. Although these also may be seen as organizational responses to some certain factors, they could be perceived as peculiarities of the industrial/start-up environment, which lead to specific actions at the organizational and/or employee level. However, the purposed category is open for future research, as due to limitations on the sample side, as of now, it consists of only a few examples.

As indicated before, all of these notions described here are closely related to each other and therefore, some of them could be seen as responses to the other (e.g., the usage of investors as a solution for extreme uncertainty). However, I find this distinction leads to unnecessary diffusion inside a category and therefore, not helpful for creating a wide picture of the type of companies in focus.

Thus, this widest layer establishes a background and basis for analysing IT start-up companies in detail. It connects the most general prerequisites and peculiarities that affect these companies due to their belonging to start-up companies in the software development field. **Several important characteristics of IT start-ups belong to this category and arise thus from their specific industrial/start-up environment, and they affect the organization either directly or indirectly**. Therefore, when trying to integrate former studies on IT start-ups and professional service firms, this is the aspect where the scientific knowledge about start-ups has an important role to play. A step forward in understanding these firms as well as possible is done by looking at the methods these companies have employed to respond to these challenges.

2) I call the next layer on the graph "**Organization specific peculiarities**" as these are characteristics that are created by the organization itself, in order to respond to the challenges coming from general industrial/start-up peculiarities, and to effectively fulfil its own purposes. As the start-up approach of Ries indicates, "entrepreneurship is management" and each institution needs to adapt its management specially for handling the extreme uncertainty of the environment (Ries 2011: 8-9). This layer, as well as both the other two, is thus to a great extent related to the other layers around it. In my cases, this category involves firm-

specific characteristics like organizational routines, company's culture; company's structure and physical working environment.

Organizational routines like team meetings, employee operations, working time regulations, everyday communication and so on, have been established to create efficiency and high performance, but also as an answer to the expectations and challenges coming from the employee side, as well as the industry level in general. Plurality of roles of the key persons may also be seen as a common element in both firms, but on the other hand it is a peculiarity that is strongly correlated to the uncertainty in the industry. However, as previously noted, displaying entrepreneurial and goal-driven internal organizational behaviour is noted to be a success factor among start-ups (Johnson 2001). In my studied cases organizational routines overlapped to a great extent, which refers to a common way of thinking about organizational operations in these types of firms. Also the physical working environment of these cases was in principle very similar. In general, it expressed the modern, open and accessible environment of the company, thus complementing their familiar organizational culture and informal structure, and offering employees some possibilities for entertainment besides their rather monotonous work behind computers.

Company's structure and culture are two aspects that are closely connected to each other, yet somewhat different in my studied cases. However, a tendency occurred - the organizational culture seemed to become more thought out and detailed when the company's size and structure grows. Former studies on start-ups indicate that successful start-ups have close/tight co-ordination (Johnson 2001). This point was supported in my findings as well: these cases can be characterized by informality in communication, excellent accessibility of leaders, a lot of ad hoc communication and a firm culture that emphasizes the fun side of working in the company and the equal position of employees and leaders inside the firm.

Thus, organization specific peculiarities act like a medium between the two groups of strong elements (those coming from the distinguishable nature of the general environment of the firms and those affected by the organizational dependence of its key employees). An important task for such a company is to find the best suitable organizational means to match these different sides and solve the challenges arising from those. This is often done through specific methods that fall under this category.

3) The third layer on the graph is called **"Employee specific peculiarities"** and it involves both characteristics and challenges related to the workforce. This category is directly tied to low capital intensity which characterizes start-ups in the software development sector, as due to this, intellectual capital has moved to the centre of these firms and forms a basis for competitive advantage in this industry. On the other hand, this is an aspect that has undeservedly received little attention in the former literature on start-ups. As at the core of my studied cases are knowledge intensity and knowledge workers, this layer could be well seen through the lenses of knowledge intensive professional service firms. Thus, this layer provides an opportunity to establish a link between start-ups and professional service firms, and therefore, to transform the valuable knowledge from one sphere to the other: from the sphere of professional service firms to provide a better understanding of software development start-ups.

At the core of this category lies knowledge intensity that creates a basis for the company's competitive advantage. Both of my studied firms provide a service that involves a certain amount of specific, esoteric knowledge about the field. One of them has established a service that is very complex and technically difficult and therefore, requires expert knowledge on the engineering side. The other company provides a service that connects expert knowledge on the design and programming side. Thus, both examples can be defined by the term "knowledge intensive company". According to Starbuck (1992) an important element to this is that the company relies on esoteric expertise instead of widely shared knowledge and that knowledge is not confused with simple flow of information. In my researched cases, neither commonplace knowledge nor flow of information is an actual issue. According to Nordenflycht, being a professional service firm means that "the firm relies on an intellectually skilled workforce, not just among its executive or support functions (e.g., R&D), but also among its "frontline workers" (Nordenflycht 2010: 159). This is the case here as well, as some frontline workers are at the same time their key knowledge workers, who put effort into developing the services and who hold this esoteric knowledge essential for company's operations. **Hence, I argue that software development start-ups can be seen as professional service firms.**

Based on my studied cases, several codes could be placed under this category, which are closely tied to each other. These codes are: knowledge workers; motivation of knowledge

workers; employee ownership; employee bargaining power and job market and recruiting. It is the presence of esoteric knowledge that is expressed through these different codes in this category. Thus, these named characteristics of an IT start-up are coming from the company's knowledge intensity, which shows that **knowledge intensity affects their nature and operations to quite a large extent.** Similarly to the organizational/managerial peculiarities arising from the industrial/start-up environment, knowledge intensity plays a crucial role in those firms. Knowledge workers in these companies are mainly motivated intrinsically through the challenge of working with services that have such a high potential. Their motivation is supported by providing them autonomy in their work, informal relations with co-workers and leaders, company shares and so on. Both of the companies noted the challenge related to the job market situation for those expert workers and difficulties related to hiring these workers. This means that knowledge workers are very valuable for these companies and also hard to recruit. Their situation secures them a good position when bargaining on one's salary, working conditions, etc., although it is not perceived that this bargaining power has been used in reality. **The existence of many interrelated aspects which all reflect knowledge intensity in those firms, supports the claim that these firms could be analysed through the PSF lenses**.

These relations between the codes within this category are also described in the theory of professional service firms. The taxonomy of PSFs compares certain types of companies using three main characteristics; five managerial challenges and opportunities, and four organizational responses. My findings cover only a few of these aspects, which are knowledge intensity and low capital intensity as peculiarities; cat herding as a challenge and alternative compensation, autonomy and informality as organizational responses to the named challenge. **Thus, in addition to the fact that software development start-ups can be seen as professional service firms, I argue that these are characterized by some common PSF peculiarities, challenges and organizational responses.**

However, Nordenflycht has pointed to some other peculiarities which I did not find to be supported by my empirical findings. As a starting point, he identified three distinctive features common to professional service firms, which are knowledge intensity, low capital intensity and professionalized workforce; although, not all of these have to be present in every professional service firm. In the current cases, neither of the studied companies can be characterized by their professionalization level. It is rather the opposite: researched start-ups

in software development tend to oppose themselves to everything that is prescribed by formal associations. They aim to approach issues when they occur and not beforehand using some book or following codes of conduct set by formal institutions. Professionalization is often seen as a response to the opaque quality problem, but I did not find any support for this challenge in the current cases either. As in these companies, their essential knowledge is incorporated into specific services and presented as products, evaluating their quality has not become an issue on the customer side. If the product works properly and looks fine, it is perceived as having good quality. In case of problems with the product, its quality will be revalued. In both cases, customers feel they can decide over the quality and although they are not familiar with the code and other technical settings behind the product, lack of knowledge about it is not seen as a barrier. The products speak for themselves and therefore, it is not necessary for the firm to signal its quality through professionalization. Muted competition and the trusteeship norm are other challenges that are closely related to professionalization of occupations and thus, these have not occurred in the current cases either. In addition to these, I have found no support from my empirical findings for organizational slack. Rather *vice versa* - although fewer formal rules, more autonomy and informality would suggest higher risk for this - organizational slack is prevented by hiring employees with strong internal motivation and with proper expectations for the job, and creating an organizational culture that helps to avoid this. Thus, a lot of these missing characteristics come from lack of professionalization in this sector.

In addition, some other former statements on knowledge intensive firms and PSFs are in conflict with the current findings. The definition of KIFs provided by Sveiby and Risling describe their production as "non-standardized, creative, strongly dependent of the individual and complexly problem-solving" (Sveiby & Risling 1987: 17). In the case of Edicy and ZeroTurnaround, the production is rather standardized and little dependent on the individual, although in some situations tailor-made adjustments have to be made. Hill and Neely describe a PSF as a type of firm where the client is significantly dependent on the provider to define the problem and give appropriate advice (Lu 20053: 13). This does not apply to my cases either, instead of a one-to-one advisory relationship between the client and the PSF provider, expert knowledge is rather embodied in a packaged service solution. The fact that professional services are delivered by professionals/knowledge workers is very characteristic to management consulting, law firms and other classical examples of PSFs, but in my studied cases the company's frontline workers with esoteric knowledge on the field are not involved

in everyday communication with customers. This is mainly done by the sales department and customer service employees. Key frontline workers speak at conferences and represent the firm in the case of important customers. **Therefore, many aspects that characterize Classic PSFs are missing in the case of start-ups in the software development industry**.

This clear distinction of Classic PSFs from other kinds of PSFs, and at the same time strong knowledge intensity within these firms, is proof of the need for a taxonomy of PSFs. In this regard I support the issue raised by Nordenflycht (2010), finding that the mess around this term is a barrier for creating a meaningful and relevant body of knowledge about these special types of firms. Focusing only on Classic PSFs is misleading, while describing the complex and developing nature of PSFs only by its various peculiarities, leads to generalizability problems. Unless the division into different types of firms takes place, it would be harder to see the relationship between start-ups and PSFs and therefore, also less likely for these schools of thought (and the increasing number of practitioners) to learn from each other.

Nevertheless, according to the initial typology of PSFs created by Nordenflycht, it has not been clear into which category software development firms could be placed or even more specifically, if software development start-ups could suit the typology of PSFs. Based on my findings, I have argued that software development start-ups could be seen as professional service firms and they are characterized by knowledge intensity and low capital intensity, cat herding challenges, and the usage of alternative compensation methods, autonomy and informality as organizational responses. Using these characteristics these start-ups are then distinguishable from the other suggested categories like Technology Developers and Neo-PSFs (see Table 5 below). Different from Technology Developers, relatively little capital is needed and no opaque quality challenge is perceived, although these types of firms stand close to each other in terms of using alternative compensation mechanisms and providing autonomy and informality. Compared to Neo-PSFs, low capital intensity and opaque quality are the distinguishable elements here as well. In addition to these, in my studied cases cat herding is perceived as a rather small challenge and thus somewhat less attention is paid to autonomy, informality and alternative compensation as organizational responses to this challenge. Different from Neo-PSFs, in software development start-ups outside ownership and investor protection are common practices. A peculiarity that all these compared types have in common, but which differentiates those from other types of firms in the taxonomy, is

the lack of a professionalized workforce. I have proposed the possible reasons for this earlier in this chapter. **When comparing these features with the existing taxonomy of PSFs, these firms would not suit directly into either of the categories and therefore, an additional category would be needed**.

Table 5. *Taxonomy and Theory of Knowledge Intensive Firms by Nordenflycht (2010), supplemented by the author of current thesis.*

	Characteristics			**Challenges and *Opportunities***					**Organizational Responses**			
Category (with examples)	Knowledge intensity	Low Capital Intensity	Professio-nalized Workforce	Cat Herding	Opaque Quality	*No Investor Protec-tions*	Trustee-ship Norm	Muted Competi-tion	Alter-native Com-pensation	Auto-nomy and Infor-mality	No Outside Owner-ship	Slack
Software Development Start-ups	X	X		V					V	VV		
Technology Developers: Biotech R&D labs	X			V	V				V	V		
Neo-PSFs: Consulting Advertising	X	X		VV	V	V			VV	VVV	V	
Professional Campuses: Hospitals	X		X	VV	V		V	V	VV	VVV	V	V
Classic PSFs: Law Accounting Architecture	X	X	X	VVV	V	V	V	V	VVV	VVVVV	VV	V

I will further reflect upon some aspects of the critique of Zardkoohi et al.2011) towards the theory of PSFs presented by Nordenflycht (2010). Their critique stated that more important than trying to define the nature of PSFs, is to see how a given service becomes optimally organized if the context changes and they considered context as a main factor behind the cat herding challenge, decentralized structure and autonomy at work, etc. I hereby agree with these scholars, as the current empirical findings prove the contextual influence on the peculiarities on all the organization's layers. **Even further, I hypothesize that to some extent, the closeness of firms (or categories of firms) in the taxonomy of PSFs may be an effect of their common or similar context instead of the common nature**. An example here could be issues related to low capital intensity, investor protections and outside ownership. The context of start-ups and software development industry is extreme in the way that it is very unpredictable and full of competitors, yet it may be relatively simple for establishing a successful start-up without significant material resources. Nevertheless, the extreme uncertainty requires extreme financing solutions. But in case of removing the word "start-up" from this type of firm and trying to place software development firms into this taxonomy, their position would be different due to their more secure and stable context, although the nature of their work, their services and other conditions may be identical.

Zardkoohi et al. (2011) have argued against Nordenflycht, who has explained the autonomy provided for knowledge workers coming from their clear preference for it and their strong bargaining power. Zardkoohi et al. do not agree with this explanation, meaning that the job market situation is the real factor behind the cat-like behaviour of some employees, not their valuable knowledge. In addition, they argue that providing autonomy is an organizational response to the decentralized information held by professionals/knowledge workers and this solution is just as efficient for the organization. In my studied cases, both points were confirmed: autonomy was preferred by knowledge workers, but also it was provided by the leaders for organizational efficiency reasons. Although the job market situation was perceived as a challenge for the company, no specific cat herding problems had arisen in these companies. Thus, autonomy and informality in these companies were provided both for employees' well-being and for increased creativity in their work from which the company in general can benefit. **In other words, these reasons can be categorized into the layers of**

"Employee specific peculiarities" and "Organization specific peculiarities" rather than among contextual factors.

To get a full understanding of software development start-up characteristics and the relations between these, I suggest viewing these firms through the different layers these companies consist of. I have proposed a three layer model which integrates influences and characteristics from the existing body of knowledge on start-ups and the software development industry, with peculiarities and knowledge coming from the knowledge worker side. In the middle of these exists the human-created organization with its specific values and behaviour as chosen means to tie these two extremes successfully together. Such a model takes into account the context of these firms and thus brings the analysis of organization closer to the principles of Zardkoohi et al. In addition, the proposed model helps to distinguish context from other peculiarities and influences, allowing focus on specific groups of characteristics separately from the context factors. In the current thesis, this approach has led to the possibility to discover the existing relationship between start-ups and PSFs.

For future research I suggest testing the proposed model on other types of PSFs and also to further study the category of IT start-ups in the PSF typology. It would be interesting to see if this category with its specific characteristics coincides with other types of start-ups and thus, if these results could be generalized to a wider selection of start-up companies. In addition, it would be necessary for the theory of PSFs to test if the closeness of firms (or categories of firms) in the taxonomy of PSFs may be an effect of their common or similar context instead of the common nature of these firms. A model that distinguishes different layers within organizations could be helpful in this research. In the empirical findings section I have thrown light on many different aspects that are common within IT start-ups, but as the purpose of the current thesis was the clarification of concepts, I have not analysed each of them in detail. To fully understand the nature of this specific and valuable new phenomenon named IT start-up, it is worth studying more about those aspects.

So, does the attention to the employee side of start-ups expand the understanding of start-ups and help them to overcome their challenges? I suggest that it does. **I find that both parties – scholars on start-up companies and professional service firms - would benefit from learning from each other.** Clear links between these schools exist and in cases like start-ups that are based on some kind of esoteric knowledge, influences from both schools are situated

side-by-side in their everyday organizational life. Viewing start-ups through the existing theory and concepts of PSFs adds an additional dimension to the already proven relations, causes and consequences, to this body of knowledge. *Vice versa*, showing new evidence of the diffuse nature of professional service firm as a phenomenon keeps the search for the best suiting definition or typology of PSFs active. As contexts are in constant change, so too are the industries and types of organizations. Just as start-ups arise from very different kinds of industries and present an important trend in today's world, interrelations between disciplines and research traditions are needed to understand, generalize and learn from these examples.

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All sources that have been used in this thesis are referred to.

The number of words in this thesis is 35 441.

Appendices

1. Interview guide

1. **BACKGROUND INFORMATION** *(depends on the secondary data I've gathered beforehands)*

- How would you introduce your company? What is it about? What does it „produce“?
- How long time have you been in the market?
- How long have you personally been in the company?
- How do you define your market (is this Estonia, some other countries or the whole world?)
- Who are those people who are your clients – are they enterprises (business clients) or is it the mass market (individuals, consumers)?
- Please give me some insight to the „production“ process. How does it start? Whom (which professions, tasks) does it involve?
- Please describe your own tasks. What is your responsibility, what do you do in the company?

2. **POSSIBLE PECULARITY 1: Knowledge intensity.**

- How many employees does the company currently have?
- What kind of knowledge do these employees have, who participate in the production process? Do they have to have some kind of specific knowledge, skills, professional knowledge (if yes, then what kind of?)? How important is this for doing the job?
- Do you require a certain education level? Is it important that your employees have an university degree from top universities / from any certain universities, colleges that in a way assures the quality of the knowledge? (University of Tartu? Tallinn Technological University?)
- Would you say that your company is a company that is based on knowledge? (a knowledge intensive company). Why would you say that?
- Is that certain specific knowledge your competitive edge? Would you say that the production bases on company's (esoteric) expertise or the fact that you have some kind of expert knowledge in your industry? Or is it mainly the widely shared knowledge / flow of information that is the key asset?
- In what extent could one say that the company relies on employees with certain intellectual skills, and this is relevant both among managers and „key employees“ (those who actually create the product)?

3. **POSSIBLE CHALLENGES RESULTING FROM THIS:**

- We now talked about the knowledge intensity of your company. What does this mean to your organisation? Do you think this peculiarity somehow affects the everyday life in your organisation? How?

- What does this pecularity mean to you as the leader/owner? Any specific problems or challenges arousing from this? Is it any kind of special to lead such employees?

- How hard is it to find good professional in your field of business? Does the labor market have enough good candidates?

- Do you sense that those workers have higher position than others (non knowledge intensive employees) to negotiate over salary, working conditions etc? Does the company have to be more flexible with those workers? Do they take advantage of that power? Are there special conditions created for them compared to others not that important from company's perspective (who can be replaced more easily)? (for example motivation programs – company shares? working from home? business trips?) Please give me some examples.

- How difficult it is to manage these workers? How much personal input and understanding their individuality have to be taken into consideration instead of classical managing, supervision and using official organizational routines? How do you lead them?
- How difficult it is to „hold on" to these people? Do you consider this as a challenge for the company – keep those employees with the company, keep them motivated? Is the risk of them finding a job easily in some of your competition thanks to their valuable skills real? Do you feel that this sets them in a power position – they're free to decide in which company they want to work (not the other way around, where company has more independence since there is a lot workforce available in the labor market)? What do you do to hold on to them?
- How would you define quality in your company's work? Please describe a high quality work / product in your business. Is it easy for a customer to evaluate the quality of your work? How (based by what) can he/she do it?

4. POSSIBLE PECULARITY 2: Low capital intensity.

- Would you say that the key resource of your company is the knowledge of your employees, not any kind of material capital (technology, inventures, property etc)?
- How important is non-human capital in your everyday work?

5. POSSIBLE CHALLENGES RESULTING FROM THIS:

- We now talked about the low capital intensity of your company. What does this mean to your organisation? Do you think this peculiarity does somehow affects the everyday life in your organisation? How?

- What does this pecularity mean to you as the leader/owner? Any specific problems or challenges arousing from this?

- Do you need investor protections in order to keep the company going?

6. POSSIBLE PECULARITY 3: Professionalized workforce.

- Do you have a dominate professional association (either in Estonia or a global one) in which you have to belong to make business in this industry? If yes, then how important is belonging to this in the context of Estonia / world? What is the main thing it provides to its members? In which issues it helps?

- In your company, approximately how many employees are members of this association?
- Do you have to have some kind of licence in order to start doing business in this industry? How important is the licence to be a successful / reliable actor in the market? Who provides that licence?
- Is there any ethical code your business activity is based on? Or if one wants to be successful in this speciality, does one have to take account of an certain ethical code? Who provides that ethical code?
- Approximately what is the percent of your firm's workforce belonging to such professionalized occupations (who may consider belonging to these professional associations, relying on ethical codes etc)?
- How can your clients be sure of the quality of your products/work? What signals quality to them?

7. POSSIBLE CHALLENGES RESULTING FROM THIS:

- We now talked about the professionalized workforce of your company. What does this mean to your organisation? Do you think this peculiarity does somehow affects the everyday life in your organisation? How?

- What does this pecularity mean to you as the leader/owner? Any specific problems or challenges arousing from this?

8. POSSIBLE PECULARITY 4: Informal leadership processes.

- What does the term „leadership" mean to you, considered your everyday work?

- What kind of routines do you have? What kind of formal routines do you have (the ones you have to do regularly because of your job description)?

- Do you have any kind of informal routines that you do regularly (f.ex. motivating employees, asking about their personal life etc)? How often does your job involve personal approach to employees? What kind of informal routines these are? Please give me some examples.

- How do you feel, in your everyday work – what is the relationship between formal and informal leading methods?

- Please describe me the organisational structure of your company. Is it hierarchical? How many different hierarchy levels are there in the company?

- In what extent the employees (especially these so-called knowledge intensive workers, professionals) in their everyday work can act autonomously? How does it emerge? In what extent do they have to report to a person standing above themselves in the hierarchy? In what extent do the workers in higher hierarchy levels have to control other who stand below them? Do you have some kind of „collegial control" between the professionals? Please give me some examples.

- Let's talk a little about the firm-level decision-making in your company. For example when it comes to deciding the product development issues – who usually says the final word here? Who decides that kind of issues? Is it leaders in some level or owners or professionals together? Why?

- Are the leader positions in your company well defined and belong to certain employees/job descriptions? Or is handling the leadership issues rather divided between several employees or considered as a part time job? Do you have rotation between leader positions – that means, once one division is responsible for example customer service, next time for production side etc? Or once an employee is responsible for leading the marketing side, next time for customer service etc? If yes, then why did you implement this order?

9. POSSIBLE CHALLENGES RESULTING FROM THIS:

- We now talked about some informal leadership processes of your company. What does this mean to your organisation? Do you think this peculiarity does somehow affects the everyday life in your organisation? How?

- What does this pecularity mean to you as the leader/owner? Any specific problems or challenges arousing from this?

10. POSSIBLE PECULARITY 5: Employee partnership / ownership.

- How is the company ownership / shares divided? Are there also employees among the company's owners?

- Are the partners usually selected inside the company (among the workers) or from outside? Why is that?

- What about the leaders – are the leading positions usually filled by persons inside the company or outside? How does it affect the company and its everyday work?

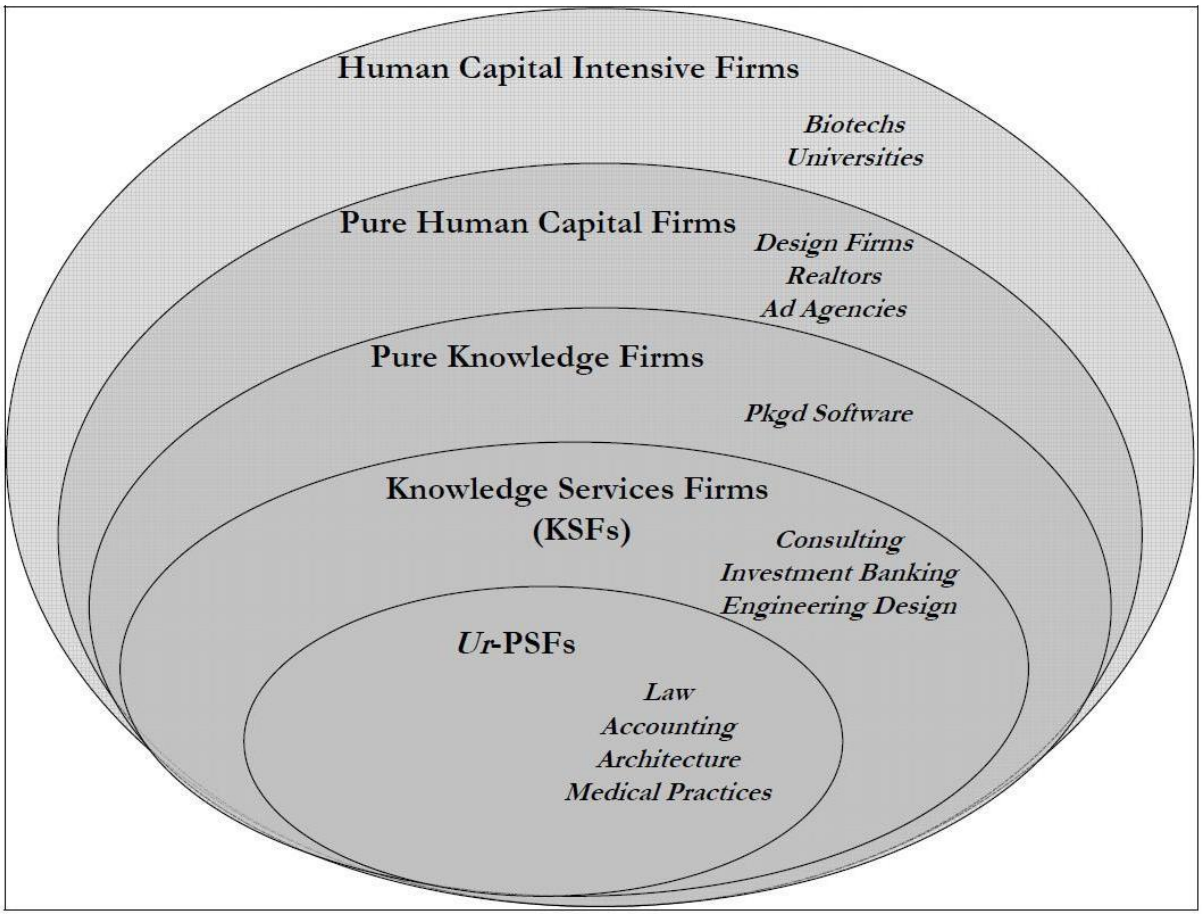
11. POSSIBLE CHALLENGES RESULTING FROM THIS:

- We now talked about the employee ownership of your company. What does this mean to your organisation? Do you think this peculiarity does somehow affects the everyday life in your organisation? How?

- What does this pecularity mean to you as the leader/owner? Any specific problems or challenges arousing from this?

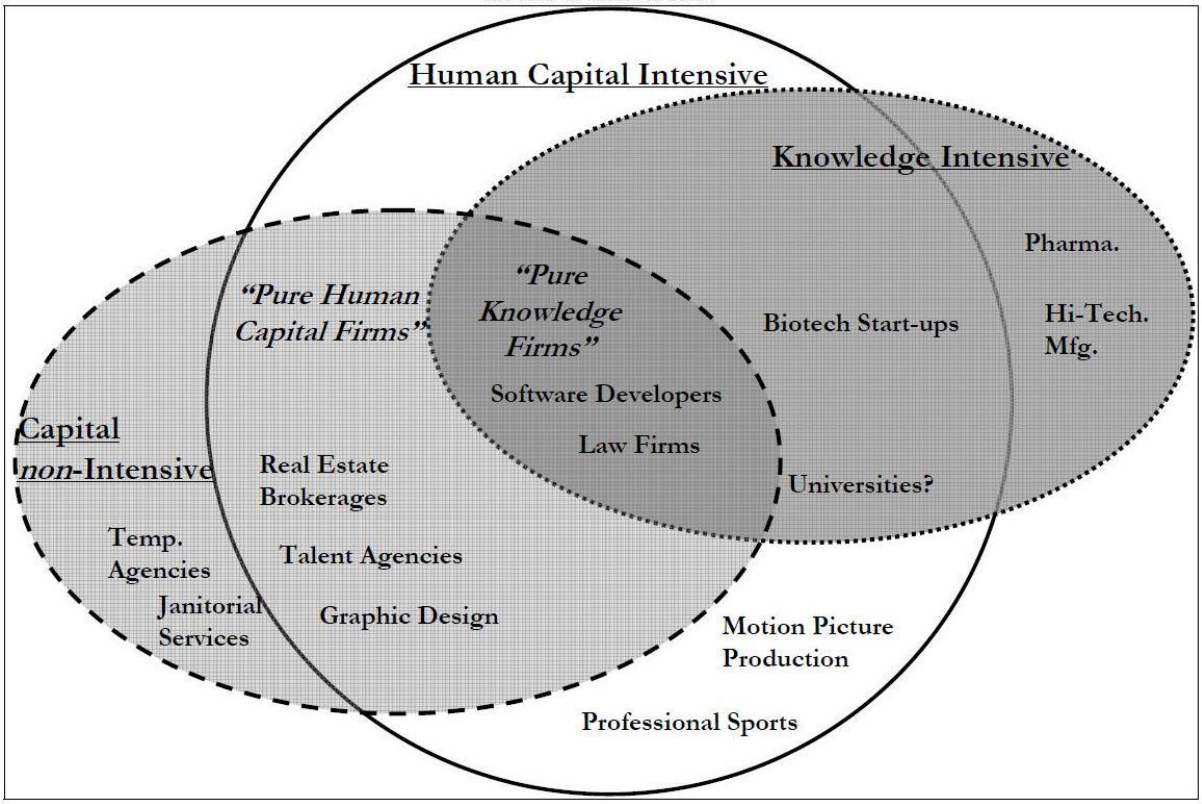
- Do you have anything else to add about the topic(s)? Anything else about the company that I should know?

2. A Typology of Professional Service Firms.



Source: Nordenflycht 2007: 45.

3. Asset Intensities.



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