Managerial Growth Challenges in Small Software Firms: A Multiple-Case Study of Growth-Oriented Enterprises

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Abstract. Notwithstanding the importance of small software firms, research focusing on understanding the growth challenges faced by their management is close to non-existent. By taking a life-cycle approach and focusing on managerial challenges, the aim of this paper is to analyze the growth process of small software firms. After forming a synthesis of possible growth challenges from relevant literature, the results are reflected upon case software firms using thematic interviews and questionnaires. According to the analysis of four software firms, managing human resources represents the greatest challenge for software services firms. Additionally, other challenges stem from competition and sales-related activities. Comparative analysis of the literature and the cases leads toward a theoretical conceptualization of growth challenges from small software firm's perspective.

Keywords: small firms, software business, growth of a firm, life-cycle model, growth challenges.

1 Introduction

In addition to the increasing impact on job and wealth creation in economies around the world, small software firms provide products and services that enable growth of other industries [1]. The majority of firms will never find any significant growth path, though, but instead live and eventually cease to exist as small businesses [2, 3], and software firms are not an exception. The firms that have achieved high growth rates, however, are increasingly more often IT or software companies [4].

Software is developed both in the primary and the secondary software industry [5]. The *primary software industry*, constituting of the actual software firms, can be divided into two business segments: software services and software products [1, 6]. Besides, a significant amount of software is developed in the *secondary software industry,* i.e., in vertical industry enterprises such as telecom operators and banks [5].

As Birley & Westhead [7] suggest, research should focus on specific firm segments, rather than trying to find a general theory to explain the growth of all firms. Although the growth and related managerial challenges of small and medium-sized firms have been researched intensively during the past decades [2, 3, 7-13], similar research focusing on small software firms—especially in the services business segment—has been close to nonexistent in the scholarship. Additionally, small firms are

P. Tyrväinen, S. Jansen, and M.A. Cusumano (Eds.): ICSOB 2010, LNBIP 51, pp. 26–37, 2010.

often not differentiated from medium-sized enterprises in studies, even though they do not share all the same characteristics [14]. Furthermore, many studies have focused on growth of young technology-intensive firms [15-20]. Even though the software industry can be seen as a subset of the technology industry, there are specific characteristics that make it unique [21], and hence, should be studied in separation. Specifically, as opposed to the technology industry in general, the core products and services of software industry are intangible. In all, we argue that none of the existing growth models and theories fully describe the management challenges small software services firms are facing during their life cycles, and that more research is required to better understand the specific managerial challenges they are confronted with.

Thus, the aim of this paper is to analyze the growth of small software firms, focusing especially on managerial challenges. The aim is pursued by forming a synthesis of possible growth challenges from relevant literature and by reflecting the results of the literature review upon case software firms. This reflection is based on thematic interviews and questionnaires conducted in four growth-oriented Finnish software firms. According to the analysis of the cases, managing human resources represents the greatest challenge for software services firms. Additionally, other challenges stem from competition and sales-related activities. Comparative analysis of the literature and the cases leads toward a new theoretical conceptualization of growth challenges especially from small software firm's perspective, whereby these challenges are projected on different life-cycle stages of the firms.

The paper proceeds as follows. The next section gives an overview of the literature concerning software business, and firm growth research. Additionally, some previous growth models relating either to small firms or software firms are introduced, which is followed by a synthesis of growth challenges identified in the literature. Next, a short introduction of the case firms and the results of the case analysis are presented. Finally, in the conclusions, the implications of the study are discussed.

2 Growth of a Software Firm and Related Challenges

Growth of a firm is a multidimensional concept [22], combining economical, social and cultural factors [23]. Further, the economic factors include various views to the research of growth, such as entrepreneurship, finance, and management. Davidsson & Wiklund describe entrepreneurial research as a multiple-level analysis, as entrepreneurship occurs and has effect on different societal levels [24]. Some scholars have searched for a universal explanatory model to explain firm growth. This kind of a model has not been found though, and Autio *et al.* [23] argue, one can never be found. One probable reason is that "[t]here is no such thing as a typical growth firm. Rather, there are many different types of growth firms with different growth patterns" [22]. The lack of a universal model causes great diverseness among research methods and settings used by researchers [25]. Thus, researchers have to be able to analyze new research data by combining different kinds of research methods [23]. Altogether, the diverseness and multitudes of research levels cause challenges in forming a coherent view of firm growth by reviewing existing literature and studies on the subject [2].

Anyhow, the growth of a firm can be observed from the *growth process* view, which indicates growth to progress through different stages separated by

organizational crises and changes [2], and from the *determinants of growth* view, which is based on identifying factors affecting the growth including motivation, strategy, resources, firm external opportunities, characteristics, the educational background and business experience of firm founders, social capital, and financing [26]. Furthermore, according to O'Farrell & Hitchens [27], four different paradigms of firm growth research are evident in the scholarship: (1) the stage model or the life-cycle model, (2) the strategic management approach, (3) the stochastic model, and (4) the industrial economics approach. The former two address the factors that affect firm growth internally, while the latter two approach firm growth mainly through external factors such as the market and the industry.

Life-cycle models generally describe a firm's growth as a predictable progress through certain evolutionary stages on which varying crises and management challenges are expected [27]. Life-cycle models serve in understanding and conceptualizing the complexity of a firm growth process. The criticism toward this approach rises from inflexibilities and unidimensionality: all the firms are usually expected to go through the same stages in certain order [28], although there are exceptions. Many life-cycle models from small firm [8, 9], technology-intensive firm [15, 17, 29], and even software firm [21, 30] perspectives have been suggested, but none focuses on small software firms, not to mention the software services segment.

Strategic management approach has focus on business strategies needed by the entrepreneurs and managers in order to maintain continuous growth [21]. Another approach to firm growth is the *resource-based view*. According to Penrose [31], one important reason for growth of a firm is its underutilized resources. Firms have a natural need to eliminate idle workforce by engaging in large operations, and at the same time, "to use the most valuable specialized services of its resources as fully as possible" [31]. Thus, firms need to grow and elevate their operations in order to take full advantage of their highly specialized workforce. The latter is especially true in case of small software firms, wherein highly specialized employees cannot necessarily utilize all their know-how efficiently because the output of the firm is too small. Penrose was also the originator of the *knowledge-based theory of the firm* [31], which states that knowledge is strategically the most important resource for a firm.

Eventually, these paradigms are purely theoretical classifications of types of firm growth studies, and hence many approaches like internationalization are likely to overlap. In the context of this paper, the objective is to focus both on the growth process by taking the life-cycle approach, and on the determining factors that internally affect the growth of small software firms through the strategic management approach. Internationalization is not taken into consideration due to the fact that it is usually relevant only for larger firms or on the later stages of the firm evolutionary cycle.

Delmar *et al.* [22] believe, that conflicting theories on the causes of firm growth are born, when an explanation for *why* firms grow is searched without actual knowledge of *how* firms grow. It is important to understand, that firms can grow in multiple ways: organically, through acquisitions (or mergers), or as in many cases, by a combination of both. At societal level, organic growth creates new jobs, in contrast to acquisitions, where existing jobs are transferred to another organization [22]. Small and young firms in emerging industries are more likely to grow organically due to their lack of resources for acquisitions [22]. Therefore, as opposed to growth of large, established firms, small firm growth creates more new jobs.

Although a multitude of ways to measure firm growth is present in the scholarship, most commonly used are sales, employment, and market share [32]. Sales growth and employment growth are used in the present study as a combination, because, although sales is a good indicator of how customers are increasingly accepting the firm's products or services [32], it does not always lead the growth process [22]: In the beginning of a software firm life cycle there might not exist ready product or service, yet [32].

2.1 Software Business

The importance of knowledge as a resource, as Penrose already suggested in 1959 [31], has become clear in today's world as many industries are becoming increasingly more dependent on and driven by it. Therefore, management challenges faced in other industries are becoming similar to the software industry [1]. Hence, the value of software industry for firm growth research is exceptional since the findings are likely to be applicable to other knowledge-intensive industries as well [21].

Software is developed both in the primary and the secondary software industry [5]. The *primary software industry* can be divided into two main business segments: *software services* and *software products* [1]. However, the distinction between software services and product businesses is not always clear, and there is evidence of more and more software firms, especially on the later stages of their life cycles, straddling both sectors [6, 33], which could also lead to many managerial challenges. According to Hoch *et al.* [1], the dynamics of software product and services businesses differ in many aspects. One of the differentiating factors between the two is the effects of marginal costs: for services firms they are almost constant while in case of product businesses the marginal costs approach zero. Furthermore, the market structure is in general more fragmented in the services segment. Pure software product business is additionally characterized by low variable costs, meaning virtually all the cost of developing software is fixed in the design and implementation of it; many copies need to be sold in order to cover the fixed costs. With regards to the growth strategies and the required management mindset, firms offering mostly services are likely more interested in their capacity utilization rate than market share, which is more important for product firms. Human resources, software development, strategy, and marketing and sales are all important management areas for both, but the level of relevance varies. [1]. According to Cusumano [6], a pure software product business is analogous to book publishing and selling sequels of bestsellers, whereas for services business, like in banking, the importance is in long-term customer relationships and recurring fees. Software products firms seek to take advantage of possible economies of scale, whereas economies of scope are more important for services businesses. [6]. Competing with either software product or software services thus requires managerial skills in marketing and sales to adopt divergent business logics.

One of the major barriers to growth in the labor-intensive software industry is the low number of available professionals, which in turn makes software managers' work more challenging [1]. The effect of this barrier varies, of course, depending on the country, area, industry sector, etc. At least major software countries such as USA and India have been long suffering severely from workforce shortages [1]. According to the authors, the reasons for the lack of talent range from increasing demand, i.e. fast growth of the industry, and competition between firms.

2.2 Growth Challenges in Finnish Software Firms

Software industry can be considered both on a regional and a global scale. Although there were seven Finnish software firms among the top 100 European software vendors in 2008 [34], Finnish software firms are very small on the average; 45 % of them have fewer than 5 employees [35]. Varying approximations of the number of software firms in Finland exists, due to the Statistics Finland's way of categorizing firms inside the IT sector. According to Ali-Yrkkö and Martikainen, software firms represent around two thirds of the IT industry in Finland, which results in around 33,000 employees altogether [36].

As a result of workgroup efforts by Growth Forum 08 several software firm growth challenges were identified and prioritized in the context of Finnish software industry [35]. The challenges are grouped to industrial, national and global challenges. The most important industrial challenges include sales and marketing, small firm size, low knowledge level of the market and customers, and difficulty of forming a growth strategy. The most important national challenges are non-supportive climate towards entrepreneurship, small size of capital market, low level of willingness to take risks, and low ability to take risks.

According to research conducted by Harju [37] there are four challenges for small Finnish software companies that rise above the others: (1) Funding, (2) how to get the right people to the company, (3) competition, and (4) rapidly changing technologies. "How to get the right people to the company" is related to the topic of "low number of available professionals" discussed earlier. High knowledge intensity and labor-intensity of the industry cause individuals to become the most important assets for a software firm, and one of the most important challenges for managers at the same time. Harju's notion of competition being one of the biggest challenges is also supported by the earlier discussions of the characteristics of the industry. Alajoutsijärvi, Mannermaa & Tikkanen attempt to identify the most important marketing challenges

Table 1. Synthesis of possible software firm growth challenges identified in the literature

Area	Growth challenges	References
Environment	Non-supportive climate towards entrepreneurship	[35]
Human	Human resource management	[1]
resources	Workforce shortages / labor supply / recruiting	[1, 27, 37]
Marketing	Knowledge of the market and customers	[35]
and sales	Managing different business logics	[38]
	Sales and marketing skills	[35]
Networking	Small firm size	[35]
Personal	(Growth) motivation	[27, 39]
	Risk taking willingness / ability	[35]
Strategy	Competition	[21, 37]
	Funding / financing	[35, 37]
	Forming a growth strategy	[35]
	Simultaneous management of product and services businesses	[1, 6, 38]
Software	Rapidly changing technologies	[21, 37]
development	Software development	[1]

for small software firms. The authors argue that the most critical challenge for the management is in balancing between entering new business domains, which require differing business logic (e.g. moving from services business towards product business) and maintaining the traditional business operations [38].

As a summary, the most important possible challenges for small Finnish software firms found in the literature are synthesized in Table 1. These challenges are grouped into 7 management areas, partially according to Hoch *et al.* [1] (adding environment, networking, and personal). The table is in alphabetical order (no prioritization).

3 Empirical Research

The challenges in Table 1 have been empirically tested, and a synthesizing model is built based on the literature research and interviews. The objectives of the empirical research were set to list growth challenges small Finnish software firms are facing, to determine which challenges are typical or dominant on certain growth stages, and to learn from entrepreneurs' and executives' attitudes, opinions, and views to growth.

The present study combines both quantitative and qualitative research methods. The qualitative part consists of four thematic interviews and their analyses, as well as of some information collected from the case firm web sites. Thematic interview is conducted as a semi-structured discussion with no detailed questions; the interview is guided only by pre-defined themes [40]. The quantitative data comes from the questionnaire conducted for the interviewees. Its purpose was to collect data prior to interviews that do not necessarily require interview as a method. The quantitative data is used to compare facts and figures of the case firms as can be seen from Table 2. The main business model is based on a classification by Rönkkö & Mutanen [26]. Sales and profit growth refer to relative growth compared to the previous year.

Table 2. Facts and figures of the case firms from year 2008 (β's sales and profit from 2007)

	Alpha (α)	**Beta (β)**	**Gamma (γ)**	**Delta (δ)**
Year of foundation	1995	1997	1987	2005
Employees [growth in 1 year]	13 [+2]	69 [+10]	53 [+5]	26 [+5]
Sales (M€) [growth/decline]	1,4 [+10 %]	4,2 [-20%]	8,7 [+16,8 %]	2,07 [+44 %]
Profit (M€) [growth]	0,4 [+55 %]	1,0 [-]	2,4 [+30 %]	0,15 [+50 %]
Customers [growth in 1 year]	~2000 [+150]	dozens [some]	16 [-]	35 [+10]
Software business segment	Products	Services	Services	Services
Main business model	Standardized product	SW devel. services	SW devel. services	SW devel. services

The case firms were selected by randomly contacting small (or medium) –sized and growing Finnish software business organizations. To determine whether a specific firm had been growing constantly, using publicly available online information sources, the sales growth rates of the firms were studied. The case firms represent rather a heterogeneous sample of small Finnish software firms, as both younger and more experienced firms, smaller and medium-sized firms, and software product and services firms are present. This can been seen mainly as an advantage for the study

because of a better coverage of the industry. The firms that have recently passed the 50-person milestone and become medium-sized (β, γ) are important for the study due to their experience of the small-firm life cycle as a whole. All the case firms are private companies (limited by shares) and have achieved good growth rates either in employment or in sales at least during the past three years. One interview of 42-76 minutes was conducted per case firm. All the interviewees are executives with significant ownership over the firm. The interviewees have been with the respective case firms from the beginning, excluding Interviewee α who joined in 2001. The citations have been translated to English from the Finnish transcript.

3.1 Interview Analysis

The interviews were analyzed by utilizing thematic analysis principles [41]. Table 3 summarizes the interview analysis results. The table includes only those challenges identified and discussed during the interviews. Hence, some of the possible challenges introduced earlier are absent. For each challenge, its importance, as perceived by the interviewee, is indicated. A "-" denotes negative support, "0" means there was no opinion or discussion, or that the challenge does not relate to the case firm, and a "+" is a sign of the interviewee agreeing that the challenge has been essential considering the case firm's growth.

Table 3. Summary of the case firm challenge analysis

Managerial growth challenge	α	β	γ	δ
Competition	+	+	0	+
Education	-	-	-	-
Evolving organization	0	+	+	+
Funding and financing	-	-	-	-
Human resource acquisition and management	+	+	+	+
Motivation	+	+	+	+
Networking	0	0	0	0
Risk taking willingness / capability	+	+	+	+
Sales and marketing	+	+	+	+
Taxation / legislation	-	-	-	-

As could be seen from the table, the most relevant growth challenges for the case firms were related to competition, evolving organization, human resources, motivation, risk taking, and sales and marketing. Neither education, nor taxation and legislation issues were seen as relevant challenges. As opposed to Harju [37], funding and financing received only negative support, meaning the case firms reported not having had any related significant problems. By education, it was discussed whether the national education system produces sufficiently knowledgeable human resources.

Among the interviewees, high motivation is seen as a necessity for growth. Being very small in size is in itself a great motivation to grow bigger, because cooperation, e.g. with potential customers, is expected to become less challenging, and because being bigger reduces the risk of total failure. In addition to money and success, entrepreneur-managers are driven by new challenges and possibilities for personal

development. Thus, the growth becomes a self-feeding process, as Interviewee δ summarizes: "The bigger the firm, tougher the challenges, higher the motivation."

As discussed earlier, software industry operations are very labor-intensive; costs come mainly from labor. Therefore, it is not surprising all the interviewees see personnel as the most important resource for a software firm. According to Hoch *et al.*, the most important managerial challenges for software service firms stem from human resources. The data gathered support this observation, as all the interviewees see both managing and acquiring human resources as major challenges for growth.

Sales and marketing was an interview theme resulting in a wide range of views and opinions. Both Interviewee α and δ mentioned the difficulty of recruiting able salespersons. Additionally, selling something intangible is a challenge for firms offering software developmental services. As a small business, it is difficult to sell ideas when there are no references or successful customer cases to tell about (β, δ). According to Alpha, "sales is just sales after all... no matter whether copy paper or Internet-applications are sold", although it is agreed—also by Interviewee β and γ—that technically oriented personnel usually lack sales and marketing skills.

Although all the case firms have had a history of constant growth, a consensus seems to exist among the interviewees of the fact that it would have been possible to grow faster if more aggressive growth strategy would have been utilized. Some of the interviewees thought they have probably been even too cautious and unwilling to take unnecessarily high risks. Interviewee δ summarizes the most important reason for keeping the risk level as low as possible: "We don't want to cause this highly professional team to lose their jobs by taking too high risks." This is in line with the results from the study by Wiklund *et al.*, wherein well being of employees was listed as a primary reason for small business managers to avoid taking too high risks and even affecting their willingness to grow the firm [39].

3.2 Mapping Growth Challenges on Life-Cycle Stages of Software Firms

Based on the available literature and conducted empirical study, the most important managerial growth challenges for small software firms have been synthesized and mapped to a theoretical life cycle of small software firms (Fig. 1). The conceptualization includes five life cycle stages each corresponding to a firm of different size (number of employees): seed, start-up, growth I, growth II, and growth III. Both managerial challenges specific only to software firms as well as general managerial challenges related to virtually all start-ups are considered.

The *seed stage* starts before the firm is founded. Challenges related to this stage include refining the business concept, finding a suitable team, and gathering capital. Especially service business firms might find it challenging to acquire the first customer without any references or history of previous projects. Indeed, finding the first customer is such a growth boundary that the firm will probably never move to the next stage if one is not found. Software product firms might move to the next stage and start the business without a ready product, and thus without customers.

For software firms, the *start-up stage* will still most likely evolve around acquiring or dealing with the first project or product. Sales for software product firms and customer acquisition for services firms are vital in order to start covering sunk costs and make the business operations profitable. Software product companies might still rely on developing their product(s), and hence might not have acquired any customers, yet.

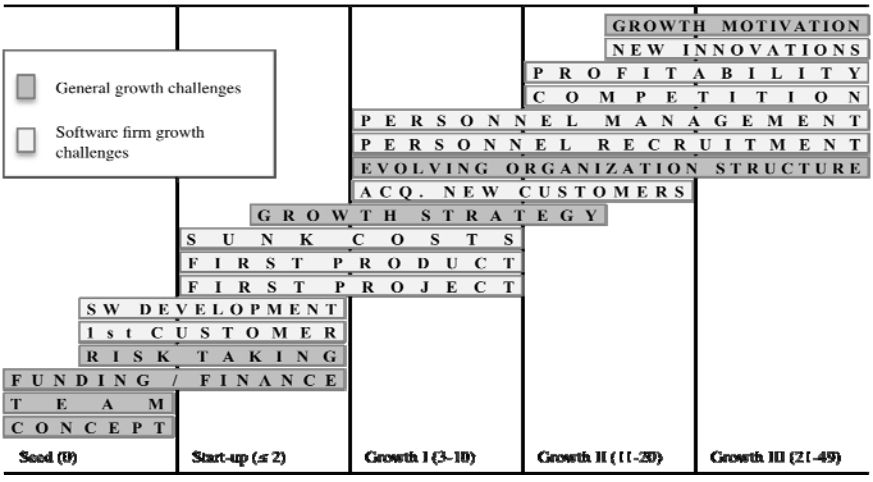

Fig. 1. Managerial growth challenge conceptualization for small software firms

The *growth I stage* for software product firms means ready product(s) and some materialized sales for the most of firms. The biggest challenges for them are likely related to sales, software development, and human resource acquisition and management. Firms offering software services are likely to struggle with acquiring new customers and/or projects after the initial one(s). A lot is depending on the success of the first project; the future of the company lies in closing new deals. Human resources are vital for software services firms, and thus, one of the major challenges for them is acquiring skilled personnel and keeping the existing ones as well. This stage often marks a point where a software firm needs to start making decisions about a growth strategy to be utilized. Whether aggressive or moderate growth is sought depends on the market situation but also on the willingness of the owners to take risks.

The *growth II stage* is a big milestone for a software firm as it has managed to grow beyond 10 employees. The organizational structure starts to take new forms and it might be challenging for the owners to share responsibility. Human resources remain most likely as the major challenges for software companies, and recruiting might become even more challenging because more specialized workforce such as project managers and sales representatives are needed. Competition might become a new big challenge for a software firm, if it is competing on a narrow market segment.

Challenges in the final *growth III stage*, are similar to the previous stage, but they can become more intense. Although it is true that acquiring new customers and employees might be easier than before, because of the references and experience the firm has touted, organizational changes and increasing need for specialized workforce pose new challenges. The growing number of employees makes managing personnel and their skills even more challenging than before. On this stage, competition might become more severe; again, depending on the market segment or the industry sector the firm is operating in. Coming up with new innovations and products might prove challenging, and some setbacks are most likely to occur.

4 Conclusions

One important theoretical finding of this paper is that the theory on managing human resources being the most important managerial challenge for software firms especially in services business receives strong empirical support. This finding is not surprising, however, as some of the major differentiating characteristics of the software industry are its high level of knowledge- and labor-intensity. This finding implicates the current theories on software firm growth challenges seem to be mainly in line with the actual managerial challenges in the Finnish software industry.

Another interesting finding is that financing or acquiring capital has never really been a significant challenge for the case firms, even though they all have grown reasonably fast. All the case firms have been able to sustain their growth through internal financing, and thus, there are no external investors involved. It should be noted, however, this does not necessarily implicate that small software firms in Finland would not have problems with acquiring growth financing. In fact, unchallenging financing might be one of the possible reasons for the firms' success in the first place.

The findings from the interview analysis further implicate a tendency of competition becoming tougher in the Finnish software industry. The current situation of the economy is likely to be one of the causes for this development. It is not clear, however, whether the finding is due to competition actually becoming more radical, or due to the growth the case firms have achieved and thus found themselves fighting for a bigger market share than before. Anyhow, depending on the market positioning of a firm, competition—especially for younger software firms—is a significant challenge.

Sales, especially for younger software firms, cause many challenges. For software services firms, this is mainly due to the tangible nature of the offered services. Selling ideas is extremely difficult without any references to previous success stories. Additionally, software firms are often founded by technically oriented teams, which lack experience in sales and marketing. Hence, if the founding team of a software firm has both technical and business oriented people the future growth of the firm looks more promising, when compared to a software firm managed only by one type of the two.

Risk taking is often a popular topic when discussing firm growth. Although undoubtedly any entrepreneur establishing a new firm has to take personal financial risks to some extent, it seems this fact is too often overemphasized. The findings from the interviews implicate that businesses can be lead to steady growth without taking significant financial risks or outside funding. Further, the theory of low willingness to take risks is also empirically supported by this study to a large extent; entrepreneur-managers are very concerned of the well being of their employees and do not thus want to risk it all. Whether or not this is typical behavior for Finnish software entrepreneurs would require a study of its own. All in all, the analysis implicates that even the most successful Finnish software entrepreneurs are not adept risk-takers.

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