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An analysis of the internationalization of small Brazilian software companies

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ABSTRACT: This article analyzes the internationalization process of small Brazilian software firms from the theoretical basis of a model that synthesizes the perspectives of experiential learning, systematic planning and the contingency approach applied to the internationalization of firms. The empirical base is a sample of firms in the software sector located in the Brazilian state of Rio Grande do Sul. The first step of the study entailed gathering data on a sample of 29 firms with international presence. From this sample, five cases were selected for a qualitative analysis from a multiple-case study approach. The results indicate that the internationalization of small firms is not a consequence of long-range planning, but rather of opportunities perceived by entrepreneurs in their relationships. Besides this, the study reveals that organizational capabilities are a key factor in this process and that the lack of knowledge about the external market is the main obstacle to the internationalization of the software firms investigated.

Key words: Internationalization; small firms; software.

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1. INTRODUCTION

Competing globally has ceased being an option and is progressively becoming a necessity, especially for knowledge-intensive companies like those in the software sector. Software firms do not require significant investments to assemble physical installations and depend particularly on the existence of technical and managerial capabilities for their development. The strong presence of multinationals in the Brazilian market means fierce competition for small local firms, whether or not they decide to seek foreign growth opportunities.

While in the recent past international presence was mainly restricted to large multinationals (Piore & Sabel, 1984; Porter, 1986; DuBois et al., 1993), nowadays it is also a reality for small firms (Oviatt & McDougall, 1994; Coviello & Munro, 1995; Jones, 1999; Yip et al., 2000). While companies in a position of advantage are concerned about strengthening the entry barriers to protect their home turf, new entrants in the global market are “burrowing under it” (Yoshino & Rangan, 1995, p. 62), introducing new ways of competing, creating new strategic groups and forcing competitors to be in constant strategic movement. Firms that are “born global” and other recent international entrants are spreading throughout the world in significant numbers, altering the traditional international business landscape (Knight & Cavusgil, 2005). As put by Yoshino & Rangan (1995, p. 69): “The world is now the arena of competitive interplay, and managers can be expected to change the rules of the game.”

Bartlett & Ghoshal (2000) argue that managers of companies located in peripheral countries may not be aware of their firms’ potential for global action. Therefore, even late movers should adopt a more active posture regarding the international market, by exploiting and protecting the resources and competencies that give them a position of advantage.

Small firms face specific challenges in the internationalization process, in large part because of the limited availability of resources and capabilities (Karagozoglu & Lindell, 1998). Chesnais (1996) highlights the difficulty of small firms to obtain information to support them in producing and selling in international markets. Li, Li & Dalgic (2004) corroborate this by indicating that small companies normally have limited resources to allocate to the acquisition of information and knowledge about the external market.

Particularly in the context of small businesses with low exposure to the international market, managers fear they do not have conditions to take on global competitors in unknown lands. In this sense, an alternative is to think globally even when acting locally, so that firms can prepare themselves to compete with international rivals, by adapting and responding to the actions of competitors as they enter these firms' local markets (Bartlett & Ghoshal, 2000).

The challenge is between internationalizing and competing in the global market or preparing to face international competition in the domestic market. This is the reality faced by a large number of companies in the most varied sectors, mainly those exposed to global competition, as is the case of software.

Software can be defined as "computer instructions that transform the *tabula rasa* of computer hardware into machines that perform useful functions" (Steinmueller, 1995). The first computer programs were written at the start of the 1950s, with the development of techniques that permitted storing programs in computers. The first true software firm was founded in 1955 by two former IBM employees. The arrival of personal computers (PCs) at the start of the 1980s triggered a revolution in the computer industry, and consequently in software. The software industry gained international scale, with American companies being the main players (Software History Center, 2006; Steinmueller, 1995).

The software industry, since its emergence, has been absorbing large a share of the total information technology (IT) market. In 2006, the international software market was estimated to account for over US$ 600 billion in sales. One of the features of this industry is its great concentration, especially of American companies. There is also a trend for intensification of the global character of the software industry (Roselino, 2006). The internationalization of the sector's companies occurs in two main ways. The first is the development of software products (packages) for sale abroad and the second is the provision of services for the development of software for the global chain, a model particularly followed by Indian firms, for example. Naturally it is possible to operate simultaneously with software products and services, such as the sale and implementation of applications systems (Stefanuto, 2004; MIT-Softex, 2002).

In Brazil, the software industry has accompanied the sector's international evolution, but with an important particularity: the legally mandated informatics market reserve. Because of this, the evolution of the software industry in Brazil can be separated into two periods: before and after the 1990s (MIT-Softex, 2002; Stefanuto, 2004). After 1990, with the end of the domestic market reserve and the opening of the economy, the market became much more complicated, with the creation of many new companies and the arrival of foreign players on the local scene. Small and medium firms emerged from old hardware companies or large users that had developed programs in house. With demand still relatively unsophisticated and dispersed, the software industry developed in regional fragmentation, with little specialization and strategic focus (Stefanuto, 2004).

It is estimated there are between 10 and 11 thousand software companies in the Brazilian market. Of this number, 3 to 5 thousand work directly with software development (Stefanuto, 2004; Roselino, 2006; Assespro, 2005; MIT-Softex, 2002). This great fragmentation impedes an overall vision of the market, but it is possible to identify some important groupings. One of these is formed by micro and small businesses with local capital. These firms account for 96% of the market, and despite their innumerous particularities, they share some common characteristics. They are companies normally founded by recent university graduates or people with backgrounds in larger companies, who have low management and marketing capacity and work with imprecise business models. These firms are reluctant to cooperate with others and have difficulty in mobilizing for exportation (Stefanuto, 2004).

In this context, the problem we address here is described in the following question: How does the internationalization process of micro and small firms in the software industry in the state of Rio Grande do Sul work?

This article is organized into five sections including this introduction. In the second section we discuss the theoretical framework, and in the third we describe the method used for the study. Then, the fourth section presents our main results and the fifth section summarizes the main contributions and presents our final considerations.

2 INTERNATIONALIZATION PROCESSES

2.1 THEORETICAL PERSPECTIVES

Three main theoretical perspectives can be identified for understanding the internationalization process: (i) the perspective of experiential learning, basically represented by the Uppsala model; (ii) the perspective of systematic planning; and (iii) the contingency perspective, which stresses the impact of contextual factors (Li, Li & Dalgic, 2004). These three perspectives are discussed below, highlighting their potentials and critiques. The analytical model adopted in this study considers aspects linked to these different perspectives and focuses on small firms.

The central thesis of the Uppsala model is the gradual acquisition, integration and use of knowledge about foreign markets and operations by means of incremental commitments. According to Johanson & Vahlne (1977), the knowledge a firm has about the external market is what determines the type of commitment assumed. Thus, the tendency is for the firm to start in a new overseas market with only slight involvement and then to intensify this as its knowledge about this market increases (Hemais & Hilal, 2002). The theory of the Uppsala school gave rise to various other studies on the perspective of experiential learning. Standouts are the innovation-related models, by which internationalization of firms is seen as an innovation – a process similar to the adoption of new technologies. These models share a vision of the internationalization process as a sequence of stages. By the characteristics of psychic distance and lack of knowledge about external markets, the firm starts its international involvement through isolated exports to neighboring countries and then gradually steps up its commitment to the international market (Andersen, 1993; Li, Li & Dalgic, 2004).

Among the criticisms of the Uppsala approach are those that point out the limited explanatory power of these models in determined situations (Oviatt & Mcdougall, 1994; Andersen, 1993). Andersen (1993) criticizes the lack of delineation between the stages, the weak understanding of why, how and when the internationalization occurs, and mainly the absence of analysis of the initial stage of entering international markets.

Another theoretical approach to the internationalization process is that of systematic planning, based on the assumption that systematic market studies and evaluations improve the international performance of firms. One of the first authors to propose this approach was Root (1987, cited in Li, Li & Dalgic, 2004). According to his proposal, the internationalization process is composed of assessment of the opportunities of the target market, definition of the objectives, selection of the entry modes, formulation of marketing plans and finally execution.

The main criticism of the systematic planning models is that they are extremely rational and rest on the premise that it is possible to obtain information and conduct meticulous studies about the market of interest, which are not always possible, especially by smaller firms. Besides this, the often turbulent and constantly changing environments make the value of extensive planning questionable (Li, Li & Dalgic, 2004).

The contingency perspective suggests that a firm's internationalization process depends on contextual factors. Originating from critics of the Uppsala model, this approach affirms that a firm's internationalization is to a great extent determined by its operational setting, the structure of its industry and its own marketing strategy (Turnbull, 1987, cited in Li, Li & Dalgic, 2004).

This perspective allows for situations of companies that do not follow a predictable order, as established by the previous approaches. Coviello & Munro (1995), in studying small firms in the software industry, identified that the traditional incremental approach to internationalization is not followed by small high-tech firms.

Also, studies examining the influence of the company's relationship networks on the internationalization process are becoming increasingly common in the literature, especially when dealing with small companies (Coviello & Munro, 1995; Jones, 1999; Wright & Dana, 2003; Johanson & Vahlne, 2003; Coviello, 2006). According to Coviello & Munro (1995), the internationalization process of small software firms is affected by formal and informal relationships, suggesting an accelerated version of the models of sequential and incremental stages. Jones (1999), in investigating the internationalization process of small high-tech firms, assumed that the nature of the international expansion can be assessed by identifying and examining the cross-border links formed over time. Wright & Dana (2003) go beyond this, suggesting a change in the prevailing paradigm of the international entrepreneurial strategy. The proposal is for an approach to internationalization that involves a multi-polar distribution of power and control, as in a network in which both large and small companies participate in a type of symbiotic management.

Johanson & Vahlne (2003), recognizing that "the old models of incremental internationalization are no longer valid" (p. 83), propose integration of the traditional model of experiential learning with network-based models. In this new internationalization model (business network model), companies learn the competencies they need to enter new markets through their relationships, and with this develop new relationships, by means of which the cycle repeats.

2.1 INTERNATIONALIZATION OF SMALL COMPANIES

Although the academic study of internationalization started in the context of large companies, there have been a number of studies focusing on smaller companies, especially high-tech firms (Oviatt & Mcdougall, 1994; Coviello & Munro, 1995; Jones, 1999; Yip et al., 2000; Knight & Cavusgil, 2004; 2005).

Boter & Holmquist (1996) suggest that while small firms in traditional sectors can follow a long and organized internationalization process, firms in technology-intense sectors tend to follow a much faster internationalization process. In this context, a series of studies have been published about new companies with global vocation from their outset. Oviatt and McDougall (1994) called these companies international new ventures and defined them as “a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries” (p. 49). Another expression coined is that of born global companies (Knight & Cavusgil, 2004; Rocha et al., 2004). Due to limited resources, a born global firm needs to have success in the initial states of operating abroad. Therefore, a strategy of focus and differentiation, combined with an entrepreneurial and technological orientation, are fundamental aspects of international action. The earlier the firm internationalizes, the better its performance will be (Knight & Cavusgil, 2005).

The main question that distinguishes the internationalization process of small companies, referred to by all authors who examine the theme, is precisely the limited resources because of their small size. Oviatt & McDougall (1994) stress, however, that new international ventures are able to compete successfully in the international arena despite limited resources. Karagozoglu & Baumile (1998) also indicate as difficulties of small American firms in the internationalization process the lack of management experience and competency to exploit opportunities in international markets; difficulties in obtaining information on international markets; and difficulties of obtaining resources in comparison to large global competitors. Yip et al. (2000) also discuss the various difficulties of the internationalization process, mainly among small and medium-sized companies that pursue greater commitment, i.e., move from being mere exporters to making direct investments abroad. They indicate as the main barriers the “unknown unknowns” and the lack of resources and competencies to face potential problems.

Li, Li & Dalgic (2004) suggest that experiential learning can be feasible for small firms that intend to exploit a foreign opportunity but that do not have relevant knowledge and competencies, or that operate in economically volatile sectors. In turn, systematic planning can be desirable for companies engaged in relatively mature industries and/or that have achieved some technological advantage.

These authors propose a model oriented to the analysis of the internationalization processes of small and mid-sized firms that integrates the perspectives of experiential learning and systematic planning, also incorporating the contingency perspective. We adopt this model here with the purpose of characterizing the steps and actions related to internationalization. According to this model, a firm’s internationalization process is composed of three main phases: antecedents, planning and execution (Li, Li & Dalgic, 2004).

A first phase, called antecedents, is characterized by the organizational motivations and competencies that trigger the start of the process. Firms need some motivation to expand abroad. These motivations can be related to the search for new markets to gain scale or scope, to the existence of a segment customers that require service abroad, or to the search for new technologies or sources of competitive advantage (Yip et al., 2000). Competencies such as the mastery of a technology, capacity for innovation, prior international experience of the company or its managers and their entrepreneurial spirit are factors that affect the internationalization process.

In a second phase, that of planning, the firm should invest intensively in market surveys to select the best alternative for international entry. Based on this information, the company then will decide on the target market and entry mode (Yip et al., 2000). In this aspect, Miller (1993) also suggests the firm should put together a business plan to prepare the entry in the selected foreign market.

The third phase is that of execution, when the company actually starts operating in the international market. This phase can result from the planning phase, or as proposed from the learning perspective, the start of exports to nearby countries, in which case the involvement and risk are lower (Johanson & Wiedershin-Paul, 1975). Nevertheless, in a contingency perspective, a company that follows its customers can start its internationalization process by producing directly abroad. Hence, the execution phase does not necessarily follow a sequence of smaller to greater involvement (Li, Li & Dalgic, 2004).

In this model some feedback flows are considered between the phases, suggesting the influence of execution of the internationalization process and the firm’s competencies and motivations for continuing its internationalization. In this respect, feedback from the execution to the planning suggests that the firm can start to plan more systematically after learning from its first foreign experience. Planning can also influence the firm's motivations (Li, Li & Dalgic, 2004).

Figure 1 depicts the model of Li, Li & Dalgic (2004), as adapted for this study.

Figure 1 – Scheme for analysis of the internationalization of small software firms.
Source: Adapted from Li, Li & Dalgic (2004).

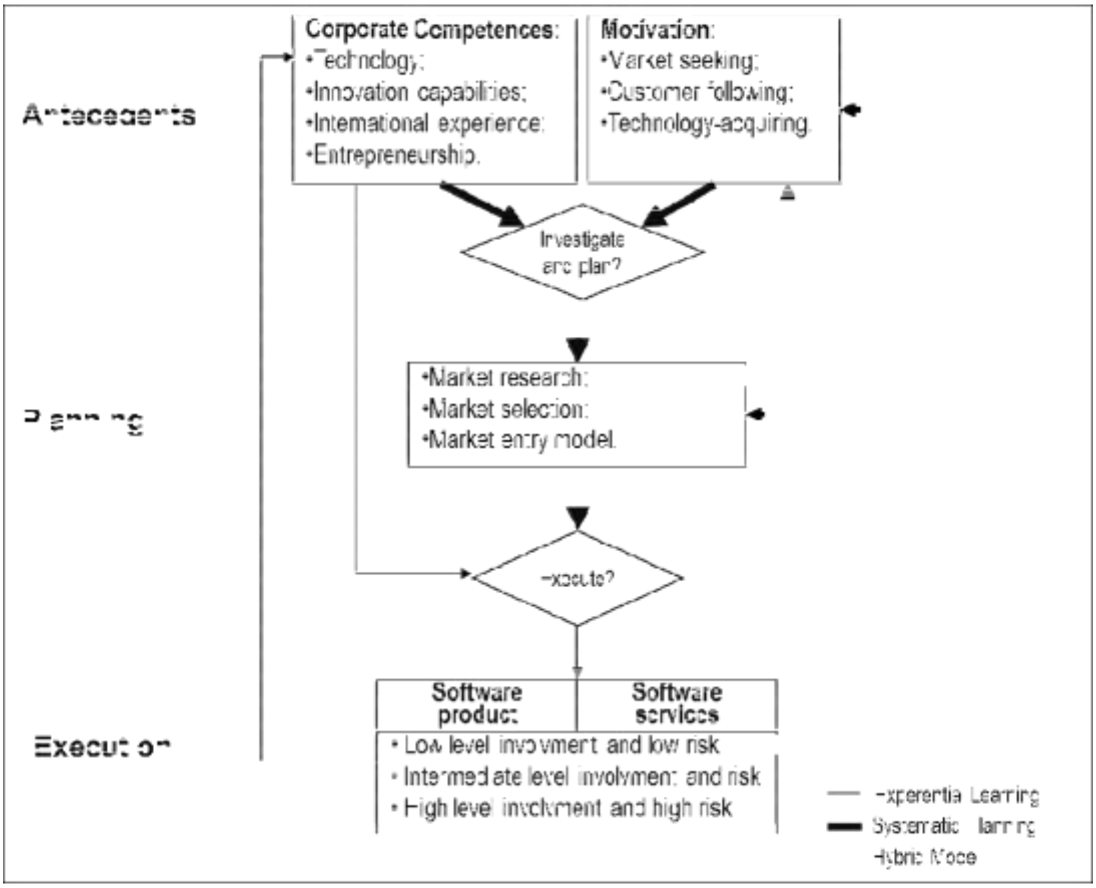

Figure 1 – Scheme for analysis of the internationalization of small software firms.
Source: Adapted from Li, Li & Dalgic (2004).

3 METHOD

To achieve our proposed objective, we analyzed a sample of small Brazilian software companies. The classification of these companies as small is based on the gross revenue criterion, as used by the Brazilian Service to Support Micro and Small Businesses (*Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* - SEBRAE). According to this criterion, micro companies are those with annual turnover under R$ 433,755.14 and small ones are those with revenue up to R$ 2,133,222.00 (2006 levels).

Due to questions of accessibility, we chose a sample of firms from one Brazilian state, Rio Grande do Sul, located in the south of the country. Therefore, the results cannot be generalized. Nevertheless, since this is an exploratory study, we believe the sample's restriction to a single region of the country does not impair the proposed analysis.

To enable an in-depth analysis of the internationalization process, we carried out two data collection steps.

In the first step we organized a database on software companies active in the state of Rio Grande do Sul, since this information was not available from secondary sources. This database was established from the listings of the main trade associations and support institutions in the state: Associação das Empresas Brasileiras de Tecnologia da Informação, Software e Internet/RS (ASSESPRO-RS); Associação das Empresas do Pólo de Informática de Caxias do Sul/RS (AEPOLO); Pólo de Exportação de Software do Planalto Médio - Passo Fundo/RS (POLOSUL); Sindicato das Empresas de Informática do RS (SEPRORGS); Sociedade Sul-Riograndense de Apoio ao Desenvolvimento de Software (SOFTSUL); and Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (SEBRAE-RS),

Table 1 presents the number of companies obtained from the lists of each of these entities. These data were then joined, culled of duplicate entries and selected according to the scope of the work, keeping only the firms engaged in development of software and provision or related services. The result was a base with data on 641 firms, composing the approximate number of such firms in the state in 2006 according to our estimates.

Table 1 – Databases used to identify the universe of firms in the state of Rio Grande do Sul.

Entity	Companies	Source
ASSESPRO-RD	90	Database technological research 2005
AEPOLO	56	Database associates companies
SEPRORGS	2293	Database Sectorial Census 2005
POLOSUL	24	Database associates companies
SEBRAE-RS	369	Database "Projeto Setorial Software e Serviços RS"
SOF TSUL	*	Newsletter base
TOTAL	641	Merged and filtered database

Source: Prepared by the authors.

After establishing the database, we began gathering further exploratory data via the Internet. The aim was to identify which firms from this sample had international activities, to identify the stage of the internationalization process and to classify the firms. The Internet was an effective tool in this research because the firms, due to their target customers, naturally use this resource.

We prepared a questionnaire, designed to take under 10 minutes to answer, and posted it on the Internet. We then sent the link to access the questionnaire by e-mail to all 641 firms. This was repeated three times to maximize the response rate, and the response page was kept active for 27 days (August 8 to September 4, 2006). During this period we also published notices at three websites regularly accessed by firms in the sector, to explain the objective of the study and encourage participation.

As a result, 121 firms responded to the questionnaire, a response rate of 19%. Of this group, 29 firms indicated they had some type of international activity, and these firms served as the base to select the cases studied in the second step of the research. Of this group, eight firms agreed to participate in the qualitative study, which was carried out in September and October 2006. Of the eight companies studied qualitatively, we analyze five in depth, since the other three were only at the preparatory step of expanding abroad, not yet in the full-blown internationalization process.

All told we conducted 19 hours of semi-structured interviews with owners and managers of these firms. These interviews followed a script containing questions on the main topics of interest (Appendix), formulated according to the recommendations of Gil (1999) and Flick (2004).

We initially analyzed the interview responses in their entirety (overall analysis) and then performed a process of fragmentation and categorization. The categories employed for analysis were derived from the theoretical framework and were complemented by an open codification of information observed in collecting the data (Strauss & Corbin, 1990; Flick, 2004).

We investigated the following cases:

- SYSTEMHAUS: This company was founded in 1988. Its head office is located in the city of Novo Hamburgo, where one of the largest clusters of leather and shoemaking firms in the world is located. The company specializes in developing software for tanneries. The system developed, called “Antara”, is used by over 70 tanneries, which together account for around 30% of Brazil’s leather output. In 2001, Systemhaus started working in Mexico, and after this it supplied the system to a tannery in China and established a joint venture with a Swiss company, a leader in tannery automation. In 2006, Systemhaus started activities in the Asian and European markets. Its revenue that year was in the range between R$ 434 thousand and R$ 2.13 million.

- PROCAD: It started up in 1994, developing applications for the metal-mechanical and furniture industries. A software package created to facilitate the design of kitchens composed of prefabricated elements was very well accepted by customers and sustained rapid expansion in the furniture sector, reaching a 90% share of the niche market in Brazil for customized kitchens formed with prefabricated elements. Its international expansion began by accompanying client firms in the furniture industry selling products and services outside the country. In this fashion, the system created by Procad has reached more than 30 countries. Besides this, a contract with a distributor enables it to sell its software to customers in Portugal, Argentina and Mexico. In 2006, the company was preparing to operate in Europe and the United States. Its revenue that year was in the range of R$ 2.13 to R$ 10.5 million.

- API: This company was founded in 2002 as a partnership between two professionals with focus on development of software for industrial automation. In 2004, API was taken under the wing of an incubator of Vale do Rio dos Sinos University (Unisinos) in Rio Grande do Sul. The company started its international activities in 2005 by participating in a technical mission to Spain, organized by this incubator. On this occasion, it established a three-way joint venture with another of the incubated firms (BMinds) and an Italian company, for the purpose of developing a project. In 2006 the company's revenue was under R$ 433 thousand.

- BMINDS: It was created in 2004 in the same incubator of Vale do Rio dos Sinos University mentioned above, as a spin-off of another company. BMinds had 26 employees when it developed a software project for the company from which it originated. Just as API, it participated in the technical mission to Spain organized by the incubator in 2005, and established a joint venture with API and the Italian firm. Its revenue in 2006 was less than R$ 433 thousand.

- ZERO DEFECT: This company is the result of a spin-off in an offshore transaction involving Hewlett Packard that happened in Tecnopuc, one of the main technology parks in Brazil. The company's main partner was a researcher in a project to test the software of Hewlett Packard and he noted there was demand in the market for software testing, and thus an opportunity to create a company. The firm passed through the incubator of this technology park and started to serve other clients besides HP. In 2006, the company's international experience consisted of serving large multinationals in software testing activities. Its revenue in 2006 was between R$ 434 thousand and R$ 2.13 million.

The next topic presents an analysis of the internationalization process of these companies, based on the qualitative data gathered on each one as well as the information obtained from the questionnaire, which enabled identification of companies with some level of international insertion among the software firms in our initial sample.

4. THE INTERNATIONALIZATION PROCESS OF SMALL SOFTWARE FIRMS

The analysis of the internationalization process of the cases studied was done based on an adaptation of the model of Li, Li & Dalgic (2004) presented previously (Figure 1), which establishes three phases of the process: antecedents, planning and execution.

4.1 THE ANTECEDENTS PHASE OF THE INTERNATIONALIZATION PROCESS

The organizational motivations and competencies that lead to the internationalization of a company are the central aspects of the antecedents phase. In this study we did not identify the aspects suggested in the literature as motivators of international insertion, such as the search for new markets, the need to serve a specific segment of customers or the search for new technologies (Yip et al., 2000). Although response to a segment of customers is among the motivations in one of the cases investigated (Procad), the international insertion in the cases studied is better understood when associated with emerging opportunities perceived by the entrepreneurs in their relationships. Of course, the motivations change as a company matures in its international situation. In other words, after an entry “by chance”, the company starts to have other motivations that are nearer to those commonly discussed in the literature.

Organizational competencies stand out as important antecedents of the firms’ internationalization process. Among the 29 firms with international activities, in the sample of 121 software firms surveyed, 41% indicated the existence of innovative and/or differentiated products as the main facilitator, followed by mastery of English (10%), the existence of certified software development processes (4%) and existing relationships abroad (4%). Although the mastery of a determined technology was not identified as a determining factor for internationalization, there is a strong influence of specialization in an activity or product.

In the relation between competencies and internationalization, we observed the establishment of virtuous circles. The technology is improved to enable the firm to compete abroad, thus developing competencies for competing in the domestic market. Technical capacity associated with a programming language occupies a standout position in the cases studied. We found that although the most frequently used programming language by the firms in the sample is Delphi, utilized by practically 30% of the companies with international insertion, the most technologically advanced programming language is Java C. The companies that managed to start their internationalization using less advanced development tools later wound up choosing more advanced technologies to sustain their competitiveness and growth in the external market, which suggests their technical capacity is a significant factor in internationalization.

4.2 THE PLANNING PHASE OF INTERNATIONALIZATION

The model proposed by Li, Li & Dalgic (2004) suggests that the planning phase is not necessarily carried out in the process of international expansion, mainly by small enterprises. The present study confirms this proposition. We did not identify a formal planning phase before the international insertion in any of the cases studied. In all of them planning occurred after actual experiences in the foreign market. The data obtained suggest that few companies perceive internationalization as a rational process, based on an analysis of market opportunities. However, after the first exposure to the external market, the firms indicated they engaged in planning to continue the internationalization process. International trade fairs and missions are utilized to obtain information about target markets, make contacts, prospect potential customers and even negotiate with representatives and distributors.

Another aspect of the planning phase identified in the study is that psychic distance, although in general considered relevant in the internationalization process (Johanson & Wiedersheim-Paul, 1975; Rocha, 2004), is not a decisive and defining factor in choosing markets by the firms surveyed.

4.3 THE EXECUTION PHASE OF INTERNATIONALIZATION

The statement of one of the entrepreneurs interviewed represents the findings on planning for internationalization: “To know the market, you have to go there.” The cases studied suggest that the execution phase occurs without previous systematic planning, and often implies adoption of strategies that suppose higher investment and risk.

For software firms, the execution phase is done in two basic ways: sale of a software product or software services, or a mixture of the two.

Among the companies studied, there was a slight predominance of foreign revenues coming from software products (52%). These product revenues, accompanied or not by services, depend on high investments associated with the need to know the target markets in detail, the need to localize the products, and particularly the need to set up a support structure for foreign clients. Among the cases analyzed, we noted two different strategies regarding the investments that are intrinsic to internationalization, one with higher investment and growth and the other leveraged by the formation of partnerships. Following the former option, one of the firms set up its own structure for services in the countries where it sells its products. In contrast, another of the firms studied works through alliances with local distributors in each market served. Both strategies have their peculiarities and difficulties, but from the perception of the entrepreneurs expressed in the interviews, the firm with the highest involvement and investment in the external market appears to have achieved the best results.

Relationship networks are indicated as facilitators of internationalization by various authors (Coviello & Munro, 1995; Jones, 1999; Wright & Dana, 2003; Johanson & Vahlne, 2003; Coviello, 2006) and also play an important role for the companies studied here. This aspect was mentioned, in the quantitative step, by one-third of the companies in the sample as a factor that enabled their international insertion. In the case studies, the relationship network has had an influence on all the firms, one of them with great relevance, Systemhaus. We also noted the influence of the trade associations and other support institutions as catalysts or enhancers of this network of contacts, especially through organization and support for participation in international fairs, a practice verified as important for the internationalization of small enterprises. Of the five cases studied, the international entry of four was helped by participating in such events. Four other firms also cited this practice in the quantitative step of the study.

Regarding the results of the internationalization process of the firms studied, although this process is still incipient, the results have been very promising. Among the companies with international activities that participated in the quantitative step, although some indicated they do not yet have a conclusive assessment, others indicated profits from abroad. Among the companies that stated they are consolidating their international presence, the forecast is that up to 90% of their total revenue can come from the external market within three years. Besides this, three companies surveyed are consolidating overseas joint ventures.

However, for the majority of the firms surveyed, the main result attained from the international experience is learning. About 30% of the firms highlighted the knowledge obtained about the international market as a main result so far. Only 10% stressed the contacts obtained as being promising for future business. In summary, knowledge of the foreign market and increased trust in their own competencies were the main benefits identified in the cases studied.

5. FINAL CONSIDERATIONS

The main objective of this work was to analyze the internationalization process of micro and small companies in the Brazilian software industry. For this purpose, we considered the model proposed by Li, Li & Dalgic (2004) to analyze the internationalization process small enterprises. This model combines aspects of different theoretical perspectives on internationalization and in this study it proved to be adequate for the analysis. In this sense, we consider that the perspectives of experiential learning, systematic planning and even contingency planning do not alone explain the internationalization process of the firms studied.

The analysis of the internationalization of small Brazilian software firms showed that in the antecedents phase of the process, motivations such as the search for new markets, the need to serve a specific segment of customers and the search for new technologies are not clear explanations of the effort for international insertion. In contrast, the data suggest that the identification of emerging opportunities, perceived by the firms' owners in their relationships, better explains the international insertion of companies that have competencies to serve international customers. We also found that the firms investigated do not conduct systematic prior planning. Rather, this planning occurs in the sequence of one or more effective experiences in the foreign market. Regarding the execution phase of the internationalization process, we found that this is based on alternative strategies with greater or lesser involvement. On this aspect, the existence of a network of relationships can be decisive for the establishment of greater involvement.

As a reflection of what favors the international expansion of small Brazilian software firms, the study suggests that specialization and focus on a niche product or market are facilitators of internationalization. Besides this, the participation in international missions and at trade fairs by the companies studied favored their international insertion. In counterpart, the study suggests that the lack of knowledge about the international software market is the main barrier to the internationalization of the companies studied. Most of the firms investigated do not consider internationalization to be a viable alternative in their growth strategy.

Another comment that should be made, although our intention is not to analyze or propose policies for the sector, is that actions at the meso-competitive level promoted by public policies or trade associations can contribute to expand knowledge about the international market, thus reducing an access barrier that appears to predominate among micro and small software companies in Brazil.

With respect to managerial implications of this study, although many micro and small businesses place expansion in the domestic market ahead of any attempt to expand abroad, Brazilian software firms should not lose sight of the need to compete globally. In the words of Bartlett & Ghoshal (2000), international competition is inevitable.

We do not intend to make statistical generalizations for the entire Brazilian software industry, but we believe the results make an analytic contribution to the research on the reality of this group of companies.

As suggestions for future studies we can highlight investigation of questions regarding the capabilities that differentiate companies that internationalize, the capabilities that are necessary for internationalization and the characteristics of the innovation process necessary for successful internationalization.

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APPENDIX – Interview script for the case studies

1 – Please comment briefly on the history of the company since its founding until the first experience abroad.

a) What type of product/service does the company work provide?

b) What technologies (languages) are utilized?

c) What sets your company apart from its competitors?

2 – What motivated the entry in the international market?

3 – Was there some type of planning of this international insertion?

4 – What knowledge does the company need (or did it need) to acquire to operate in the international market?

5 – How does the company acquire (or is it acquiring) this knowledge?

6 – How is this knowledge internalized in the organization?

7 – Does the company have a network of contacts in the external market? How is it formed?

8 – What has been learned from these alliances and partnerships?

9 – Does the company participate in any joint venture abroad? If so, what has been learned from this experience?

10 – What are the main difficulties faced for acquisition of the knowledge necessary to operate in the international market?

11 – What aspects can favor the acquisition of the knowledge necessary to operate in the international market?

12 – What has the company learned from its international participation? What has changed in the dynamic of the internal market?