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Towards a Supply-Demand Model for Incubators Success – A Cases' Study in Brazil

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TOWARDS A SUPPLY-DEMAND MODEL FOR INCUBATORS SUCCESS – A CASES' STUDY IN BRAZIL

EXECUTIVE SUMMARY

This paper draws on previous studies on the technology parks of Minas Gerais State, Brazil. It is based on in-depth research on five incubators and on the evaluation of the generation of self-sustained businesses in the one with the highest number of graduated businesses—the ultimate indicator of an incubator's success. The analysis of the supply side success determinants is done in four main supply dimensions: type of sponsoring institutions; physical location relative to a university; incubator type by constituents; and the existence of idle capacity and economic and financial equilibrium. Our research indicates that incubators that have a technological basis and are multi-sector seem to have the highest rates of success. From the demand perspective, our research shows that businesses originated by entrepreneurial innovations that achieved the best performance, in terms of acquiring customers, revenue and survival, were those with the highest level of market orientation.

Keywords: incubators, market orientation, success determinants, academic setting.

INTRODUCTION

In this study we define a business incubator as a facility designed to assist businesses at their startup phase to become established and profitable. Incubators strive to accomplish this by providing startups with shared premises, business consulting, business services, networking, mentoring, and a full time manager. The incubation time for each startup business runs usually from one to three years. US statistics show that business incubators increase the success rate of startups from 20% to 87% (www.nzte.govt.nz, 2006).

Given the increase of competition, small and medium enterprises (SMEs) face some difficulties to survive in the market, including the lack of funds for investment and low power to negotiate with suppliers and clients. On the other hand, we know that small and medium enterprises are important for the economy of many countries. Studies conducted by the Brazilian government agency for SMEs (Sebrae) show that the Brazilian SMEs represent 98% of the number of new enterprises, 60% of the jobs, 42% of the wages, 72% of the retail sales, 56% of the services enterprises, 25% of the Gross Domestic Product, and 21% of the exports (Sebrae, 2004).

In spite of their importance and the high number of SMEs in Brazil, there is a long way for small and medium size companies in the country to achieve survival and success. Past research indicates that the mortality rate among SMEs is high. According to Sebrae (2004), the mortality rates in Brazil were 59.9% in the year 2000, 56.4% in 2001, and 49.4% in 2002. This indicates that about half of the Brazilian SMEs go out of business during their first year of operation.

To professionalize the new SMEs and increase their survival chances, business incubators have the primary mission of not only stimulating new startups—generally technology-based businesses—but of accelerating their growth rates to reach maturity. Managed by governmental organizations, universities, foundations, entrepreneurship and business associations, among others, business incubators are responsible for innovative businesses

(Fonseca & Kruglianskas, 2000). In Brazil, according to Nascimento & Souza (2003), the first step for the implementation of parks and incubators was taken by the Technologic and Innovation Program (Programa de Inovação Tecnológica) of the Brazilian state research funding agency National Council for Scientific and Technologic Development (CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico). Created in 1982, this program had the objective of putting together the academy and entrepreneurs. The program created thirteen technology and innovation nuclei in educational institutions throughout the country. Table 1 illustrates the growth of the business incubating activities in Brazil over the last decade.

Table 1: Growth of the Brazilians Business Incubators over the Last Ten Years

Year	Number of business incubators
1997	60
1999	100
2001	150
2003	207
2005	339
2007	401

Incubated enterprises	2,800
Consolidated companies	1,500
Generated jobs	33,000
Total revenue of the incubated companies	R$ 1.6 billion

Source: Revista Exame, March 06, 2008.

The incubation process encompasses three phases. The first, named pre-incubation, focus on the project idea, lasting approximately six months. The second is the startup phase, with an incubation time for an individual business of somewhere between one to three years. The third phase is the post-incubation, when the interaction of the business with the market is achieved, usually requiring over six months (Filártiga, 1999; Guedes & Medeiros, 1999).

Bermudez (2000) points out that in order to generate jobs and profits there must be synergy not only among the incubated companies, but also between them and the local community. This is essential in the development of any incubating program, and must be taken into consideration when measuring the performance of the Brazilian incubators' program. Shared facilities, business advice, business services, networking, mentoring, and a full time manager offered by incubators can reduce the risks of SMEs, increase the number of created jobs, and contribute to reducing social unfairness.

According to Bermudez and Guedes (1997), the main Brazilian incubators' difficulties include: lack of family business tradition; business inexperience of the entrepreneurs; limited access to credit imposed by the country's financial policies; absence of sources of venture capital; inexperience in marketing and technology transfer; shortage of entrepreneurship programs at the universities; lack of joint ventures and strategic partnerships between small and big companies; and, finally, lack of an entrepreneurial culture in the Brazilian society. The Globo Online (2006) published that two thirds of new businesses in Brazil invest less than 4,500 US dollars and 22% less than 870 US dollars. In Brazil, the difficulties to open a new business include the lack of financial support, lack of adequate public policies to reduce taxes and bureaucracy (the government intends to reduce poverty but does not value entrepreneurship), and lack of infrastructure.

In this paper, business survival is considered to be the main success indicator of an incubated enterprise. Here, the ability of the incubators to perform is regarded as a key to increasing the business survival rates. The objective of this paper is to point out a series of dimensions that can be worked out in order to improve the performance of incubators to achieve their objectives. We do so by integrating decisions related to the supply side—the ones that impact the incubator as an offering—and the ones related to the demand side, centered on the market orientation of new businesses. The first section presents a broad description of the business incubators in Brazil. Next, we present a case study focused on five incubators of a specific region to investigate the dimensions subjacent to the supply side decisions, and the way we found such decisions impact incubator performance. Section 3 touches upon one of the most decisive of these dimensions—links with a university. The following section draws on a survey with all of the incubated enterprises of one incubator to evaluate the importance of market orientation. The last section presents the main findings and conclusions of this paper.

1. GENERAL CHARACTERISTICS OF BUSINESS INCUBATORS IN BRAZIL

According to the kinds of businesses they shelter, in Brazil incubators are classified as (ANPROTEC, 2003):

- Traditional (25% of the total): startups in manufacturing, retail and services, stimulating business sectors such as mechanics, electronics, clothing, etc.;
- Technological (52% of the total): ventures that require the use of an extensive amount of know-how, both in processes and products, such as information technology, biotechnology, fine chemistry and precision mechanics;
- Mixed (20% of the total), sheltering both traditional and technological basis companies;
- Others (3% of the total).

In a particular incubator, four incubation levels can coexist (Sebrae 2005):

- Pre-incubated company: venture in the phase of technical and financial viability analysis, which precedes the beginning of the business.
- Incubated company: once verified the viability, the enterprise undergoes the incubation itself, becoming associated (incubation at distance) or resident (when it benefits from having physical space provided to it—usually shared space with other companies).
- Graduated company: consolidated and enabled in the incubator, the company is ready to fare for itself.
- Associated company: enterprise that receives, at distance, orientation and benefits from an incubator, but develops and grows on its own.

In a paper, Barquette (2003) concluded that “the proximity of incubators to larger companies and learning institutions is essential for their sustainability and for the development of “an enterprise culture”. Studies conducted by ANPROTEC (2003) on 122 Brazilian incubators showed that most of the businesses incubators are located less than one kilometer from universities and centers of research, distributed as follows: less than 1 km (60%); 1 to 5 km (22%); more than 5 km (18%) (ANPROTEC, 2003).

2. PERFORMANCE AND SUPPLY-SIDE INCUBATOR CHARACTERISTICS

For this research, we have conducted an in-depth study of five enterprise incubators in the region of the Triângulo Mineiro and Alto Paranaíba, in Minas Gerais State, Brazil. Their names are INETEC, CIAEM, IEP, Unitecne and Incisa. From the analysis, we have identified four dimensions that affect the incubator's chances of achieving its objective. We call these dimensions the supply-side dimensions because they characterize the "offering" of an incubator. The supply side success determinants were found to reside in four main supply dimensions: *1)* the type of incubator sponsoring institution; *2)* the physical location relative to a university; *3)* the incubator's constituent types; and *4)* the presence of idle capacity and economic and financial equilibrium. The main aspects identified in each of these dimensions are as follows.

2.1. Entity-partnership

The arrangement of entities which stands behind all of the five incubators of the region is similar. As a rule, the partners and supporters of all of them include some arrangement of an academic institution, the local municipal government, a local business association, the Sebrae (the federal agency for SMEs), the regional branch of FIEMG (Federação das Indústrias do Estado de Minas Gerais—the Minas Gerais State business association), the Fapemig (Fundação de Amparo à Pesquisa de Minas Gerais—the Minas Gerais State governmental agency for research development) and the Sectes (Secretaria de Estado da Tecnologia e Ensino Superior—the state secretary for technology and higher education). Of the five incubators evaluated, only Unitecne does not include the municipality and the local business bureau among its supporters.

However, the kind of support provided in such entity-partnership arrangements differs across the incubators. In particular, the support provided by the academic institution may have a positive impact on the success of the incubators. Incubators which have not benefited from a location within an academic institution face difficulties in terms of a place to operate, of demand and of innovativeness. Ideally, this type of location is accompanied by a partner willing to provide financial support for the incubator operation.

Of the five incubators, CIAEM is the only one which has a location inside the campus of a federal university and receives support from its municipality. IEP is located in an industrial area, far from a university campus, even though it is maintained by the local private university. It does not receive any type of support from other local partners. INETEC is maintained by a not-for-profit entity that does not have its own facilities and does not have the capability to provide physical space to the incubated ventures. Insisa is located inside the facilities of a private school of economics, and is maintained by the local industrial and commercial association. Unitecne is located nearby the campus of its sponsoring university. It does not have a partnership with the municipality nor with the local commercial and industrial association (the local business association already maintains another traditional incubator).

In general, the managers of the incubators count on resources coming from the proclamations of funding institutions for SMEs and technological innovation, such as the proclamations of Sebrae (the most common proclamation being the Sebrae Program for Incubators – PSI), of Fapemig (such as the Program of Support to in-Company Research – PAPPE, run jointly with Finep and SECT), of the federal agencies for research development Finep and CNPq, and of the Minas Gerais State agencies for innovation (RMI) and development (BDMG).

In the interviews that we have conducted with the managers of the incubators, all were unanimous in saying that, to this moment, they are not aware of any incubator that is

financially self-sufficient. Without the partnerships which come up with facilities and cover the costs with consumables, personal, utilities, and others, the incubators is likely to face deficit, given their high fixed costs structure, and the existence of ventures that are in constants default with the incubators. They believe that incubators can only recover their costs without external support if they have a steady source of revenues from royalties, plus some participation in the revenues or profits made by graduated enterprises, at least for a time equivalent to the time the company was incubated. Unitecne and CIAEM already established such a rule for their incubated enterprises.

2.2. Location

Regarding the topic of location, a relevant outcome of this research is that the incubators located outside a learning or research institution are likely to present some problems, either in terms of keeping the incubated ventures motivated, or of meeting their fixed costs. The incubator IEP, located far outside the local academic institution (Fepam), has difficulties in covering its operational costs, such as space rental and other expenses, and wants a share of the revenues from the incubated companies. Moreover, it has to support promotional activities to make the incubator known by students and company owners. In spite of such efforts, it is experiencing a reduction on the number of incubated ventures. Such situation has led the incubator to decide to move to an area closer to the local university campus.

The incubator INETEC, after having its budget reduced by entities that supported it, did not find the means to keep its facilities at the commercial association quarters. It had to temporarily moved to an unrelated learning institution, which it had to leave shortly after. It found itself having to negotiate so another area could provide space to the existing incubated ventures, which demanded it be done by contract. INETEC has capacity for eight ongoing ventures, but following the space turmoil, its capacity was reduced to only two.

Insisa intends to be a mixed incubator, located inside the campus of an academic institution exclusively devoted to humanities—one that does not work with techno-scientific research. After only one year of activity, it had incubated three ventures—all of them service providers in business consulting.

The incubator Unitecne, maintained by a private academic institution, with programs both in the technology and business areas, does not have difficulties in facing its operating costs. It has graduated a company whose owners became partners with the proprietors of this academic institution. These partners have supported all the costs for the deposit of international patents in several countries. This case illustrates an incubator that provides a new dimension of quality and dynamism to a private academic institution, using entrepreneurship as a stimulator of creative activities and as a source of jobs to its students. Currently, it experiences a growing demand for new projects, both in the technology and design areas.

The incubator CIAEM, located inside the campus of a federal public university, does not present problems in covering its operating costs. It does, however, face difficulties with the slow decision processes typical of public institutions, such as installation of Internet and facilities' repairs. It is also required to pay 10% of its revenues to the public university foundation (FAU), which acts as the formal manager of the incubator's funds. On the other hand, as it becomes better known by the professors and students, the interest on the incubator has grown, and the exchange of ideas increasingly benefits the incubated ventures.

This incubator has been receiving spontaneous visits from professors and students, and installed the Nucleus of Support for Patents and Innovation (NAPI). Some university courses on entrepreneurship have been arranging for field trips to the incubator's facilities, creating opportunities to inspire potential users. It is interesting to observe that a successful business, Warm, sprung from a spin-off between an incubated venture and a company already established in the market. This joint venture took advantage of the market and technology knowledge of the professor and university students involved in the incubated firm, and of the commercial and marketing experience of the company that was already established. In the division of quotas of the new company, the students became owners of one third of the capital, and each company (the incubated and the previously established one) controlled another one third.

2.3. Type of Constituents

Among the five investigated incubators, it stands out that the mixed incubators and the specialized incubators have smaller numbers of incubated companies and operate live with a lower demand for new projects. Moreover, their projects clearly tend to be less innovative. The incubators with a multi-sector technological basis, on the other hand, present several ventures seeking new patents and using resources of PAPPE (which provides non-reimbursing financial aid to make new ventures viable). This indicates that the technology and innovation aspects tend to play an important role on the performance of the incubator. Their superior ability to attract new governmental support programs, such as PAPPE, seems unsurpassable by more traditional incubator types. This is likely to remain as long as the governmental policies are addressed to companies that are devoted to technological innovation of products and/or processes.

However, important programs focused on managerial support, such as the program promoted by Sebrae, through providing specialized business consulting at no cost, are available to any incubated venture regardless of its technological base. Sebrae provides incubated ventures with courses and consulting on business plan development, marketing, commercialization, etc. As well, Fapemig supports programs such as the Project of Commercial Administration for Companies in Incubators, addressed to any company and incubator type. Such programs offer support for the administration, marketing orientation, distribution and logistics of diverse projects.

2.4. Idle Capacity and Financial Equilibrium

Analysis of the financial aspects of the studied incubators indicates that none of them has reached financial self-sustainability. Incubators located outside a learning and research institution seem to face more difficulties in meeting their operating costs, and try to survive by charging incubation fees from the incubated ventures. However, this contributes to the appearance or increase of idle capacity on the incubator, if not serious problems with ventures in default. As a result, incubators' managers concluded that financing the incubators with funds from the very ventures that need to be nurtured by the incubator is not viable. The incubators themselves need to find arrangements to cover at least the fixed costs. In the case of CIAEM, the municipality pays for the consumption materials and the incubator's manager salary. The facilities are maintained by the university. As per the other incubators, partners—municipality, business associations and state agencies—assume only eventual support, such as paying for some specific events and promoting the incubator. However, they do not commit themselves to long-term funding.

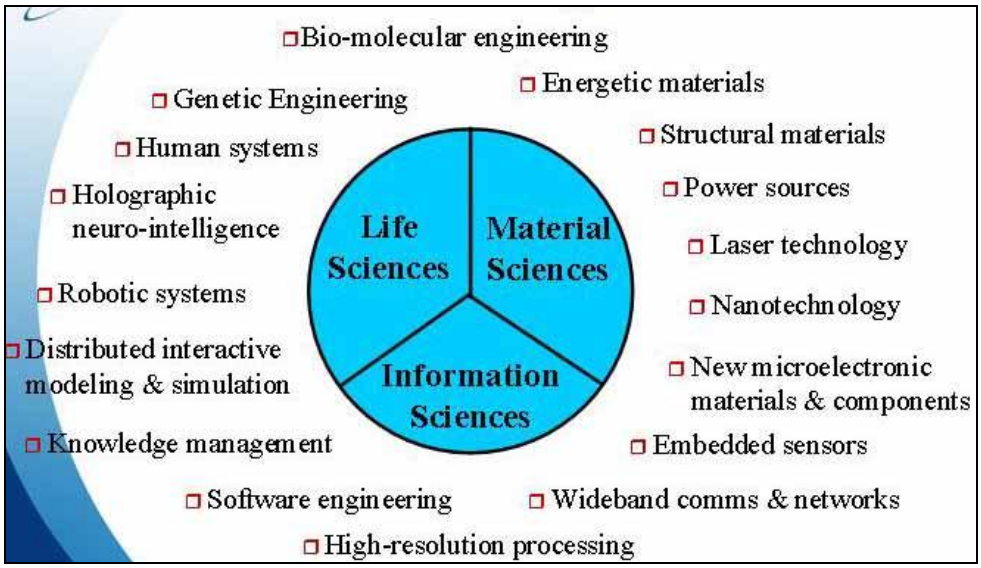
In general the managers of the incubators count on resources from proclamations of state funding agencies for SMEs and technological innovation. Sebrae's most utilized proclamation is Sebrae's Program for Incubators – PSI. Fapemig's is the Program of Support for in-Company Research – PAPPE, in which also participate the Finep – Financiadora de Estudos e Projetos (agency for the Financing of Studies and Projects) and the State Secretary of Science, Technology and Higher Education – SECTES. In addition, proclamations of CNPq, RMI and BDMG are not an unusual source of funding.

3. ADVANTAGES OF THE BUSINESS INCUBATOR WITHIN A UNIVERSITY CAMPUS

A relevant finding of our interviews is that the enterprise incubator in a university campus can count with business plans written by student groups during their academic courses. As stated by Honig (2004), the preparation of a business plan produces an aura of formality and conviction often required before an individual's creation of a new organization is taken on a more concrete form.

Students with a new concept of product or service and a business plan fully developed can take part in a pre-incubation project at the university's new enterprise incubator established on campus. In this phase, they will be stimulated to interact with students from technology areas, such as engineering, which study and work with material sciences, or biotechnology, which study and work with life sciences, or information sciences, in order to form interdisciplinary and multidisciplinary teams. Figure 1 shows the Technology Drivers with many possibilities of developing innovative products, processes, and services. With such combinations of knowledge, business students can supply technology students with management and marketing skills—skills that technology researchers usually lack. Acting together, they can create projects that are innovative, viable and ready to apply for an opening in the enterprise incubator, with greater possibility of success (Oliveira & Moriguchi, 2006).

Figure 1: The Technology Drivers



Source: Oliveira & Moriguchi (2006).

It is interesting that, with the partnerships among students and, eventually, professors, the possibility to observe different views and opportunities arises. Such interactions, possible on a university campus, combine creativity with the opportunity identification process, matching external stimuli with specific individual knowledge and capabilities.

As pointed out by Man, Lau, and Chan (2002), it is important to note that the ability to generate innovative business ideas is viewed as a necessary but not sufficient condition for entrepreneurs who develop wealth-creating businesses with sustainable competitive advantages based on the innovativeness of their products or processes. The university environment can place the innovative ideas together with managerial competences from business students and professors.

Besides the competences related to recognizing and developing market opportunities, other competences with these multidisciplinary approaches in a university campus include building relationships and alliances, as well as building conceptual, organizational, strategic competences and commitment.

4. THE DEMAND PERSPECTIVES IN BUSINESS INCUBATORS

4.1. Measuring Market Orientation

Technology-based businesses are businesses whose products, processes and services are generated by research in which technology represents a high portion of the aggregated value. In general, technology-based enterprises spring from research and high technical qualification. Meanwhile, some entrepreneurs say that technology is not all that matters in achieving success, and that technology alone is not enough to sell a product. Marketing aspects have brought difficulty to technology-based businesses in business incubators, creating barriers to market insertion, growth, and to the very survival of the ventures nurtured in an incubator.

It is important to have a marketing plan to reach the desired consumer. Formica (1999) argues that, contrary to common sense, entrepreneurs generally lack the ability to explore opportunities associated with technology, which in most cases limits a company's innovation process. A proper view of technological processes should to be enriched with creativity in producing, planning and marketing processes. A technology entrepreneur also needs to change his/her attitude in order to help customers take advantage of technological changes.

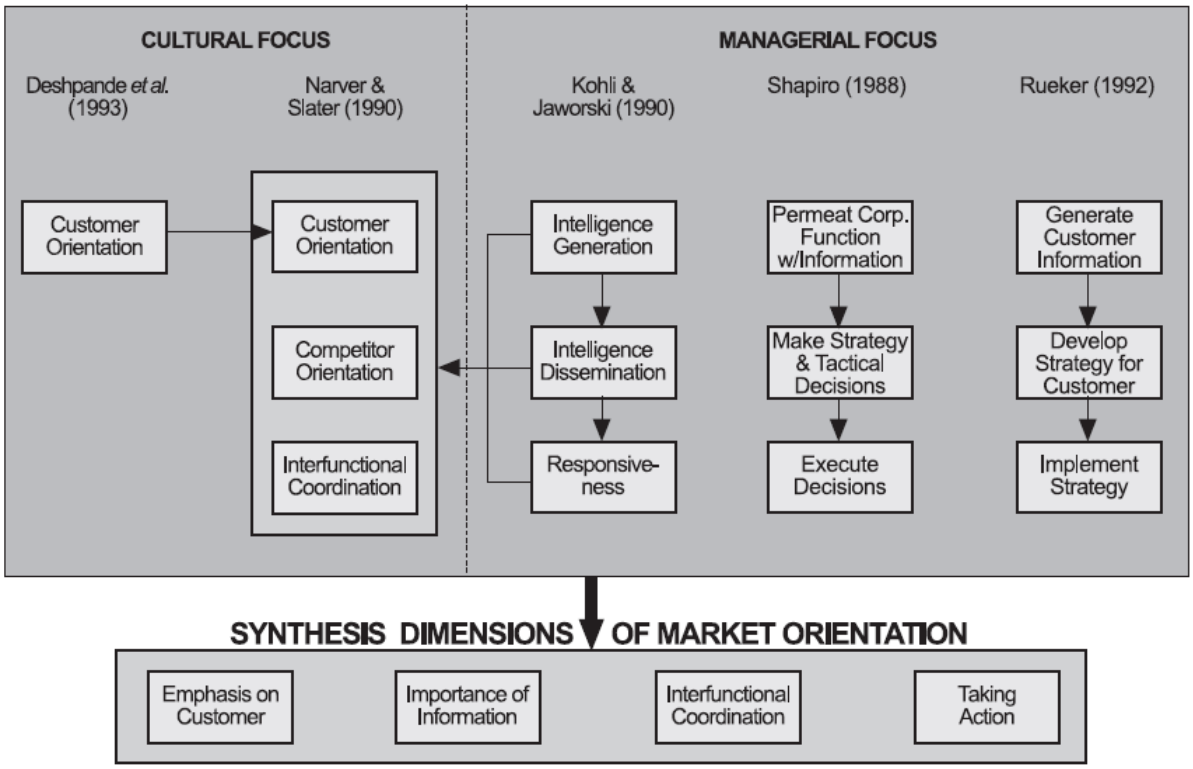
According to Morita, the Sony Company founder (*apud* Formica, 1999), "we cannot forget the creativity in marketing. If you have high technology in new or substantially superior products, services, or processes, you only will be successful if the market is well informed to accept it". In the walkman case, for example, the success came after product planning and marketing action. With this same point of view, Formica (1999) pointed out that even the best technology does not sell by itself, and technology entrepreneurs suffer from a lack of marketing and selling skills that make it difficult to market his/her inventions.

Given the importance of marketing, we recognize that creativity and entrepreneurial innovation are not enough to bring new technologies to the marketplace, without market orientation. Entrepreneurs not only need to introduce new products and services, but they

also need to create and/or change the market condition within which the product or service is sold. The goal is to satisfy consumers' needs and desires.

Hult and Lafferty (1999) created five models of market orientation with several similarities that reflect a general agreement as to what constitutes the foundation of a market orientation. There are four general areas of agreement in the five studied perspectives, including: *1)* the emphasis on customers; *2)* the importance of shared knowledge (information); *3)* inter-functional coordination of marketing activities and relationships; and *4)* responsiveness to market activities by taking appropriate actions. Hult and Lafferty (1999) proposed a synthesis of the five contemporary market orientation perspectives, presented in Figure 2. Next, we briefly these discuss four marketing orientation components.

Figure 2 – A conceptual framework of market orientation perspectives



Source: Hult and Lafferty (1999)

Emphasis on the Customer. The central element of all the definitions of Market Orientation is the emphasis on customers. Since Market Orientation is the process of operating and implementing the marketing concept, it makes sense that the fundamental premise of satisfying the needs and wants of a firm's customers should be inherent in any basic conceptualization of market orientation. Regardless of the perspective taken, the need for the company to understand its customers (Shapiro, 1988), meet their needs (Ruekert, 1992) now and in the future (Kohli and Jaworski, 1990), create value (Narver and Slater, 1990) and put their interests first (Deshpande et al., 1993) is clearly put forth in the various definitions of market orientation (p.10).

Importance of Information. The second unifying element about Market Orientation is the need of information throughout the entire organization. This information also has a focus on the customers. Shapiro (1988) indicates that a market-driven company is one that acquires

and utilizes information on all the important influencing factors that affect the buyers. Other perspectives echo this sentiment. Kohli and Jaworski (1990) refer to the need to generate information that they discuss within the broader framework of market intelligence. Narver and Slater (1990) indicate that in order to create value for the customer, a level of understanding is required, which requires acquiring information on all the constraints they face. Ruekert (1992) also clearly specifies that the degree to which a firm obtains and uses information from customers will determine the level of market orientation of that organization. Finally, in the conceptualization of market orientation by Deshpande et al. (1993), there is discussion on the idea that even though a focus on having information about the customers'needs is important in a customer-oriented firm, it is insufficient without considering of the values that build the organization and help to define their customer focus (p.10).

Inter-functional Coordination. The third area of agreement in the models is the inter-functional coordination. In the conceptualization by Shapiro (1988), the importance of this cooperative orientation is evident in all three of the characteristics he specifies that define a market-driven firm. Not only does he state that information should permeate the entire firm, he also emphasizes strategic and tactical decisions should be made and executed inter-functionally. The second key element in the definition of market orientation by Kohli and Jaworski (1990) specifically addresses intelligence dissemination interdepartmentally and the necessity of this step to ensure concerted action by the different departments. Narver and Slater (1990) single out inter-functional coordination as a key element in the conceptualization of Market Orientation and indicate that it is an equally important element of customer and competitor orientation. Ruekert (1992) also agrees with the need for inter-functional coordination in order to deliver customer value, and Deshpande et al. (1993) acknowledge that inter-functional coordination is consistent with a customer orientation and should be part of its definition (p.11).

Taking Action. The fourth area of agreement among four of the five models is the action taken by the firm. Whether it is phrased as executing well-coordinated decisions with a sense of commitment (Shapiro, 1988), corporate wide responsiveness to market intelligence (Kohli and Jaworski, 1993), utilizing company resources to deliver value to its customers (Narver and Slater, 1990), or implementing and executing corporate strategy by being responsive to the needs and wants of the marketplace (Ruekert, 1992), it is clear that implementation of a customer orientation is a critical ingredient to the definition of market orientation.

According to the definitions above, it is possible to conclude that a market-oriented company is the one that presents all four aspects: emphasis on customer, importance of information, inter-functional coordination, and taking action. This definition was used to measure the level of market orientation of incubated companies.

4.2 Research Method

A survey was conveyed by interviewing the owners and/or managers of all of the INETEC incubated companies, totaling fourteen interviews, including the companies that survived and the one company that did not enter the market. A quantitative approach was used in this descriptive research. The scale adopted has been proposed by Deshpandé and Farley (1998) and complemented by Oliveira and Viola (2006) with questions that consider the local reality of the companies and the here proposed definition for market orientation.

In this way, the scale used in this survey measures the level of market orientation of the INETEC incubated companies, considering the four basic aspects of : emphasis on customer, importance in information, inter-functional coordination and taking action.

As all of the enterprises of the study were interviewed, the results here presented do not reveal statistical error when it comes to drawing conclusions about the INETEC incubated companies. It is important to mention that the intention of this work was not gone beyond the INETEC scope to extend its conclusion about other companies that are not part of this incubator.

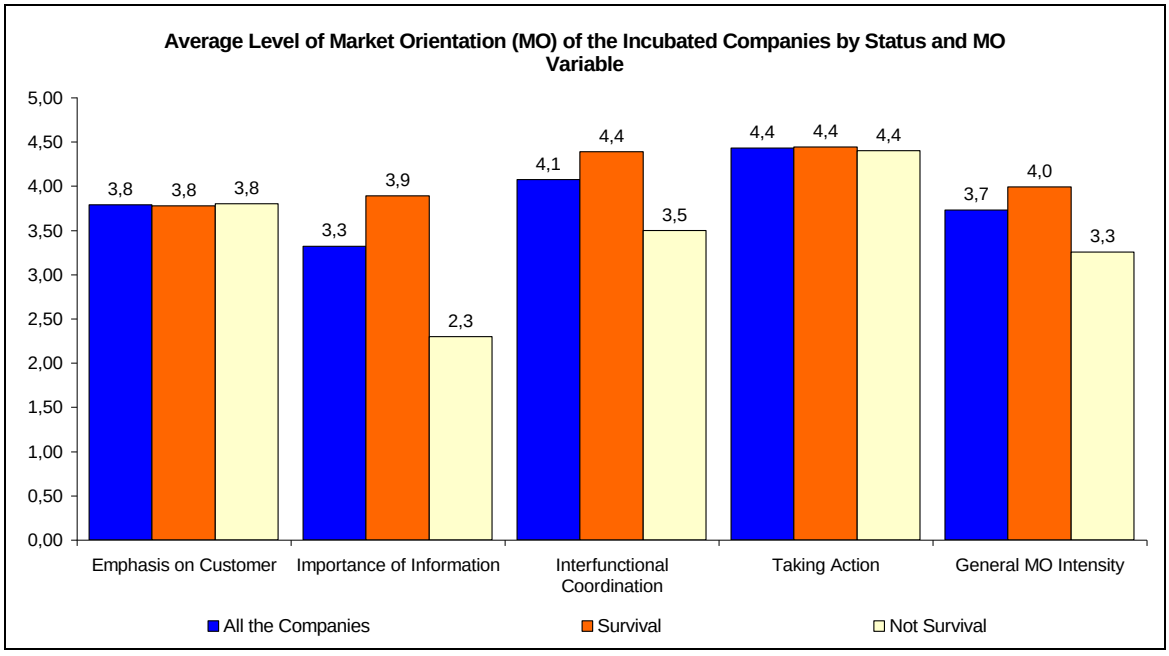
4.3 Discussion of Results

Concerning the general objective of this work—to verify the impact of Market Orientation in the survival of the incubated companies from INETEC—a positive impact of marketing orientation has been supported, given that the more market oriented companies have achieved a greater number of customers, higher annual revenue and longer survival in competitive information technology markets.

Figure 3 shows de level of Market Orientation of the interviewed companies. It shows a higher Market Orientation in companies that were opened during the research period. This superior orientation of the surviving companies is noticed in the 'General Market Orientation Intensity', which presents an average rate of 4.0, (on a scale where the maximum is 5)—above de general average of 'all companies' (average rate of 3.7).

It can be also observed that the non-surviving companies presented a Market Orientation level bellow the population average, an average rate of 3.3. This also shows that the managers/owners of theses companies seemed to be more neutral to the affirmations about the ideal practices or market orientation presented in the research survey.

Figure 3: Level of Market Orientation



Moreover, the non-surviving companies present a Market Orientation average level of 3.3, below the population average. This also shows that the managers/owners of these companies seemed to be more neutral to the questions about the ideal practices and/or market orientation presented in the research survey.

It is also possible to affirm that Market Orientation has a positive correlation to the INETEC companies' survival, by achieving not only market survival but better revenues.

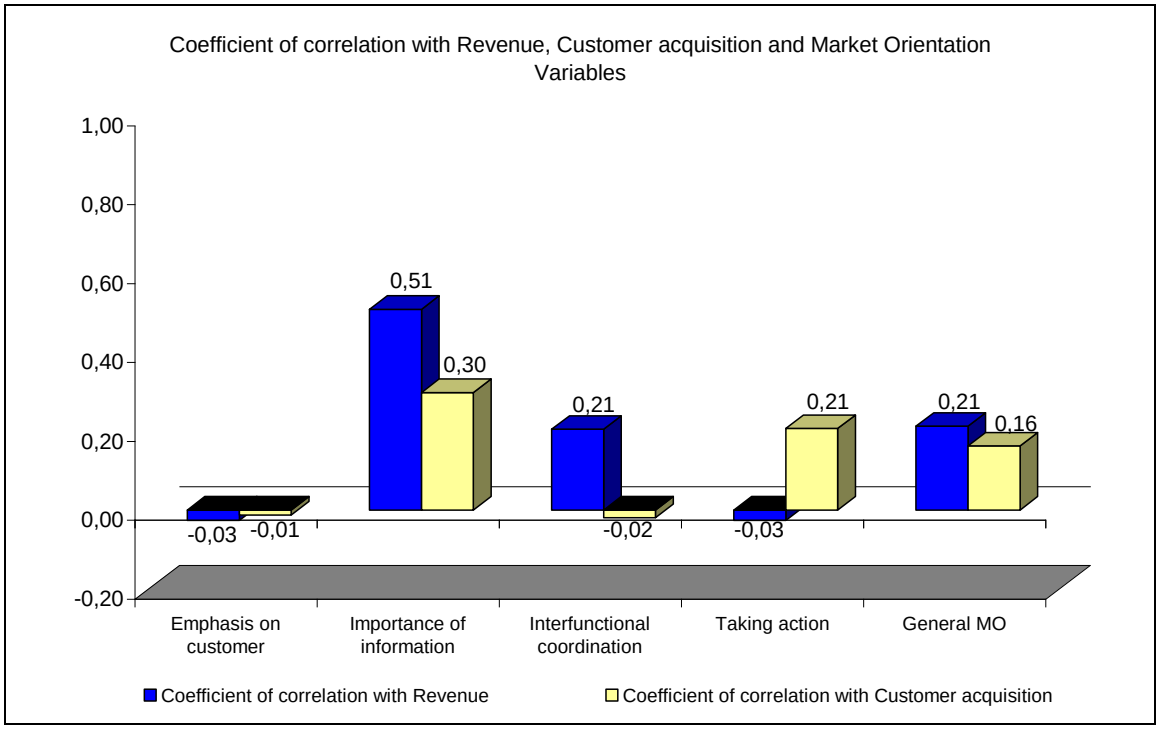
The non-surviving companies—with a Market Orientation average of 3.3—present inexpressive or even "insignificant" revenues, as suggested by some of the managers interviewed. On the other hand, 56% of the surviving companies reached annual average revenues of US$100,000, significantly superior to the revenue of non-surviving companies.

As a way to verify the correlation between 'Market Orientation average level' and 'revenue range', we conducted a correlation analysis and found a correlation coefficient (*r)* of 0.21, indicating a positive relation, as shown in Figure 4.

In terms of the acquisition of new customers, the results indicate that the more market oriented companies presented better results. This explains why such companies obtained higher levels of annual revenue. The correlation coefficient (*r)* found between the "customers' acquisition" and "Market Orientation level" variables is 0.16—low but positive, which confirms the correlation between the two variables.

Figure 4 shows the correlations between both Revenue and Customer Acquisition, and General Market Orientation and its four dimensions (Emphasis on Customer; Importance of Information, Inter-functional Coordinator and Taking Action).

Figure 4: Coefficient of correlation with Revenue, Customer Acquisition and Market Orientation Variables and Market Orientation in general:



As per Revenue, the most significant dimensions are the Importance of Information, Inter-functional Coordination, and General Market Orientation. The variables Emphasis on Customer and Taking Action do not show a positive correlation.

As per Customer Acquisition, the most significant dimensions are the Importance of Information, Taking Action and General Market Orientation. The variables Emphasis on Customer, and Inter-functional Coordination do not show positive correlation.

All of the Market Orientation variables had a positive and significant joint result for Revenue and for Customer Acquisition. Therefore, besides the Importance of Information, Market Orientation is important to all the interviewed entrepreneurs. This confirms the positive impact of Market Orientation over the INETEC incubated companies, indicating that the higher the level of Market Orientation, the higher are the chances of survival and of achieving better results, in terms of Customers' Acquisition and Revenue.

Concerning the product portfolio of the incubated companies, there is a concentration of "management systems", that potentially reveals some fragility in the definition of the ideal products portfolio, given that 86% of the companies focused on the same market.

5. MAIN CONTRIBUTIONS OF THIS PAPER

In this paper, we propose a model in which both the supply side and the demand side are considered to affect an incubator's performance. The supply side has four relevant dimensions: entity-partnership, location (relative to a learning and research institution), incubator type, and the idle capacity and financial equilibrium. On the demand side, the ability to include a market orientation in the venture enterprises it nurtures is regarded as essential to the success of the incubated business and to the incubator itself.

A case study with five incubators of the region of Triângulo Mineiro and Alto Paranaíba lead to the conclusion that maintainers of incubators should be responsible for providing the physical infrastructure and the basic services to the incubators. Information on the incubators under the RMI (Rede Mineira de Incubadoras—Minas Gerais State Network of Incubators), encompassing all of the incubators in Minas Gerais State, shows that none of them is financially self-sufficient. Alternatively, without a maintainer or an arrangement of maintainers able to assume such a role, the incubators' managers become overwhelmed by financial concerns of the survival of the incubator itself. This may deprive the incubator's manager from achieving the incubator's main objectives, which include consulting, qualification, and establishing networks. Santos (2005), representing the federal funding agency Finep at the Seminário Universidade/Indústria in Belo Horizonte, proposed that the success factors for a small innovative company can be synthesized in the acronym MEDIG, which deciphers into Market, Entrepreneurship, Money ("Dinheiro" in Portuguese), Innovation (new product differential) and Administration ("Gestão" in Portuguese). According to Santos, 95% of the success of a small company resides on the last dimension (Administration).

Besides the possibility of the funds and resources it provides, the entity-partnership arrangement's support is important to obtaining resources through proclamations of other funding agencies. However, resources obtained though proclamations are directed to specific ends, such as consulting, training, marketing, participation in trade fairs, etc. They cannot be used, for example, for paying employees' salaries. Only some sources of funding—such as Fapemig and CNPq—can provide support in this sense, and only in some specific cases. Moreover, in 2005, Sebrae, which was always been a great supporter of incubators through

Sebrae's Program of Incubators, started to restrict its funding activities in support of incubators that are inserted in the Local Productive Arrangements – APLs.

The location of an incubator within a learning and research institution exerts strong influence on the performance of an incubator. Such location influences the demand for new ideas and new projects. This confirms Venkataraman's research (2004), when he concluded that the good universities and research laboratories are committed to providing a constant flow of ideas and innovative techniques. This author considers that innovative ideas, entrepreneurs and a culture prone of taking risks are intangible factors for the development of a region—combined with the tangible aspect of initial capital, they create ideas for revolutionary businesses.

Another finding is that successful incubators tend to be ones of technological base, located within a learning and research institution. Besides drawing on a larger flow of ideas and innovative new projects, such incubators tend to be more prone to obtaining financial support from several sources. They may include funding sources that do not require reimbursing the funds they provide—such is the case of the program PAPPE, dedicated exclusively to projects in areas of technology. Technology has a strong appeal as an enhancer of economic activity, and is generally given priority when directing state resources. In Brazil, governmental policies tend to support areas of software development, nanotechnology, biotechnology and pharmacy. With the recent laws that favor technological innovation and with innovation becoming more popular in the media, plus the creation of structures for patenting the intellectual property generated inside universities, the consolidation of business incubators in a university atmosphere of scientific research, the trend towards incubators devoted to technological innovation is becoming more and more favorable.

On the demand side, our study indicates that Market Orientation entails a positive impact over the INETEC incubated companies, given its positive effects on the general survival rate of incubators. A positive correlation was also found between Market Orientation and success both in acquiring customers and revenues.

Following this result, we argue that monitoring the Market Orientation level of incubated companies contributes to increasing their survival rate. This can be achieved by taking preventive actions during the incubation process. Thus, it is expected that it will be possible to perform corrections in the practice of the entrepreneurial managerial process after the incubator's graduation, at a time when the incubators leave the incubating environment and conduct their business by themselves. It is also believed that with Market Orientation innovations might be more based on the market's needs and information, customer's desires, inter-functional coordination and action taking, which increase business' chances of survival.

Marketing training can also be suggested to provide market knowledge to future entrepreneurs. For this purpose, marketing courses must emphasize the concept of market orientation (emphasis on customer, importance of information, inter-functional coordination and taking action) and provide entrepreneurs with tools that will enable them to give students and prospective entrepreneurs an edge to compete in the market place.

For future investigations, it is suggested that this study be extended to other companies from other incubators, in order to increase their chances of survival and, better yet, help them to achieve their goals.

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