

Managing Innovation: A Point Of View Of SME'S Networks In The Brazilian Electronic Industry.

OPERATIONS STRATEGY

ABSTRACT

Innovation is widely recognized as central to the success of most companies. This paper investigates the advantages and disadvantages of the innovation process on Brazilian Small and medium enterprises (SME's) of the electronic sector. We used a case study and applied a detailed questionnaire. Among the principal disadvantages, we highlight a poor laboratories infrastructure and troubles for obtain financial resources. Similarly, as advantages, we detect a quick availability of information, organization learning and cultural change. Besides this, the intention is to point out some possible ways to improve the innovation process supported by sme's networks on electronic industries.

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Introduction

Innovation is an easy word to toss around. Innovation includes the notion of creativity: the conception, adoption and implementation of new services or ideas or ways of doing things in order to improve or reform services, ideas and ways of doing things.

In the last two decades technological innovation has changed dramatically the mass production paradigm endangering the viability of many large firms. According to (Goldman et al,1995) many are the forces that at changing the competition for example :market fragmentation, information capacity to treat mass of clients as individuals, product life time reduction, convergence between products and services, global production networks, cooperation and competition at the same time among firms, logistic infrastructure, incentive for corporation restructuring and pressure to internalize the predominant social values. In attempting to adapt to this climate characterized by increasing of uncertainty, turbulence and discontinuity within this complex competitive environment it is growing the diffusion of cooperative relations among firms. Collaboration between firms often leads to exciting and rewarding results which none of the participants could achieve on their own.

Enterprises and innovation are vital to improving Brazilian's competitive position in the knowledge driven economy. They hold the key to the high-tech industries of the future, as well as the success of our electronic sector. We need to encourage Brazilian companies to move forward together in order to secure a competitive edge in the global marketplace.

Innovation Strategy In Small Firms

According to (Tidd et al,1997) innovation involves complexity and change, whether in the firm' s technology, its organization or its economic environment. As a consequence, technological opportunities and threats are often difficult to identify and innovation strategies difficult to predict. In all cases a capacity to learn from experience and analysis is essential. None the less, both research and experience point to three essential ingredients in corporate innovation strategies:

- The position of the firm, compared to its competitors, in terms of its product, processes and technologies, and in terms of the national system of innovation in which it is embedded;
- The technological paths open to the firm, given its accumulated competencies, and the emerging opportunities that these enable it to exploit,
- The organizational process followed by the firm, in order to integrate strategic learning across functional and divisional boundaries.

Much of the analysis in the literature has been directed to the problems of managing innovation in complex organizations where deliberate management action is necessary to co-ordinate or integrate specialized resources and skills. Like their large counterparts, small and medium firms also need to concern themselves with their market position, their technological trajectories and competence-building, and their organizational processes.

According to (Tidd et al,1997) the evidence shows that compared to large innovations firms, small innovating firms have the following characteristics:

- *Similar objectives*: to develop and combine technological and other competencies to provide goods and services that satisfy customers better than alternatives, and that are difficult to imitate,
- *Organizational strengths*- ease of communication, speed of decision making degree of employee commitment and receptiveness to novelty. This is why small firms often do not need the formal strategies that are used in large firms to ensure communication and co-ordination,
- *Technological weakness* –specialized range of technological competencies, inability to develop and manage complex systems, inability to fund long-term and risky programmers,
- *Different sectors* – small firms make a greater contribution to innovation in certain sectors, such as machinery, instruments and software, than in chemicals, electronics and transport.

Therefore, this paper investigated the advantages and disadvantages of the innovation process in Brazilian small and medium enterprises in the electronic sector. This research encouraged the building of firms networks that to include regional agencies and universities, for the benefit of small enterprises.

Electronic Sector : High Technology Firms

The electronic is an area of extreme dynamism and with several applications. It does with that the technological development is configured as a central element for those companies that want to keep up with its evolution, staying competitive. The electronic sector is one of the most outstanding examples of the deep structural changes for the which it is passing the national production. From the opening of the market, in the beginning of the nineties, the companies of almost all of the sectors of the industry continue altering the productive chain, increasing the imports and reducing the value added by manufactured product. (Gomide and França, 1996).

The electronic area understands the responsible sections for the project and production of systems, and the several supplying sections of inputs, parts and equipment's. Some electronics systems are final consumer good (audio and video, photographic equipment's, clocks, etc). Others are goods of investments used in the industry, in the agriculture and in the services (data processing equipment's, office, telecommunications and instruments of precision for scientific uses, medical and industrial.

(Oakey,1985) argue that much of the current interest in small high technology firms lies in their potential for providing propulsive nodes of new high technology growth which act as embryonic vehicles for the industrial structural change of regions. Without improvements (innovations process) in product and process design, the competitive edge of the firm in national and international markets will be decline over time.

The innovation process essentially involves:

Scanning the environment, and processing relevant signals about threats and opportunities for change, deciding on the basis of a strategic view of how the enterprise can best develop, obtaining the resources to enable the response, implementing the project to respond effectively.

The enterprises have the opportunity to learn from progressing through this cycle so that they can build their knowledge base and can improve the ways in which the process is managed. All firms are trying to find a way of organizing and managing this process in such a way as to provide a good solution to the problem of innovation. Different circumstances lead to many different solutions for example: large high tech firms like electronics companies will tend to create solutions which have heavy activities around formal R&D, whilst small engineering subcontractors as electronic SME's will emphasize rapid implementation capability. The author (Tidd et al, 1997) made a good research and indicated that exist technical difficulties, bugs to fix, teething troubles to be resolved and the occasional major technical barrier to surmount.

Success in innovation appears to depend upon two key ingredients technical resources (people, equipment, knowledge, money) and the capabilities in the organization to manage them.

Research Methodology

Case study analysis have traditionally been used as the principal means to examine field data. Questionnaires were sent to six small and medium size electronic firms, enfatized about advantages and disadvantages of the innovation process. The questionnaire was answered by the

managers or leading engineers . In addition, it included topics related to the enterprises` current situation, cooperative profile, possibilities and concern regarding the creation of cooperative networks among them.

Respondents were required to indicate their level of agreement with statements referring to advantages and disadvantages in the innovation process. A five- point scale, where (1) represented strong agreement and (5) strong disagreement was used.

The first implication of the study is the fact that small firms depend more than others for their innovations on their suppliers of machinery and materials, in which the innovations are embodied.

Findings

In this research of exploratory and qualitative nature interviews were accomplished with the managers and engineers bosses in six companies considered as small and medium size enterprises (SME´s) manufacturers of components for the electronic sector in the São Paulo State, and also a structured questionnaire was applied. (León, 1998).

The companies of our research are manufacturing of: filters and condensers, central systems for telephony, control board, controllers logical programs, general systems for communications, relay for telecommunication. Of the six studied companies, five of them have capital of national origin and one of American origin. They manufacture several types of products used mainly in the communication area, being three of them considered of small size for the criterion of the number of people that uses and three of medium size.

The six studied companies (SME´s) : appeared as factors linked important the innovation strategy the following points:

The shortage of financial resources: It is to say difficulties to obtain capital, to invest in innovations, in reason of the limited access of resources the long term. The small and medium size enterprises have limited access to the credit and they usually operate at competitive markets, with small profit margin. In this aspect, it can be indicates as possible solution the financing of the government's organs through fiscal subsidies that allow SME´s to innovate. Under the point of view of the public politics, the necessary vision is that small and medium size enterprises should receive special treatment, once these use a significant part of the workforce and they are important job creators. Another solution for the problem of shortage of financial resources, would be the incorporation of these SME´s inside of the calls incubators of enterprises of technological base, where they would share resources, equipment's, experiences and they would try to give solution to problems associated at the costs to innovate.

Lacks of a structure laboratorial: The small and medium size companies tend to have smaller access to the infrastructure, that includes information on technology, markets trends, administrative innovations, training techniques etc. Exist access restriction to indivisible equipment's (large scale or expensive machinery) or services.

The access lack to the infrastructure and the indivisible equipment's and services reduce and create obstacles to the technological innovation process in SME´s. It could be made partnerships

with universities and centers of researches which count with a wide structure laboratorial, allowing the phase of tests and prototype in several areas as in this case, the electronic sector.

Fear to the risk and the own uncertainties of innovation process: The small and medium size enterprises in their majority feels fear for the stranger, they don't want to assume risks that can according to them to benefit (in the case of the innovation to have success) or end with the business. In this point a possible solution would be the formation of partnerships between companies of great size and the small and medium size firms founding subcontracting relationships, supply or simply alliances for specific purposes.

Vision extremely conservative for the entrepreneurs: in agreement with our research, many small and medium enterprises resist to the technology, to changes that lead to the cooperation, the lack of information, the fear of failing, the false idea of being necessary to spend resources in technological investments, is to say, a vision extremely conservative.

Today it is not enough to have price and quality to face the competition, because are the technological and managerial innovation that guarantee to the entrepreneur one position of the market. In this point is noticed that the entrepreneur has a predominant role in the choice of the technological strategy in SME's , because is to him basically the initiative of adopting a posture returned to the change (innovation). About the technological innovation it is important to count with employees, but logically they need knowledge and freedom to act. Therefore, the entrepreneur to need extending technical knowledge among the employees, to improve the productive efficiency and to activate the processes of resolution of problems with innovatives efforts.

Some of the most important characteristics of the innovation process in small and medium enterprises in Brazil are:

Disadvantages:

- Troubles for obtain financial resources (66%): lack of resources in terms of money and difficult access of public and private credits.
- Lack of resources in terms of technology (83%): specifically a poor laboratories infrastructure
- Fear for a risk: (50%) . Innovation is inherently risky even well endowed firms cannot take unlimited risks.
- SME's are in general just concentrated in performing everyday operations and there is no vision for the long run (50%).

Similarly to *advantages* we detect:

- Capability to react in front of the market place. (100%)
- Management : absence of the bureaucracy (83%)
- Internal conditions : informal and efficient communication system (33%)
- Quick adaptation of the external changes (66%)

Networking Relations:

(Loveman and Singer,1991) argue that small enterprises are able to organize into communal groups to enable them to benefit from the scale economies available to large companies. The communal organization is able to co ordinate a range of aspects including financing, purchasing and lobbying.

Questions were asked regarding relationships with customers and suppliers, networks and scope for improvements.

Respondents indicated that they strongly agreed that they collaborated closely with their customers and suppliers regarding detailed design of their products/ services, agreed that deliveries to customers and from suppliers were well organized, agreed that they were receptive to customers and suppliers` innovative ideas, agreed that they would take every opportunity to explore collaborative relationships with other firms. The majority of respondents in SME`s agreed that networks of contacts will be continually developing and expanding to exploit trading opportunities. Close relations with other firms in the electronic sector were rated as very important for success by respondents.

Conclusions

Various factors emerge as important for small enterprises growth, namely, internalization and ability to export, innovation and ability to keep up with technological change, human resource management, especially training, finance, networks with other firms, customers and suppliers.

Taking about the innovation process even more than in large firms, the opportunities for innovation in small firms are strongly influenced by: 1) The system of innovation in which they are embedded. Smaller firms also make less frequent use of outside sources of knowledge than large firms. (Tidd et al, 1997). 2) by the innovativeness of their suppliers, 3) by the innovativeness of their customers. In both cases (2 and 3) personal contacts with, and close geographical proximity to, suppliers and customers reinforce and augment the effectiveness innovation in small firms.

A small firms` innovativeness is strongly conditioned by the national and regional context in which it finds itself embedded. Examples of regional concentration of innovative small firms include not only Silicon Valley in northern California, but also the small machinery firms linked to large firms like Robert Bosch and Daimler Benz in Baden- Württemberg, and the industrial districts producing textiles in Italy. (Cooke and Morgan,1997).

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