Initiatives in benchmarking Innovation Management in small high-technology firms: A case study in the Brazilian digital communications manufacturing sector

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Abstract: The Brazilian government has been promoting innovation initiatives for small, medium and big-sized companies for the past years. Among its initiatives, a benchmarking program - developed by the Euvaldo Lodi Institute in Santa Catarina State, Brazil – was started, aiming at assessing the current performance and practice levels, regarding innovation in Brazilian SME and at comparing them against an international database containing data from more than a thousand firms from 32 countries. In this paper, we report how a small firm faced the challenges imposed by this benchmarking initiative. The firm in study was selected for the pilot project in the State of Santa Catarina, along with four other firms, due to their technology and product development-oriented strategies and for being awarded several times, state and nation-wide, for their R&D and innovation practices. We report the challenges imposed by the benchmarking program the firm needed to overcome and how the company achieved this objective, through bibliographical surveys and on-site visits to the company during the period 2006-2010 and we outline how the firm evolved since then and their current challenges for the forthcoming years. We conclude by assessing the gains of the firm in relation to their innovation management programme.

Keywords: Innovation Management, Benchmarking, SME, Performance Indicators, Practice Indicators.
I. Introduction

Innovation activities have become essential for all industries and markets. It is commonly accepted to say that innovative companies are more competitive and often do better in financial terms. For instance, a study made by the European Commission found out that, innovative firms in the EU displayed higher percentages of sold goods and/or services on international markets (Eurostat, 2008).

In Brazil, the growing support of the government in the last decades has been recognized as one of the major reasons for the country to gain importance as an emergent economy (Russo, 2009). Over the last years, Brazil has seen an improvement in their university-industry relationship, with approximately 80% of their research projects being developed in public universities and research institutes (Bound, 2008), while their private sector is one of the strongest in the world.

The support of Brazilian Federal and State funding agencies to small and medium-sized (SME) companies has also being growing in the last years, and specially in the promotion of innovation initiatives. The Euvaldo Lodi Institute of Santa Catarina (IEL/SC) is the entity responsible for the orchestration between the industrial sector, development agencies and research and education institutions in the State of Santa Catarina, Brazil. In 2006, a study conducted by IEL/SC aimed at benchmarking small companies against a database of European firms in relation to their management of innovation.

One of the chosen firms for the pilot project was a digital communications solutions manufacturer, due to their technology and product development-oriented strategies and for being awarded several times, state and nation-wide, for their R&D and innovation practices.

After the assessment programme was completed in 2006, the firm's broader view of their maturity level in relation to innovation management helped to identify their strengths and specially their weaknesses.

In this paper we report the challenges imposed by the assessment programme that needed to be overcome and how the company achieved this objective, through bibliographical surveys, starting in 2006 and on-site visits to the company during the period 2006-2010. The visits enabled a greater understanding of the innovation management model developed by the firm as well as to better contrast it with prior findings.

Semi-structured interviews were conducted with several employees of the firm. Interviewees were drawn from different hierarchical levels of the firm, including senior management levels.

The paper has six sections. The first section is this introduction. The second one introduces some details regarding the creation and development of the Benchstar methodology. The third section brings the methodology used for data collection. The fourth one brings the case of the firm in study. The fifth section concludes the work.

II. How the Benchstar methodology came to be

The Diagnosing/Benchmarking phase was developed in 2006 by the Euvaldo Lodi Institute of Santa Catarina (IEL/SC), through the participation of a project financed by FINEP. The objective of the project was to develop a Brazilian benchmarking methodology for innovation management in small companies, namely the Benchstar Methodology.

The origin of the Benchstar Methodology (BM) was the "Made-in-Europe" program for benchmarking best practices in European companies in the mid 90's. Since 1997, IEL/SC

1 http://www.ielsc.org.br/
worked in the acquisition and adaptation of this knowledge, finally producing the “Made in Brazil” methodology (Seibel, 2004).

The “Made in Brazil” methodology consists in a rapid and effective diagnose for medium and big-sized enterprises, covering all the key areas in the company, allowing the comparison of its results with the indexes stored in an international database, containing more than a thousand companies from 32 different countries (Gariba, 2005).

The Benchstar methodology then, was adapted from the MIB, for suiting the SME’s characteristics and needs, seeking to disseminate modern management techniques, and to communicate what the market leaders, contained in the database, are doing to secure their leadership position (Mazo, 2003). The application of this tool allows a complete analysis of the firm’s management practices and performance and its competitiveness compared to others in the same sector or region.

The Benchstar methodology aims at: disseminating modern techniques of business management, and report what the leaders contained on an international Database are doing to ensure its leadership position.

It is composed of six phases, which are:

- Survey
- Visit to the company
- Measurement discussion and fitting
- Measured data processing
- Presentation of the results to the company
- Client satisfaction measurement

**Practice and Performance Index**

The methodology uses two concepts for the establishment of comparison parameters, the Practice index and the Performance Index. The practice index is related to the management and technological tools and techniques in the productive system and the performance index measures the company’s performance through the practices implemented (Mazo, 2003). It uses two types of graphs to present the results, the first one is the Radar Graph, and the second one is the X-Y Plot, called the Practice and Performance Graph.

The radar graph is composed by five axis, each one with a scale from 0-100%, the position of the company in a specific aspect is represented with a point, linking them with a line, forming a closed polygon of five faces, the corners of the polygon represent the aspects that were measured: Innovation, Innovation Organization, Competitive Intelligence (CI), Monitoring and New Product Development (NPD).

The second graph uses a boxing analogy (Hanson and Voss, 1995, Mazo, 2003). The basic test of validity of the model is to correlate the use of Best Practice versus Performance, the designated areas in the graph are:

- **World class**: Those with both practice and performance higher than 80%.
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- **Innovatives**: Those with practice and performance higher than 60%.
- **Contenders**: Those with both practice and performance higher than 50%.
- **Promising**: Those with 50% or more of the practice but had yet to enjoy the performance benefits to the same level.
- **Vulnerables**: Those with 50% or more of the performance scores but without having the enduring best practice to the same level.
- **Reactives**: Those with practice and performance below 50%.

The Benchstar measures four key Practice Processes: Organization for Innovation, Competitive Intelligence, Product Development and Monitoring.

Finally, the variables that measure performance are organized in a separate group, called Innovation Activities which include: Cycle Time – From product release to market availability, Cycle Time – From product design to product release, Market share, Quality of new product in relation to specifications, Introduction of new products (last 2 years), ROI Time, New product/process release time, Innovative Capacity, Workers satisfaction, Functional product performance and Customer Satisfaction.

### III. Research Methodology

This study was undertaken within a small digital communication solutions manufacturer in Brazil, which was identified by the authors as a benchmark in innovation practices, confirmed by several prizes awarded to the company state and nation-wide by science and technology agencies.

The methodology had two phases, first, a deep bibliographical survey on several Cianet’s documents; and second, multiple on-site visit to the company from June/2006 to April/2010. The timing of the visit enabled a greater understanding of the innovation model developed and used by Cianet as well as a better contrast with prior documentation and findings.

Semi-structured interviews were conducted with several employees from Cianet. Interviewees were drawn from different levels of Cianet, including senior management, mid management, and operational area.

The CEO and some operational employees were interviewed on multiple occasions, allowing examination of several aspects of the process over time.

### III.1 Company Background

Cianet Networking provides digital communication solutions for several markets around the globe, by developing and incorporating technologies in a convergent and flexible way. With 15 years of market and based in Florianopolis, Cianet Networking is an industry that has as its goal to provide solutions in digital communications for the global market by developing and adding technologies and services in a convergent and flexible way.

The technologies developed by the company allow users to reduce costs in the implementation of market-oriented systems for data, voice / data and quad-play, based plug & play equipment,

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1 [http://www.cianet.ind.br]
enabling integration with existing systems without complex configuration. The solutions are fully compliant with current platforms, also allowing the transparent implementation of VoIP, IPTV and VoD (video on demand).

The use of federal tax benefits, at state and municipal levels, allowed the company to face Asian competitors in the Brazilian market. In this sense, Cianet Networking reported a 40% increase in revenues in 2009 compared to the previous year. Moreover, the number of employees increased 10% over the same period.

The innovative and entrepreneurial nature of the firm are visible through the various awards they received: FINEP¹ Award in 2005 and 2008 - was second placed in the regional South in the Product category and third in the SME segment, respectively; Excellence Award in R&D for the Yearbook Informatics Today in 2005 and 2007 (winner); Expression of Technological Excellence Award 2007, SME category; Best apprenticeships practices Trophy by FIESC/IEL 2006; Innovation featured firm in 2007 and also in 2008 by FIESC².

IV. The Cianet Case

IV.1 The assessment phase

The assessment programme on innovation management was developed by the Instituto Euvaldo Lodi in Santa Catarina State (IEL/SC) and funded by the Brazilian Agency for Project Funding (FINEP). The programme methodology was adapted from a European benchmarking tool, namely ‘Made in Europe’, which aimed at benchmarking best practices in European companies in the mid 90’s.

After adapting the ‘Made in Europe’ methodology to the Brazilian context, the IEL/SC started applying it in big-sized enterprises allowing the comparison of the results against data stored in an international database, containing more than a thousand companies from 32 different countries (Gariba, 2005).

Later, the methodology was adapted again in order to comply with the needs and requirements of Brazilian SME’s aimed at seeking to disseminate modern management techniques in use by European firms (Mazo, 2003).

IEL/SC selected five SMEs in the State of Santa Catarina for the pilot study. This paper will study the implications of the assessment programme on one of the chosen firms. The assessment tool was applied in 2006 and produced as final result two graphs summarizing the data collected.

Figure 2 shows the positioning of the case study in relation to the World leaders in the electro-electronic sector based on the measurement of Innovation Practice (61.60%) and Innovation Performance (52.73%), boxing the firm in study inside the ‘Contenders’ area in the graph, according to Hanson and Voss’ boxing classification (Hanson and Voss, 1995, Voss et al., 1997).

¹ Brazilian Agency for Project Funding (FINEP)
² Santa Catarina State Industry Federation (FIESC)
IV.2 The post-assessment phase

After the presentation of the final report by IEL/SC in 2006 to the firm’s managers and a meeting held in August 2007, some aspects were discussed and analysed, in order to identify some of the causes that contributed to obtain those values in Practice and Performance indexes.

First of all, it was determined that the methodology didn’t consider explicitly the environmental context of the companies studied in Brazil, in the sense that some of the weaknesses identified by the assessment tool were known to the firm’s managers, however because of the unavailability of more own financial resources, lack of supporting public policies, etc., these actions (e.g. specialized equipment for product testing, ERP system, extra staff for quality management, etc.) weren’t executed.

These characteristics could inevitably affect the performance and practice indexes, since benchmarking companies of different contexts, like the Latin American SME’s and European world class companies, present exogenous variables, that sometimes are determinant factors for producing biased values.

Afterwards, an improvement plan was designed. The firm adopted an strategy-driven approach, by focusing on a top-down management, working over Strategic Planning concepts, in order to analyse internal and external aspects of the company (Jeston and Nellis, 2008). Some models were used in order to establish an innovation- driven strategy, among them, SWOT analysis, competitive forces and environmental aspects as well as core competencies (Porter, 1980, Hamel and Prahalad, 1994).

Until April, 2010, the implementation process was still in execution. The firm is positioned now on four pillars: Diagnosing, Internal Technology Analysis, Project Management and Competitive Intelligence.

Periodically, new diagnosing activities are made internally, which seek to evaluate and identify performance gaps in the innovation process. The internal technology analysis is supported by
the SWOT model, aiding to understand the current technological positioning of the company. The activities for project development are supported now in tools and techniques of Project Management.

And, finally competitive intelligence systems were implemented. The results after four years of implementation have shown an improved control over current and new projects, a better alignment with innovation for employees, more qualitative and quantitative information processing improving decision making and a stronger market focus. The implications of these changes have led to a greater number of projects being developed by the firm, and also, a greater number of new products going to the market.

V. Conclusion

Innovation initiatives have been increasing its importance for Brazil. The positive outcomes of those initiatives were caused by 1) government support, 2) university research and 3) firms and industry qualification and improvement.

This paper has proven that Innovation Management benchmarking is an effective initiative for improving organizational performance. This paper presented the challenges a small high-technology firm faced when implementing an innovation management and measurement system, through their first three phases: diagnosing/benchmarking, action plan proposal and implementation.

The experiences gained by Cianet Inc. in the process, as showed in this paper, facilitated the identification of the causes that were preventing the company to reach higher performance levels and the establishment of actions aiming to eliminate or at least reduce those causes.

These experiences also showed to be positive for the implementation of a continuous innovation management cycle inside the company, incorporating periodic meetings with the IEL/SC staff in order to measure the changes perceived by Cianet.

Another relevant fact that was learned from the Benchstar application in the case study company was that some of the weaknesses of the methodology were identified, especially regarding to contextual or situational variables, that impact directly on the indicators measurement and analysis, creating a feedback process for the IEL/SC Institute in order to improve the BM.

The results after three years of implementation corroborate the success of the model, when reached a better visualization and control over project development, improved qualitative and quantitative information processing and specially, a greater number of new developed projects and with market insertion. As one of the corporate managers suggested “it has been a positive experience with a clear and visible development of the company with a sharper focus on innovation”.

The need for companies to focus on innovation and to design, implement and manage innovation activities as a core competency inside the firm. Second, the need for a process of organizational change, which enhance drastically the performance of such initiatives.

The next step for Cianet Networking is to continue with the implementation process, and to start a new innovation practice and performance measurement in order to visualize the qualitative and quantitative changes experienced in the process.
Acknowledgments

This work was partially funded by CAPES/CNPq – IEL Nacional – Brazil, through the PEC/PG 2009-2012 Program, supporting the author Mauricio Uriona Maldonado.

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