An Integral Glance of the Innovation Capabilities: a Sociological Proposal

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ABSTRACT

To understand the factors that promote the firm’s competitive advantages it is necessary to carry out an analysis about its learning trajectories and a reconstruction of its innovation capabilities, as well as to recognize that we cannot fit this study into one general theory of the firm.

To make a comprehensive analysis about how the companies construct their innovation capabilities we must take into account the economical, technological, social and cultural contexts in which they belong as well as their own individual stories. For example, in regards to technology, in high technology sectors the innovation capabilities are related to the research and development activities. Meanwhile, in low added value sectors, the innovation capabilities are contained in other kinds of activities, like distribution, marketing, design. Thus is important to be able to identify those activities that produce knowledge. Such activities are carried out both inside and outside the firm. Innovation refers to knowledge and its management, as well as the learning process.

To reconstruct the organization’s innovation capabilities it is important to take the role played by each one of the social agents into account. In this process, firm and subject are merged. It is not possible to understand the company performance without acknowledging the role played by the social actors, and then it is necessary to make this study from a sociological perspective. Innovation capabilities constitute a competitive advantage for a firm; they have been built up over time and cannot be easily imitated. Therefore we must be able to identify and to reconstruct these capabilities.

This paper constitutes an effort to study the reconstruction of the innovation capabilities in a footwear firm located in the city of Leon during the period of 1981 to 2002.

Key words: innovation capabilities, technological learning, knowledge, competitive advantages.

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1 The presented information of this paper is part of the doctorate thesis: “Modes of social construction of the knowledge and the innovation capabilities: two case studies in the footwear sector in Leon”, in the Doctorate Program of Social Studies in the UAM – I.

2 The footwear’s participation in the Guanajuato’s GDP almost represents 30%.
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Introduction

To understand how firms deploy different levels of performance it is necessary to search not only the technological and economical explanations but also to realize that there are social and cultural thing matters as well. We can see examples of two companies with the same technology and the same organizational practices but with different economic results.

The purpose of this paper is to reconstruct, from technological and sociological approaches, the learning trajectory of a sporting and casual footwear company and to reconstruct its innovation capabilities during the period of 1981 to 2002.

3 The presented information of this paper is part of the doctorate thesis: “Modes of social construction of the knowledge and the innovation capabilities: two case studies in the footwear sector in Leon”, in the Doctorate Program of Social Studies in the UAM – I.
4 Cited by Reygadas (2002:101)
The paper is divided into four sections. In the first one, we approached some methodological aspects of the research. The second one constitutes our theoretical framework and points out our definition of innovation capabilities and their social constructions. In the third section we make a reconstruction of the TENISMEX’s innovation capabilities during a learning trajectory. Finally, we presented our reflections.

I. Methodological Aspects

The information that we present was compiled through in depth interviews applied during the periods of February to June of 2000 and August of 2001 to June of 2002. Altogether we made 39 formal interviews and 10 informal interviews.

The interviews that we applied were ill-structured, they did not have a closed format. We only identified the important subjects and the interviewees were allowed to go into depth about what they considered important. In the course of the interviews, we formulated questions that had not been in mind and which arose during the application. All the interviews were recorded and transcribed for later analysis.

The interviews permitted us to participate, in a more active way, in the recovery of the information, because they allowed us to talk and to participate in a closer way with the interviewees and allowed us to obtaining detailed and diverse stories which provided greater and better quality of information. Through the interviews, we could see the point of view of the interviewees without predetermining it by means of a previous selection of the categories of the questionnaire. We could see a greater depth of meaning in the scope of their personal experiences and we could obtain an understanding of the world in which they see themselves as actors.

In addition, we made visits to all different departments and we also stayed in the company as employees, which allowed us to interact with the workers in the same process of production and to make informal interviews. All this was registered in a fieldwork journal.

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5 To hold the company name confidential we will use this fictitious name.
6 Before starting the interviews we asked participants if they agreed with the recording of this.
II. Theoretical Aspects towards a Definition of Innovation Capabilities

Many theoreticians have been concerned with identifying and analyzing the factors that support the competitive advantages of the companies. In this paper, we agreed with the authors who have pointed out that the innovation capabilities support the competitiveness of the companies (Leonard - Barton, 1995; D. Teece, 1997 and Dosi, et al, 2000a)

All of this is related to the introduction of new products, processes or services and even the improvement of the already existing products, processes and services. The innovations take place in any area from the company, involving activities that go from the routine to strategic. According to Thomson (1993a), the learning promotes the invention and this modifies the productive process.

In agreement with Villavicencio (2000), the innovation in the companies is essentially a question of learning to organize the diffusion and creation of knowledge. In fact, it is a learning process. The ways to capitalize the knowledge within the companies appeal to collective processes of learning, whose material support is constituted by the set of social relations, tacit and/or explicit practices and organizational rules that delimit the guidelines of behavior and interaction of the actors. The learning helps us to understand the continuity of the technological change and to explain how and with what limits specified technologies evolve.

In this process, the establishment of social networks, the flows of knowledge, the kind of knowledge that is shared and the frequency with which the companies do it are important issues.

Next we will indicate some definitions that have been given by different authors which we called Innovation Capabilities.

Leonard – Barton (1995:18) uses the term *Core Capabilities* to encompass the system of activities, physical systems, skills, managerial systems of education and reward and values that create a special advantage for a company or line of business. A true technological competitive advantage derives from a combination of abilities and knowledge from the technical and managerial systems that use and help to increase the value that the client perceives. Also, it emphasizes the importance of the reward systems, because if these inhibit or punish the participants, then they will promote a specific kind of knowledge that will destroy the capabilities of the organization to grow.
In 1997, D. Teece introduced the concept of *Dynamic Capabilities* and defined it as the firm’s ability to integrate, to build and to reconfigure internal and external competences to meet rapidly changing environments. In areas of high technology, the dynamic capabilities of a firm depend heavily on its Research and Development (R & D) resources. However the dynamic capabilities cannot be built simply by spending on R & D. Often it is necessary to establish strong links with the suppliers or alliance partners. Such coordination is needed for effective identification and linking of technological options and market opportunities, as well as identifying the strengths and weaknesses of existing resources relative to the requirements of a new product or process. Nevertheless, in areas of low technology the dependency will be made in other activities, for example in marketing, design.

G. Dosi, R. Nelson and S. Winter (2000a:1-3) use the term *Organizational Capabilities* and define it as the know – how that enables organizations to create a tangible product or the provision of a service and the development of new products and services. These capabilities need to be supported by effective internal and external communication flows. According to them it is important to take into account the distinction between the execution of high frequency, repetitive daily business by low – level employees and the decisions of executives about the development and deployment of capabilities. At this point we disagree with them, according to our view, the daily activities and the knowledge of the blue - collar workers play a critical role in the social construction of the firm’s innovation capabilities.

In this paper we use the concept *Innovation Capabilities* and we defined it as the ability of a company to use efficiently its internal competencies (technological learning activities, and types of knowledge’s construction) as well as its external competencies (the use of the external knowledge through the establishment of social networks with other institutions: suppliers, users, universities, research centers, etcetera). These capabilities allow the company to elaborate new products or to supply new services, and even the improvement of the existing ones. In addition they are socially and culturally embedded.

In sum, we must emphasize again that the innovation capabilities constitute a competitive advantage for a company; they have been built over the time and they cannot easily be imitated. The products or services that the company offers are only the manifestation of the innovation capabilities. In addition they depend on the type of product or service that the company provides. For example, in a sector of high added value (like biotechnology, electronics, etc.) the R & D activities play a transcendental role. However in traditional sectors, of low added level (for example, clothing industry, footwear, etc.) other activities such as the logistics are important. Specifically, in the footwear sector, the most important
innovation factors are the design and the time. In the design process, the client’s feedback is transcendental. Thus the activity developed by each firm is very important. Since we have already indicated that the innovation process is both socially and culturally embedded then we need realize that the specificities matter and that these delineate different ways of innovation.

The Social Construction of the Innovation Capabilities

The innovation capabilities (IC) can provide competitive advantages when they are based on routine collection, abilities and complementary assets. In this situation, these capabilities are not easily imitated, and the reason is that very few routines are unique and their coherence would require that a change in a group of routines in a part of the company would require changing others unavoidably. In other words, to understand them we would need to know the entire context and not only to study them in isolated ways. For example, in the footwear sector, if one company imitates the product of the leader, but it does not reproduce the technical and social systems that are needed to manufacture this product, then it does not comprehend the competitive advantage of the leader. In the words of Leonard – Barton (1995:4-5), “even excellent assembly operations are unlikely to constitute a core technological capability because the knowledge content required to bring such operations to peak quality performance is available to all competitors”.

![Diagram of Innovation Capabilities]

Source: own elaborated
Besides creating and maintaining the IC, managers need at least two abilities: they must 1) know how to manage the activities that create knowledge, and 2) possess an understanding of exactly what constitutes the IC, this is, its dimensions.

We can say the following: the construction of the organizational knowledge happens when we combine the individualities of people with a particular group of activities. Thus, we propose the following model to analyze the elements that constitute the capacity of innovation in a company.

First we must identify the innovation landmarks\(^7\), then we have to identify the learning technological activities (LTA) that support the firm’s performance, next to make an analysis of these activities and finally to study the role played by each one of the social actors. Thus we must take the workers, supervisors and directors into account. From our point of view each one of them contributes to the innovation process of the company.

The LTA that we considered important to take into account are: use and acquisition of machinery, implementation of quality systems, problem solving, product design and relations with the suppliers and clients. The use and acquisition of machinery refers to the process that follows the company to select the suitable machinery, the relations that are established with their suppliers, and the training of the users. Systems of quality control, allow the companies to codify part of the tacit knowledge, and promote the dissemination and sharing of the knowledge. These systems permit that all the members of the organization share such standard. Problem solving, this activity allows the conformation of routines. These routines comprise the accumulated knowledge of the company. Problem solving refers to how the workers react in a well – known situation and how they solve it. The problem is when the workers are not able to analyze the situation and give the same answer to two different situations that superficially they seem similar. Before this we would be before the presence of a passive knowledge that could impede in the performance of the organization. The design of new products or new processes must be seen like the interaction of all the units of the organization in order to develop new alternatives for its market. The market is the one that dictates the tendencies. The department of sales must be the receiver of the necessities of the clients and to interact with the department of design (or product development). This department will be the one in charge of materializing the ideas for new products, and will have to work closely with the suppliers of the company in the development and

\(^7\) We defined innovation landmarks as the events that cause technological, organizational or social changes in the firm and these promote the innovation capability building up.
selection of the materials; as well as with the department of production to make the prototypes and to develop, if it is necessary, the productive process that will be adapted to the new product (*recurrent engineering*).

In addition, it is important to take into account the specifics from the industrial sector in which the company is immersed. For example, the footwear sector is a sector dominated by the supplier because the main innovations are made in the development of materials and machinery. Within the same sector, the innovation is reduced to the introduction of new designs. In this type of product, we would hope that the workers had participated with ideas for the development of the products. For example, a stitcher could suggest that a specific type of stitch goes better with the design. In sectors of greater technological complexity, the worker could participate with recommendations for the process when the product already is being manufactured.

The use of the external knowledge makes us recognize that an important source of knowledge is found in other organizations (Teece, 2000, Leonard – Barton, 1995). It is important that the employees of a company make a constant process of “benchmarking” other organizations. In addition, it is important for the company to establish relations with its suppliers and its clients. From these relations a virtuous circle of constant innovation and improvement can be constructed.

### III. The Learning Trajectory of TENISMEX

In order to analyze the TENISMEX’s learning trajectory, first we identified the innovation landmarks. From these we established some stages in the company’s trajectory. The second step was to identify the LTA that create knowledge and to analyze them.

We identified the following landmarks of innovation:

1. Creation of its own trademark.
2. Implementation of the COMPITE workshop.
3. Production of footwear with upper – injected sole.
4. Subcontract with FLEXI.
Each one of these landmarks of innovation provoked a stage in the learning trajectory of the company. In the following table we show the stages and we identified a strategy for each one:

<table>
<thead>
<tr>
<th>TABLE 1: TENISMEX’S LEARNING TRAJECTORY</th>
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<td>Name of the stage</td>
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<td>Landmark Innovation</td>
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<td>Strategy</td>
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In the rest of this section we will make a tour of the “trajectory of learning” in the company. We will stop at the third innovation landmark, because we have studied it in a more exhaustive way.

In these innovation landmarks, the AAT that we identified were:
1. Acquisition and use of new machinery,
2. Implementation of a quality system,
3. Design of new products, and
4. Clients and suppliers relationships.

The following is the narrative.

**A. First Stage: Learning, 1981 to 1989**

TENISMEX was founded in 1981; its owner is a shoemaker by tradition, their family being one of the most important in the locality, in specific the Barrio del Coecillo⁸. We considered it as a family

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⁸ Barrio del Coecillo is one of the most important footwear zone in the city of Leon.
enterprise since, although a formal organizational structure exists, the important decisions continue to be made under the trusteeship of the proprietor.

The company has two plants; one of them is dedicated to the production of a sport shoe that is manufactured with the trademark TENISMEX; the other is dedicated to the production of casual shoes with upper – injected sole and it is manufactured under the trademark TENISLAND\textsuperscript{9}.

In the 1980’s most of the sport footwear producers in Leon and San Francisco del Rincon were dedicated to imitate products of the world-wide leaders (NIKE, ADIDAS, REEBOK, etc.). This activity provoked a great economic spillover in the region. During this period, TENISMEX made sport decathlon type footwear under the trademark DIN DON. Nevertheless, at the beginning of the 1990’s, stricter measures began to protect the trademarks. The proprietor of the company saw this situation as an opportunity and decided to create his own sport footwear trademark in the year 1990: TENISMEX.

During the next five years, the company continued handling itself with employees doing various jobs and the production department used obsolete technology.

**B. Consolidation: 1995 to 1999**

In 1995, TENISMEX did not have functional areas or a boundary of the functions. The first great rupture appeared in 1998 when they implemented a COMPITE workshop in the factory. With this event began the strong training programs for workers as well as teamwork at the managerial level.

During this time, the Commercial Director, the Administrative Director and the Director of Operations joined the company and TENISMEX also began its relations with the consulting company TECNOS which was recognized in the zone. All of these people were important factors in the evolution and consolidation of the company.

One of the changes that produced the COMPITE workshop was the redefinition of the production process. Before the workshop, the production process was handled by three plants, each one of them in charge of one of the phases of the process. This provoked high costs and low productivity. One of the

\textsuperscript{9} TENISMEX and TENISLAND are fictitious names.
plants is now closed and it was decided to have all the productive processes in a single place; the purpose being to improve the communication channels and to increase the efficiency of the production flows. The other plant will be used two years later for the production of casual shoes with upper–injected sole.

In that same year (1998), the department of Human Resources was created and only covered traditional functions like the hiring, the payment of salaries and wages and the firing of the workers. Functions like the training and development of the employees and reward systems were not carried out.

The styles introduced to the market up to 1999 took into account the “feeling\textsuperscript{10},” of the owner (knowledge intuitive, Zemelman, 1987). The experience allowed him to know what products would be successful in the market. His product introduction process was the following: he attended the international footwear exhibitions in order to know the leader’s new styles, he selected and bought some of these, then he brought them to Mexico and these styles were imitated. In the end, in the introduction of new models, the client’s opinion was not taken into account.

In 1999 TENISMEX begun to incorporate the opinion of its clients (wholesalers). The company brought soles, prototypes, pictures from the international exhibitions. All of these elements helped them to make fashionable concepts. In addition, the company asked its main clients what product they believed could have the greatest success in the market.

Also in 1999 they began to have meetings that were called “directive team’s meetings” and “the guide team’s meetings”\textsuperscript{11}. In these meetings, the involved departments participated and jointly they analyze the advantages and the disadvantages of the new projects.

\textbf{C. Institutionalization and Redefinition: 2000 to 2002}

In this stage the goal was to institutionalize TENISMEX, to transform it from a family company to a corporate one. The first change made was the decentralization of the decision making, allowing each

\textsuperscript{10} Kenichi Ohmae (1982) has pointed out the importance of intuition in the business strategy; According to him, intuition implies creativity.

\textsuperscript{11} The directive team is formed by all the department directors and the owner. Every week they have a meeting whose purpose is to analyze and to solve problems as well as to make strategic planning. The guide team is composed of employees from different departments and they analyze and solve daily problems.
area director area to handle his own budget and make the decisions concerning his functional area. Nevertheless, the most important decisions continued to be made by the owner.

In the year 2000, they began to work on people development and the philosophy was: people are the key factor to the firm’s competitiveness. In order to support this new culture, they carried out an Internal Communication Program, with the Commercial Director of the company in charge:

“(…) I am working very hard to promote the Internal Communication Program. I believe it is the most important Program of the company. It is important that the workers, the employees and everybody know the company’s goal exactly. All employees have the detailed knowledge to improve work, so managers must delegate more responsibility to them. And for this, it is fundamental to empower the employees so that they have a profound knowledge about their functions (…). That program must be very efficient and must reach all employees and they must know the importance of the change, why things happen, and they must understand it and become promotional agents (Interview with the Commercial Director, 18th of July, 2000).

The components of the Internal Communication Program were: the Suggestions Mailbox, the Program of Contribution of Ideas, the Monthly Contest of Productivity, the boards of warnings and the dining room equipped with videos and televisions.

Regarding the Suggestions Mailbox, approximately 30 suggestions per week were received. Managers were aware that if the workers realized that their suggestions were being taken into account, then they would increase their participation level.

”Now we have a mailbox of suggestions. Weekly we received 30 suggestions, I would like that there be more, but little by little. Employees have increased their participation and if they see that their suggestions are taken into account, automatically they are going to motivate their fellow workers; but if they see that there is no change, then that mailbox becomes an adornment: “Why should I use it if they are just going to use it as a waste basket?”” (Interview with the Commercial Director; 18th of July, 2000).

Due to the success of the Suggestion Mailbox, the company designed the Program of Contribution of Ideas; the contributed ideas were going to be evaluated by a committee and if they were accepted its
creator would receive 100 pesos. The creator of the best idea of the month would receive 1000 pesos. The new approach of Human Development contributed to the reduction of the turnover rate, which decreased, in June of 2000, from 10% to 3.6%. The benefit was the increase of productivity, since a lower turnover rate prevented the necessity of hiring and training people for the jobs.

All of this corresponds to the theories of the social construction of knowledge, since the workers play an important role in the daily process of learning that takes place in the production and the many improvements are the result of qualified workers. If the workers are directly involved in the innovation process, the result in terms of productivity and efficiency is more satisfactory than when they are excluded from this process. This is indeed what the company tried to do: to involve the workers in the innovation process.

In this stage the design of products showed an advance: the use of the external knowledge. In 2000, the company began to work with an exclusive designer, a company called WOD, located in Korea. This company was in charge of developing the prototypes of the soles (important raw materials for the manufacture of sport footwear). The use of this external knowledge provided the advantage for them to follow the future trends in fashion, because the WOD has connections with the worldwide leaders and it knows both the technological innovations and the demands of the market (D. Teece, 2000). Nevertheless, in regards to the cut, they still did not have a clear definition of originality. They only followed the leader’s trends.

It is important to indicate that in the formal market of sport footwear, the trademark plays a transcendental role. The consumer makes his purchase decision based on the trademark: NIKE, REEBOK, ADIDAS and the national producers (ESCORD, BRAZIL 2000, CONCORD and COURT) do not count on that recognition, which makes it difficult for them to find a position in the market.

According to this situation, TENISMEX sells most of their production, 90%, in the informal market, where the purchase decision is based on the price. In the last two years, this channel of distribution has constituted a weak point for the company, since in this type of market the threat of the Chinese footwear is greater. The illegal Chinese footwear is sold in those places, and the product constitutes sport footwear of prestigious trademarks at accessible prices. Although the company considers that the quality of its sport footwear is superior to the one of incoming products, this factor is not taken into account by the final consumer.
The New Plant: The Way towards the Cutting Edge in Technology

Anticipating the displacement of their products by the Chinese footwear, TENISMEX decided to manufacture footwear with upper – injected sole and created the trademark TENISLAND, and also created an independent plant. The idea was to move away from sport footwear towards a new kind of footwear. TENISMEX pursued the strategy of specialization in a specific product of greater quality and with its own designs;

“(...) for the new product we took the shoe of prestigious trademark and we did something similar, similar but not equal (...) we did not copy, we had an original design (...) all the shoe producers followed the leader’s trends (...) In the market we always found similar products. The most important thing is that we have originality (Interview with the Commercial Director, 19th of July, 2000)

Thus when they introduce new models for TENISLAND, the ensuing lines were the result of the pursuit of trends, and this had led to a decrease in imitation.

The new plant represented a great investment of machinery and equipment, in training, which at the beginning; saw itself as an organization of the productive plant in the Japanese style: flexible productive process, multifunctional workers, team work, department of engineering, department of logistics and department of product development.

“(…) I consider myself as an entrepreneur not as a merchant (...) I am an anxious person and I like to invest in cutting edge machinery. My factory is one of the few in Leon that uses an automated stitch. Now, I am putting all my faith in the injection machine” (Interview with the owner of TENISMEX, 21st of August, 2000).

Next we will narrate the story of the new plant.

In August of 1999, the Director of Operations presented to the TENISMEX’s owner a proposal about the new plant operation. The purpose of his proposal was to professionalize the process through the use of engineering. The new plant handles high technology (direct injection to the polyurethane cut of two densities). A strong investment was made in an injection machine with 12 heads (approximately US$
800,000), cutting machines and stitching machines. This was done in order to make the new plant independent from the old plant and for two years this new plant was put into incubation.

The goal was the insertion of this new product into a new niche of market little noticed in the region. In Leon there is only one leading company in the process to inject the sole to the upper part of the shoe. There are other companies that had wanted to imitate the leader, but they imitated only the design of its product. Without making machinery investments:

“(…) I introduced the new product because I saw a great opportunity, a great business, which was before dominated by another leading company. There are other companies that have wanted to compete with the leader, but only with copying the product and they do not invest. Only we have done it; the others have wanted to compete with shoes using pre-fabricated soles. (Interview with the owner of TENISMEX, 21st of August, 2000).

The philosophy of this new plant was to have participative and creative personnel who would be able to identify, analyze and solve problems. This philosophy sought human development and team work. In order to reach this goal, workers were trained. However, these ideas could not be consolidated. We will mention two reasons: first, the turnaround time of the investment was being extended more than predicted so the production was begun suddenly, and second, and perhaps more important, was the relocation of the manager of operations to the production old plant of sport footwear.

**The Production Process and the Technology**

The installation of the line of production was aerial, the purpose was to be able to work in work cells; hand by hand, or with conveyor belt, depending on the specifications of the product that was going to be manufactured.

Due to the great variety of styles, the production process was organized in work cells, except in the department of adornment, which is an area that work like conveyor belt because the functions always are the same ones and are independent of the style that is manufactured. The advantage of the work cells is that they allow flexibility, they promote the worker’s multifunctionality, manufacturing errors are not generated and the production is not affected by the absenteeism of the workers, because if somebody is absent, the equipment is responsible for producing the fixed quota. The problem arises
when the people that run this equipment cannot work the equipment because of personal frictions. For the work cells to function well a natural leader must arise who is able to influence the performance of the other members of the equipment.

The production process follows the following phases: a) cutting, where the important thing is the bordering and that each one of the pieces is cut in the correct way, b) stitching, assembling the upper parts of the shoes, c) DESMA, where the soles are injected to the upper, d) adornment and packing.

The problematic area was the injection department, where the problems that appeared were polyurethane leaks which caused the shoes to be stained. In addition they had problems with shoes coming apart.

The firm uses the process of STROBEL construction, which does not need assembly machines and requires having strong design and modeling development. This system requires fewer personnel (approximately 50% if we compared this with a traditional assembly factory).

The advantages of making the product with direct injection are mainly found in the quality of the product. The shoes are stronger and do not become unstuck. In this process the soles hold up to 95 kilograms while shoes made by the old process with a single adhesive come unstuck with 35 kilograms. In addition there is the advantage that the workers do not have to inhale in adhesive fumes and this increased the quality of life of the workers. Also the sole injection process saves on inventory, because the soles are manufactured at the moment of being injected to the uppers and in addition, ends the problems of depending on the supplier’s deliveries.

The installed production capacity of the plant was five hundred pairs per shift and could be carried out in three shifts. In May of 2000, they began to produce fifty pairs per shift daily. In June of that year, the production increased to three hundred fifty pairs with two daily shifts. In July of 2000, they had problems with the control of the process.
**The Workers Training and the Use of the Machinery**

At the beginning, they were planning to hire only women for stitching. In fact they sent them to a training course in the Center of Research and Educational and Cultural Promotion (CIPEC) direct by Father Jacobo\(^\text{12}\). The course should have lasted three months; nevertheless one month later, given the urgency to begin the production, they had to begin to work and obtained a very low productivity. The company decided to hire men with experience. We must indicate that the stitching office is traditionally a man’s office. By January of 2002, only five of the women continued working in the plant and handled only flat machines.

In the new plant, the key process is the injection of the sole, made by the DESMA machine. The workers who use it received technical qualifications from the suppliers. This machine is very technical and the problem that has arisen is the workers lack of discipline. They also learned in companies that were beginning to work with the upper – injected, of which altogether, they were five in the city of Leon. With these companies they exchanged ideas, knowledge and in some occasions material and even loaned spare parts. The workers have established links of friendship with workers from the other companies such as COMANDO, FLEXI, and EMYCO.

When we made the study, only the production manager had been going to the companies to analyze the production process. Nevertheless, it had been planned that the workers from each of the different factories would exchange experiences. Although the workers received qualification from the supplier of the machinery, the best qualification for the use of this particular machine was offered by a mechanic from another factory that had already worked with this type of process and who gave a course to the workers in which practical cases were presented which had been experienced in his company and that the TENISMEX workers took to be feedback.

For the use of polyurethane, two courses were given, in which the workers were taught how to control the temperature, mixtures, viscosities and how to make adjustments. The courses were given by the supplier of the polyurethane, DAO, to workers, heads and maintenance personnel.

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\(^{12}\) Father Jacobo is a well recognized personality in Leon. He is considered one of the most important actor n the Footwear sector, because in his institute he trains people in stitching and cutting labor.
Introduction of New Products

In the development of the product, the departments of Development, Engineering and Production take part. The department of Development does not design only develops. In this department they handle the system by computer, called San Crispin in two dimensions. They have tables to make patterns, an engineer of development, two modelists, a designer, a person who makes the scales, in addition a factory of samples with two cutters and four stitchers.

During the year 2000, the director of operations of the new plant worked jointly with the person who used San Crispin to teach everything referring to the development of injection (the knowledge conversion from tacit to tacit; socialization; Nonaka, 1999).

“(…) I brought from IUSA the modelist and the person who controls the CRISPIN (…) right now I am working with the person who controls the CRISPIN. My purpose is to pass to him all the knowledge about the development of injection, because this development is not like any other, it is just a little bit more complicated. Yes, it implies taking care of more technical details so that we do not have any operating problems” (Interview with the Director of Operations, July, 26th, 2000).

Once Development conceives of a product, the Department of engineering revises the specifications of the materials (the leather, the calibers of the threads, etc.) and carries out the technical testing, the scales and makes recommendations on the type of process (in line, handling of cells, hand by hand, etc.) and layout; also it takes the times of each one of the operations. Later, the Development Department orders the dies.

When the dies arrive, the Production Department carries out another test called the “Scale or pattern test”. It is the responsibility of each one of the supervisors to write down the possible problems that can arise with the dies. They check the caliber of the leather, the specifications of the stitches by inch, the tone of the sole, and they try to identify the bottlenecks. The purpose is to make the required adjustments and avoid unexpected problems during the production.

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13 IUSA is a factory located in Apastaje (in the Mexico State). This plant belongs to the GRUPO IUSA, one of the most important corporative in Mexico. This factory had plans to produce 40,000 cut – injected shoes daily. In order to do that GRUPO IUSA made a huge investment in cutting edge machinery, facilities, trained people. The project was unsuccessful because they do not could establish clients.
As we can see, the process of product introduction is dominated by the company. Nevertheless, and also unfortunately, one of the points against the company’s performance was that they did not do a market study and they were already positioned in the mind of the clients as sport footwear producers. At the beginning, they began with an integral plan of marketing research in which the points of sale were in the formal market. In order to face the lack of demand, they wanted to introduce the product in the informal market, but this strategy did not work.

The demand problem worsened with the problems of the bad quality in the injection of the sole that they had in the first order for COPPEL.

Creation of a Quality System

At the beginning, the company had a department of quality control that had as its goals to create and to implement a system of control and securing of quality. The department had eight people; one who was in charge and who was studying a Masters Degree in Environmental Control, a supervisor and six inspectors assigned to each one of the production areas. In each zone of inspection, a format of inspection was designed based on the specifications of each style and weekly the defects were determined that appeared repetitive, and remedial actions were delineated.
In August of 2000, they had 8% of defective articles, which is a high indicator. The goal at that moment was to have, at the most, 3%. 8% was derived from the lack of experience in the injection process. In order to correct this, it was planned to give a course of introduction to the quality, in which the concept of client-supplier chains would be emphasized. The purpose was to form the workers into inspectors of their own work.

Due to the decrease in the demand and consequently the reduction of the production, the Quality Department was disintegrated. In December of 2001, the quality control was already handled by the old plant and two supervisors in the new plant. This did not allow for the consolidation of a quality culture.

**Relations with the Suppliers**

Their two main suppliers were: DESMEX, the company in which they acquired the injection machine and DAO, the polyurethane supplier. The relation which they established with them became permanent and of a high frequency. They have had difficulties with the company DESMEX. According to TENISMEX, when technical problems arose and since a part of the information comes from Germany and the company suppliers are not able to solve the technical problems. For example, they had problems with the used robot in the injection machine and they hoped that a German technician would solve the problem because none of the Mexican technicians have the necessary qualifications to solve it.

With the company’s polyurethane supplier, a problem arose that was related to the use of the unmolded. This was not applied correctly and therefore the soles became completely unstuck. The question was that the supplier did not say to them that before applying it was necessary to shake it, and the supplier had nothing about this written in the contract and so was absolved of any recriminations.

They have had problems with the leather suppliers, because there is not a quality culture and the supplier did not respect the established standards of quality. When TENISMEX has quality problems, they talk to the suppliers and this problem is explained to them and if the suppliers do not take these problems into account then TENISMEX will look for a new supplier.
D. Fourth Innovation Landmark: Subcontract with FLEXI

The year 2002 was crucial for the future of the new plant. In the months of April and May, the plant was almost closed because the volumes of production were very low. The costs of using the injection machine continued to be very high and the feasibility of continuing to operate was put into question. The plans that the company had made when it began with the installation and beginning of the plant were not allowed to be carried off. The idea that the two plants would subsist independently could not be carried out and the administrative processes of the new plant were absorbed by the old plant.

In July of 2002, the company carried out a subcontract with the company FLEXI, leader in the national market of injected shoes. This subcontract caused TENISMEX to use 80 % of their installed production capacity to take care of the FLEXI orders.

FLEXI gives all the specifications of the products and the materials TENISMEX. So that the products elaborated by TENISMEX fulfill the requirements of quality imposed by FLEXI and these are checked by a FLEXI inspector who works full – time in the TENISMEX facilities.

Under this contract, TENISMEX only has to be responsible for hiring and the costs of the manual labor.

Finally in the table # 2 we show the evolution of the product’s development during the learning trajectory of TENISMEX.

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<th>TABLE # 2: EVOLUTION OF THE PRODUCT’S DEVELOPMENT</th>
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<td><strong>Stages / Characteristics</strong></td>
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Learning Based on Production process Design Design Design Logistics

Channels of Distribution
Informal markets located in the mayor cities. Informal markets located in the mayor cities. Informal markets located in the mayor cities. They sell their sports shoes in the informal markets. They sell their casual shoes in the formal channels (shoes stores)

Innovation Capabilities Weak Medium Strong Medium

Source: elaborated with the firm’s given information
Note: 1 fictitious trademarks

IV. Conclusions

All the presented information helped us to put in order some streamlined facts that we considered important in the definition of the behavior of the companies in the footwear sector.

In the footwear sector, innovation is reduced to the introduction of new designs or the improvement of the already existing ones. Because we are in the presence of highly socialized knowledge which is highly tacit in the owner, the time factor becomes of utmost important in the support of the competitiveness of the companies. By time factor we are referring to the speed of the companies in introducing new products to the market (“Be the first in arriving at the market”).

In spite of the imitation that appears in the footwear sector, we can say that there is innovation since: “Any imitation” - writes social anthropologist H.G. Barnett, “must suppose some discrepancy. No matter how eager the person is that copies an original one faithfully, the copy always differs from the original model. This is true even though the person and the creator of the original one is the same person; the mental attitude, the materials, the instruments and the conditions of work differ slightly, which makes an exact reproduction impossible. When there are more people added in the copying process, the number of deviations from the original one is still greater”. (Basalla, 1991:129)

REFERENCES


