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## Knowledge Management, Market Orientation and Innovation: a study at a Technology Park of Santa Catarina

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### ABSTRACT

The study analyzes how the Gama Park articulates Knowledge Management, Market Orientation and Innovation in the development processes of incubated companies. The methodology used was qualitative, exploratory, through a case study. The main findings were that the Park is directed to innovation, and its greatest difficulty is the lack of resources at national level and of public policies, as supporters of this innovation. It was stressed that knowledge management, when aligned with the goals of the organization, enhances market orientation, resulting in innovation, supporting the research of Ferraresi et al. (2012 and Ozkaya et al. (2015).

**Keywords:** Knowledge management. Market orientation. Innovation. Technology park.

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## 1 INTRODUCTION

The market has presented itself as a challenge in that technology and knowledge are evolving and disseminating at great speed, forcing organizations to constant improvements, culminating in the corporate stance of market orientation with customer-focused learning (DAY, 1991, 1994; JAWORSKI; KOHLI, 1990, 1993; NARVER; SLATER, 1990; SINKULA; BAKER; NOORDEWIER, 1997; SLATER; NARVER, 1994, 1995). Firstly, business stance is focused on meeting the needs of the market, and only then, it is directed to internal processes, as in knowledge management (PALADINO, 2008), which has been the object of study of several authors such as Drucker (1994), Toffler (1994) and Nonaka and Takeuchi (1997).

In this sense, organizations need to satisfactorily conduct their intellectual assets (PROBST; RAUB; ROMHARDT, 2002), in order to use them as a tool that enhances other resources of the organization if aligned with organizational objectives (FERRARESI; QUANDT; SANTOS; FREGA, 2012) converting them into increased productivity and innovation and in a wider competitive advantage (BAETA; MARTINS; BAETA, 2002).

In this context, innovation as an expression of knowledge gains intensity as it is able to promote structural breaks in the production system and in the traditional ways of doing things, and in many cases, innovation involves the creation of new work organization, or new management practice (NELSON; MALERBA, 2008). In this respect, innovation cannot be concealed by a single individual or organization, it is bound to an entrepreneurial environment (incubators, technology parks, innovation systems) in which learning and innovation occur from a network of organizational interrelationships and amongst them (CUNHA *et. al.*, 2009).

An example of a relationship network is a technology park in which this innovative environment is sustained through the establishment of an institutional apparatus that enables the free-flowing and consolidates knowledge relationships, market orientation and innovation, promoting local entrepreneurship and generating competitiveness for organizations (RAUPP; BEUREN, 2006). According to Anprotec (ANPROTEC, 2014), technology parks are a model of concentration, organization, articulation and promotion of innovative enterprises, aiming at strengthening this segment within a perspective of globalization and sustainable development.

Studies separately addressing the subjects of Knowledge Management, Market Orientation or Innovation are abundant in literature; however, researches dealing with these three constructs simultaneously are scarce, as indicated by Ferraresi *et al.* (2012), who

reviewed these topics along with organizational results in companies in the industrial and services sector. Among the results, the authors highlighted that knowledge management is in fact primary resource for organizations, because the impact of its effective management enhances activities related to the companies' value creation, providing support for a culture of market orientation and innovation. In this regard, Ozkaya, Droge, Hult, Calantone and Ozkaya (2015) claim that knowledge can mediate positive relations between market orientation and innovation which, in turn, will reflect positively on business performance. Such findings reinforce and justify the purpose of the present research, since they demonstrate the constructs' relevance and their relationship in face of business management.

Thus, in this article our objective is to analyze how the Gama Technology Park deals with Knowledge Management, Market Orientation, and Innovation as a means of incentive and development of local entrepreneurs (incubated companies). To achieve these goals, the methodology we used was qualitative and exploratory. Performed through a case study, in which data were collected from primary sources, with semi-structured interviews, and secondary sources, through documents and information on websites.

Thus, the empirical relevance of this study is based on the fact that the results will assist with strategies of integration, strengthening, and development of Technology Parks. As a theoretical contribution, we intended to help through the dissemination and the reflection of the presented concepts and theme, and fill existing research gaps on Knowledge Management, Market Orientation and Innovation towards technology parks, collectively treated in the view of the manager.

The present study is organized as follows: first, we present the theoretical framework regarding the studied topics, followed by the methodology. Then, we explain the collected data with their respective analyses. Finally, we debate over some final remarks followed by the references used.

## **2 THEORETICAL FRAMEWORK**

### **2.1 KNOWLEDGE MANAGEMENT**

To survive fierce competition markets, organizations need to learn how to conduct their intellectual assets satisfactorily (PROBST, 2002) so they can be used as a competitive factor for the organization (HSU; SABHERWAL, 2012; PROBST, 2002). Thus, knowledge management has been increasingly valued nowadays (ZEIDE; LIEBOWITZ, 2012), being a resource that is built up with use, regarded as the "hidden treasure" housed in the intellect of employees (PROBST, 2002).

Nonaka and Takeuchi (1997) define knowledge creation as the ability of an organization to create and expand new knowledge and to group it to products, services and systems in the organization as a whole, providing their continuous improvement.

Administration theorists claim that, it is much more advantageous for organizations to invest in intellectual capital than spending the same amount in material resources (PROBST *et al.*, 2002), and knowledge can be considered as a resource to be used (DRUCKER, 1994), being a source of power of the highest category and cornerstone for future changes of power (TOFFLER, 1994). The challenge is in the companies reorganizing themselves and managing these resources, in order to convert it into productivity gains, innovation and in greater competitive advantage (BAETA *et al.*, 2002). According to Ferraresi *et al.* (2012), knowledge has been considered as a tool designed to enhance other resources of the organization, requiring to be aligned to organizational objectives, so that it may generate effective results.

Hence, Probst *et al.* (2002) state that there are processes considered as essential in knowledge management. They are: knowledge identification, acquisition, development, sharing, usage and retention. The identification of knowledge means to assess and describe the knowledge environment of the organization, internally and externally, with sufficient information to assist employees to find what they need. The acquisition of knowledge occurs when organizations convey knowledge from external sources such as relationship with customers, suppliers, competing companies and partners in cooperative ventures. Knowledge development is an element that completes the acquisition of knowledge, and its direction is in the increment of new skills, new products, improved ideas and more efficient processes aimed at producing skills that have not been present in the organization yet, therefore non-existent inside and outside. The sharing and distribution of knowledge are ways to transform individual knowledge into certain information, which the organization as a whole can benefit from. In addition, when that knowledge is applied in a beneficial way by the organization, the use of knowledge occurs. Knowledge retention will depend on the efficient use of storage by the organization.

According to Nonaka and Takeuchi (1997), the explanation on the creation of new knowledge in organizations occurs when tacit knowledge is converted into explicit, as defined by Polanyi (1967), according to whom tacit knowledge is particular, characteristic to the context, and explicit knowledge covers the one which is possible to turn into formal language, being thus transmitted systematically, in the form of formulas and manuals. They interact with each other in a spiral of knowledge creation, which begins at individual condition and

ascends, expanding interaction communities who cross boundaries between sections, departments, divisions, and organizations. It can be said that when organizations innovate, the information required is not limited from the outside in, but also from the inside out, in order to redefine both the problems and the solutions and, in the process, reinvent their environment.

## 2.2 MARKET ORIENTATION

Market orientation is associated with the subject of knowledge management, since it also discusses learning and the dissemination of knowledge. It began to be studied in marketing, with McKitterick (1957), who highlighted an organizational philosophy focused on understanding and meeting the needs of consumers, however its concept became popular with the study entitled “Marketing Myopia” by Theodore Levitt, in 1960 (URBAN; ROCHA, 2006).

In 1990, Kohli and Jaworski proposed that market orientation was understood as the creation, dissemination of intelligence in the organization and the correspondence of that intelligence by the organization as a whole. The focus of this intelligence is the analysis of factors that change behaviors and trends, which in turn may affect the desires and the needs of consumers, in order to anticipate their needs. Kohli, Jaworski and Kumar (1993) believe market orientation is the basis for the development of high-quality marketing practice.

Thus, Day (2001) claimed that a market-oriented company is the one that seeks strategies to provide higher value to its customers, aligning strategies with constant market requirements supported by a culture toward the understanding and to the effort of all of the company’s internal functions, thus enabling the creation of superior value. Similarly, Narver and Slater (1990), state that market orientation develops behaviors necessary for the creation of superior value for customers, which also influences the consistently superior business performance. In this context, the strategy can be seen as the art of creating value (NORMANN; RAMIREZ, 2005).

In a recent study by Yaprak, Tasoluk and Kocas (2015), it was observed that the perception of managers in emerging markets (in the case of Brazil) on market orientation suffers influence from corporate and national cultures and from the institutional context. The survey found that organizational culture contexts that inspire adaptability, cohesion, participation and family sense make it easier to create a higher level of perception of market orientation for managers in emerging markets.

### 2.3 INNOVATION

Innovative society stands as a form of knowledge and market opportunities, being an important way of reinforcement between organizations. However it was Schumpeter (1912) who acknowledged that innovation is a process which is conditioned by innovative results obtained on the market, and the process of innovation occurs in conditions of dynamic and imperfect competition.

In this respect, innovation can be considered the rupture of traditional ways of doing things, and refers to products or processes. In many cases, innovation involves the creation of a new means of work organization or management practice (NELSON; MALERBA, 2008). It is worth highlighting the importance of companies acting as agents in the process of innovation, clustered together, as in the case of Technology Parks, in which they induce information exchange and strengthening each other. In this regard, one can verify that the innovative waves can reach and achieve various systems which they are inserted in (PEREZ, 2004), generating reflections across the existing chain, in which the innovative systems are relevant.

National Systems of Innovation (NSI) are organizations embedded within a macro structure and supported by a range of non-market organizations, universities for example, which often are funded by the Government to conduct research and training on issues relevant to the industry (NELSON, 2006, ANSANELLI, 2011).

Innovation can also either be supported or not by Regional Innovation Systems when a region in particular stands out as an innovative source. In this sense, the advancement in certain regions is highlighted, through an existing innovative potential, which can influence and develop an entire regional chain, for example the Silicon Valley in the United States (CASTELLS, 2003).

Similarly, Sectoral Systems of Innovation are strong influencers of economic growth, and have been particularly observed in Europe, in many cases, having greater influence than the NSI. This aspect can be noted by the information technology (IT) and biotechnology industries, as well as in various other industrial sectors (DODGSON, KASTELLE, POTTS, 2009; MAÇANEIRO, CHEROBIM, 2011).

In countries where the innovation system is structured, partnerships to generate innovation and technology are constant, autonomous, historical and efficient, and determine the success and progress of the country. In this regard, innovative public policies generate

reflections in companies and can change their internal and external development structures through the different diffusion of innovations between companies and regions.

In an economic system in which innovation is paramount, multiplication occurs through the establishment of bridges, turning knowledge into innovation and boosting performance before the market. Thus, technology parks are primary sources that encourage knowledge, market orientation and innovation through their practices.

## 2.4 TECHNOLOGY PARKS AND LOCAL ENTREPRENEURS

In the business environment, entrepreneurship is considered an essential means to the competitiveness of organizations. Micro and small enterprises are not always prepared for these effects of increased competitiveness, since they have a simpler business structure, if compared to medium and large sized companies. And they are, most often, administered by individuals with little experience or training to carry out this duty. However, they represent an important segment within the market, and as an attempt to mitigate this instability, one of the mechanisms used is to settled in technology parks that present company incubating characteristics, where administrative, financial and structure support offers incubated companies assistance to better organize and prepare to compete in the market (RAUPP; BEUREN, 2006).

According to Schumpeter (1959), the function of the entrepreneur is to improve or revolutionize completely the current form of production, either through the exploitation of an invention, or by an alternative technology to produce something new that has not been tested yet, or even something that already exists but in a new way. The discovery of new sources of supply or new forms of product distribution can also be characterized as entrepreneurial functions. This perspective reflects an enterprise practice generated by innovation, entrepreneurial spirit and entrepreneurship, where innovation becomes a key element to identify owners who identify themselves as entrepreneurs (RAUPP; BEUREN, 2006).

In addition to supporting incubated companies, there is a need to potentiate inherent entrepreneurial characteristics of small companies inserted therein, with the creator figure who constantly seeks the continuity of the business. To operate a company successfully, some different skills are required at each stage of its life cycle, especially business-related technical expertise and knowledge of business administration (RAUPP; BEUREN, 2006).

Sábato and Botana (1968), inserted in Latin America, the seminal concepts of integration of knowledge and technology for the development of countries, through the



articulation of three pillars: government, universities and companies, which form “Sábato’s triangle”. It is composed by the relationships in each vertex (inner relationships), relationships that occur among the three vertices of the triangle (interrelationship) and the relationships between the vertices and the external environment (outer relationships), considering innovation as a resulting product of these relationships.

In this sense, the conjecture of the “triple helix” by Etzkowitz and Leydesdorff (2000) identifies these relationships between university, business and government in an evolutionary process.

In relation to the benefits observed by Segatto-Mendes and Sbraggia (2002) on this interaction process, the possibility of raising additional financial, physical and human resources is highlighted, aimed at incrementing research offering universities education linked to high technology, thereby contributing to the country’s economic development. For companies, interaction provides technology development with lesser risk and financial resources, in addition to access to research laboratories, making use of skilled labor. In relation to the Government, the University-Enterprise interaction provides a lesser degree of investment in infrastructure and capacity to promote and achieve better results in the development of programs involving several areas, economic, social and technological, thereby contributing to its expansion in society.

According to Anprotec (ANPROTEC, 2014), technology parks are models of concentration, connection, organization, establishment and promotion of innovative business ventures in order to strengthen this segment within a perspective of globalization and sustainable development. Within this perspective, scientific progress is analyzed because of long-term efforts of multiple actors, each pursuing specific objectives, but integrated with each other. Thus, the importance of companies as agents in the process of innovation, gathered in a single space as in the case of Technology Parks, which are intended to produce information exchange and strengthen the companies involved in these exchanges.

Examples are the Silicon Valley in the United States, and Sophia-Antipolis, in France, and Cambridge, in England, as quoted by Castells (2003). These are Technology Parks that through their interconnection and technological partnerships especially in technological areas, have astonishingly developed themselves and broken paradigms, leading these regions in which they are inserted in to face outstanding development, considerably modifying the existing production processes and creating new relational structures.

These structures are often broad and even break national barriers, further fomenting the process of globalization, which for Barquero (1999), leads competitiveness to another dimension, boosting production process adjustments, innovation diffusion, strengthening of relationships with other cities forming industrial spaces. These structures also alter inserted urban centers with a form of extensive development, based on economic and social relations.

As such, the external environment can influence companies through internal human capital externally shaped or by market preparation, or by the level of knowledge from scientific and technological knowledge in non-profitable business organizations, as in universities or research institutes (MALERBA, 2002). This integration between companies, governments, universities and research laboratories has great importance to the innovative chain, generating links to all who aim to produce innovations that meet demands of the market and so develop economic relations as a whole.

### **3 METHODOLOGY**

The present study aims at a theoretical reflection on the theories based on knowledge management, market orientation, Schumpeterian and neo-Schumpeterian theory of innovation and entrepreneurship, making an empirical counterpoint through an analysis of the Gama Technology Park manager's view on these topics, as a means of incentive and development of local entrepreneurs (incubated companies).

The research follows the methodological characteristics by Raupp and Beuren (2003) and it is qualitative and exploratory. For data collection, we used the case study method, which is characterized as a way of looking at society's reality, and thus organize data so as to keep its characteristics as a social unit (GOODE; HATT, 1968). We use a descriptive case study, which for Yin (2005), refers to an investigation of a contemporary phenomenon in its context especially when there is no real sense of limits between the phenomenon and the context, using a pre-specified set of procedures. For data collection, we used secondary sources from sites and documentary research, and a primary source, through semi-structured interviews held with the director of the Gama Park. The name of the Park and the respondent were disguised in order to preserve their identities, as requested by the Park's manager. The interview was conducted by a non-limited script, leaving space for new questions that were added, during the course of the dialogue.

After completing the interview, we observed the reference model on the procedures of organization and analysis of the set of interviews, by Godoi, Bandeira-de-Mello and Silva (2006), structured into five phases. Phase one, termed as recovery, consisted in the process

transcribing the recorded material along with preliminary notes. In phase two, we read the material, observing the questions and the responses and analyzing the pragmatic character of the conversation. Phase three consisted in the validation of the material by the actual respondent, after having read the notes and transcripts of the researcher. Phase four was characterized by assembling sentences in order to form sets, associating the respondent's reports, opinions and attitudes. Finally, phase five stood out as the moment of greatest importance to the result of the analysis, which is characterized by the highlighted marking on the meaning of sentences.

## **4 DATA PRESENTATION**

### **4.1 GAMA TECHNOLOGY PARK**

The Gama Technology Park was established in 2007, with its land purchase, in 2008/2009, along with strategic studies and preparing the project for its implementation. It maintains relationship bonds with four regional universities: UFSC, Univille, Udesc and PUC, which together have a total of fifteen thousand students, a fact that stands out as a differential to its academic competence with different lines of research. Therefore, these educational institutions are part of the Park's co-management, running it together with specific boards that contribute with more political, economic and academic strength.

Inaugurated in 2010, it immediately began its activities. At first, six companies were selected and incubated, and today the Park has 11 incubated companies, although it projects 84 installed companies for the future. The areas of expertise of the incubated companies are framed in the high-tech industry, being: Biotechnology, Design, Materials, Environment, Metal-mechanical, Chemical and Pharmaceutical.

The Gama Technology Park, in addition to the concept of economic development, brings strong social and environmental concepts, essential characteristics for the approval of projects. The objective of the Park is to create a rapprochement environment between universities, companies and governments to respond to challenges faced by the region, in order to promote sustainable regional development. The actors that participate in technology parks can be classified into three groups with convergent motivations: universities and research institutes, government and businesses. The following constituent elements can be identified in the Technology Park: basic infrastructure, business buildings, technological infrastructure and green social areas. One can also consider the infrastructure of partner education institutions close to the Park.

### **4.2 INTERVIEW ANALYSIS**

The interview was conducted with the founder and current administrative and financial manager of the Gama Park. To facilitate understanding, the interview was structured in order to cover the three topics addressed and their corresponding spoken sentences, as shown below.

#### **4.2.1 Knowledge management**

Nonaka and Takeuchi (1997) define that knowledge management is characterized by the way an organization models new knowledge, adding products, services and systems that cover the organization as a whole, in its continuous improvement. In the Gama Park, this practice is evident in the business incubator, considered as an extra element in the Park which features among its duties the development of businesses installed there (incubated), giving them support and advice through specialized research in partnership with universities and companies financed by the government.

This articulation of the three pillars (government, universities and companies), is characterized by Sábato and Botana (1968) as “Sábato’s triangle”, and also by Etzkowitz and Leydesdorff (2000), as the “triple helix” model, considering innovation as a resulting product of these relationships, supported by the statement of its founder: “It is this clear vision of having three helixes, industries, government and university, working together, working for innovation to happen. The Park is the axis of this triple helix” (Manager).

Within knowledge management, according to Probst *et al.* (2002), there are processes considered as essential, such as the identification, acquisition, development, sharing, use and retention of knowledge, so that these processes are identified in the Park.

Thus, the identification of knowledge (evaluation and description of the knowledge environment) and its acquisition (when knowledge comes from external sources) were confirmed in the words of its founder and current manager when referring to university support, through its laboratories and labor provided by researchers, who are regarded and identified as follows:

Parks’ success is due to the fact that we are close to the universities and to the interaction between universities and the technology park. [...] For us, this is very interesting. It is about another view for the researcher, ‘I finished my research, it is in the drawer’, it isn’t like this in here. Everybody wins, the university and us”.  
(Manager)

For the development of knowledge, its direction is in the increment of new competences, new products, improved ideas and more efficient processes to produce skills that have not been present in the organization yet (PROBST *et al.*, 2002). This practice has

been identified in the Park, once the focus of research is on its application in enterprises, according to the words: “The idea is that with the development of the Park [...] more services and industries will develop [...] here we do research [...] we conduct basic and applied research, industry has no interest in just the basic.” (Manager).

The sharing of knowledge is a way of transforming individual knowledge into information that the organization as a whole can use (PROBST *et al.*, 2002), in the Park, this dissemination is carried out both by means of research laboratories, and the consulting services provided. “[...] one of the functions of the park is to provide such support, produce this knowledge, leave this knowledge, the intellectual property is very important”. (Manager).

And when this knowledge is applied by the organization, the use of the knowledge occurs (PROBST *et al.*, 2002). In the park, the incubator is not limited only to the initial support to the incubated, but the use of knowledge remains in the monitoring of their development. The process lasts on average four years of direct support, which can vary depending on the profile and the research involved in each incubated, as stated by the manager: “[...] Sometimes a research can take longer, and you have to respect that, the incubator has this function, the monitoring process, the report, the annual review, to check on the company” (Manager).

Knowledge retention depends on the efficient use of the organization's means of storage (PROBST *et al.*, 2002). Thus, guidance and clarification for researchers occur in the Park concerning the importance of patents that protect the intellectual legacy, as the concern demonstrated in the words:

[...] to show who is working with intellectual property, inventions, that you have to have a certain standard, being careful, because there's a lot of “hoopla”, they start talking too much, they write a scientific article, [...] and then they say they want to protect it and the person has talked to everyone about it, it's no use then, if you want to protect the intellectual property, you have to be careful. (Manager)

Therefore, we can observe that the Park proceeds according to Probst *et al.* (2002) with regard to knowledge management processes, therefore, if the park satisfactorily conducts its intellectual assets, these can be a competitive factor (PROBST *et al.*, 2002; HSU; SABHERWAL, 2012), contributing to increased efficiency (HSU; SABHERWAL, 2012), effectiveness (ZEIDE; LIEBOWITZ, 2012) and promoting innovation (HSU; SABHERWAL, 2012; ZEIDE; LIEBOWITZ, 2012) for businesses inserted there. However the challenge is in how to organize it in order to manage this resource, converting into a potentiation that

generates greater productivity, innovation and greater competitive advantages (BAETA *et al.*, 2002).

#### **4.2.2 Market orientation**

As evidenced by Day (2001), a market oriented company is one that seeks strategies to provide higher value to its customers, lining them up with the constant demands of the market. Regarding this, we identified in the interview that, since its inception, the Park has already followed the assumptions of market orientation, considering the competences and characteristics of the region where it is located as research focus.

Initially, there was a conversation with universities to define the fields of research based on the competencies of the region [...] and the environment, but there was the induction of new fields with the aid of partner universities, when the seven operation areas were defined. (Manager).

Thus, as incubated companies establish which areas to target their research and development, the Gama Park aids them in providing higher value to their customers. This occurs when companies meet the requirements of the market, whose characteristics and needs are constantly changing (NARVER; SLATER, 1990; DAY, 2001). Thus, through research conducted in the Park, for example, the incubated are able to anticipate those requirements, and create a superior value to their customers, as pointed by Narver and Slater (1990).

Another factor that contributes to the creation of superior value that the Park provides for incubated companies, and which also grants differentiation before other technology parks, is its partnership with four universities.

Our big advantage is related to this partnership with the four universities. This difference gives us such a large base of researchers, with a municipal, state and federal scale. With these four organizations, you can have a greater range of possibilities, which is not common for other parks. (Manager)

The link of the Gama Park with social issues was also investigated, as such engagement consists of a requirement increasingly present in the market. “We have a project to accomplish social incubators, along with the City Hall. [...]We’ve got some specific social projects, aimed at society’s problems, projects in school.” (Manager).

Another demand of the market that has been met and encouraged by the Gama technology Park refers to the Internationalization of companies. According to the Park manager, the program is directed not only at incubated companies, but also at companies present in the city, and helps, for example, in export processes.

The program of internationalization of enterprises is a university outreach program, but which is installed here and serves both our companies as well as other companies in our city. One of the functions of the Park is to provide such support, to

pass on this knowledge [...].It was the group that went through the first export process here in town. And one of the only ones in Brazil that worked. It was one of four cities in Brazil that were used as beta testing and the one with the most success (Manager).

Recovering findings by Yanprak *et al.* (2015), we can suggest that the Gama Park management seeks to be market oriented, since it is influenced by an organizational culture based on adaptability to the requirements and local needs. It also prioritizes the participation and engagement of all who are involved, including society, a fact that also demonstrates the existing cohesion in their activities, and the sense of family, especially when addressing the common good with social projects and community outreach.

#### 4.2.3 Innovation

For Schumpeter (1912) and Nelson and Malerba (2008), innovation can be considered as the breaking of the traditional way of doing things, and can be linked to both the products and the processes. In this respect, the Gama Park highlights innovation entirely linked to research, to market requirements, to the search for product innovation and its increased demand: “[...]Here we do research, there’s no room to put a foundry industry here, but nothing prevents the institutions from doing research here, as company W, who has one of their international laboratories here [...].” (Manager)

Normally, innovations are processes and products, more to do with products, the industry is seeking new materials, equipment. There is demand for processes, but they (incubated) do that more internally and turn it into new practices between the units [...] Innovation is everything, but the demand for product innovation is greater. (Manager)

Innovation generated by the Gama Park described in the citations above promotes activities related to not only the Park, but the whole context in which it is inserted. That would be what Perez (2004) names as Innovative Waves, that is, where innovation happens it generates reflections in the entire existing chain/system. That was made evident in the words of the Gama Park’s manager when he stated:

Creating economic development for the region is one of the main goals of the Park, [...] through the companies that generate resources, taxes, through innovation, that is, it's an entire chain. Through research, it was identified that the city had lost some of its innovative power, it was always at the forefront regarding technological issues, and that is over. The innovation issue came to bring back this characteristic to the region; companies are coming here seeking for innovation to obtain the ability to innovate, to bring growth and development for society. (Manager)

Thus, by observing the Innovative Systems, both the National as described by Nelson (2006), the Sectoral appointed by Castells (2003) and the Regional addressed by Dodgson, Kastelle and Potts (2009), we noted that they could be strong supporter of innovative process. In this context, we verified that in the Gama Park, the National Innovative System still has few resources to the big amount of

existing demand. In the Sectoral Innovative System, it was observed a great interest from private initiative. And the Regional Innovative System was described as supportive and as being very interested in investing. According to the manager:

The government says it gives supports, the federal one, this year, seems too complicated, the only project opening was from the CNPQ (National Council for Scientific and Technological Development), six million for the entire country is nothing, right? Last year we saw a larger sum of 50 million for the whole country, but it still isn't much considering the size of demand from our parks, it was a project for parks working for longer than four years, very directed. Today, this building here was funded by the government of the state of Santa Catarina, and we're looking for other initiatives, the state government is very interested to continue investing here, so these are the investment models that they have to create so not to have problems; the government is interested and the private sector too, because the idea here is not of a real estate venture right, there are parks that think like this, 'I'm going to allot, I'll sell the spaces ...' we can't do that in here. However, the private sector can somehow take advantage of this, they want the company to settle, and there's the research, researchers, doctors and the private initiative obtaining the return desired [...] (Manager)

It is clear that to be effective, Innovative systems need primarily supporting public policies that are interested in the development of technology parks. Hence, when the manager was asked about state, municipal and federal supporting public policies towards the Gama Park, he stated:

Within the State, we have a policy toward innovation. The municipal government is also creating an innovation law with support for the parks. In addition, the federal government has a specific decree regarding Science and Technology for Parks. This ministerial order differentiates the Park and incubator, defining what a park is, it facilitates during public calls, whether it is classified as park or not. (Manager)

By further observing the importance of public policies and to have the state as a great promoter of innovation and technology parks maintenance, the manager was emphatic in stating that the parks' success is linked to the state as a provider, since innovation is a specific and uncertain asset which promotes high risk, and often the private investor is not willing to take it:

The success of the parks is due to being close to universities and the interaction between businesses and the technology park. The time of return, to be self-sustainable is too long. If you put this before an investor, he gives up right away. Then, the function of the state as a provider begins, so that in 10 to 20 years we can walk with our own legs. The state is not an intervener but a provider. Because research and innovation require investment and a high degree of risk and that may not work. It's hard to convince an investor to take that risk. (Manager)

Thus, it is clear the importance of the triple helix for innovation to occur, but primarily we also showed that public policies are fundamental to the development of the Gama Park.



#### **4.2.4 Relationship between knowledge management, market orientation and innovation in the Gama Park**

It was possible to identify that the Gama Park covers the processes considered essential, according to Probst *et al.* (2002), with respect to knowledge management, such as knowledge identification, acquisition, development, sharing, use and retention. We also evidenced the presence and the articulation of the triple helix (ETZKOWITZ; LEYDESDORFF, 2000) or Sábato's triangle (SÁBATO; BOTANA, 1968) with the consolidation of three pillars, i.e. government, universities and industry, developing activities, acting as a propeller for innovation.

With regard to the assumptions of market orientation, according to Day (2001), Narver and Slater (1990;1993) and Kohli and Jaworski (1993) and Kohli, Jaworski and Kumar (1990), the Gama Park is market orientated. That can be implied because it seeks through particular actions to be aligned with the needs of the region where it is inserted in, directing efforts to evident competences in the locality. As for the clients' needs of its incubated companies, the Park has also worked attentively, supporting and developing research to better serve them, as well as observing current and relevant expectations to society as a whole. By acting in a market-orientated manner, the Gama Park is assisting their incubated companies to use their knowledge effectively and, with that, enabling the creation of innovative products in that market, corroborating the ideas by Oskaya *et al.* (2015).

By observing the Gama Park under the innovative prism, it appeared to be linked to specific products innovations and that the innovations generated in it produce effect through its innovative waves on all systems or chains in which it is inserted. When we verified the matter of National Systems of Innovation, they were considered faulty specifically regarding the generation and availability of resources. Regional Innovation Systems however appeared to have great interest and to be supporters of the Gama Park. Sectoral Systems of Innovation also appeared to be very participative.

By analyzing these three constructs, knowledge management, market orientation and innovation, we observed that the Park does not treat them separately, since they complement each other. Universities (that promote knowledge) seek market orientation to direct their research, thus, aligning them to the competences of the region. By these guidelines, the knowledge is focused on research within the Park and will serve as a basis for the work and the activities carried out in their incubated companies. The result will be innovation, both in

the form of processes as well as in products, that will be launched on the market and that can generate new competencies, in a steady stream.

In general, knowledge management is highlighted as a resource, which, when aligned with the goals of the organization, enhances value generation in companies, through the support for a market-orientated culture, resulting in innovation, thus corroborating with studies by Ferraresi *et al.* (2012) and Ozkaya (2015).

## **5 FINAL REMARKS**

We can point out that the fundamental aspect of the Gama Park is linked to product innovation and that its greatest difficulty is the lack of resources at a national level as a supporter of innovation. We also emphasized the importance of public policies as major providers and not only interventionists of innovation in the Technology Park investigated. Among the results, we highlight that knowledge management is a resource that when aligned with the goals of the organization, enhances companies' value creation, through the support for a market-orientated culture, resulting in innovation, thus corroborating with research by Ferraresi *et al.* (2012) and Ozkaya (2015).

As a limiting aspect of the research, it is possible to highlight the fact that it has not been possible to carry out the survey of the incubated companies in the Park, which could have generated different insights into the issues investigated. Thus, we recommend for future research to perform interviews with the incubated companies within the Gama Park, in order to be able to perform further analyses on the subjects studied. A second research suggestion would be the development of this study in a comparative form with other technology parks in the state of Santa Catarina, or even from different Brazilian states.

As theoretical contribution, we can affirm that, through the reflection of the concepts and topics presented, it was possible to assist in the understanding of the relationships between Knowledge Management, Market Orientation and Innovation in the context of technology parks, treated together, according to the manager. As empirical relevance, we expect that the results obtained can help with integration, strengthening, expanding and developing strategies of technology parks in Santa Catarina and Brazil.

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