TECHNOLOGICAL INNOVATION IN FIRMS OF ARACAJU CITY/ BRAZIL

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***Abstract*— The relationship between universities and companies is important in the innovation process are quite different and the contributions made by universities for this process, permeating their teaching, research, transfer / commercialization of knowledge. The new model of innovation: The Open Innovation, replaces the isolation of the shares by the sharing of knowledge. A major factor in innovation activities is the intention to innovate and the degree of innovation that the company sees need to remain competitive in its market segment. Therefore, it becomes essential to consider that according to the stance taken by this company have specific interests and possibly different from other companies. The objective of this study is to identify whether there are actions in technological innovation companies Aracaju and what potential innovation that will serve to promote the creation of partnerships in R&D projects, as well as generating business opportunities for innovation**

***Index Terms*— Technological Innovation, Research, Partnership**

I. INTRODUCTION

With the Technological Innovation Law (Law No. 10.973 of December 2, 2004), Brazil's government provides incentives for innovation and scientific and technological research in the production environment, with a view to capacity building and technological autonomy and industrial development of the country, stimulating the creation of specialized environments and collaborative innovation. Through these changes occurring globally nowadays, technological innovation has become a vital requirement for all organizations, be they small, medium or large, as well as belonging to any sector of activity whatsoever.

According to Silva et al (2008), "Is not it enough just to offer more to customers. Many companies that produce products or services offered quality perished in recent years in view of the lack of innovation perceived by its consumers. "

In this sense, innovation has become a basic condition for the survival of organizations today, in relation to the large amount of products and services offered to consumers. Aiming to increase the number of customers, firms innovate in providing its products or services or improving them. The innovation has a positive result from the acceptance of the final customer, the purchase, testing and approval of product or service (GUIDELLI And BRESCIANI, 2008).

The new value-added products, processes and services that increase advantages over competitors, ie, companies that are ahead in terms of innovation are those that have major advantages over others in its segment.

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The objective of this study is to identify whether there is stock of technological innovation in companies of Aracaju and what potential innovation that will serve to promote the creation of partnerships in RD & I projects, as well as generating business opportunities for innovation.

II. RELATIONSHIP BETWEEN UNIVERSITY-INDUSTRY

According Pietrovski (2002) in order to find new ways to compete, companies are seeking to introduce the formalization of partnerships that will assist in their difficulties. This need for interaction can be supplied by the process of cooperation between universities and industry, presenting itself as a strategic factor that promotes the relationship between institutions, though, have very different realities.

The economic analysis of technological innovation allows to investigate the motivations of companies to enter the process of collaboration with the university, and the theory of the relationship between organizations studying the characteristics of the process of knowledge transfer (REIS, 1994).

The process of interaction between university and company follows a model involving completely different organizations, that despite having different purposes, may be useful to each other. The relationship between universities and industry can occur in many ways, but that the cooperation process is put in place there must be a break with prejudices, both for the company and for the institution.

Some of these biases are cited by Brescianini et al. (1994):

- profits and results are more important to the company;
- The School is operated by the company;
- partners' goals are different;
- the educational institution will mischaracterize;
- teaching and research are not part of the company's metier;
- the company is not seeking a teaching and research institution to cooperate

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It appears that an approach aiming to break these prejudices is very important in cooperative relationship. The company needs to know the institution with all its potential and likewise the university needs to match business aspirations.

(i) Search Anteriority

A search was made to find a prior similar work and found a online portal whose name is INNOVERSIA. The first portal is INNOVERSIA open innovation created by and for the Iberian America. Here the most important companies in the world publish their development needs and technological innovation, so that researchers and scientists propose solutions. It is an opportunity to expose their work to large companies, assisting them and enabling extend its gains.

The INNOVERSIA became synonymous with Open Innovation for the Ibero-American community, bringing this innovation model, which has generated so much value in countries like the U.S., to our community.

Traditionally, innovation in the industry was driven to a closed innovation where technological advances have been made based on the internal capabilities of each company. Recently, Henry Chesbrough (2003), director of the Center for Open Innovation at the University of California, Berkeley, introduced the concept of Open Innovation, stating that Open Innovation is the use of input and output streams that allow knowledge to accelerate internal innovation and expand the market for external use thereof. This paradigm assumes that, to advance their technologies, companies can and should use external ideas as both internal as well as resorting to internal and external paths to market their technologies.

Moreover, from the point of view of research centers, this new approach to innovation brings numerous benefits which translate into the ability to diversify the search, generating concrete alternative to the development of products, processes or services that improve the quality of life for users. This development enables research centers have a direct interaction with industry, increasing the capabilities of each area and the possibility of creating research centers to access new sources of funding for their research.

Thus INNOVERSIA provides a vital element for the current generation of open innovation, enabling technological proposals are distributed to a database of scientists, researchers and inventors capable of solving them. (Http://www.innoversia.net/innoversia-29-1.html)

We also found an association called COTEC Portugal (Portugal COTEC - Association for Innovation) that was formed in April 2003, following an initiative of the then President of the Republic, Jorge Sampaio, and was endorsed by the Prime Minister and received the membership of a group of companies whose gross value added global represented in 2002 about 14% of national GDP. Since the beginning of its activity the office of President of the General Assembly has been exercised by the President. COTEC currently has 119 Members.

With a mission to promote increased competitiveness of companies located in Portugal, through the development and dissemination of a culture and practice of innovation and knowledge resident in the country, COTEC is a nonprofit association that has the support of its Members and of the institutions of the National Innovation System (NIS) to achieve its goals through the implementation of initiatives in various areas.

The project is proposed to achieve COTEC part of a social context of extreme complexity, involving many potential actors (firms - some associated COTEC Portugal and others not -, voluntary organizations, public institutions - some linked to other central government to local authorities - , etc..) with distinct and potentially conflicting objectives, constraints of very different orders - economic, social, educational and cultural - that determine the most significant changes will necessarily operate medium and long term perspectives and with very different assessment.

COTEC know that only with a culture of rigor, not dispersion in action and a policy more focused on "doing" rather than "promise" will honor up and be a significant part of the SNI. This is the way of being and culture that have driven COTEC Portugal in its activity to date and that this association will continue to advocate in the future; domestically, with the support of the Associates and institutions and actors of the NIS, and the plan Europe, with a special partnership with their Spanish and Italian counterparts. (Http://www.cotecportugal.pt)

III. Results and Discussion

The survey was conducted in companies belonging to the city of Aracaju, capital of Sergipe state. 40 questionnaires were applied, between the periods of 30 April to 08 June of the year 2012. The Table 1 shows that 75% of surveyed companies were founded after 1994, while only 25% were founded before 1994.

Table 1. Foundation Year of the Company

Foundation Year	Frequency
Before of 1980	10%
1980 |- 1987	5%
1987 |- 1994	10%
1994 |- 2001	35%
2001 |- 2008	15%
2008 |- 2013	25%
Total	100%

53% of companies surveyed proffer services to Individuals, while 46.97% proffer services to Corporate. It is valid to point out that 26 companies, representing 65% of all companies surveyed said they proffer services for both. And, 68.89% of the surveyed companies trade goods, while 31.11% market services. It is noteworthy that 5 companies, representing 12.5% of all companies surveyed said they sell both products. The Table 2 shows that 60.42% of the companies belong to the Secondary sector, while 37.5% and 2.08% belong to the tertiary sector and the primary sector, respectively. It is noteworthy that 8 companies, representing 20% of companies surveyed said they belong to more than one economic sector.

Table 2. Activity Sector

Activity Sector	Frequency
Secondary	60,42%
Tertiary	37,50%
Primary	2,08%
Total	100,00%

Table 3 shows that 32.5% of the interviewed companies belong to the textile clothing and cloth artifacts while 27.5% belong to Food Industry, beverages and ethyl alcohol, representing more than half of companies and interviewed.

Table 3. Economic Activity

Economic activity	Frequency
Textile clothing industry and cloth artifacts	32,50%
Industry of foodstuffs, drinks and ethylic alcohol	27,50%
Other	17,50%
Construction civil	10,00%
Industry of wood and furniture	5,00%
Industry of electric material and communication	2,50%
Metallurgic Industry	2,50%
Several industries	2,50%
Total	100%

The Table 4 shows that 37.97% of companies said that another scientific domain, without being listed, could help in economic activity provided by the company. In relation to scientific domains listed, most companies said the chemistry was important in the production of economic activity. It is noteworthy that 21 companies, representing 52.5% of all companies surveyed said that more than one scientific field belonged to their economic activity.

Table 4. Scientific Domain

Scientific Domain	Frequency
Other Technologies	37,97%
Chemistry	11,39%
Organization and Management of Companies	11,39%
Mathematics	8,86%
Civil Engineering and / or Architecture	6,33%
Physics	6,33%
Engineering and Technology Mechanical (and Materials)	3,80%
Metallurgical Engineering	3,80%
Engineering and Technology Chemistry	2,53%
Science of Living Resources and Nature Conservation (Science and Environment)	1,27%
Legal Sciences	1,27%
Geography / History	1,27%
Electrical Engineering	1,27%
Sociology / Philosophy	1,27%
Earth Sciences, of Environment and of the Space	1,27%
Total	100,00%

Note: Multiple Choice Question

The Table 5 shows that among the companies surveyed, 72.5% have no technological innovation, while only 27.5% have some kind of technological innovation. And companies that have innovation said that technological innovation has 78.57% developed technological innovation with their own resources, while 21.43% said they were funding.

Table 5. The Company owns innovation

Innovation	Frequency
No	72,50%
Yes	27,50%
Total	100%

The Table 6 shows that among the companies with technological innovation, 42.86% said that innovation came by market requirement, 21.43% by internal requirements, 14.29% at the suggestion of the client, at the suggestion of 14.29% supplier and 7.14% at the suggestion of an employee. 63.64% of companies said that innovation has produced this innovation without partnership. 36.36% of companies do not produced innovation.

Table 6. Why emerged the innovation?

Why emerged the innovation	Frequency (%)
Market requirements	42,86%
Internal requirements	21,43%
Suggestion of client	14,29%
Suggestion supplier	14,29%
Employee Suggestion	7,14%
Total	100%

The Table 7 shows that among the companies that produced in partnership, 50% did this partnership with independent researchers, 25% with another company and another 25% with Universities.

Table 7. Who is the partner?

Partner	Frequency
Research(s) independent(s)	50,00%
Another Company	25,00%
Universities,	25,00%
Total	100%

Among the companies with technological innovation, 83.33% said that innovation has caused an economic impact, which caused 8.33% and 8.33% environmental impact that there was a social impact. It is noteworthy that 2 companies, representing 5% of all companies surveyed said they were more of an impact. Among the companies with technological innovation, 81.82% said there was no deposit of Intellectual Property (IP), while 18.18% said they recorded their technological innovations.

The Table 8 shows that among the companies that reported the innovations, one of the deposits was the PI type Industrial Design and the other was the type Computer Program.

Table 8. Type of IP deposited

Type	Frequency
Industrial Drawing	50,00%
Software	50,00%
Total	100%

The Table 9 shows that among the companies that have reported innovation, 63.64% said they had not faced any difficulty while 36.36% said they faced some difficulty in producing technological innovation.

Table 9. Difficulties faced in the innovation

Difficulties in the innovation	Frequency
No	63,64%
Yes	36,36%
Total	100%

85% of companies said they do not offer training in technological innovation for its employees and 15% said they offer this type of training to their employees. Among the companies offering training in technological innovation, 50% of them said that this training is conducted by private companies, while 50% said they were held by public agencies.

CONCLUSIONS

We conclude that most companies Aracaju has over 12 years of establishment, since 60% were established before 2001, the allocation of services is somewhat homogeneous, because 65% of companies offer services to individuals and companies. We also observed the fact that the majority of companies (68.89%) claim to market goods, rather than services, and 60.42% belong to the secondary sector. Of all companies surveyed only 27.5% said owning and innovation among these 42.86% stated that the factor that drove the emergence of innovation was the requirement of the market. The most companies (78.57%) developed innovation with their own resources. Among the companies that have some innovative product, the total of 11, 90.9% said that innovation has caused a positive economic impact.

We conclude that knowledge of Intellectual Property in companies is very weak, because few respondents knew what it was and the fact that only 18.18% of the companies that have reported have logged innovation. It was concluded that training in technological innovation is something very rare in business, because only 15% of all companies reported offering this type of training to their employees.

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