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A Virtual Technological Park,
an innovation towards the Federal Institute Identity
(https://tinyurl.com/VirtualTechPark)

IMP INNOVATION MANAGEMENT PROFESSIONAL

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DRAFT 07 – May 07, 2018

Declaration

Affidavit

I, Antonio Mauro Barbosa de Oliveira, born on the September 20, 1954, in Fortaleza (Ce)/Brazil, hereby declare:

1. that I have independently written my Project Study Paper. I have neither made use of any other sources, tools and resources as those given nor have I used any other unauthorized,

2. that I have neither at home nor abroad presented my Project Study Paper in any other form as examination paper,

3. that I have informed my employer and obtained his understanding concerning the title, form and content of this Project Study Paper.

Aracati, 15 de abril de 2018

Antonio Mauro Barbosa de Oliveira

"O aluno nos percebe mais pelo que fazemos do que pelo que dizemos"

(The students notice us more what we do than we say)

"E quando nosso aluno for tentado a mentir,
a humilhar ou a ser injusto
que ele honre sua Escola que o preparou ...
dono de seu destino, capitão de sua alma"!

(And when our student tempted to lie,
to humiliate or to be unfair
he may honor his school that prepared him…
owner of his destiny, captain of his soul!

"Uma Escola que é o reflexo da sociedade
não serve a ela... nem pra ela"
(A School that reflects the Society
doesn't serve to it… neither for it)

(in ESCOLA PRA VALER book)

Summary

TITLE:

Virtual Technological Park, an innovation towards the Federal Institute Identity

RESUMO
Vários campi da Rede de Institutos Federais (IF) estão localizados em pequenas cidades que, em geral, não oferecem ao recém-formados dos IFs oportunidade de emprego ou facilidade para abertura de seu próprio negócio. Em consequência, estes egressos acabam aceitando trabalhos inapropriados com a sua formação ou migram para centros mais desenvolvidos de maior empregabilidade. Neste último caso, acontece um paradoxo em relação a missão do IF enquanto agente de transformação social da região, a medida que o município perde seus jovens com grande potencial para engendrar esta transformação. A proposta da criação de um Parque Tecnológico Virtual nos IF como componente de sua identidade, pode ser um mecanismo seguro para mitigar este problema que põe em xeque a eficiência da missão do IF. Este trabalho apresenta os resultados já alcançados com o Aracati Digital, uma experiência neste contexto levada a efeito no IFCE campus Aracati (Ce), além de uma metodologia baseada em um framework de Gestão da Inovação (PEST, BCG e SWOT) e pela metodologia PLANNER360, ambas propostas no Innovation Management Professional, um curso da Steinbeis Berlin University, promovido pela Secretaria de Ensino Profissional (SETEC) do MEC.

Palavras-chave: Parque Tecnológico, Inovação, Empreendedorismo, Planejamento Estratégico.

ABSTRACT

Nowadays, we have observed the positive expansion of several Federal Institutes of Technology (FI) campuses in small cities. However, most of these small cities are not prepared to offer facilities to absorb formed students, such as a job opportunity or facility to open their own business. Consequently, these professionals end up accepting jobs that are not related with their formations or migrating to developed centers, where job offers in their areas are most attractive. In the latter case, we identify a paradox in relation to the IF mission once this institution tries to be a social transformation agent of the region, since these small cities lose the main subject of this transformation, the young people. Our proposal linked to the creation of Virtual Technological Park becomes an important component of FIs identity, which could be a safe mechanism to mitigate the negative results caused by these mentioned problems, as well as can increase the efficiency of the FIs. In this work, we propose a methodology for the creation a Virtual Technological Park, showing the positive results achieved in a small city jointly with a FI campus. An evaluation of the case study is presented, based on an Innovation Management Professional framework (PEST, BCG and SWOT) and the PLANNER360 Methodology, both presented by the Steinbeis Berlin University, promoted by the Secretariat for Professional Education (SETEC) of the MEC.

Keywords: Technological Park, Innovation Management, Entrepreneurship, Strategic Planning.

1. Introduction

1.1 Network Federal Institute Mission

The Federal Institute (FI) has about six hundred units spread out in the country. Most of these units are in small cities, where the local market is sometimes inappropriate regarding to the formation given by the Institute. In general, many graduate students have two unsatisfactory options in these small cities: accept a local inappropriate job (not related with their formation) or go away to a big city. Unfortunately, this reality threatens the FI mission because small cities lose the potential young people able to transform the local society.

To mitigate this problem, one among several solutions is to create appropriate jobs for these young people. This is an important challenge to be considered by the FI National Network.

In parallel, another problem with most of young Brazilian people is to have a public job as a priority for professional future, although the market is calling for entrepreneurship. However, to develop their own business is sometimes outside of their professional plans. It is a cultural problem, since the young people that comes to the FI, in general, have a lack of initiative and capability to solve problems.

All things considered, we propose the Virtual Technological Park in order to mitigate negative results caused by the mentioned problems. It concerns a new concept of Park without a physical space, different of the traditional ones. In this new concept, FI labs are used for all activities.

Actually, the IFCE- Campus Aracati has already an experience that can be considered a case study for the Virtual Technological Park proposed here. This experience, named Aracati Digital (www.aracatidigital.com.br), began four years ago and it is linked strongly with two supporting actions: LAR lab and EMBRAPII.

1.2 About LAR - Computer Network and System Laboratory

The LAR is the first research and development computer lab of Ceará State, Brasil. It was founded in 1987 at the Federal Technical School of Ceará, called today Federal Institute of Ceará. At this time the LAR had the technical support of the Telemedia Lab from Pontifical Catholic University of Rio de Janeiro, created by Prof Luiz Fernando Gomes Soares (SOARES, 2018). He was the inventor of the Nested context language (NCL) and Ginga-NCL[1] for IPTV services, a declarative glue language that holds media object presentations synchronized in time and space.

LAR is a lab at the IFCE-Campus Aracati, Ceará State (Br), since 2014. It gives the technological and scientific support to the Virtual Technological Park, the project has been presented here. Nowadays, the LAR time has 3 PhD researchers, 5 PhD students, 10 MSc teachers and about 70 scholarship students from the Computer Science Bachelor of the IFCE-Campus Aracati. The PhD professors are also participants of the Post Graduate Computer Science Program at the IFCE. These 70 LAR students have scholarships supported from the R&D Brazilian Governmental Agencies (FINEP, CNPq, CAPES, FUNCAP) or from private companies encouraged by EMBRAPII, the Brazilian Agency for Industrial Research and Innovation that has had an important role (EMBRAPII, 2018) to the Virtual Technological Park concept..

1.3 About the EMBRAPII

EMBRAPII is a Social Organization connected to the Ministry of Science, Technology, Innovations and Communications (MCTIC) and to the Ministry of Education (MEC). Its operating model enables quickness, flexibility and reduced risk in supporting companies' RD&I projects. The non-refundable grants managed by EMBRAPII are invested in projects carried out by companies and research institutions, acknowledged for their excellence, technological focus and the ability to meet companies´ RD&I demands.

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[1] The Ginga-NCL becomes the Recommendation H.761 of the ITU-T, a specialized agency of the United Nations

EMBRAPII Units have funds that are available exclusively for innovation projects. It operates through cooperation with public or private technological and scientific research institutions, that are accredited as EMBRAPII Research Units. These Units focus on entrepreneurial demands and innovation projects that are in the pre-competitive stage.

How EMBRAPII works:

The R&D Institution submits proposals to the Public Call (link) accreditation, open periodically by EMBRAPII. Once accredited, through a Plan of Action, the EMBRAPII Units (link) and EMBRAPII Hubs (link) are able to develop RD&I projects with industrial companies.

Advantages for R&D Institutions:

- Investment is shared – EMBRAPII model affords lower risk and costs to innovation projects;
- Agility: a portion of financial resources is released immediately;
- Partnership with companies that commercialize products developed jointly with RD&I Institution;
- Professional qualification of RD&I management, supported by the EMBRAPII Operational Excellence System.

How financial resources are released:

- EMBRAPII anticipates resources for Unit hire projects with companies >resources for costs.
- Project is negotiated directly between the COMPANY and Accredited Unit.
- Enables agility, flexibility and speed in the use of resources and changing scope of projects.

1.4 IFCE EMBRAPII

The Federal Institute of Ceará (IFCE) has many laboratories specialized in computer networks, embedded and intelligent systems, and telecommunications and software engineering:

- LIT – Laboratório de Inovação Tecnológica, Sistemas Embarcados para energia;
- LDS – Laboratório de Desenvolvimento de Software;
- LAPADA – Laboratório de Pesquisa Aplicada e Automação;
- NASH – Laboratório do Núcleo Avançado em Engenharia de Software Distribuído
- FOTÔNICA – Laboratório de Fotônica;
- SISCOME – Laboratório de Controle e Medição de Energia;
- LAMP – Laboratório de Aplicações Maciçamente Paralelas;
- LAR – Laboratório de Redes;
- LIVIA – Laboratório de Inteligência, Visão e Automação;
- LARS – Laboratório de Automação, Redes e Sinais;
- GDESTE – Laboratório do Grupo de Desenvolvimento em Telecomunicações

The first IFCE industrial innovation project was carried out in partnership with COELCE in 2002. Since then, IFCE has increased the number of research projects carried out in partnership with companies, and over the past four years more than 100 projects have been developed with 73 firms from various sectors of the economy.

The experience accumulated by IFCE in recent years enabled a set of actions that that resulted in its accreditation, through public call EMBRAPII 02/2014, as EMBRAPII Hub Fortaleza. It is accredited in the technological competencies associated with Embedded and Digital Mobility Systems. These skills enable industrial companies to develop innovative product design and processes.

2. Justification

2.1 Virtual Technological Park Approaches

We believe it is a FI mission to help the students for their professional career in terms of creativity, initiative, management knowledge and other activities needed to become them entrepreneur even though is not in their plans. Therefore, creativity, initiative and management knowledge are important skills for any kind of professional activities.

In fact, there are two approaches in this Virtual Technological Park strategy (VIRTUAL TECHNOLOGICAL PARK, 2017):

- Pedagogical approach: creativity, initiative and management knowledge are very important for graduate students independently if they decide to become the owner of their business, a public or private employee.
- Citizen approach: the knowledge about the set up and management of a company can help the students to become a conscious citizen and to collaborate much better to the society.

The FI must open the students' mind for the perception of this understanding and motivate them to become an entrepreneur, independently of their professional choice. The process of the production and sales of products and services is not easy and evident for the students. However, this understanding is indispensable for the company survival. This kind of subject about business management hasn't been developed properly in pedagogical programs by the FI teachers.

Finally, these pedagogical and citizen approaches concern the educational fundamentals from "Escola Pra Valer" book (OLIVEIRA, 2016), inspiration source to the Virtual Technological Park proposed here.

2.2 Some LAR Results

We can consider two classes of results from the LAR experience: RD&I and Education results:

Table 1 – RD&I and Education Results

Achieved Result	Discussions
RD&I Results	Since 2014, the LAR Lab has performed many research projects from the governmental agencies, in special from the CNPq. The LAR Lab average is about 10 projects per year, involving 40 scholarship students.
• Scholarship student projects.	The most of these projects has served to guide the student TCC projects (Work of Course Conclusion) or as a solution for help the non-profit public or private institutions. We can highlight the following projects: • SISAPP to Peter Pan Hospital, supported by CNPq and Peter Pan Association • NextSaude to Aracati City, supported by FUNCAP These projects above and the other projects supported by the Government Agencies correspond the financial and economic investments around R$2.000.000,00
• Energy Agency Projects	The second step on the LAR trajectory was the project demanded by ANEEL, the Brazilian Energy Agency, in collaboration with the IFCE-Fortaleza researchers. Financial and economic investments around R$1.000.000,00
• EMBRAPII Projects	After EMPRAPII-IFCE Polo was inaugurated, the LAR lab started his collaboration with the private companies. Financial and economic investments around R$5.000.000,00.
• Other projects	The LAR Lab has collaborated with many other institutions in order to find the innovation solutions for them: • Atlantico Institute: GISSA Project, supported by FINEP • Avicena Software and Services: GISSA Urgency and Emergency, supported by FUNCAP

	Nowadays, the LAR Lab has two researchers with FUNCAP Productivity Scholarships that involves 10 students and almost R$300.000,00 for computer material, participation in scientific events and scholarship students.
Education Results	Likewise, the RD&I Results, the Education Results play an important role in the Virtual Technological Park proposal. However, this kind of results are, naturally, more abstract than the RD&I Results presented before. We consider here the pedagogical and social aspect provided by the LAR lab environment. It is very common we hear all the time that there are two kinds of students in the IFCE-Aracati Computer Science Course: the regular students and the LAR scholarship students.
	In the LAR Lab the students are involved on an intangible atmosphere, a fantastic pedagogical mix between the academic scenario and the market real scenario. These scenarios correspond respectively the academic projects and the projects related with the private companies encouraged by the EMBRAPII as mentioned before.
	Anyway, this pedagogical mix experience is very rich in terms of the entrepreneurship skill. It is a very important concept for the Virtual Technological Park and is not easy to find it in regular classes.

3. Objectives

3.1 General

Create a methodology to implement and manage a Virtual Technological Park, a proposal based on an experience taken by the IFCE Aracati campus (ARACATI, 2018). The main purpose of this project is to be adopted by the Federal Institute network as a part of Its brand identity, in order to mitigate the problem caused the by the migration of the former students from the small cities that doesn't offer adequate job opportunities for them.

For that, we expect to be supported by the local, national and international private companies and public programs as EMBRAPII, SEBRAE, Governmental Sponsored Agencies (FINEP, CNPq, FUNCAP, etc.).

3.2 Specific

1) Elaborate a study about the Aracati Digital experience (ARACATI, 2018) in terms of its social and economic impacts and other technological parks available in the country and abroad, their successes and fails.

2) Define a Virtual Technological Park proposal as a new concept and highlighting the advantages and disadvantages issues comparing it to the traditional Parks based on physical spaces.

3) Prepare a Strategical Plan based on the innovation management concepts, using IMP framework (STEINBEIS BERLIN UNIVERSITY, 2018).

4) Describe a new methodology composed by the steps able to develop and manage a Virtual Technological Park.

5) Elaborate a business model to involve the FI community (students, administrative and teachers) and the entrepreneurs about the importance of the Virtual Technological Park to the FI mission and the socioeconomic advantages for the local society.

6) Prepare an installation and operation Guide of the Virtual Technological Park based on the IMP innovation framework (DOSTLER, 2016).

3.3   Execution Plan

In order to achieve the objectives above, we propose:

1) Visit the following case studies:
- Porto Digital (http://www.portodigital.org),
- São José dos Campos (http://www.pqtec.org.br/),
- Sapiens Parque de Florianópolis (http://www.sapiensparque.com.br/);

2) Perform the partnership with the sponsors mentioned in General Objective: EMBRAPII, SEBRAE, Governmental Sponsored Agencies (FINEP, CNPq, FUNCAP, etc.).

3) Install new cell productions based on the lab models that work properly in the Aracati Digital experience.

4) Training new cell productions using the installation and operation Guide of the Virtual Technological Park based on the IMP innovation framework.

5) Make a marketing plan for the consolidation of the Virtual Technological Park.

3.4   Stakeholders

How does the project intend to have the support from the stakeholders? The main stakeholders of the Virtual Technological Park are:

- IFCE Rector;
- President of FUNCAP (Ceará State Research and Development Agency);
- President of EMBRAPII and his staff;
- General Director of the IFCE Aracati Campus;
- BCC Course Coordinator;
- BCC Course Teachers;
- BCC Course Students;
- The representatives of companies (SEBRAE, FIEC, State government, etc).

For all these stakeholders will be used a general strategy:

- Present to them the huge problem regarding the lack of appropriate jobs to the former students in the small cities where the IFCE has a campus:

    "The most of these small cities are not prepared to offer facilities to absorb formed students, such as a job opportunity or facility to open their own business. Consequently, these professionals end up accepting jobs that are not related with their formations or migrating to developed centers, where job offers in their areas are most attractive.

    In the latter case, we identify a paradox in relation to the IF mission once this institution tries to be a social transformation agent of the region, since these small cities lose the main subject of this transformation, the young people".

- Show the solution proposed by the project concerned in building a virtual technological ecosystem based on scholarships supported by the governmental agencies and the private companies:

    "The creation of Virtual Technological Park becomes an important component of FIs identity, which could be a safe mechanism to mitigate the negative results caused by these mentioned problems, as well as can increase the efficiency of the FIs. In this work, we propose a methodology for the creation a Virtual Technological Park, showing the positive results achieved in a small city jointly with a FI campus".

3.4.1 IFCE Rector

Motivate the rector to set this strategy as an internal pedagogical policy, initially for the IFCE. The final target is to propose this strategy for the other units that belong to the IF network.

3.4.2 President of FUNCAP

Convince the president of FUNCAP to create the specific programs to support this initiative into a innovation perspective in order to develop the small cities.

3.4.3 President of EMBRAPII and his staff

Convince the president of EMBRAPII to give a special attention and priority to all IF campus that make the best effort to participate of the Virtual Technological Park initiative.

3.4.4 General Director of the IFCE Aracati Campus

Ask him to help in communicating all internal IFCE Aracati community in order to involve students, teachers and administrative staff about the proposal and convince some people to participate of the project activities.

3.4.5 The BCC course Coordinator

Ask his help as an active participant of the actions needed to perform the activities concerning the relationship with the BCC students and teachers, becoming a formal effective member of the project.

3.4.6 The BCC Course Teachers

Invite them to participate as active participants in some project actions according to their profiles. On the other hand, they will enroll in the Innovation Management Professional methodology and the Planer360 system provided by the Steinbeins University.

3.4.7 The BCC Course Students

Discuss with them the real threats that lack of (or inappropriate) jobs can create, the main problem treated by the project, and the consequences they might cause for them. Consequently, invite them to help in some project activities in order to better achieve the project target.

3.4.8 The representatives of companies (SEBRAE, FIEC, State government, etc).

Receive from them the suggestions about the adopted strategies and listen to new suggestions in order to have better relationships and consequently to get also the concrete help to build the project.

4.   Problem Identification

In order to fill the Project Plan (item 5), This work has used two strategies.

- The first one is a pool form set involving teachers and students from IFCE. Their perception about the problem treated by the Virtual Technological Park is very important for the real problem identification. These pool forms are showed on the APPENDIX 01.

- The second strategy take advantage the tools available on the Innovation Management Professional (IMP) course from the Steinbeis Berlin University (STEINBEIS BERLIN UNIVERSITY, 2018), supported by SETEC/MEC initiative (BRASIL, 2017): Pest Analyses, BCG Matrix (Boston Consulting Group) and SWOT Analysis.

4.1 PEST Analysis

PEST Analysis is a simple and widely used tool that helps you analyze the Political, Economic, Socio-Cultural, and Technological changes in your business environment. This helps you understand the "big picture" forces of change that you're exposed to, and, from this, take advantage of the opportunities that they present (MINDTOOL, 2018).

4.1.1 Political Aspects that may affect the Virtual Technological Park Project

- New Elections in the country:

CURRENT SITUATION: In Brazil when we have national or regional elections and change of political parties running the country, many governmental programs don't continue. For instance, the Virtual Technological Park project depends on the programs involving strong relationship between FIs and the private companies, as proposed by the

EMBRAPII strategy. Unfortunately, this political behavior is still a cultural problem in Brazil that we consider as a challenge for the education system.

TENDENCY: Nowadays, the new vision and perception about the innovation concept is spread out in all private and even more in public companies worldwide. So, it is easy to conclude innovation concept that support the relationship with the market has a big chance to remain, independently of the political ideology running the country.

- Lack of an integrated internal policy of innovation

CURRENT SITUATION: Supposing the FI Superior Council decides to approve an innovation policy to improve the integration of the Institution with the society. For that, this council, through the FI main board, proposes to apply this policy in all FI units. Nowadays, each unit is a little bit independent to adopt or not the policies that are out of the FI regular education statute, because each general director is elected by the local community. If this is good to the FI democracy practical, on the other hand is not evident the introduction of new general policies in the Institute, as the innovation management.

TENDENCY: We believe the adoption of an integrated internal policy of innovation management, for instance, is a fact in all units of the FI network, independent of the political vision of the general director because the unit that does not adopt the innovation tendency take a risk to fail in terms of the local administration. There are many opportunities that a unit can miss if it keeps isolated of the society and its market and the local community understands that.

4.1.2 Market Aspects that may affect the Virtual Technological Park Project:

CURRENT SITUATION: The health of the Brazilian economy has been very unstable in the past years. One of the consequences of this instability is the fragility of the market for attracting international investments. The

result is a low growth rate of our economy. The Virtual Technological Park proposal depends of the market projects. So, the RD&I results of the Virtual Technological Park are strongly dependent of the local and national current economy.

TENDENCY: Recently, the Brazilian economy has given little signs of growth. We expect the Brazilian economy may recover its growth rate. The country has great potential to add innovation in their products considering the recent approach of the market with the academy. We consider also a better maturity of the society in terms of the innovation understanding and better mechanisms of the political control despite the inefficiency of current political class.

4.1.3 Social Aspects that may affect the Virtual Technological Park Project

CURRENT SITUATION: The most of the FI students come from poor families, especially in the small towns far from the capital. Sometimes, these students leave the course before ending it. Their socioeconomic situation makes them to find a job in order to help their family. Associated to this financial problem, there is another higher problem: the drugs have increased in all the Brazilian cities.

TENDENCY: Unfortunately, different of the economic situation, the social problem has gone up. The Brazilian education model has failed in both problems: to keep the students at school, as it happens in the developed countries and about the drugs spread out among young people.

4.1.4 Technological Aspects that may affect the Virtual Technological Park Project

CURRENT SITUATION: Recently, the Information Technology seems to be the aspect that more affect the youth daily routine. The new generation born in this century is distinguished by the excessive use of digital technology, as the smartphone, associated to its social medias. This kind of situation could be good or bad depending on the social, cultural and economic context where the youth is involved. After all, the introduction of the digital technology in our lives is inevitable, as the artificial intelligence.

TENDENCY: The studies performed by the social and education researches point out to the influence of the information technology tools in young people lives, added with artificial intelligence (AI) structures. According to Elon Musk, Tesla and SpaceX CEO, AI can threaten the democracy and the human future (MUSK, 2018).

4.1.5 Environmental Aspects that may affect the Virtual Technological Park Project

CURRENT SITUATION: Nothing special relates the environment aspects and the Virtual Technological Park aims, except the common proceedings like the conscious to treat properly the nature: garbage, selected garbage, recycling, energy economy, etc.

TENDENCY: The conscious awareness campaigns are more often at schools, on the news and by the government institutions.

4.1.6 Legal Aspects that may affect the Virtual Technological Park Project

CURRENT SITUATION: As the Virtual Technological Park is based on the projects involving FI and the private companies, it strongly depends on the legal aspects for this relationship.

The good results got with the first experience inside the FI labs with EMBRAPII strategies seem to be enough to guarantee the continuation of the relationship between FI and the market.

4.2 BCG Matrix (Boston Consulting Group)

The BCG matrix assesses products on two dimensions. The first dimension looks at the products general level of growth within its market. The second dimension then measures the product's market share relative to the largest competitor in the industry. Analyzing products in this way provides a useful insight into the likely opportunities and problems with a particular product. Products are classified into four distinct groups, Stars, Cash Cows, Problem Child and Dog (PROFESSIONAL ACADEMY, 2018).

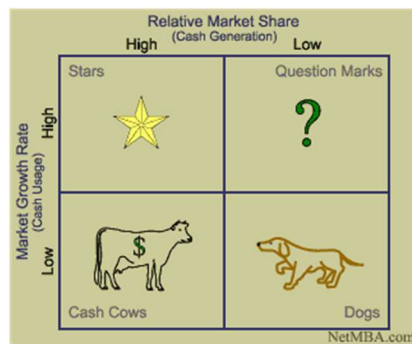
Figure 01: BCG Matrix

Let's have a look at what each one for Virtual Technological Park decision-making process.

4.2.1 STAR: HIGH market growth rate and HIGH market share

- o Development of web solutions (front end and back end) in all modern platforms for the international and national market;
- o Governmental programs help to initial support of the Virtual Technological Park process.

4.2.2 Question Marks: HIGH market growth rate and LOW market share

o Development of web solutions (front end and back end) in all modern platforms for local market.

4.2.3 CASH COW: LOW market growth rate and HIGH market share

o Development of solutions involving modern technologies (Artificial Intelligence, Internet of Things - IoT, Big Data, Web Semantic) for the international and national market.

4.2.4 DOG: LOW sales growth rate and LOW market participation

o The internal fake image built by the colleagues not advised about the target and the results of the Virtual Technological Park.
o The prejudice of the market about the technical competence of the labs in the FI in the small cities located in the underdeveloped cities..

4.3 SWOT Analysis

It is a strategic planning technique used to help a person or organization identify the Strengths, Weaknesses, Opportunities and Threats related to business competition or project planning. It is intended to specify the objectives of the business venture or project and identify the internal and external factors that are favorable and unfavorable to achieving those objectives.

	Opportunities (external, positive)	Threats (external, negative)
Strengths (internal, positive)	**Strength-Opportunity strategies** Which of the company's strengths can be used to maximize the opportunities you identified?	**Strength-Threats strategies** How can you use the company's strengths to minimize the threats you identified?
Weaknesses (internal, negative)	**Weakness-Opportunity strategies** What action(s) can you take to minimize the company's weaknesses using the opportunities you identified?	**Weakness-Threats strategies** How can you minimize the company's weaknesses to avoid the threats you identified?

Figure 02: SWOT Matrix

4.3.1 Strength about the Virtual Technological Park Project

o Believe the school is truly a space for the transformation of the society through the good education, awakening their students to become the actors of this transformation.

o The commitment with the FI mission as a real mechanism able to give the opportunities for the students, preparing them to face the society challenges.

o Consider the tradition of the FI network into the solution of the real society problems, due its different trajectory from the formation of the basic professional to the high-level research in all the areas.

o Assume FI network has a mystic identity able to influence the future of each student and, as consequence, the nation.

o The need to have strategies able to motivate the former students to stay in their cities, helping to mitigate their social, cultural, technological and economic problems.

o The FI network has a recognized group of teachers, administrative people and researchers able to perform a high quality of products and services for the market.

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4.3.2 Weakness about the Virtual Technological Park Project

o Some teachers and administrative employees don't understand the FI identity, its mission, and its capability to change the society. When the new employees are hired they are influenced by this behavior.

o In general, the FI campus doesn't have an efficient marketing strategy able to be known by the society and collaborate with it in many. This situation interferes in the close relationship with the market and, consequently, difficult to catch projects to keep the Virtual Technological Park.

4.3.3 Opportunities about the Virtual Technological Park Project

o In terms of technological formation, the FI network is known as an institution of excellence. So, the market is more accessible to our professionals.

o In terms of education, the FI network has (still) a good reputation in the society, in the market and the public and private institutions. This image makes easier the participation of our students in management position.

o The government mentality about innovation is fundamental to keep strategies to grow the development and research involving students towards entrepreneurship and start-up concepts.

o The existence of programs like EMBRAPII are fundamental for the incentive of the creation of the mechanisms like the Virtual Technological Park.

4.3.4 Threatening about the Virtual Technological Park Project

- o Unstable economy seems to be the first issue that can threaten the creation and maintenance of a Virtual Technological Park.
- o A conservative policy in terms of Federal Innovation Law that denies the recent progress achieved, making it harder the relationship between the FI and the private companies.
- o The current model of internal elections for rector and general director that sometimes uses the bad procedures used in the regular political elections not recommended for a school. Sometimes, groups that support a candidate receive privileges from the winner.

5   Project Plan

5.1 Project Scope Management (Project Map)

The scope of the project considers the focus, the target, the objectives of the project and the goals that need to be met to achieve a good result. There are some steps that can be followed when doing this.
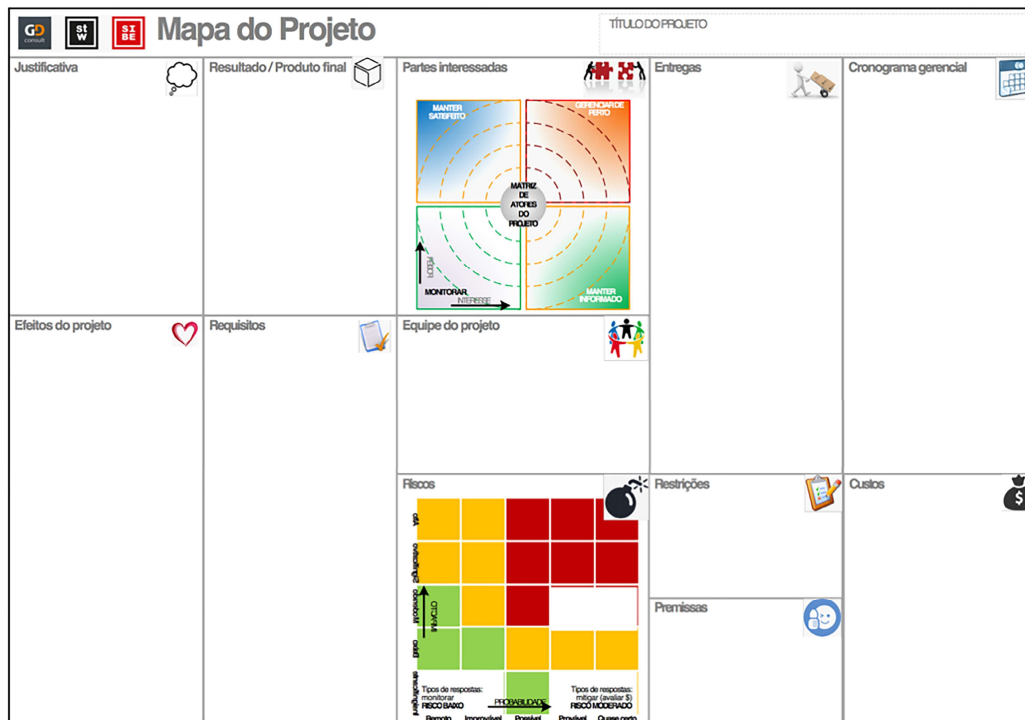

Figure 03: PLANNER 360 Project Map – Steinbeis Methodology

In this work we adopt the "Mapa do Projeto" from the Planer360, a tool used in the IMP Innovation Management Course of the Steinbeis Berlin University (BRASIL, 2017), as shown on the figure 3. It uses the following components:

a) Justification

- POST-IT J1: The FI has many units in small cities where the local market is sometimes inappropriate regarding to the formation given by the Institute.
- POST-IT J2: many graduate students take a local inappropriate job or go away to a big city

- POST-IT J3: when it happens, the small cities lose their potential young people able to transform the local society.
- POST-IT J4: this reality threatens the FI mission.

b) Project Effects

- POST-IT E1: Appropriate jobs for the former students
- POST-IT E2: More startups created by the former students
- POST-IT E3: Attraction of the private companies to the city
- POST-IT E4: More interaction and participation of the former students in the social and political issues of the city.
- POST-IT E5: Gradual improvement of the cultural, education and social solution in order to solve the local problems.

c) Final Results

- POST-IT F1: Definition of the Virtual Technological Park model
- POST-IT F2: Preparation of a methodology to create a Virtual Technological Park
- POST-IT F3: Implementation of the Virtual Technological Park Methodology
- POST-IT F4: Build a set of strategies to maintain of the Virtual Technological Park
- POST-IT 54: Adoption of the Virtual Technological Park as a concept of the FI national network identity

- **Requirements**

- POST-IT R1: A favorable local culture oriented to the innovation management
- POST-IT R2: The support to the project from the FI General Direction and the IF leaders
- POST-IT R3: Economic innovation policies as the EMBRAPII program

- **Stakeholders**

- <u>POST-IT S1:</u> Teachers and coordinators of all FI areas.
- <u>POST-IT S2:</u> FI Administration staff
- <u>POST-IT S3:</u> Students and former students
- <u>POST-IT R4:</u> Local Management

- **Deliveries (EAP)**
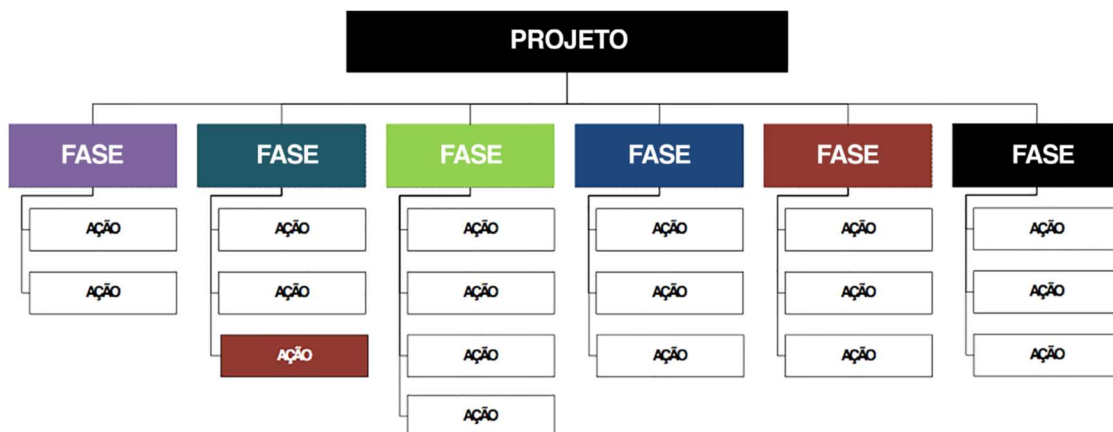
POST-IT D1: Definition of the Virtual Technological Park

- D1.1: Report about the educational, social and economic impacts of the Aracati Digital experience, since 2014.

- D1.2: Report detailing the technical aspects of the Aracati Digital Park implementation at the IFCE,

- D1.3: Report describing the main Brazilian Technological Park and the   international Technological Parks.

- D1.4: Report about the Virtual Technological Park concept, highlighting the difference to a conventional Technological Park concept and the advantages and disadvantages issues comparing it to the traditional Parks based on physical spaces.

POST-IT D2: Creation of the Virtual Technological Park Methodology

- D2.1: Report about the methodologies used to create the main Brazilian and the International Technological Parks.

- D2.2: Design of interactive website mockups of the Virtual Technological Park defined above

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- D2.3: Business model to involve the FI community (students, administrative and teachers), entrepreneurs and other stakeholders.
- D2.4: Methodology of the Virtual Technological Park in the IF network context.

. POST-IT D3: Implementation of the Virtual Technological Park Prototype

- D3.1: Strategical Plan to implement the Virtual Technological Park based on the innovation management concepts, using IMP framework
- D3.2: Information Technology architecture to support the Virtual Technological Park Methodology based on the website mockup designs.
- D3.3: Frontend interface (IT System) for the Virtual Technological Park Methodology APP.
- D3.4: Backend (IT System) to support the related frontend interface.
- D3.5: Prototype of the Virtual Technological Park in the IF network context.

POST-IT D4: Maintenance of the Virtual Technological Park

- D4.1: Report about the importance of the Virtual Technological Park to the FI mission and the socioeconomic advantages for the local society.
- D4.2: Installation and operation Guide of the Virtual Technological Park based on the IMP innovation framework.
- D4.3: Strategies to propose the Virtual Technological Park Model as a concept of the FI identity.
-

- **Project Team**

- POST-IT T1: Management Committee

- General Director of IFCE

- IFCE Education Director

- IFCE Coordinator Courses

- Representative of the IFCE Rector

- Project Leader

- POST-IT T2: Project Leader

  - Prof Mauro Oliveira

- POST-IT T3: Action Coordinators

  - Collaborator teachers and administrative people

- POST-IT T4:

  - Collaborator teachers, administrative people scholarship students and Former Students

5.2 Chronogram

	TITULO	INÍCIO	FIM	DUR
1 ✏ ⊟	Parque Tecnológico como estratégia de inov	02/02/2018	06/03/2019	284
2 ✏ ⊟	Definition of a Virtual Technological Park	02/02/2018	29/08/2018	149
3 ✏ ⊟	Report about the educational, social and ⟨	02/02/2018	04/06/2018	87
4 ✏	Network Federal Institute Mission	03/05/2018	18/05/2018	12
5 ✏	Virtual Technological Park Approaches	03/05/2018	18/05/2018	12
6 ✏ ⊟	Report detailing the technical aspects of t	05/03/2018	03/07/2018	87
7 ✏	PEST Analysis - Problem Identification	21/05/2018	01/06/2018	10
8 ✏	BCG Matrix - Problem Identification	21/05/2018	01/06/2018	10
9 ✏	SWOT Analysis - Problem Identification	21/05/2018	01/06/2018	10
10 ✏ ⊟	Report describing the main Brazilian Tech	02/04/2018	29/08/2018	108
11 ✏	Em andamento	16/07/2018	10/08/2018	20
12 ✏ ⊟	Report about the Virtual Technological Pa	02/02/2018	11/07/2018	114
13 ✏	Em andamento	02/02/2018	01/03/2018	20
14 ✏ ⊟	Creation of the Virtual Technological Park ℕ	02/05/2018	04/09/2018	90
15 ✏	Report about the methodologies used to ⟨	02/05/2018	04/06/2018	24
16 ✏	Design of interactive website mockups of	04/06/2018	04/09/2018	67
17 ✏	Business model to involve the FI commur	02/05/2018	03/07/2018	45
18 ✏	Methodology of the Virtual Technological	03/07/2018	04/09/2018	46
19 ✏ ⊟	Implementation of the Virtual Technological	02/08/2018	06/03/2019	155
20 ✏	Strategical Plan to implement the Virtual ⸀	02/08/2018	04/09/2018	24
21 ✏	Information Technology architecture to su	02/08/2018	04/09/2018	24
22 ✏	Frontend interfaces (IT System) for the Vi	02/08/2018	02/10/2018	44
23 ✏	Backend (IT System) to support the relate	02/10/2018	01/01/2019	66
24 ✏	Prototype of the Virtual Technological Par	04/12/2018	04/02/2019	45
25 ✏ ⊟	Maintenance of the Virtual Technological P	02/02/2018	06/03/2019	284
26 ✏	Paper about the Virtual Technological Par	02/02/2018	03/09/2018	152
27 ✏	Installation and operation Guide of the Vir	02/07/2018	06/03/2019	178
28 ✏	Strategies to propose the Virtual Technolc	02/07/2018	06/03/2019	178

5.3   Costs

(in progress)

5.4   Risks, Premises and Restrictions

5.4.1 Risks

Risk management is defined as an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives. According to the Project Management Institute's PMBOK, Risk management is one of the ten knowledge areas in which a project manager must be competent. The following are listed threes risks that threaten the Virtual technological Park project, proposed here:

a) PRIVATE PROJECTS: The main risk to implement The Virtual Technological Park is probably the lack of projects coming from private companies. These projects provide the financial support to maintain the appropriated jobs to the former students in the initial period of their professional life. They come from many different sources and can be motivate by the governmental politics. For instances, the EMBRAPII program is a good example of a source of the private projects in the IT area.

b) UNDERSTANDING: The rejection of the Virtual Technological Park idea by the local IF community due the lack of information about the project proposal and the innovation management concept. Unfortunately, this kind of proposal the innovation concept are outside of the current cultural in the Federal Institutes, neither in the universities.

c) ECONOMY: The weakness of the national economic system that may affect the ordinary activities of the IF, as the administrative internal works (cleaning, security, material maintenance, electricity, etc.). Besides this, this kind of weakness inhibits the private companies to invest in new projects.

5.4.2 Premises

Premises are the hypotheses or statements that an argument claims will induce or justify a conclusion. In other words, a premise is an assumption precise and clear that something is true for the planning project. The following are listed two premises about the Virtual Technological Park project:

a) INNOVATION POLICY of the FEDERAL INSTITUTE UNIT: The adoption of the innovation concept as a general direction for education policy in the Federal Institute. For that the rector and his staff must to consider the research and development as important activities as the education action. Unfortunately, it isn't the reality in many Federal Institute units that consider research activities more concerning with the university mission. In this case, the premise is to have a FI staff strategy against this conservative action.

b) CULTURAL ORGANIZATION: While the adoption FI INNOVATION POLICY is a premise concerning the FI staff, the CULTURAL ORGANIZATION is related to the each FI unit. Actually, the FI units are different spaces in terms of cultural organization that depend on the many abstract aspects able to promote changes: commitment of the teachers, administrative people and students; political vision of them; general sensibility to changes; etc.

5.4.3 Restrictions

In project management restriction is any constraint that defines a project's limitations and difficult what is expected to accomplish it. Although, the three most significant project restrictions are schedule, cost and scope, each project's scope involves the specific goals, deliverables and tasks that define the boundaries of the project. The following are listed threes concerned restrictions about the Virtual Technological Park project:

a) TECHNICAL INFRASTRUCTURE: The term "virtual" in the title of the proposal is an import feature of the project because dismiss the big investment in buildings, as happen in the conventional Technological Park concept. However, in order to implement the proposed here it is indispensable to have adequate labs to execute the projects, the main requirement to execute the Virtual Technological Park project.

b) AVAILIBILITY TIME of RESEARCHS and COLLABORATORS: The availability of the research professors and collaborators teachers to coordinate and manage the projects is indispensable to execute the main activities of the Virtual Technological park. Sometimes these professors and teaches are very charged in education activities and there isn't time to dedicate to the projects.

c) FINANCIAL SUPPORT of the SCOLARSHIP STUDENTS: Besides the TECHNICAL INFRASTRUCTURE and the AVAILIBILITY TIME of RESEARCHS and COLLABORATORS restrictions above, without the scholarship students is also impossible to archive the objective of the proposed here. After all, the professional formation of these students and their experience in real scenarios provided by the projects come from the private companies is the main strategy proposed by the Virtual Technological Park.

6   Final Considerations

The Virtual Technological Park proposed in this work is based on two perspectives. In the Pedagogical approach are considered the creativity, initiative and knowledge management, important aspects for graduate students independently if they decide to become or not the owner of their business or maybe a public or private employee. The Citizen approach take in account the knowledge about the set up and management of a company and how this can help the students to become a conscious citizen and to collaborate much better to the society.

Actually, this proposal is part of the Call for Participation (BRASIL, 2017) to an Innovation Management Professional (IMP) from the Steinbeis Berlin University, promoted by the SETEC/MEC to IF teachers and administrative people involved in the innovation theme. The aim of this IMP course is the dissemination of the technology transfer cultural in IF environment to help all the IF campuses to add the innovation management as regular process in their daily routine.

The results presented by the initial experience from the Aracati Digital (ARACATI, 2018), listed before (item 2.2), are positives towards the Virtual Technological Park objectives and they prove that the FI Mission could be helped in this way.

We truly expect the IMP methodology will improve the Virtual Technological Park experience in order to create more local opportunities for the former student for his professional career and formation of a new Brazilian citizen through commitment, innovation and a change in attitude.

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MINISTÉRIO DA EDUCAÇÃO
Secretaria de Educação Profissional e Tecnológica
Instituto Federal do Ceará – Campus ARACATI

INNOVATION
MANAGEMENT
PROFESSIONAL

Steinbeis Berlin University

Prezado Professor,
Convido-o a colaborar com o projeto
Virtual Technological Park respondendo às
perguntas, a seguir (em uma linha).

1. Cite um projeto seu que pode melhorar o município onde você trabalha! Qual o título?

Resposta: _____

2. Por que este projeto melhoraria o município onde você trabalha?

R: _____

3. Você acha que este projeto melhoraria a sua vida?

R:

_____

4. Qual a principal motivação para outras pessoas participarem de seu projeto?

R: _____

5. Cite 3 qualidades que alguém deveria ter para ser colaborador de seu projeto?

R: _____

6. Escreva uma frase (sua ou não) que identifica os resultados esperados em seu projeto:

R: _____

7. Qual o resultado mais impactante que você espera do seu projeto?

R._____

8. Qual a principal dificuldade para a realização do seu projeto?

R. _____

9. Você acha que alguém poderia não gostar do seu projeto? Imagine uma razão?

R: _____

10: Qual sua principal motivação para a realização do seu projeto?

R:_____

EXCELENTE! Muito grato pela sua colaboração.
Também acredito, como você, que a EDUCAÇÃO pode mudar o Brasil.

Mauro Oliveira (mauro@lar.edu.ifce.br)

APPENDIX 01b: Pool forms: IFCE Student

MINISTÉRIO DA EDUCAÇÃO
Secretaria de Educação Profissional e Tecnológica
Instituto Federal do Ceará – Campus ARACATI

INNOVATION
MANAGEMENT
PROFESSIONAL

Steinbeis Berlin University

Prezado Professor,
Convido-o a colaborar com o projeto
Virtual Technological Park respondendo às
perguntas, a seguir (em uma linha).

O projeto PARQUE TECNOLÓGICO VIRTUAL, submetido ao programa INNOVATION MANAGEMENT PROFESSIONAL, promovido pelo MEC/SETEC, realizado pela *Steinbeis Berlin University*, tem como objetivo criar um "ecossistema profissional" nos Institutos Federais que permita ao aluno trabalhar/gerar renda ao terminar seu curso no IFCE, contribuindo para o desenvolvimento social, cultural e econômico de sua cidade. Para tanto o projeto objetiva a criação de empresas, startups, etc., a partir da parceria em projetos realizados com o mercado.

Agradeço sua colaboração dando uma nota de 0 a 5 (e justificando) a cada um dos itens abaixo:

1. [   ] Qual a importância da EDUCAÇÃO para a solução dos atuais problemas brasileiros?
Justifique: _____

2. [   ] A EDUCAÇÃO que você recebe no IFCE é adequada à solução destes problemas?
J: _____

3. [   ] Você tem certeza de que o IFCE contribui eficientemente para sua melhoria pessoal e profissional?
J: _____

4. [   ] O IFCE contribui efetivamente para o desenvolvimento social, cultural e econômico de sua cidade?
J: _____

5. [   ] Você tem alguma responsabilidade social com sua cidade (participa de algum projeto social)?
J: _____

6. [   ] O problema tratado (empregabilidade) no projeto VIRTUAL TECHNOLOGICAL PARK é relevante?
J: _____

7. [   ] Ao terminar seu curso você já tem planos para ir trabalhar em outra cidade?
J: _____

8. [   ] Você permaneceria no município se houvesse trabalho e remuneração adequados à sua formação?
J: _____

9. [   ] Você trabalharia no seu município em uma atividade de menor (diferente) qualificação profissional?
J: _____

10. [   ] Você estaria motivado a criar uma empresa em seu município na sua área profissional?
J: _____

Enviar resposta para (mauro@lar.edu.ifce.br).
Grato! **Mauro Oliveira**

TAP - Termo de abertura de projeto
(apresentado na candidatura ao curso – nov/2017)

TÍTULO

Parque Tecnológico como estratégia de inovação profissional e fortalecimento da identidade dos Institutos Federais

JUSTIFICATIVA

Almejar um emprego público ainda é desejo profissional prioritário de muitos jovens, apesar de que a realidade de mercado tem despertado neles a busca de empreendimento em seu próprio negócio. Este desejo do emprego público tem fortes razões culturais e educacionais: a falta de iniciativa dos alunos, dificuldade na resolução de problemas, falta de criatividade na solução destes, costume de deixar incompleto e mal feito o que lhes é confiado.

É dever do Instituto Federal ajudar o aluno a ter iniciativa, exercitar sua criatividade, zelar pela completude e qualidade das tarefas. Para tanto, faz-se necessário um leque de conceitos até então desconhecidos do aluno, tais como Economia Criativa, modelos de negócio ou gestão que se originam em atividades, produtos ou serviços desenvolvidos a partir do conhecimento, criatividade ou capital intelectual de indivíduos com vistas à geração de trabalho e renda. Iniciativa, criatividade e determinação são, portanto, requisitos desejáveis em qualquer atividade profissional, mas indispensáveis para quem quer ser dono do seu próprio negócio.

Preparar o aluno nesta direção faz parte do conceito do Instituto Federal, mesmo que o aluno não tenha a vocação empresarial. Afinal, existem riquezas pedagógica e cidadã neste processo:

• Pedagógica: o conhecimento sobre os mecanismos de gestão de uma empresa pode ser importante para o futuro pessoal e profissional do aluno, independentemente dele ser empregado no setor público ou privado. A aprendizagem da gestão de coisas pessoais, seja em casa quanto na Escola, é um primeiro benefício para o aluno envolvido nestas atividades.

• Cidadã: à medida que o aluno compreende melhor as etapas na criação e manutenção de uma empresa, ele passa a ter melhor consciência dos desafios diários enfrentados por um dono de um negócio qualquer, do "fantasma" da folha de pagamento no final do mês, etc. Sua criticidade e capacidade de colaborar com a sociedade serão mais refinadas, justas e eficientes.

Fazer o negócio acontecer, ou seja, vender o produto ou o serviço é uma parte complexa e determinante na sobrevivência de uma empresa de qualquer porte.

É dever do Instituto Federal ajudar o aluno a ampliar estas percepções e incentivá-lo a empreender, a se preparar para ter seu próprio negócio, mesmo que não seja esta a sua vocação. Nota-se que esta percepção do negócio pelo nosso aluno não tem sido bem cuidada na sua formação.

OBJETIVOS

Objetivo Geral

Criação de uma metodologia de implantação e gestão de Parques Tecnológicos baseada no Aracati Digital (https://www.aracatidigital.com.br/), experiência em curso no IFCE campus Aracati, como uma ação piloto inovadora, propositiva de uma política educacional a ser adotada pelos Institutos Federais envolvendo educadores e discentes, apoiada por programas privados e púbicos, tais como EMBRAPII, Rede de Incubadoras, Agências de Fomento (FINEP, CNPq, Fundações Estaduais, etc.), SEBRAE, etc.

Objetivos Específicos

1) Elaborar estudo sobre a experiência do Aracati Digital (https://www.aracatidigital.com.br/), além dos impactos socioeconômicos de outros parques tecnológicos existentes, razões de êxitos e fracassos;

2) Elaborar uma metodologia para a implantação de Parques Tecnológicos como estratégia de inovação profissional e fortalecimento da identidade dos Institutos Federais, capaz de fortalecer sua identidade;

3) Implantar células de produção, a partir dos laboratórios "treinados", como prova de conceito da proposta de Parques Tecnológicos como estratégia de inovação profissional e fortalecimento da identidade dos Institutos Federais;

4) Realizar parceria com o setor produtivo na perspectiva da instalação e manutenção de um parque tecnológico piloto, a partir dos resultados obtidos nas células de produção;

5) Elaborar um manual de gestão da inovação com recomendações para a replicação do projeto em qualquer Instituto Federal.

Estratégia de Execução

1) Realização visitas de campo e estudos sobre casos de Parques Tecnológicos de sucesso no Brasil: Porto Digital (http://www.portodigital.org), São José dos Campos (http://www.pqtec.org.br/), Sapiens Parque de Florianópolis (http://www.sapiensparque.com.br/);

2) Construção de um modelo que junto à comunidade docente, servidores e representação de empresários concernentes que potencialize um Parque Tecnológico de TI como estratégia de inovação profissional e fortalecimento da identidade dos Institutos Federais, capaz de fortalecer sua identidade;

3) Criação de processos que definam requisitos objetivando a especificação formal do modelo construído;

4) Apresentação de objetivos, metas e simulações que melhor ilustrem para a comunidade discente a proposta da criação de um Parque Tecnológico, seu contexto, seu universos de capacitação e de oportunidades;

5) Definir um modelo de negócio para o funcionamento do Parque Tecnológico no contexto da proposta apresentada.
6) Treinamento de laboratórios de P&D dentro da metodologia da proposta de um Parque Tecnológico de TI como estratégia de inovação profissional e fortalecimento da identidade dos Institutos Federais, capaz de fortalecer sua identidade;

7) Apoio a programas locais de redes de incubadora e ações similares (SEBRAE, governo, empresas, etc.), corredores digitais (Secretaria de C&T do Ceará);

8) Visitação de empresas para prospecção de parcerias e fortalecimento da proposta do Parque Tecnológico como estratégica pedagógica a ser adotada pelos Institutos Federais;

9) Realização de workshops com empresários e gestores, organizado por professores e alunos envolvidos na execução, objetivando facilitar a prospecção de futuras parcerias

10) Publicização da proposta com o intuito de consolidar o Parque Tecnológico como estratégia de inovação profissional e fortalecimento da identidade dos Institutos Federais, tornando-a pública;

Equipe do projeto

Profa Dra Marcia Negreiros (http://lattes.cnpq.br/4324545790655825)
-Coordenadora do PARTEC – NUTEC;

Profa Dra Carina Oliveira (http://lattes.cnpq.br/2893590409825756)
-Coordenadora P&D-IFCE Aracati;

Prof Dr Reinaldo Braga (http://lattes.cnpq.br/6508590684390942)
-Coordenador de Projeto de TI

Carta de Apresentação
(apresentada na candidatura ao curso – nov /2017)

A expansão recente dos Institutos Federais de Ensino vem se configurando como uma das medidas mais impactantes na história da Educação profissional no Brasil, desde o decreto 7.566 do Presidente Nilo Peçanha que cria, em 23 de setembro de 1909, a Escola de Aprendizes e Artífices.

A visibilidade deste impacto é, talvez, mais nítida para quem teve a oportunidade de acompanhar a evolução desta instituição centenária. Em 1970, ingressávamos no curso de Eletrotécnica da então Escola Técnica Federal do Ceará (ETFCE), denominação que acabara de substituir a Escola Industrial do Ceará. Já em 1974, tornávamo-nos professor da ETFCE, iniciando uma carreira no magistério e toda uma saga que conduziria nossa vida pessoal e profissional, definitivamente, afetadas por esta instituição. Nos anos 80, assumíamos a coordenação do Curso de Eletrotécnica sem imaginar que teríamos, na mudança de século (e de milênio), a nobre missão de comandar, como Diretor Geral, a transição da ETFCE para Centro Federal de Educação Tecnológica do Ceará (CEFET Ceará).

Éramos, na ocasião, o único professor com doutorado em uma comunidade originária dos ensinos médio e técnico de segundo grau. Assumir responsabilidade no ensino superior apresentava-se como um grande desafio cultural e científico, por vezes assustador. A formação maciça de mestres e, posteriormente, de doutores era a alternativa mais segura para o CEFET Ceará encontrar sua nova identidade que exigia ousadia nos novos caminhos na educação superior. Sim, defendíamos já no raiar do novo século a ideia de uma universidade tecnológica, inspiradas nos institutos de tecnologia da Alemanha que já "respiravam" o conceito de inovação, dando maior brilho à clássica tríade Ensino, Pesquisa e Extensão.

Ao presenciarmos, hoje, a solidez dos Institutos Federais, há de se considerar sua origem fundamentada numa estrutura que possuiu, em algum momento de sua história, mais laboratórios do que salas de aula convencional. Talvez este perfil, alicerçado no praticar as "coisas da teoria", seja o diferencial maior que dá aos Institutos Federais uma característica de uma instituição de ensino mais próxima da sociedade, de seus anseios e demandas.

Não é por acaso que nossos alunos apresentam um potencial mais criativo em soluções tecnológicas, deixando o primor científico às universidades. Afinal, seus professores foram forjados, historicamente, numa ambiência que associa a prática à teoria, num equilíbrio que se adequa à evolução temporal da instituição e seus contínuos desafios.

Se a missão da universidade, do latim "universitas" (conjunto, universalidade, comunidade) está associada ao pensamento empírico e às descobertas científicas que vieram na sequência da revolução industrial iniciada no século XVIII, há de se perguntar: teriam os Institutos Federais a mesma missão?

Claro que não! Não haveria um porquê de se criar um "outro" pra se falar "do mesmo". O clássico diagrama de Venn-Euler ajuda na busca da identidade dos Institutos Federais. No que se refere ao que há em comum, em sendo instituições de nível superior as universidades e os Institutos Federais, demanda das mesmas um diferencial de formação propedêutica em relação ao ensino médio. Isto é lógico! Há também nesta visão comum uma perspectiva vertical: universidade e institutos federais devem(riam) zelar por desenvolver habilidades criativas em seus alunos. No entanto, creio que os Institutos Federais são mais pragmáticos do que as universidades em relação as demandas da sociedade às suas instituições de nível superior. A EMBRAPII e os Institutos Federais ilustram bem esta sinergia.

Em nosso livro Escola Pra Valer, lançado em 2016, destacamos como missão maior de uma Escola "ajudar o aluno a ser feliz". Em seguida, defendemos que "uma escola que é reflexo da sociedade não serva pra ela... nem a ela". Argumentamos também a indispensabilidade de uma quinta linguagem (além de português, matemática, inglês e informática) a qual chamamos de estética (na falta de um termo melhor), para designar a importância da arte e da filosofia na formação deste aluno que o queremos feliz e transformador da sociedade.

Voltando à busca da identidade dos Institutos Federais, advogamos que o conceito de Parque Tecnológico fortalece a vocação dos Institutos Federais. Por isso defendemos que este conceito deve estar presente no imaginário do aluno de um Instituto Federal, desde o seu primeiro dia na instituição.

Este trabalho propõe a adoção de um Parque Tecnológico em cada Instituto Federal como uma ação pedagógica, tendo como estratégia o envolvimento de educador comprometido e do discente cúmplice de um ecossistema empresarial a ser exercitado nesta nova ambiência, durante toda a sua permanência na instituição. Este ecossistema fortalece a identidade dos Institutos Federais, ajudando-os a melhor cumprirem seus papéis de formação profissional e cidadã, incentivando o espírito empreendedor do aluno e a cultura de inovação tecnológica nos campi da Instituição.

APPENDIX 04: Author Biography (www.maurooliveira.com.br)

Education:

Mauro Oliveira is a former IFCE (Insituto Federal de Educação Ciência e Tecnologia do Ceará - 1974) student and holds an Electrical Engineer degree from UFC (Federal Universidade do Ceará – 1983). He earned his Master of Science degree in Computational Systems from the PUC-Rio (Universidade Católica do Rio de Janeiro - 1987) and earned his PhD in Computer Science from the Université Pierre et Marie Curie (Paris VI, France/1993). He then carried out a postdoctoral stage at the Centre for Telecommunication Research (CTR) at the King's College of London (2003). He finished another postdoctoral stage at the School of Information Technology and Engineering (SITE), University of Ottawa (Canadá/2009).
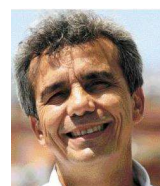
Current Situation:

He was born in Fortaleza/Brazil, works at the Aracati City and lives in Canoa Quebrada beach. At the IFCE he teaches Computer Networks, Computer Architecture and Scientific Methodology since 1974 and he is also Professor of the Postgraduate Program at the IFCE where he researches the theme Computer Application in Health Systems. He founded a computer network research group in 1987. Nowadays this group applies Computational Intelligence in Health Systems. Mauro Oliveira has created the BARCA – Bodega de Artes Raimundo de Chiquinha do Aracati, the first bookstore of Aracati city, a little "café des arts" that promotes many cultural activities and each year give the prize "Prêmio LF de Computação" (https://amauroboliveira.wordpress.com/galeria/meus-amigos/prof-luiz-fernando-lf/) for the best social project.

Administrative Experiences:

He served as The National Secretary of Telecommunications of the Brazilian Communications Ministry (MC) from June 2004 until September 2005, where acting as responsible by the Brazilian Digital TV Project. He was also Adjunct Secretary of Science & Technology and Higher Education at the State of Ceará, from January 2007 to April 2008. Prior to his nomination as MC's Telecommunication Secretary, Professor Mauro Oliveira was IFCE General Director (1988-2003). He spearheaded the IFCE's education activities, particularly a social project at Pirambu, a disadvantaged district of Fortaleza with many problems of infrastructure, unemployment, drugs and marginalization among the young people. This project, initiated in 1993, is an experience of success in the Digital Divide context. The youths were trained at the IFCE in Software Development and Network Connectivity. Nowadays, they are entrepreneurs of the IT sector, in their own neighborhood. This project, called "Pirambu Digital", is based on the cooperative model and uses concepts of solidarity economy. His methodology has been replicated in other suburbs of the Ceará state. He participated of the first meeting (1988) for the implementation of the Internet in Brazil and was member of the CGI.BR (Manager Committee of the Internet Brazil).

Personal information:

Mauro Oliveira has 4 daughters: Karol, Carolina, Carina e Raquel. He likes music and in his free time, sings, plays tambourine (Dr Luiz Fernando´s student) and writes poems.
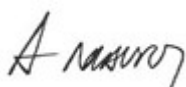
International Experiences:

On the international scene, Professor Mauro Oliveira actively participated in several meetings on the ADVANCE Project / RACE European Program (1991-1993) and he has given countless technical lectures about Digital TV and Computer Networks in Europe (Paris, Zurique) and Digital Divide lectures in Latin America (Santiago, Buenos Aires). As Telecommunication Secretary of Brazil, he attended meetings for the Preparatory Committee (met in Geneva at 19 Sep.2005) for the World Summit on the Information Society (WSIS) in Tunis, in 2005. He served as The National Secretary of Telecommunications of the Brazilian Communications Ministry (MC) from June 2004 until September 2005, where acting as responsible by the Brazilian Digital TV Project. He was also Adjunct Secretary of Science & Technology and Higher Education at the State of Ceará, from January 2007 until April 2008. He was Guest Professor of the DEA Program at the Université de Technologie de Troyes (2003). He also gave lectures in the Département D'Informatique at the Université Claude-Bernard, Lyon 1 (1991). Mauro Oliveira is proficient in three languages: French, English and Portuguese.

Decorations and honorary titles:

- Homenagem do Depto de Computação da Universidade Federal do Ceará (UFC) em reconhecimento ao pioneirismo na área de Redes de Computadores no estado (2018)
- Medalha de Honra ao Mérito Raimundo Cesar G. A. Araripe, IFCE (2018)
- The Best Paper Award In 1st IEEE Summer School on Smart Cities, UFRN (2017)
- Requerimento do Vereador Evaldo Lima transcrevendo o artigo "Porque hoje é sábado" nos anais da Câmara de Vereadores de Fortaleza (fevereiro de 2016)
- Menção Honrosa no Prêmio Celso Furtado de Desenvolvimento Regional do Ministério de Desenvolvimento Social com o Projeto PRECES – PRofissionalização do dependentE químico, Como Estratégia de inserção Social (2015)
- Ordem do Mérito Judiciário - Grau Distinção, Superior Tribunal Militar (2010)
- Homenagem da Assembleia Legislativa do Estado do Ceará: TV Digital & CEFET Ceará. (2010)
- Homenagem do IFCE: Dia do Ex-Aluno, Instituto Federal de Educação C&T do Ceará. (2008)
- Segundo Lugar no Prêmio FINEP de Inovação - Região Nordeste, FINEP (2008).
- Prêmio Vivaleitura, Ministério da Educação - OEI. (2008)
- Transcrição para os Anais do Artigo "O Abraço do Dragão" - Jornal O POVO, Assembleia Legislativa do Ceará - Requerimento do Dep Roberto Claudio - No 1081 de 03 de abril de 2008.
- Voto de Congratulação pelo Projeto Titanzinho Digital, Assembléia Legislativa do Ceará - Requerimento do Dep Artur Bruno No 1384 de 23 de abril de 2008. (2006)
- Medalha do Mérito da Educação Profissional, Secretaria de Ciência e Tecnologia do Ceará 2005
- II Prêmio Telemar de Inclusão Digital, Fundação Telemar. (2003)
- The Best Paper Award In Simulation at ASCC 2003, IEEE Comp Society. (1997)
- Voto de Congratulação pela criação de um site no bairro Cristo Redentor, Assembléia Legislativa do Ceará - Ofício AL03978/97 - Iniciativa do Dep. Artur Bruno. (1997)
- Voto de Congratulação pela Criação do Projeto Escolinha Virtual, Câmara Municipal de Fortaleza - Oficio 3924/97- Iniciativa do Vereador Cid Marconi. (1997)
- Reportagem sobre o Projeto Escolinha Virtual, Folha de Sao Paulo (1995).
- Reportagem sobre a Rádio Uirapuru de Itapipoca, Folha de São Paulo (Folha Ilustrada) 1995.
- Voto de Congratulação pela realização da III Escola de Verão em Redes de Comutadores, Assembléia Legislativa do Ceará - Ofício 0369/95 - Iniciativa do Dep. Mário Mamede. (1995)
- Placa de Agradecimento da Presidência da República, Diretor Geral de Administração da Presidência da República. (1994)
- Segundo Lugar no Concurso de Melhor Trabalho do XII SBRC, SBRC. (1994)
- Menção Honrosa - Trabalho de Iniciação Científica da UECE, UECE. (1993)
- Reportagem sobre a Radio Uirapuru de Itapipoca, Revista VEJA (coluna Educação). (1993)
- Carta de Reconhecimento do trabalho no ADVANCE Project, ADVANCE Project. (1989)
- Troféu Símbolo do Trabalho, Grupo Direção da ETFCE. (1987).

Aracati, 07 de maio de 2018

Antonio Mauro Barbosa de Oliveira