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The internationalization of new technological venture with the STPs new business models

PARALLEL 4

New business models for incubators in STPs

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Executive Summary

The new business models for incubators in STPs are important for new technological venture, but in developing countries they are crucial, for several reasons. The first reason is the dominance of foreign investment in critical manufacturingsectors. New national technological ventures have great difficulty to compete with suchmore established international enterprises inside their own borders. The second aspect is the shortage of effective R&D funding in development countries, making the conversion of university research into economicgrowth a vital issue for the future of these countries. This article aims to show that the success of a technologybased company—inaddition to technological innovation—depends on organizational innovation, marketing innovation andinnovative business models to complete efficiently in the full cycle of innovation, comprised of research, development and commercialization (R&D&C). Finally, this paper presents a mechanism and method for technology transfer between university and enterprise, and points out the restrictions faced.

Introduction

In order to implement any innovation, it is necessary that enterprises have the full cycle of innovation, including dynamic research, development and commercialization (R&D&C). However, in many developing countries, and in Brazil in particular, most of the research and generation of science and technology happensatstate universities and research centers. Of the approximately one hundred and fifty thousand scientists and researchers working in Brazil, 82% are in universities and only 18% are in research centers of private companies (Cruz, 2008). According to Barreto (2011), President of the Brazilian Support Service for Micro and Small Enterprises (SEBRAE), "one of the aspects that need to be improved in Brazil is the issue of innovation. In 2010, only 16.8% of the Brazilian entrepreneurs stated that their product was new to some or all consumers.In innovation, we need to improve a lot. […] In the United States this figure is nearly 40%" (www.veja.abril.com.br).

According to Fekete and Viegas (2011), only 1.2% of the Brazilian GDP was directed to technology development in 2004, while in developed countries from 2 to 2.7% of the GDP go to this purpose. In number of deposited patents—aparameter internationally accepted as evidence of the technological development of a nation—inBrazil only 98 patent applicationswere filed in 2000, whereas in South Korea—whichhas a similaramount of scientific production as Brazil—reached3,314 patents deposited in the same year—nearly43 times as much. The Brazilian scientific production represents 1.55% of the scientific papers published in the world, but very little of it is transformed into patents, and even less into wealth (Fekete andViegas, 2011).

Given this situation, there is a need forentities tosupport starting technology based enterprises (TBEs), so they can launch innovative products and impact society. The act of taking research outcomes and technologies to the market was called *technological entrepreneurship*by Ndonzuau et al. (2002). The technological entrepreneurship is typified by the creation of new TBEs by entrepreneurs, mostly with previous experience in R&D, either in large companies or in academicenvironments. The constant generation of cutting-edge research is indispensable for the consolidation of a dynamic productive sector, and the innovation process only completes its cycle within the companies when technologies generated in the laboratory are incorporated into products and marketed successfully in the market (Cruz, 1999).

Considering that a new technologybased company planning to launch a new technology in the market needs be innovative, technology entrepreneurs have to know how to outline the concept of innovation, the innovation cycle and how to market it.

In this venue, the purpose of this paper is to describe models of technology transfer from technological research, the concepts of innovation, andwhat distinguishes technological, organizational, marketing and business models. We assume that such knowledge is a success factor for new technology-based entrepreneurs, and should be considered by policymakers in order tomake dynamic and productive the Technological Innovation Nuclei which today exist in most Brazilian stateuniversities and research entities.

Innovationtypes or approaches

The document produced by the OECD – Organization for Economic Co-operation and Development (OCDE/FINEP, 2005), called 2005 Oslo Manual, divides innovation in four levels: product innovation, process innovation, marketing innovation and organizational innovation. Innovation is thus defined as "the implementation of a new or significantly improvedproduct (good or service), or process, or new marketing method, or new organizational method intobusiness practices, workplace organization or external relation"(OCDE/FINEP, 2005, p.55).

Product innovations involve significant changes in the potentialities of products and services. They include totally new goods and services and significant improvements in existing products, such as technical specifications, components, materials, incorporated software or ease of use.

Process innovations are represented by significant changes in production and distributionmethods. They include changes in techniques, equipment and/or software. Process innovations may be intended to reduce costs of production or distribution and improve quality.

Marketing innovations are the implementations of new marketing methods with changes in product design, conception or packaging, in product positioning, promotion or pricing. Marketing innovations aim to better meet the needs of consumers, open new markets, or reposition the company's product in the market, with the goal of increasing sales.

Finally, organizational innovations are the implementations of new organizational methods into business practices of the company, organization of its workplace or its external relations. Organizational innovations aimat improving the performance of a company by reducing administrative costs or transaction costs, or stimulating workplace satisfaction (and therefore the labor productivity) (OCDE/FINEP, 2005).

In firms with low and medium technology,regardless of their size, innovation activities are generally focused on production efficiency, product differentiation and marketing (Von Tunzelmann andAcha, 2005). On the other hand, small and medium enterprises (SMEs) have more specialized needs in their activities. This increases the importance of an efficient interaction with other firms and with state research institutions for R&D, knowledge exchange, and potentially commercialization and marketing activities (OCDE/FINEP, 2005).

Innovations can be seen as an evolution or incremental contribution to an existing technology, or as something totally new that differs significantly in value and use of something previously in the market—situation in which no parameters for value comparison are available. In either case, an innovation will be important when it disseminates in society (Guerra, Gomes and Cheng, 2011). Moreover, innovations do not achieve success before the right economic and social conditions arise, as well as complementary innovations (Etzkowitz, 2003).

Innovation through business models for value creation

Even after the recognition of the four levels of innovation (product, process, marketing and organizational) in the 2005 Oslo Manual, some authors have pointed out that the concept of innovation is yet limited. They call for the idea of innovation of the business model. According to Ades, Vasconcelos and Plonski (2011), "the innovation of the business model should be contemplated by international criteria such as the Oslo Manual and the Technological Innovation Survey released by the Brazilian Institute of Geography and Statistics (PINTEC/IBGE), and valued by managers and international regulatory bodies, and not just seen as organizational innovation."

According to Johnson, Christensen and Kagermann (2008), business model innovation occurs simultaneously in more than one of the levels or areas preconized in the Oslo Manual. Business model innovation aims at creating value for the customer, as itrefers to seeking to understand a fundamental problem that needs to be solved, to then design the good or service that the company will offer to the market. Business model innovation is a formula for profit, as it defines how the company will generate value for itself in the act of delivering value to the customer. With this in order, the company will look for obtaining key resources (people, technology, products, facilities,

equipment, channels, partnerships and brand) and for operation and management processing in order to provide value in a way that is reproducible and likely to grow in scale (marketing, training, information technology, product development, metric rules, etc.). It is possible to involve a technology (new or existing) combined with software or a new type of service that will deliver value to consumers.

More than a business plan that deals with estimated sales, prices and projected financial results, a business model has been regarded as strategic for the introduction and implementation of an innovation. Chesbrough (2010) comes to the point of saying that"one mediocre technology accompanied by a great business model will be more valuable and well rewarded than a superior technology with a mediocre business model." The literature well describes Apple Inc.'s experience of basically giving for free iTunes music (low-margin) to secure the purchase of the iPod (high margin). Apple's business model has showed the value of a new way of doing business and gave consumers such a revolutionary convenience in purchasing music that it made competitioninsignificant. Johnson et al. (2008) stated that "Apple did something smarter than wrap a good technology with a flashy casing—it took a good technology and wrapped it in a great business model. In just three years, the duo iPod/iTunes became a product of nearly $10 billion, generating about 50% of Apple's revenue."

Taking into consideration the observations contained in the studies of the aforementionedauthors, plus the analysis inChesbrough and Schwartz (2007), it appears that, in general, an innovative business model consists of the following elements:
(a) market segments that value innovation;
(b) value proposition to customers;
(c) cost structure;
(d) revenue generation;
(e) distribution channels;
(f) strategic partnerships and the company's position in the value chain, and
(g) competitive strategy.

These components can lead to functions that can be briefly described as follows:
1. Define market segments, i.e., identify the users for whom the technology is useful and the purpose for which it will be used;
2. Determine the value proposition to be created for the customers through the product offerings based on the new technology or distribution model;
3. Draw the company's value chain structure that is required to create and distribute the goods and services, and to determine the complementary assets needed to support the company's position in the value chain;
4. Describe the mechanism(s) for revenue generation to the company, and calculate the cost structure and margins required to produce the goods and services considering the value chain of your choice;
5. Find the company's position within the value network, connecting suppliers and customers, including the identification of potential complementary and competing firms;
6. Consider the scenario of reference innovation and build new scenarios of value appropriation of the results of R&D, marketing and distribution.

With respect to the formation of strategic partnerships for innovation, one can observe that globalization has been providing businesses a good environment to identify partners in different parts of the world with complementary assets, as well as means to commercialize their technologies in different markets simultaneously with the national market. Kim and Mauborgne (2005) show that a strategy of partnerships with larger companies can reduce the costs needed for marketing and distribution. As an example, they mention the case of the software company SAP R/3, which used a partnership to benefit with the know-how and economies of scale of a manufacturing company. In doing so, itearned overnight a global sales force at no additional cost. Other mentioned example is the partnerships that made it possible to innovate in pricing, such as the case of Hewlett-Packard, which went on to receive a percentage of the revenuesof other companies.

Besides sharing production structures, partnerships are important for learning the process of enterprise development (DOMINGUINHOS, 2007), in special for small and medium enterprises (Baron and Shane, 2007). There are several ways of incorporating new knowledge in business, such as

seminars with other organizations, participating in the development of partnership projects and hiring professionals with high specialized skills to attend both partners. In exploring a new opportunity it is important to have a state of readiness and a prompt evaluation mechanism to provide rapid responses to requests from the partners and market challenges.

Regarding venture capital, besides providing access to capital and organizing decision making, partnering with venture capital companies can add new competencies to the base of the capital seeking company, due to the venture capital expertise in activating new enterprises and relationships that can mobilize access to resources, markets and information.

Lastly, partnerships with universities and research centers through research projects are importantdue to the global dispersion of knowledge.They allow the creation of mechanisms that make it possible to firms enter places where knowledge is generated. This increases their knowledge base, especially when the knowledge is protected by patents (Dominguinhos, 2007; Baron and Shane, 2007). Through such partnerships, new technologies with the potential of being transformed into new products may be disseminated.Moreover, partnerships with universities and research centers allow, in some cases, that the company focuses on the niche product and market, as it develops organizational competence to make innovative new productsavailable to the markets and learns how to compete in them.

The innovation cycle

Despite incentives from the Brazilian government, Araújo (2008) identified gaps on the indicators for R&D and patent deposition. In particular, he points out the lack of indicators for marketing and adoption of new or improveddevices or processes, already included in the Oslo Manualand by FINEP (OCDE/FINEP, 2005). Moreover, this limitation pertains to most of the literature, as it seems to be forgetting that both R&D and patent depositing do not encompass the entire innovation cycle.

In general the full cycle of innovation has a pattern of effort and expense of resources as illustrated in Figure 1 below.

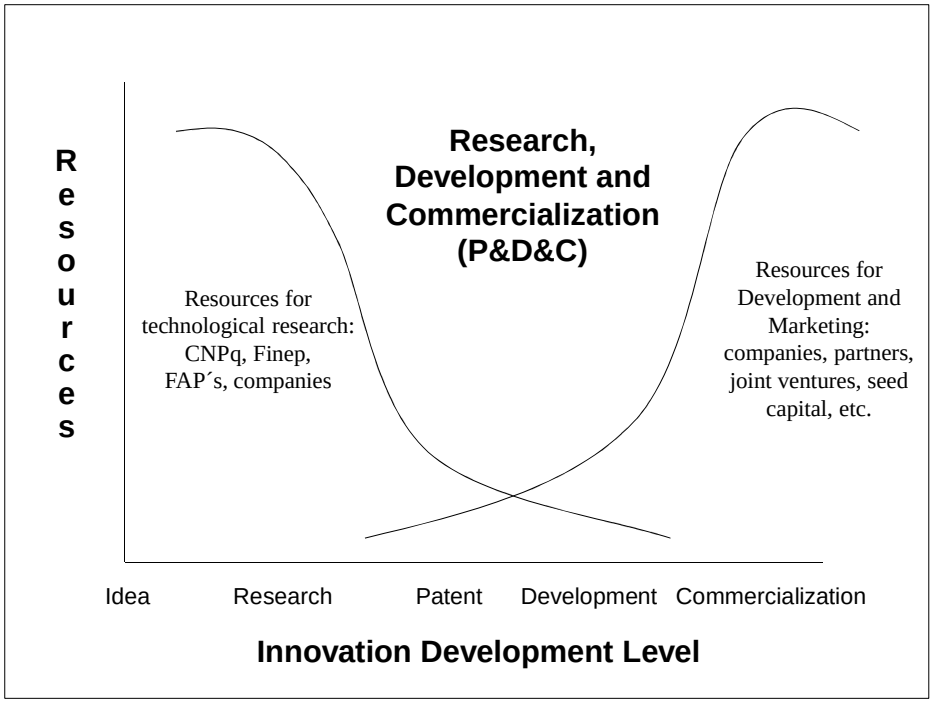

Figure 1. The Cycle of Innovation: distribution of resources for research, development and commercialization
Source: adapted from Markham (2002), Oliveira and Menck (2008).

The curve to the left of Figure 1 indicates the resources needed to create a technology, encompassing the research infrastructure of the company or university (labs), the time of highly

qualified researchers and external funding from research promoting agencies. The aggregate effort can result in a patent. In Brazil, some of the main science, technology and innovation funding agencies for companies are the CNPq (National Council for Scientific and Technological Development), the FINEP (Funder of Studies and Projects) and the several States' FAPs (Foundations for Research Support).

The curve to the right of the figure shows the resources needed for development—such as the production structures, tools and equipment—and marketing—marketing structure, advertising, sales and distribution.

Both sides are essential for the success of innovation, materialized with in the launch of an innovative product in the market.

Figure 1 makes clear the phases of Research, Development and Marketing (R&D&C). I.e., that in order to have Innovation (I), the three phases are needed, which is to say that Innovation = Research + Development + Commercialization (I = P&D&C).

This highlights that the usual notion represented by R&D&I—which indicates that innovation comes along with research and development—misses a relevant stage needed for innovation to acquire value. This is the stage of commercialization of the new innovating products, processes and services. Only when innovation reaches the market and represents some sort of value to solve consumer problems and needs it becomes truly an innovation, according to the definitions of the Cruz (1999), OCDE/FINEP (2005), Etzkowitz (2003), Guerra, Gomes and Cheng (2011), among others.

Figure 1 also highlights that universities and research centers only haves a structure for research and creation of technology. In those entities, prospection predominates, and there is no way to complete the cycle of innovation. On the other hand, a company can do research, develop products, processes, services, and marketing. Moreover, a company can also look for available technologies in research centers and universities to solve their customers'problems. Thus, a company can work in prospection and exploration to create value for itself and society.

Herk, Pinese,Desiderio and Oliveira (2011) noted that among technology-based incubators of Minas Gerais State in Brazil, the ones that are most successful are the very ones that created nuclei for the development of projects and products, or acquired basic tools and equipment for shared production among the incubated companies. Moreover, successful incubators maintain business relationships with large companies established in the market, able to help testing product concept and attractiveness, undertaking marketing strategies and implement commercialization. These incubators are working throughout the innovation cycle.

Open innovation in innovative business models

Having the R&D activities—both for products and processes—carriedout only in the company is understood, in some traditional industries, as a barrier to entry and competitive advantage against competitors (Ades,Sbragia, Porto,Plonski,Figlioli and Celadon, 2011). However, the advance of information technology and communication, online information, production technology and reduced costs introduced a new approach to technology management. In this new environment, companies can be more efficient in their R&D efforts using what is called open innovation. In 2003 Henry Chesbrough published the book titled "Open Innovation: the New Imperative for Creating and Profiting from Technology", arguing that companies could increase the results of R&D by taken advantage of synergies between their own knowledge assets and the knowledge of others available throughout the world.

The approach of open innovation has enabled companies to obtain advantage of ideas that would not make sense to be developed internally and others that perfectly fit the needs of the company, but were developed externally to it. This model allows "the company to commercialize their own ideas as well as innovations from other companies, and develop new products even outside their usual business" (Chesbrough, 2003).

Figure 2 below represents the Model of Open Innovation. The company's innovation funnel—fromcapturing ideas to commercializing products/technologies in the market—isrepresented by dashed lines, indicating that the company boundaries are permeable.

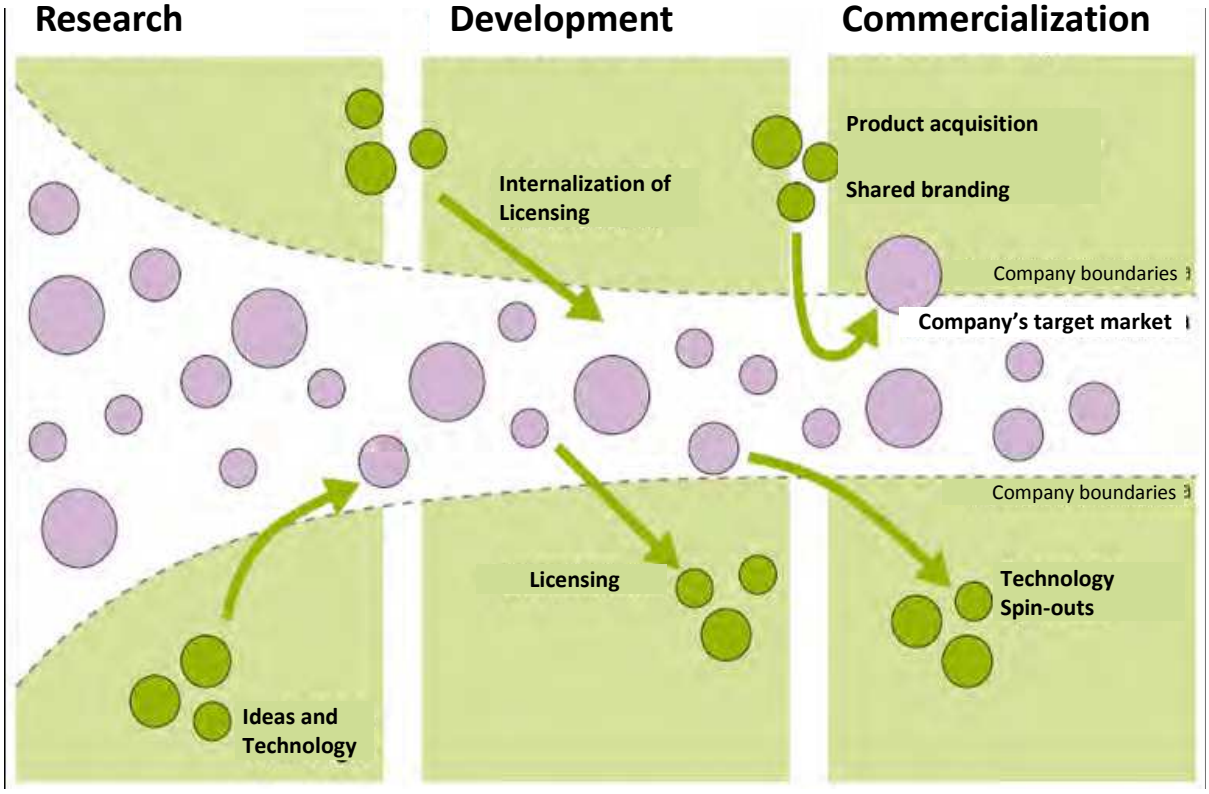

Figure 2: Model of Open Innovation
Source: Mortara etal. (2009)

In Figure 2, the Model of Open Innovation shows the phases of Research, Development and Marketing (R&D&C) contained in the Cycle of Innovation. In the Research and Development (R&D) phase, the *outside-in*processesare considered.Outside-in processes are the ones related to the internalization of knowledge and resources for the company, and include ideas and technology, internalization of licensing, product acquisition, and shared branding. In the stage of commercialization (C) reside the *inside-out*processes. Inside-out processes are related to the transfer of knowledge and results of R&D to C—theenvironment external to the company. They include licensing, outplacement of technology, and spin-outs.This model makes it explicit that it is equally important to consider all stages of the innovation: Research, Development and Commercialization.

The adoption of the open innovation model does not mean that R&D activities performed internally cease to exist. However, with the open innovation modelthey assume a new role and require new skills, such as identifying, understanding and accessing external knowledge, integration between internal and external knowledge, and generation of additional revenue from the integration. One exemplar case is the one of the small technology-based company Invit, in Uberlandia, Brazil. With an innovative idea and the open innovation model, it granted the commitment of 10 PhDs and 12 doctoral students to develop a project to identifyface images in crowds, which lead it to secure funding from FINEP (Desiderio, Oliveira and Ferreira, 2011).

The open innovation model is currently representing an evolution in organizational forms of companies in relation to innovation. The challenge of systematically generating technological innovations (of products and processes), marketing innovation and organizational innovation to create sustainable competitive advantages is making researchers, enterprises and governments to

deliberateabout how to best encourage innovation, i.e., the set of measures needed to achieve such goal.

Regardless of the model chosen for technologytransfer, what is central here is pivotal role of companies to make an innovation valuable to society. Only when companies appropriate a particular technology and use it to produce goods or provide services to society one can talk about valuable innovation. Therefore, the initial step in technological development is necessarily the empowerment of local companies toget and apply scientific and technological knowledge, be it foreign or domestic, developed within the company (closed innovation) or in research institutions and universities (open Innovation) (Chesbrough, 2003).

A model for the technology absorption for incubated companies in technology parks

With the increasing speed of the competition, many global business organizations are motivated to seek new concepts and configurations externally. Traditionally, outsourcing models used a similar approach to encourage outsourced firms to seek innovation on the products they supplied. Now, the idea is to stimulate the creation of content and ideas capable of enhancingthe core businesses.

The process of technology transfer to businesses and markets may result in an innovation when marketed.In order to be legal, when a technology is generated by a state university and then commercialized an external company, patenting and licensing of the technologies is usually required. However, good research resultsare not enough to start the marketing process. Beforehand, it is necessary to demonstrate the economic viability of transforming it into an innovation. This implicates the absorption of the knowledge generated in the universities by companies, requiring the commitment of both parties in the transfer process (Sbragia, 2006).

Partnerships established with research centers and universities with the goal of technology transfer are important for the companies, as they have contact with new pure and applied research paradigmsdeveloped by people with advanced scientific know-how and the new concepts they come up with (Oliveira andFilion, 2008). These authors consider that the participation of subsidized research in innovation processes can happen in the form of patents sold or licensed to an existing company, or in the form of the creation of a new technology company that will produce or market the outcomes of research. Such new venue to market technologies and knowledge developed in universities contributes to the creation of relationships that have the bonus of stimulating future research in the universities. In brief, Oliveira and Filion (2008) recognized two ways capable oftransferring technology from a research center to a market oriented company:*a)* "selling" technology in the form of extension, consulting or licensing of patents, technology, and b*)* creating a technology-based company to serve as a bridge (Oliveira andFilion, 2008).

The same way as in Brazil, emerging Asian countries also show a growing concern about technology transfer from university to industry(Teng, 2010).Teng (2010) presented a model to make technology-based companies able to implement and commercialize new technologies successfully. He listed six steps for this type of transfer from universities to firms:

1.Market requirements: As in many business models, in many technology transfer and absorption models, the starting point is lead and defined by the market, given that a good understanding of the market is needed when someone tries to introduce new goods, services and technologies.Unsatisfiedneeds represent many opportunities for entrepreneurs and universities. In some cases, the needs can be verybasic (e.g., there may be a need for modern and efficient public services), but also, in high technology markets,the needs might be as complex and sophisticated as those has in any developed country.A good understanding of the market is necessary when somebody is trying to introduce new products ortechnologies.

2.Imaging or creation phase: In this phase a solution and a process is developed. In thisphase, not only market needs need to be considered but it is also important to look at the political andeconomicenvironment in order to foresee the actual viability for introducing the product in the market.

3.Technology seeking: Once a solution has been created and documented, the seeking for available technologies starts. The commonpractice is the creation of joint ventures between universities and

companies.A company with an idea and a business model typically starts to look to universities trying to find availabletechnologies that may satisfy the needs. In such ventures, the university typically provides the technology andknow-how of the core business while the partner provides theknow-how on administrative tasks (accounting,human resources, taxation, etc.), plus the business model by which the technology will generate consumer value and the way it is going to be marketed.

4. Product design: One important point to consider is that it is often necessary to adapt the technology. Teng (2010) termed it as the "tropicalization" of the technology. This may generate a dense process of going back and forth between the university and the company until until the technology is ready for the enterprise conditions. The chosen technology must be adapted not only to meet the needs of the market, but also the regulatory aspects, such as technical specifications and safety standards.

5.Implementations phase: When the technology is ready, the implementations phase starts. If the technology is a final product that goes directly to a consumer, the implementation phase may be the commercialization and the related logistics, including supply importation, product delivery, and so on. If the technology to be deployed is part of a manufacturing process orinfrastructure of a venture, the implementation phase involves deploying the technology to the point where it isready to produce the final products.

6.Life cycle management: The final step in the model is the "life cycle management", when the product, the market, and theprocess have to be constantly evaluated.

Constraintstouniversity-industry technology transfer

In developing countries,the university-industry collaboration and commercialization of research outcomes is complicated by a number of constraints, including:

1. The dominance of foreign investments in critical of manufacturing sectors:To avoid the strong competition with multinationals in Brazil, a country with abundant resources, Dominguinhos (2007) suggested that local companies seeking new technologies for innovation should adopta niche strategy in global markets. For him, given the intangible nature of the resources—which require investments in R&D—selling to foreign markets would provide scale for the investments and even access to funding sources for new research. This is essential for making companies able to renew their value offer. Due to intense business competition, the time windows are very short, forcing companies to explore the advantages of innovation in international markets in a fast-paced fashion (DOMINGUINHOS, 2007).

2. Lack of truly effective R&D funding: In Brazil there are the Innovation Law (Law 10,973) and the Law of the Good (Law 11,196). However, as Soares (2013) pointed out, the analysis of the results in the 2010 Usage of Tax Incentives for Innovation Annual Report—tax incentives which are provided by the Law of the Good—a report published by the Ministry of Science, Technology and Innovation (MTCI), "there is still a misalignment between regulators and the business community due to the high number of companies 'unqualified' to obtain incentives for innovation" (Soares, 2013).

3. Lack of highly capable scientists who can lead to the knowledge frontiers.

4.Lack of innovative entrepreneurship. (These last two cases may be due to the existence of few national high technology companies.)

5. Focus of the universities on teaching, thus creating a divergence of objectives between university and industry.

According to Teng (2010), it is difficult to obtain an effective academic interest in R&D activities that are relevant to specific problems of the industry. Additionally,the scientific knowledge of universities is not something that companies can receive and use immediately. It requiresextra research and development in the companies, besides the support of university research to grant

cooperation.On the other hand, technology-based incubators and innovation centers are in a better position to establish more links with the academy.

From a legal standpoint, the issue of the ownership of inventions and patents arising from university research has been revealing itself a complex one, resulting in many questionings that hinder technology transfer. Another impasse occurs between public funding for R&D and market needs, as most of the results of R&D are not appropriate to go the market. Programs to encourage the development of new technologies should be focused to meet the needs of businesses and also global markets.

Incentives for technology transfer

Teng (2010) noted that Malaysia is already trying to focus on key areas and research strategies, aiming to provide adequate funding to align the needs of the market with R&D. Commercial viability of the research outcomes has been posited as key criterion for funding approval evaluation process, alongwith technical criteria. The author mentions that there is a grant scheme aligned with the generation of new knowledge and technology development appropriate for commercialization, incubation and pilot plant production. Base work started from R&D follows to commercial tests and then to a full industrial scale-up.This arrangement seeks to generate a linear flow of the innovation cycle, which Teng (2010) calls Research, Development and Marketing Value Chain (R&D&C).

Also in Portugal, Dominguinhos (2007) reported that the founder of Critical Software, a company established in 1998 in the incubator at the University of Coimbra, attended a Technology Commercialization Course held in conjunction by the Universities of Coimbra and Austin, directed at Portuguese and foreigners. As the founders of Critical Software lacked business and management knowledge, the course enabled the acquisition of essential knowledge for the newly created company. This lead to the construction of a clear business model, plus the incorporation of a corporate vision for Critical Software. Moreover, the networking provide by the Technology Commercialization Course in the United States led to relationship with the International Business Incubator (IBI) in San Jose, California, through a classmate, and opened the doors to clients such as the U.S. (NASA) and European (ESA)space agencies.

Conclusion

University research is a source of innovation and knowledge generation that can be significantly diffused to companies and entrepreneurs. Universities of developed countries have established technology transfer offices to promote interaction with industry and commercialization of research outcomes.

Innovation and diffusion of technology-based companies in the Brazilian domestic market requires further efforts from the agents of interest, in particular because of the fact that most of the Brazilian research is done in the academic environment (Cruz, 2008). Moreover, the new more competitive environment reinforcesthe need for structural changes require new production cycles driven by intense interaction among universities, research centers and business organizations.

As theinnovation contextis interwoveninto the business model, organizational changescan encounter resistanceinits own structure. This structure is often affected bymodels andhabitsbroader thanmanagementcanperceive, given that innovation in thebusiness modelcan beasimpactfulastechnological innovation(Davila,Epstein andShelton, 2007). Critical aspects arethe absorptionof the modeloftechnology transfer, patent licensingandpartnership formation.

The debate should be in the ways to clearing the forms of interaction between companies and academic research, particularly the management of state universities and research centers, which concentrate most of the patent depositions and scientific production. The challenge lies in providing companies that already internalize the process of open innovation (Chesbrough, 2003) with accessto projects and patents filed by Brazilian universities. Brazilian state institutions of higher education do not share a homogeneous process of acquisition or licensing by companies for their patents and technology projects.

In seeking innovation in the business model and the knowledge transfer model as a way to enhance successin technology-based companies, this paper proposes new approaches to the concern about the grounding of these companies in the market. This is particularly important forbusinesses that are small and/ortoo oriented by their targeted technological solutions. Such companies ran into a bottleneck when it comes to formatting the marketing phase of their projects. The technological innovation may be well delineated, but there are other aspects needed to materialize the business, such as financial resources, means of production, design, distribution channels, communication, and sales activities. Chesbrough and Schwartz (2007) observed that an innovative business model must take into account the external aspects such as the market segments interested in innovation, value proposition to customers, company's position in the value chain, strategic partnerships, and internal management.

This paper also proposes a model for creating innovation arising from technologies developed in university research, highlighting the importance that this research takes into consideration consumer needs identified by businesses, or goes through a"tropicalization" process of adaptation to be successfully implemented in the marketplace. Moreover, consideration of economically viable production scale must be taken into account.

This paper tries to bring out several aspects for discussion on innovation projects and technology transfer relevant to the Brazilian national scene, in order to achieve competitive parity with more developed nations in creating valuable innovation from technological end scientific research. The approaches here presented may well serve to other developing nations. In particular, this paper calls for the importance of research on the most effective business models for technology-based enterprises, particularly on the basis of the triad technology-product-market and on technology transfer processes made more accessible to business organizations.

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