

Critical issues of the cooperation for innovation between universities and SMEs

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1. Introduction

Even if the position of advanced scientific and technical knowledge generated and available in universities has a relevant role for SMEs' effective innovation of products and processes, many difficulties arise when trying to set up and to implement the cooperation between universities and SMEs.

These criticalities come from the economic, behavioral, organizational characteristics of either universities and SMEs.

It's necessary to take well into cooperation these items when designing structures and mechanisms for promoting and implementing the so called Technology Transfer from Academia to industry.

Failures of many initiatives in this field, specially at local/regional level, are due to the very simplistic model of Technology Transfer that is at their basis, which implies a straight "transfer" of technical knowledge from a university to an SME, and doesn't take into a proper consideration that a "transformation" of knowledge is required in order to exploit the scientific results for developing innovative industrial products and processes with a distinctive economic value in the market.

Aim of this paper is to describe the main critical factors that constraint the interactions between universities and SMEs, and to outline an "optimal" model of Technology Transfer, that overcomes such criticalities.

2. On the side of universities

The first critical factor lies in the differences of psycho-socio - cognitive features between university researchers and firm's managers, which have a relevant impact on their approach to technology innovation.

First of all, the "time horizon" for providing an innovative solution is quite different: university researchers are oriented towards the long term, while business managers of SMEs need to achieve concrete results in the short, eventually medium, term.

Related to this factor is the "risk acceptance". Failure of developing an innovation, to which financial and organizational resources have been devoted, show up finally as a loss in the financial balance of a firm, while it has a limited negative impact of the status and the career of a researcher, which are mostly based on indicator of scientific, not economical, productivity.

One more difference comes out in the "approach to problem solving". University researchers are interested mostly of the scientific and technical features of an innovation project, while business managers need to achieve an overall (technical & economic) effective solution to an industrial problem.

Related to this factor is the "difference of language" spoken by a university researcher (highly scientific) and by a business manager (oriented towards applications).

More than this, the TTOs (Technology Transfer Office) set up by many universities have usually achieved poor results, due to the limited financial and organizational (professional) resources they¹

are given, to the lack of cooperation from research departments and centers, which are jealous of their knowledge and want to exploit it economically by themselves, finally to the “state” of scientific knowledge they are supposed to market.

The research results are often at a very preliminary stage of the technology development process and require more efforts and resources in order to be transformed into an industrial prototype; this process is also uncertain. University researchers are often not interested in this development and prefer to devote their resources to other research projects, likely to be more rewarding for their career and status. Business managers are unwilling to invest resources in a project that is not clear and likely to achieve economic results.

3. On the side of SME

The cost of a cooperation project for innovation with a university is often perceived and evaluated too high by a SME, as it includes not only the payment for the contract to the university research team, but also the economic effort for identifying the appropriate researcher, competent of the technical problem of interest and the cost of interacting with the research team during the implementation of the contract.

More than this SMEs have a limited “absorption/capacity” of scientific knowledge that are basic for developing some advanced technological innovations, due to the limited technical professionals in their organizational structure and the usually narrow range of technical competence they have.

Finally most SMEs lack a strategic culture of technology innovation, as they are little aware of the dynamics of the innovation process and of its reliance on scientific achievements.

4. The “optimal” model of Technology Transfer”

By taking into account the previous analysis of the criticalities of the process of Technology Transfer, it is possible to outline the main features of an “optimal” system of Technology Transfer, such as:

- it should consider all the different players involved in the process and their specific contributions
- it should adopt a pro- active approach and intervene in all the stages of the process
- it should be equipped with appropriate organizational, financial, managerial resources
- it should make appropriate actions on either the side of universities and the one of SMEs, by promoting and supporting their interactions
- it should make a focus on the relevant and specific needs and opportunities of technological innovation for the local industrial system, but, at the same time, look for scientific and technical achievements worldwide, so avoiding the pitfalls of mere “localist” approach to Technology Transfer.

It's apparent that local/regional governments can play a crucial role by designing and supporting the implementation of this kind of system in cooperation with the main stakeholders of the scientific and industrial system.

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Prof. Roveda has been consultant of international organizations, such as the European Commission, the OECD, the Committee of Universities of Central America, in the field of regional economic and entrepreneurial development, based and driven by technology innovation as a response to global competition.

More than this, prof. Roveda has been the Scientific Coordinator of a many foresight projects, aiming at identifying and evaluating the main advanced technology areas, that can enable the increase of the competitiveness of medium-small sized firms in the framework of the global economy.