ISSN 1454 - 8003
Proceedings of 2017 International Conference on Hydraulics and Pneumatics - HERVEX
November 8-10, Băile Govora, Romania

TECHNOLOGY TRANSFER. STAGES FOR IMPLEMENTATION. SELECTING AND IMPLEMENTING "THE BEST PRACTICES". FACTORS WHICH INFLUENCE THE TECHNOLOGY TRANSFER ACTIVITIES

Diana Mura BADEA[1], F.T. TANASESCU[2], Dumitru VLAD[1], Valentina Daniela BAJENARU[1]

[1] National Institute of Research and Development in Mechatronics and Measurement Technique, Bucharest, Romania

[2] Comitetul Electrotehnic Roman, comisia6@icpe.ro

Abstract: *In this paper we introduce a model for Benchmarking analise witch can be applied to products/technologies/services/processes, or only to some of them. It can be applied to the manufacturing process of products and services. A significant example of this is the take-up of new products/technologies/services superior to competition and the level of market resulting from the research activities of universities and/or research institutes.*

Keywords*: Benchmarking, new products, new technologies, new services*

1. Introduction

The Technology Transfer Center pays particular attention to the transfer of state-funded scientific research results, to the development of firms and their increased competitiveness, a priority of European research [1].
Technology Transfer does not just mean selling a patent, but it also adds everything the scientific research can provide to a company: knowledge transfer, personal training, training sessions, joint projects and activities, access to laboratories and innovation platforms, technical assistance, services.
Technological Transfer is carried out within TT entities established within the academic environment (universities or research institutes), entity with or without legal personality, specialized in transfer, marketing, industrial property, dimensioned to perform a range of activities which will be included in the Regulation for its organization and operation.
The Shift of a Knowledge Transfer is generally performed after a certain TT scheme, but there may also be some customized phases for a particular application.

2. Steps in conducting a Technology Transfer

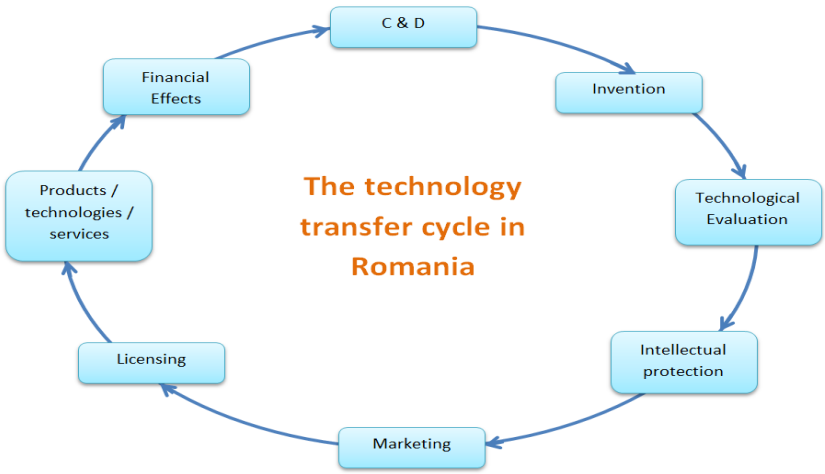

Fig. 1. Steps (stages) that go from the research/idea phase to capitalizing on the outcome

Generally speaking, the patterns encountered internationally foresee the same steps with a nuance difference signaled at the starting point: some believe that research is the basis of a patent from which the process begins, others that the idea of a future patent lies at the heart of research.
In the following, the steps will start from research, the patent being a result of C-D activity. It is the process through which the knowledge, products and technologies developed by government-funded public research are passed on to companies to accelerate their development as well as increasing competitiveness.
The goal of TT is to support the economy and enable companies to become as competitive as possible.

2.1 Step 1. Research

Throughout the research, a number of elements are considered to be new, less known, and through which new products, new technologies, or ideas can be built to provide services.
The researcher who benefited from public funding for his project has a moral duty to commercialize the scientific result obtained by giving him a scientific and economic recognition through the benefits of the patent and attracting additional funds to the institution in which he works.
The company engaged in the transfer of a new product / technology / knowledge is interested in taking a patent to increase its competitiveness on the market, superior technical and economic effects.

2.2 Step 2. Presenting the patented idea (description) to the Technology Transfer Center (TTC)

In a first step, the researcher will present TTC with the idea that should be patented, the novelty resulting from the research that has been developed and the impact it may have on its application.
TTC will ask the virtual inventor for the necessary information, submitting a note with technical and economic elements that justify the development of a patent. This note will be confidential and will be recorded as such, TTC responding to its secret [2].
The researcher must work with TTC in the next stages of evaluation and patenting, all documents and discussions of a confidential nature, including written documents or records.

2.3 Step 3. Technological evaluation of the invention and establishment of the conditions for elaboration of a patent

At this stage, we assess the impact of this invention, the technical and economic effects, the market and competitors in the field of the patent, comparisons with the patent literature and the retention of the elements of originality, marketing potential, possible licensing strategies, company licensing or start-up development -up, the final form of the Patent for Invention is to be submitted to the Patent Organization (OSIM). Without disclosing the secret of the invention to be developed, TTC may consult with OSIM Intellectual Property Specialists or OSH professionals in clarifying some of the Intellectual Protection issues at which the process begins. All documents drawn up are confidential and recorded as such [3].
It is not appropriate for the researcher or members of the research team to publish works or to support communications on this subject that would betray the secret of the invention until the release of the patent.

2.4 Step 4. Intellectual Protection. Patent

The patent application is filed with the State Office for Inventions and Trademarks - OSIM. Once patented, it is granted for a certain period of time when the rights of the inventor after the patent are protected. To reconcile the rights of the participants to the commercialization of the Patent. From now on the patent is public and any information about it can be made for marketing. The patent can also be registered with the European Patent Office.

2.5 Step 5. Marketing

TTC develops a market study identifying partners who may be interested in taking over the patent, competitors who make the same product / technology and their technical and economic performance, the existence of companies that want to diversify their profile, distribution networks, workforce level and their ability to leverage their patent, material resources, ability to promote a new product on the market. The analysis also takes into account the possibility of developing the patent at start-ups, in which case parallel assessments of advantages, disadvantages and risks are made.

2.6 Step 6. Licensing

The licensing of a patent is granted through the conclusion of a licensing agreement concluded between TTC (licensor) and the Company that is interested in taking over the patent (the licensee). The agreement fixes the rights that the patent owner grants, the financial benefits of this act. The same agreement ends also when the patent is taken over by a start up. By understanding between partners, a number of information can circulate between partners under confidentiality. The agreement specifies the rights and obligations of the partners, the exclusivity or the exclusivity of the Patent.

2.7 Step 7. Comercialization of the Patent

The company that licensed the patent agrees to its purchase, develops its production / application, develops manufacturing lines, launches the product, receives licensor assistance when it is provided in the contract, improves workforce, diversifies itself or in collaboration with the patent owner, the initial invention and the development of products adjacent to the subject of the patent.

2.8 Step 8. Economic Effects, Breaking the Income of the Patent

The revenue resulting from the sale of a patent is shared between the TTC, the beneficiary of the patent and the inventor / inventor usually one third if not otherwise agreed. In Romania the rights to the inventor are at least 30%. The money for the other parties is foreseen for development, new research, development of activities, etc., according to the interests of the Parties.

3. Selecting and implementing "The Best Practices”

Dissemination of the results obtained in research activities by specialized institutes, universities and some innovative enterprises is a moral and material obligation of these entities to use them in industry and economy.
Through the extended benchmarking process and / or through own actions of the interested entities, an industrial research is carried out which highlights the solutions offered by the research results and from which the best solution is chosen as the "best practice".
As a result, universities and institutes in the field accomplish through the research process technical solutions that are "best practices" while other entities (SMEs) through internal analyzes or as a result of their own strategic development policies aim to take over and to implement "best practice".
In this technology transfer activity and / or in the benchmarking process, the following main actors are involved:

- ✓ entities doing research through products/technologies/equipment /services;
- ✓ entities that from objective needs want to take over and implement these results;
- ✓ entities in the form of technology transfer centers created within universities and / or institutes that have extensive attributions in technology transfer, and are bridges between academia and industry.

The realization of the technological transfer depends on several issues that are related to the policies of the entities that generate the best solutions and want their capitalization in the industrial environment as well as the policies and strategies of the entities that want to take over and implement by transferring them [4].

Among the main issues of technology transfer policies can be listed:

- the existence and development of an adequate infrastructure for innovation;
- increasing the technical and professional skills and competences of the personnel (especially in the entities that take over the technological transfer);
- a possibility to allocate funds to support the commercialization of research results (this concerns both the transferring entity and the receiving entity, since each stage of the transfer requires staff costs, licenses, patents, property rights, expenses equipment materials, organization of production, distribution network expenses, etc.);
- protection systems, regulations and legal framework for property rights, innovation results, etc.

It should be underlined that the interaction between the entities that generate "best practice" and users is essential for the success of the technological transfer. For this reason, the importance of technology transfer centers as liaison points is special and the organization of these centers, their competencies as well as their attributions must be considered and established with much responsibility.

The success of the technological transfer is conditioned by the technical competence but also by the abilities that must lead to the identification of the "best practice" but also of the partner (s) whose product / technology / equipment / service is needed and to which the technology fits and is it is possible to implement it (in terms of resources, technical, development, etc.).

4. Factors which influence actions in technological transfer

In view of the emergence of such difficulties and important barriers to the transfer of research and development results in industry and economy, a number of factors that directly influence the technological transfer actions

and which have a significant technical, financial, economic, social impact on these actions. A list of principles of these factors must primarily focus on the comparative benchmarking analysis, focusing primarily on those qualitative elements from which we present some more important:

- Factors related to the Technology Transfer request
  - Potential Market (global)
  - Stability of TT demand
  - The life cycle of the technology
- Market Acceptance Factors
  - The necessary promotion effort
  - Distribution network
- Factors related to competition
  - Competitive partner position
  - Direct and existing competition
  - The price of technology
- Factors related to economic risks
  - Product development stage
  - Functional feasibility
  - Recovering the investments made both for the initial realization of the technology and for the exploitation after the takeover.
- Environmental factors
  - Impact of technology / technological process on the environment
  - Impact on society
  - Safety in operation of the product / equipment / installation
- Various other elements
  - The sale or location of machines, machines, etc.
  - Concession of a trademark or other intellectual property rights (design, model, etc.)

- Selling to the person who receives the technology of raw materials, materials, components, subassemblies necessary for the manufacture and exploitation of the acquired technology / license.

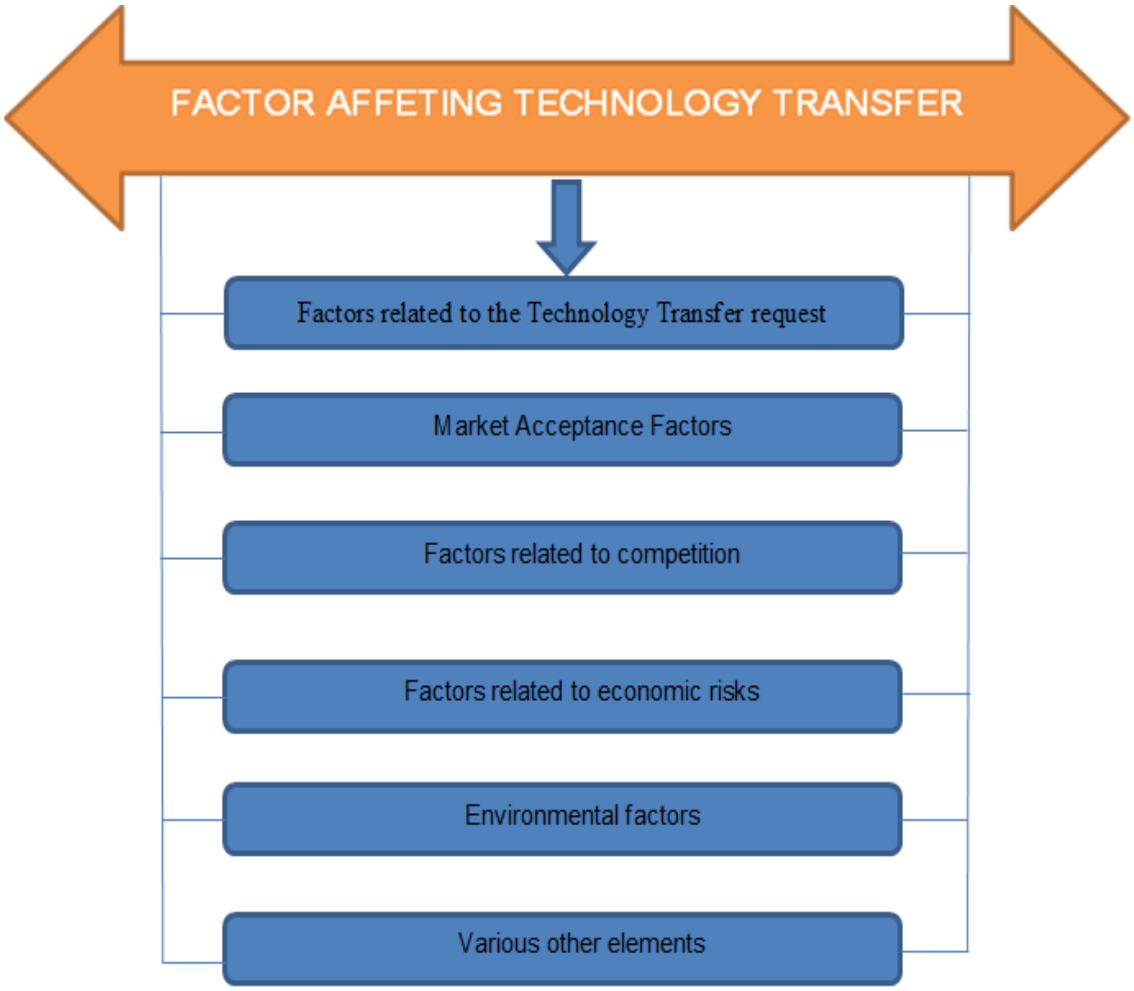

Fig. 2. Factor affeting technology transfer

5. Conclusions

Some important measures are needed to support TT activities:

- ✓ realization of financial instruments (loans, venture funds, public-private capital);
- ✓ communicating the results obtained in CDs through the websites of the developers, periodically, to SMEs even to multinational companies;
- ✓ the initiation of periodical publications summarizing the results of research by universities, institutes (public or private), innovative entities, individuals, etc;
- ✓ Informal transfer of knowledge through a structured network for this purpose;

Developing (more) broader, at least annual, programs of technical and scientific events focusing on topics such as:

- ✓ research results;
- ✓ trends in the development of high market products;
- ✓ European and international market trends lectures on certain technologies (from research, design, training, etc. manufacturing, production organization, commercial issues, marketing distribution strategic and operational, management, etc.).

References

[1] Comanescu, D., M., ş.a., "Benchmarking. Analize and Competitivity" („Benchmarking. Analizã şi Competitivitate"), University Publishing, Bucharest, 2008;
[2] Scurtu, V., Russu C., "Benchmarking – Application and theory", Economical Publishing; Bucharest, 2006;
[3] Armstrong, M, "Human resources management. Practice manual" ("Managementul resurselor umane. Manual de practica"), CODECS Publishing; Bucharest, 2003;
[4] European Commision DG III, "Benchmarking. Introduction and principles of the basic industry applied in organizational benchmarking" ("Benchmarking. Introducere şi principii de Industrie baza aplicate în benchmarkingul organizational");