# Technology Transfer of Research Project Results

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**Abstract***: This paper discusses on various aspects of technology transfer of the results of research projects. The focus is on results of academic research projects in European environment funded by the EU and national budgets.*

**Keywords:** *research projects, technology transfer, academic research*

## 1. INTRODUCTION

Technology transfer is the key issue in exploitation of research. Without direct technology transfer from the research institutions to the users the exploitation of research results can be done only indirectly, e.g. through publication of results, patents, etc. – the process is difficult, inefficient, and does not allow for timely innovation and exploitation of the research results.

This contribution addresses some of the issues connected with the process of technology transfer from research organizations in the Czech Republic that are, however, expandable to many European institutions. The contribution includes interests of the research institutions, interests of the users of research results, issues connected to ownership of research results, and also financial and legal aspects of the technology transfer process. Additionally, the contribution presents practical examples of the technology transfer cases.

## 2. INTERESTS OF RESEARCH OGRANIZATIONS

The organizations that perform research can be subdivided into the three following categories:

a) **Research organizations** focusing on research only and paid in majority from state budget directly and/or through projects and/or international research projects,
b) **academic organizations** that apart of research perform educational activities and are financed similarly to the research organizations,

c) **company research** – organizations that perform the research financed mostly through private funds, e.g. company research institutions, private research institutions, etc.

It should be noted that while or not the technology transfer results are part of evaluation of the institutions, the research institutions are (possibly except the last type from the above list) not financially dependent on technology transfer.

The (economical and other) interests of the research organizations are:

i. **Securing income** from state/company and research project funding bodies mostly through passing of some evaluation procedures,
ii. **keeping the resources** necessary to perform research for the evaluated research,
iii. **technology transfer income** from successfully realized business cases,
iv. **balancing the spendings** on research with the income generated through technology transfer – setting a "high-enough price".

It is interesting that although the above interests are quite clear and known, the systems of control of such institutions are not always reflecting these facts.

## 3. INTERESTS OF RESEARCH RESULT USERS

The research users can be generally characterized through a single set of interests regardless of their type. This is true regardless of different situations in private and public sectors.

The interests include:

i. **Technical quality**/clarity/usability of the result researches,
ii. **good price/performance** of the gathered result of research,
iii. **exclusivity of rights** to use the research results except for situation where the marketing strategy involves "open source/specifications" approach,
iv. **connection** of the technology transfer input **with own activities**.

From the point of view of "free market" the research users are much more in the position of "free market customer" comparing to the research organizations being in the position of "free market producer" as in the case of the research results consumer, the free market principles are unaffected by the state budget exploitation.

## 4. ISSUES CONNECTED WITH OWNERSHIP

The ownership of the research results is usually with the research institution but several more or less significant exceptions may occur that adversely affect ability to transfer the results – to sell or license the right to exploit the research results.

The limitations may be varying country to country; may be combined, etc.; however, most of them are valid internationally:

- **Ownership shared with funding body** is often resulting from funding of the research through a public (or private) funding body; in such cases, the funding body defines the ownership of the results and sharing is often contained in such definition,
- **ownership shared with the employee(s)** is sometimes result of a "discovery" involved in the research that goes beyond the "normal" duty of the researcher; in some countries (including Czech Republic) this leads into shared ownership (organization with the inventor) or shared rights to use the results,
- **ownership with restricted rights to disseminate** is again one of the possible options in arrangements between the funding body and the research institution; examples include the obligation to disseminate contained generally in the EU funded projects or obligation to disseminate only under equal conditions for all the interested parties in the project funded e.g. by the Czech Republic state budget,
- **group ownership or right to exploit** is often required by the funding bodies beyond the "natural and legally enforced" level – an example can be consortium agreements encouraged in EU projects.

While the limitations of ownership do not affect the licensing process involved in technology transfer too much, they can very adversely affect the sales of the intellectual property which results from the research. E.g. the ownership with restricted rights to disseminate may mean that the intellectual property looses value very dramatically in cases where the restriction affects possibility to exclusively offer the results of research.

## 5. FINANCIAL ASPECTS

The financial issues connected with technology transfer are quite interesting. In the free market the financial issues would normally reflect the interests of the

research result provider and consumer – in ideal case, they would fairly share the profit. However, in the environment where research is funded from other sources than license/sales fees, this balance is affected and in general, the research institutions tend to license/sell their results for a price that is lower than the market one. The reason is that the evaluation of the research institutions often includes "points" for successfully realized technology transfer. The organizations are able to get funds e.g. from the state budget in much higher amounts, just based on the "increased evaluation" of the institutions rather than from the actual license fees. In fact, this phenomenon might lead (and maybe already lead) in situations where the research institution "pays" the research results users to use them.

On the other hand, the research institutions tend to sped large amounts of funds on research. These amounts of funds are in vast majority of cases at least in basic research much bigger than the income that could ever be generated by the technology transfer in such cases. While this fact is normal and well understandable, the financially responsible representatives of research organizations sometimes tend to the conclusion that the funds collected through the technology transfer should to large proportion correspond to the amount of money spent of research. Such conclusion leads into unrealistically high prices of licenses that are impossible to sell and eventually prevents the technology transfer. Other option is that the representatives tend to offer the know-how for free, e.g. through open source approach, which possibility is, of course, better than the previous one but still does not lead into an efficient technology transfer. Additionally, the financial aspects of the technology transfer are often out of interest of the representatives of research institutions as they do mostly generate a very small proportion of the budget.

## 6. LEGAL ASPECTS

From the legal point of view, the technology transfer is often quite risky although at a first glance it does not seem so. The reason why it is so is that the competition between the potential users of the results of research can be high and if the technology transfer conditions are not well defined and reasoned, they can be argued by e.g. the companies competing with the technology transfer user(s). Additionally, the technology transfer of the results of research from the projects funded from public money may be argued by the authorities controlling the free market within the countries and/or internationally.

## 7. EXAMPLES

Brno University of Technology is a good example of a research university in the Czech Republic. The author comes from its Faculty of Information Technology so the examples are taken from that faculty.

***Example 1: CAMEA***

CAMEA, spol. s r.o. is a company that has been founded in 1994 by 5 employees of Brno University of Technology on direct recommendation of dean of Faculty of Electrical Engineering. The company specializes in signal and image processing in industry and traffic. It has been founded in situation where spin-off companies were impossible to create due to legislative problems. The technology transfer is for fixed fees and no problems occurred except for it is sometimes questioned by the financial university authorities.

***Example 2: Phonexia***

Phonexia, s.r.o. has been founded in 2006 by 6 employees of Brno University of Technology and focuses on speech technologies. While it was possible to start is as a spin-off, the founders decided not to do so as it would have created very difficult environment for negotiations about the technology transfer and intellectual property. The company licenses technology from Brno University of Technology on a regular basis. The technology transfer is quite smooth while it so far generates only a small amount of money. This fact, however, can be changed as the volume of production of Phonexia increases.

***Example 3: INVEA***

INVEA, a.s., has been founded in 2007 as a spin-off company of Brno University of Technology. The company has been founded for the purpose of exploitation of intellectual property gathered during the research project on network packet processing acceleration. The company develops end-user applications in the field and so far the technology transfer was done as a purchase of production data of a set of hardware boards and software purchase.

## 8. CONCLUSIONS

Technology transfer is a process that is not easy to perform but that is vital for the functionality and existence of technologically oriented research organizations. This contribution discussed the issues connected with it a hopefully invokes some discussion about the issues yet to be solved.