



# Knowledge Transfer Study

2010–2012

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## East Central Europe Expert workshop

### Knowledge Transfer at Universities and Public Research Institutions in the Czech Republic, Slovakia, Hungary and Slovenia: the Road Ahead

Prague, Czech Industrial Property Office, Czech Republic 25<sup>th</sup> April 2012

## Summary

### Background

This workshop supported the implementation of the European Commission's 2008 Recommendation on the management of intellectual property (IP) in knowledge transfer (KT) activities and Code of Practice for universities and public research organisations (PROs) ([http://ec.europa.eu/invest-in-research/pdf/ip\\_recommendation\\_de.pdf](http://ec.europa.eu/invest-in-research/pdf/ip_recommendation_de.pdf)). It was part of a workshop series covering 39 European countries in 2011 and 2012.

The workshop convened 44 KT stakeholders, in particular from universities, other PROs, and policy. See a list of attendees in the Annex. The presentation files are available at <http://knowledge-transfer-study.eu/workshops/east-central-europe-cz-sk-hu-si/>.

### Main results

In the **Czech Republic**, PROs' KT activities have significantly increased in past years, and PROs are integrating KT strategies and policies in their internal structures. Barriers to implementing KT include the motivation of the PROs' management, understaffing and lack of professional experience of KTOs, and a decentralised KT system with ambiguous responsibilities. The national programme EF-TRANS is seeking to overcome such barriers.

In **Slovakia**, KTOs have been established during recent years at main PROs, and these are in the process of continual development. The National Infrastructure for Technology Transfer Support in Slovakia – NITT SK is a project aimed at setting up a national TT system including the main PROs and other relevant players. The main barrier to developing KT at PROs is a lack of experience in this field.

In **Hungary**, as a result of the Innovation Act in 2004, KTOs were set up at PROs with state funding from 2006 to 2011. It is now difficult for PROs to continue funding them, while five years were insufficient to establish strong ties with industry. Since most KTOs were set up at the same time a sufficient number of KT professionals were not available.

The government in **Slovenia** launched several KT-related initiatives in recent years, including Centres of Excellence, a National Expert Group for Knowledge Transfer, and the Young Researchers for the Business Sector programme. However, these initiatives are focused on financing research and partially supporting IPR costs, while not much has been done in the field of commercialisation, and there is a no national KT monitoring system.

A case study of the Kennispark Twente in the Netherlands showed that it may take several decades to develop successful KT and that regional authorities may be willing to co-fund KTOs when the KTOs contribute to creating jobs and tax income. A case study from the Czech Technical University indicated increasing interest in start-ups among students, but a lack of entrepreneurial education, motivation and finance.

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### About the Knowledge Transfer Study 2010-2012



The "Knowledge Transfer Study" (monitoring study regarding the implementation of the Commission Recommendation and Code of Practice on the management of intellectual property in knowledge transfer activities in Member States and Associated Countries) is based on a Contract (No. RTD/Dir C/C2/2010/SI2.569045) between the European Commission, Research Directorate General, and empirica GmbH, the Maastricht Economic Research Institute on Innovation and Technology, and the School of Business of the University of Applied Sciences North-Western Switzerland.



# 1 Welcome and introduction

## *Naděžda Witzanyová, Director, Department of International Cooperation in Research and Development, Czech Ministry of Education, Youth and Sports*

In recent years much has progressed with regard to KT in the Czech Republic. The Ministry of Education, Youth and Sports has been able to make use of structural funds for KT activities. There are three notable initiatives: A national project for KT named "**EF-TRANS**" (<http://eftrans.reformy-msmt.cz>) involving ten Czech universities and four other public research organisations has been launched. EF-TRANS comprises seven distinct areas of KT: a commercialisation system, IP protection, cooperation with business, licenses use, company establishment, result evaluation, and entrepreneurship education. Second, the ministry has launched a project which focuses on supporting the development of KT centres at universities. A third initiative of the ministry supports seed funding from private sources, allowing research organisations to test the commercialisation of results themselves. The ministry has run many round tables which have provided opportunities to meet with young people. Naděžda Witzanyová's key message for the workshop is that even with limited money one can change the atmosphere in research organisations for the improvement of KT.

## *Eva Schneiderová, Director of Patent Department, Czech Industrial Property Office*

Long gone are the days when IP was understood as mainly the creation of exclusive rights and monopolies as a barrier preventing progress. The real tasks for the industrial property protection system now lie elsewhere: providing support for putting research into practice, seeking out innovation and protecting it. The role of the Office is to make quality decisions, administer patents, utility models, trademarks and designs, and resolve disputed cases. Optimising methods of IP protection and raising awareness are also key concerns. The Czech IPO raises awareness on IPR through publicly available patent literature, an information portal on the enforcement of IPR and through workshops with international and national partners. The IPO also co-operates with universities, carrying out lectures and classes on IP protection.

## *Stefan Lilischkis, empirica, on behalf of the European Commission*

Stefan Lilischkis described the political background about the motivation and objectives of the European Commission's 2008 Recommendation on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and public research organisations. The overall challenge is improving European competitiveness in the knowledge-based economy through better and more pervasive commercial exploitation of all forms of intellectual property. The Knowledge Transfer Study monitors the implementation of the Recommendation. The study's workshops are meant to provide an in-depth understanding of national and regional situations, to discuss new issues, and to promote knowledge transfer and application of the Code of Practice.

# 2 Country profiles about knowledge transfer

## 2.1 Slovakia

### *Prof. Ján Turňa, Director, Slovak Centre of Scientific and Technical Information*

The Ministry of Education, Science, Research and Sport of the SR (**Ministry of Education**) is the founder of many grants and agencies relevant for KT such the Research and Development Agency, the Slovak Centre of Scientific and Technical Information (SCSTI) and the Scientific Grant Agency (VEGA). The Ministry of Economy of



the SR manages agencies such as the Slovak Innovation and Energy Agency (SIEA) and the National Agency for the Development of SMEs (NADSME) as well as the Innovation Fund. The main research institution along with universities is the Slovak Academy of Sciences (SAS).

When comparing **Slovakian investment in research and development** (R&D) to other European countries, Slovakia is failing to increase R&D expenditure rate on gross domestic product (GDP). This reason is not only the relatively high increase in GDP, but also the fact that European Union (EU) structural funds money allocated in the Operational Programme Research and Development, which are rather substantial, is not included in total R&D expenditure. However, the prognoses for next years' development are quite optimistic. In terms of innovation performance Slovakia's position is a little better but still below the EU average. In terms of growth of innovation performance Slovakia's growth is nearly 3% which is, comparatively, quite good.

The **Slovak Centre of Scientific and Technical Information** (SCSTI) is directly managed by the Ministry of Education. The SCSTI's mission is to provide library and information services for the scientific community, build and administer complex information systems for R&D, support evaluation of Slovak R&D organisations and popularise science and technology. SCSTI was established in 1938 as the Slovak technical library. This remains the main role of SCSTI, but now the centre is also responsible for building complex infrastructure for technical research innovation, which is mainly aimed at PROs in the Slovak Republic. This infrastructure includes a central portal for Research, Development and Innovation, the Slovak Current Research Information System (SK CRIS), a Central registry of publication activity and a Central registry of theses, dissertations, including the Anti-plagiarism system. Another of SCSTI's missions is fulfilled through the National Centre for Popularisation of Science and Technology in Society. The Technology transfer centre with nation-wide operation has also been established at SCSTI. SCSTI implements and runs number of national and international projects co-financed with EU funds. SCSTI participates as the only representative from Slovakia in the EPO pilot project for reorienting PATLIB centres towards provision of sophisticated services related to IP protection and commercialisation.

The **National Infrastructure for Technology Transfer Support** in Slovakia (NITT SK) is a national project implemented by SCSTI within the Operational Programme Research and Development, co-financed from the ERDF. Implementation runs between June 2010 and December 2014, the projects aims at setting up a national technology transfer (TT) system, creation of an integrated system of ICT services for researchers and raising awareness on IPR protection and TT within the scientific community. The project is focused also on development and provision of specialised TT support services. The National Portal for Technology Transfer (NPTT), which is currently in testing phase, will include general information on TT, IPR and IP protection as well as various methodological documents. Registrations of interest and needs for consultancy services will also be available through the portal as will information on national and international TT related initiatives. Plans for the creating national TT centre formed by SCSTI and main PROs (universities and SAS) represented by local TT centres are underway. A national patent fund is planned to be established as a part of the TT system with aim to provide funds for IP protection and commercialisation, including consultancy and expert services. The sustainability of the system has to be secured.

## Discussion

A participant inquired into the amount of business angels and **venture companies** in Slovakia. Prof. Ján Turňa replied that there have not been any real ventures in the last year. In general funds are available but there are no real venture funds. There are several VC related initiatives run by different organisations and concrete programmes are expected to be launched in coming period.



Another participant noted that the project for a national TT office will involve universities and was curious about the provision of **TT services within universities** and the infrastructure in place for TT at the university level. Prof. Turňa advised that the circumstances for TT within universities are not satisfactory and that apart from the large projects with funding from EU structural funds not much was in place. There have been some smaller funding projects to allow universities to set up their own TT offices and start TT related activities. However, these projects are now at the end and although some progress has been made in universities founding TT offices, they are only in the early stages of development. A condition of the NITT SK project is the creation of a national TT office and the introduction of a system coordinating TT activities at PROs. The main obstacle to successful TT at universities is the lack of experience.

A participant asked whether a **national patent fund** could be accomplished through the SCSTI's project. Prof. Turňa explained that the SCSTI is working heavily on establishing a patent fund. However, the truth is that money from structural funds cannot be used for such purposes. There is money available for setting up the system including patent fund, but the operation of patent fund itself needs to be secured by funds allocated from the state budget.

## 2.2 Hungary

*Gábor Németh, Director, Innovation and Information Centre, Hungarian Intellectual Property Office*

The main goal of the **Hungarian Intellectual Property Office** (IPO) is to raise awareness of IP. This includes maintaining connections with and supporting the education system in Hungary. However, the core remains with IP protection as the entire system of knowledge transfer would not function without this. Once IP protection is in place exploitation can take place.

In four ministries are in charge of R&D and innovation issues. The **Hungarian science system** is very similar to others in the region which is dominated by state-funded research comprised of universities and scientific institutes. There are 15 higher education institutions in Hungary of which six to eight are relevant to KT. The Hungarian Academy of Sciences is active in facilitating research co-operation agreements between research institutes and universities. The academy is also responsible for the distribution of scientific results and establishing connections between Hungarian and international research organisations.

As regards **Hungary's innovation profile**, the country's IP output is dramatically low and well below the Organisation for Economic Co-operation and Development (OECD) average, although the number of scientific articles is relatively good at about half of the OECD average. This shows that scientific outputs can be achieved but as they are not protected exploitation cannot be considered. Hungary's R&D activity is largely financed from abroad, mainly supported by EU funds. Internal resources spent on R&D are rather low. Hungary is gradually increasing R&D expenditure but at present it remains below the EU average. However, in 2010 enterprises exceeded government funding in the R&D sector. The role of enterprises is increasing in Hungary as the ratio of R&D employees in industry has increased in recent years.

The area in which Hungary excels is in patents for **collaboration with foreign inventors**. Hungary is heavily involved with foreign research and is quite outstanding for the region. In terms of patent applications these figures are still relatively moderate with approximately 250 applications from enterprises. As these are just applications they do not necessarily describe commercialisation of research results. Universities' activities regarding the service inventions and patent applications for the years 2005-2010 are



quite limited. Even at the largest Hungarian University less than ten invention disclosures were made. Universities have a similar approach to patent applications and similarly disappointing results. However, in terms of exploitation universities have more diverse approaches. The number of licence agreements is not impressive for any university but for some the number of **spin-offs** is. The approach to setting up and managing spin-offs is quite different from university to university: some universities want to own the spin-off, some do not think ownership is important and some universities lack the researchers to spare for such activities such as Szeged University.

In 2004 the **Innovation Act** made it compulsory for public research organisations (PROs) to adopt an IPR management policy, set up a legal framework for spin-offs, allow researchers to work on spin-offs and produce a guide to facilitate the elaboration of IPR policies. This meant that PROs had to describe the responsibilities of KT and how to manage it as well as developing a legal framework. As a result of the act most PROs set up IP policies. However, this compulsory adoption of the act had positive and negative impacts. On the positive side it meant that the most basic issues were adopted and it was obligatory for researchers to be informed on matters of IP, while on the negative side most institutes IP policy was adopted in principle but not always actively used.

As a result of the Innovation Act **Knowledge Transfer Offices** were set up, mainly at universities, and state funding was made available for founding KTOs. Grants were available from 2006 until 2011. However, as these KTOs received state funding until 2011 and were thus not included in universities' budgets it is now very difficult for universities to continue funding them. It is also not possible for KTOs to finance themselves, as it is very difficult for KTOs to even make revenue for the university. Therefore, alternative resources for KTO funding need to be found. Another consequence of the Innovation Act and the resulting five years of funding is that five years has proved an insufficient timeframe for KTOs to establish solid grounding or develop strong ties with industry. This funding window also means that most KTOs were set up at the same time and so there was a sudden demand for trained professionals in KT. Unfortunately the market was not prepared for such a demand and there was not enough trained staff available. The KTO system is now fragmented so that in each office there is a lack of critical mass of research findings that could be commercialised. This has resulted in inefficiencies. Furthermore, legal regulations are not in accordance with international practice; the protection of the inventor's rights is not properly defined; past habits have not been changed by policies; regulations are unclear, the reward system is inadequate and does not motivate; and no measures are in place against underperformance.

For the **future of KTOs** universities need to redirect funds to support them, training needs to be introduced for KT professionals and it needs to be examined whether such a fragmented system is appropriate for such a small country as Hungary, or whether a nationally led approach would be more efficient. Attitudes of researchers have proved the biggest obstacle to the promotion of KT. Except for a few individuals very few researchers take part in IP activities because it is not acknowledged in their career. The IP office should take a role in improving enthusiasm.

## Discussion

A participant enquired as to what KTO activities were funded and what **performance measures** were put in place for KTO outputs. Gábor Németh explained that when PROs applied for funding to establish KT infrastructure around 2007, patent applications were one of the measures. Funded items included wages, official fees of patent applications, and attorney costs.

One participant asked why the regulation of **spin-offs** would not be in line with international practice. Mr Németh replied that the OECD definition of a spin-off company, which he used in his presentation, was different from the Hungarian definition. A spin-off company in Hungary is defined as a company in which the university has a share whereas



the OECD definition of a spin-off is any company where university R&D is exploited. The terms of the Hungarian definition are much more difficult to meet as it is hard to manage a company where the university has a share, especially when consent is required from university management as regulations are very strict. This means that the OECD definition on spin-offs produces a higher result.

Kees Eijkel asked about **entrepreneurship training** for students in Hungary. Mr Németh replied that such efforts are being made. There are events to educate students in this matter and how to create a business plan. Since the IPO's key themes are IPR awareness and setting up of a business, the IPO is planning on launching courses in these areas. However, students' interest in entrepreneurship needs to be increased, and their professors also need to be convinced. Furthermore, researchers will often not be good entrepreneurs, so the aim of the IPO is to help researchers to realise that their research can be used and exploited. Once this has been achieved then entrepreneurs can be brought in to carry out the exploitation.

## 2.3 Slovenia

*Dr. Špela Stres, Head of Technology Transfer and Innovation Centre CTT - Jožef Stefan Institute*

Clients of the **Centre for Technology Transfer** (CTT) of the Jožef Stefan Institute are large institutions as well as small enterprises. It is important that both ends of the scale are included. The CTT is also well embedded into operations of the National Institute for Chemistry and acts as a joint KTO for both institutes.

In terms of **KT and R&D** Slovenia is close to EU averages. In terms of innovation performance increase, Slovenia has some of the best results and is close to France, Belgium and Luxembourg. Part of the reason is that the government has invested much in the research system in recent years and formed competence and excellence centres. Slovenia has four universities, ten higher education institutes and 17 PROs. In Slovenia there has been a steep drop in GDP from 2009-2011. The slow recovery from this has revealed structural weaknesses in the Slovenian economy. Therefore the new government plans sharp cuts in financing of universities (18%) and PROs (25%). There is no funding of KTOs in Slovenia, neither at national or PRO level, and the effect of this lack of national support for KTOs means that offices are often small and irrelevant or surviving on EC funding.

There has been recognition of the need to invest in KT and so the government has invested 85 million Euro in eight **Centres of Excellence** (CoE) and asked them to produce more patents. The CoEs were launched in 2009 to form new support for R&D excellence in selected focus areas. CoEs combine critical mass of knowledge with adequate research infrastructure. The eight CoEs are composed of 107 partners, 68 from the business sphere and 39 from research organisations. By November 2011 the CoEs had registered 40 patents. The success of CoEs is difficult to measure. The people employed by the CoE are also employed by PROs, this means that the CoE acts as another means of financing for PROs. However, as CoEs are obliged to produce patents (and not e.g. licences) and spin-out companies (and not new e.g. employments) the result is that patents are forced and become patents for the sake of patenting or artificial.

Another government initiative is the **National Expert Group for Knowledge Transfer** which was formed in 2010 to coordinate KT activities. The establishment of the group has aided the inclusion of KT topics in the National Research Strategy 2010-2020. However, in reality the group has only met once and from the eight targets set in the strategy none have yet been met.



A third government initiative is the **Young Researchers for the Business Sector** programme. The programme aims at integrating PhD students into business. The core of the programme has been running since 2001. In 2010 and 2011 the programme supported 140 projects annually. Currently, approximately 300 PhD students are involved. However, in 2012 there will most probably be no further funds for the programme. Also, financed researchers are employed in business but actually work for PROs which makes interaction between businesses and PROs dubious. Another issue with the programme is contracts with a lack of proper solutions for IPR issues.

Furthermore there are **tax incentives** in place for enterprises which invest in R&D. However, there are no tax incentives which encourage collaboration between enterprises and research organisations.

One issue for KT in Slovenia is the **lack of a national monitoring system**. There is a database of researchers, research organisations, projects and scientific publications but there are no specific KT indicators. Key PROs measure their KT performance according to their own indicators; however, this is prone to inconsistencies. The absence of a clear definition or rules on what a spin out is also provides unreliable results. The only body gathering information on KT is SI-TT (Association of Science and Technology Professionals of Slovenia).

In terms of common **mistakes and lessons** to be learnt from the Slovenian and wider European examples, one should not invest in KTOs if available staff is not trained - otherwise money invested will be wasted. Second, it is not worthwhile to invest in patents for their own sake, without proper assessments, proper quality assurance and proper plans for commercialisation. The Slovenian government should look at the whole commercialisation process and its results in terms of licences, contract and collaborative research contracts (number and amounts in EUR) not just patent numbers. For this reason patent funds are ineffective; they increase the amount of patenting without commercialisation. Funding should be put in place for commercialisation rather than limited to patenting. There are too many KTOs in Slovenia as a country with a population of 2 million and 3,000 researchers. Researchers need to be contacted personally level; decrees from above meant to foster KT are not effective. Patent attorneys are left out of the KT equation at present; they should be educated and included. KT cannot exist for itself; it must be connected to SME development. Therefore there is a need to connect the Association of Science and Technology Professionals (ASTP) with the Enterprise Europe Network and local KTOs.

## Discussion

As regards **centralisation versus decentralisation of KT**, one participant agreed with Dr. Špela Stres' comment that there are too many TTOs and so efforts should be made towards local co-operations. Some KT tasks should be allocated to central KTOs, but there still need to be contact points at the universities. Dr. Stres explained that the only KT things which need to be done within the university are those requiring trust. For example, for the eight CTT employees it is impossible to know what is going on in R&D in the whole institute. So they decided to appoint KT representatives in each department – to chat with, not to formally report to the CTT.

Another participant observed that the situation in the Czech Republic is even worse than in Slovenia in terms of the emphasis placed on patent counting. Start ups may be a faster way to reap results. Dr. Stres elaborated on her **commercialisation priorities** and hypothesised that if a researcher asked her whether to sell his informal IP knowledge, her first priority would be to stay with a long-lasting relationship with a well established firm. If the researcher does not have such a relationship she would advise to work with CTT in order to find a company to work with. Third, if after a while no licensee could be found, she would advise the researcher to try a spin off. CTT wants inventions to become alive, not to create as many licenses and spin-offs as possible. Start ups are the slowest and



most insecure path which is why this would be the last option, but if a researcher feels a spin-out is his obligation, she would give him 100% support.

In Slovenia the ministries involved have different views on whether PROs should be allowed to take **shares in spin-offs**. Dr Stres welcomes that PROs cannot take shares in new companies because it would mean that PROs would be involved in governing spin-offs, which is a role PROs cannot fulfil adequately at this point in time, as there is too few knowledge.

A question arose what **commercialisation indicators** are appropriate, if patents and licences are not. Dr. Stres suggested that both patents and licenses are valid indicators of KT, however not only – also numbers of contracts in collaborative research, funding volume of such contracts, licensing numbers and returns, as well as number of spin-offs that survived five years after their establishment and the employment they created. Patents are also important, but rather international than national ones.

## 2.4 Czech Republic

*Michal Pazour, Head of Strategic Studies Department, Technology Centre ASCR*

In the **Czech research system** more than 60% of R&D is by private enterprises with around 40% by PROs. Within the 26 universities of the Czech Republic 87% of R&D funding is from national public sources and only 1% from national business sources. A similarly high figure regarding national public resources (82%) and a low figure regarding national business resources (5%) applies to R&D funding for 54 research institutes of the Academy of Sciences. This indicates that there is some space for improvement in collaboration between public research and national business sector.

There is a **positive trend in KT activities** of universities and other PROs which can be seen in the increase in patent applications from 63 in 2005 to 271 in 2011. The number of licenses has also increased although not as much. There is a huge jump in the revenue from license fees between 2005 and 2008. This was however due to only one institute, for a vaccine for the treatment for AIDS and Hepatitis B.

Considering **KTOs** in the Czech Republic, ten are within public universities, two within research institutions, five established by municipalities, one by a private research institute and two established jointly by universities and joint research institutes. The Academy of Sciences also has a central office for patent and licensing. A survey was carried out on universities and other PROs, checking whether KT policy and IP protection was implemented or merely a formality. The survey discovered that strategy for IP protection and KT is usually integrated in broader development strategies. One third of universities and one fifth of research institutes have explicit IP procedures related to patenting and licensing. More than 60% of research institutes plan to implement new KT mechanisms.

The main **barriers to implementing KT** include the following: First, the motivation of the organisation's management, understaffing of KTOs with regard to number and professional experience, and the absence of a complex system for KT – the system is decentralised and responsibilities are ambiguous.

A major activity to overcome these barriers is the project **EF-TRANS** (Efficient Transfer of Research and Development Outputs in Production and their Subsequent Utilisation). The main objectives of the EF-TRANS are: to improve the cooperation between research institutions and universities with industry in order to facilitate the commercialisation of R&D results; to enhance the utilisation and legal protection of intellectual property; and to motivate students, employees of universities and research institutions and to instruct them on which steps to take in this process. The EF-TRANS project analysed the legal environment and the KT situation in the Czech Republic and abroad. The project's



methodologies are currently undergoing revision, after which they will be finalised and ready for use by PROs.

Other plans for overcoming barriers to KT include the development of „hard“ **infrastructure for KT** such as the setting up of KTOs at universities and other PROs, development of science parks, business incubators and technology centres and creating systems for commercialisation of R&D results. Developing financial instruments for KT is another area which could benefit from some improvement, such as pre-seed financing or provision of seed funds for financing innovative SMEs in their starting phase. Human resources for KT are also deficient and so plans are in place for training of researchers in IP matters and KT officers in KT management as well as making training available in innovation entrepreneurship. There are also a number of funding measures in place to meet these plans.

In **summary**, KT activities at universities and other PROs have significantly increased over last few years, and universities and other PROs are currently subsuming IP and KT strategies and regulations with their internal structures. The national innovation policy supports this process both financially and methodologically. However, IP protection, KT and science-industry cooperation are still far behind EU best practice countries.

The **challenges** that the Czech Republic faces stem from three core areas: motivation, competences and collaboration. In terms of motivation a new methodology and system for R&D evaluation and R&D funding is required. With regard to competences there needs to be better education on policies for IP among KTO officers and PRO managers. Improving collaboration between industry and academia is the final challenge; more motivation is required on both sides. On the side of academia the motivation is influenced by the system of R&D funding (changes are required), on the industry side the motivation could be achieved with targeted direct and indirect support.

### Discussion

One participant asked whether **changes to legislation**, such as the Bayh-Dole Act in the US, need to happen in the Czech Republic. Mr Pazour explained that the main obstacle to better KT and to collaboration with business is motivation not legislation. Mr Pazour elaborated that **learning by doing** is key. To support this aim proof of concept projects are being run with the aim of bringing research results closer to industry. This will support the building of commercialisation structures and capacity for KT.

## 3 Case studies

### 3.1 KT and IP management at the Kennispark Twente

*Kees Eijkel, Director, Kennispark Twente (Enschede, Netherlands)*

Up until the 1960s **Twente** was the largest industrial region in Holland due to the textile industry. The university was founded in 1961 due to economic collapse as textile industry moved away to cheaper locations such as China. In 1983 the Vice Chancellor introduced entrepreneurship as a career option. Today the university is recognised as an innovation campus of national interest with 750 spin-offs, 10% of Benelux Technology Fast 50 companies, 300 companies in total and 6,000 commercial jobs on site. The heart of the university is based on the setting up of small businesses, reflecting the motivation behind originally setting it up.

Kennispark means Knowledge Park in Dutch. Kennispark was created due to needs for KT which came from outside of the university. Most of the spin-offs from the Kennispark are innovative but not IP based, “just” entrepreneurial; Booking.com is an example. For



innovation success the university needs to have an “integral agenda”, which is the **Kennispark’s approach to KT**. If a university misses an important component of the agenda, it will not succeed. The university should seek to empower the system, not the organisation, and regional economic strength is needed in order to support the whole system. Thus, rather than creating income for the university, it should empower the ecosystem and also support systems in place outside of the central organisation. The Kennispark approach implies starting and growing firms locally, developing strong industrial links such as an SME portal, joint research ventures and building clusters. An important component is finance. In Twente there are 20 funds in place which invested more than 28 million Euro into companies in 2011. The focus of the funds is on building industrial links. There are many events which allow people to meet. The idea behind is that the more opportunities provided the more likely it is that the right people will meet.

Kennispark does not agree with the “patent counting” approach to KT and pursues **distinguished approaches to KT**. Most patents are in the biomedical field, so if one only measures KT with patents then this only reflects a very narrow sphere. KT in other areas needs to be considered. Pharma, semiconductor, aerospace are all fields with known market development, suppliers, integrators, technology development. Here there is a nice clean line to KT for researchers: roadmaps are in place, players are known and patents play a central role. Other markets such as nanotech and ICT are often emerging markets with disruptive technologies. Established companies would consider researchers offering related inventions as “nuts or dangerous”. Thus, for such markets the path to KT is less established, requiring a business development approach and start-up firms. Then entrepreneurial talent is key, not IP.

The Kennispark has a long history of developing its **KT organisation**. In 1983 a standard TTO was introduced but it did not fit the disruptive nature of an innovative centre like Kennispark. In 1995 a switch was made to KT via research institutes. This was better organised than through a standard TTO but still there were not any KT professionals. Then in 2003 individual professionals in KT were introduced at research institutes. This was an improvement, but no critical mass or learning curve was achieved. So in 2008 a joint business development team with a portfolio was introduced. This involved a diverse team through which a critical mass and learning curve were brought in. In 2008 there were two to three cases of transfer per year, until today it grew to more than 15 per year, with the same amount of people, just a better process and critical mass. In 2011 “Idea2Venture” was launched. It is an organised approach for filtering, maturing, communication and information management.

In **summary**, the Kennispark’s transfer model is focused for areas which do not fit traditional methods. Instead of licensing technology out, the model aims to build a business and a regional system for entrepreneurship and innovation. A uniform approach is not possible – the model is customised to each case and the business team plays a central role. Overall the model goes through four phases: screening and scouting, development, transfer and sign-off support. It has been found that a large, diverse team is better than a more experienced team with less diversity. Diversity of skills helps allocate more time to outreach action, i.e. to identify inventions and to evaluate commercial feasibility of inventions.

## Discussion

The Kennispark’s business development activities are **largely co-funded** (75%); the income generated covers 25% of costs. The share is growing: The share is growing: It started with three IP transfers per year, now it is at 15 or 16. Kees Eijkel advised that the purpose of a TTO should not be to generate income for the university but to generate benefits for the region. Through its spin-offs – 75% of which stay in the region – Kennispark created 10,000 jobs in the region and related tax income for public entities. Such results are convincing for the province’s government to partially fund the Kennispark’s business development.



Members of the Kennispark's **business development team** are mainly brought in from outside of the university, hired on the basis of knowledge in a particular field. However, it is important that they can balance their understanding with knowledge of how a university functions. Crucially business developers should understand the process of interaction between the university and industry. Another key feature is that Kennispark has been working on commercialisation for 30 years, so most researchers know about spin offs.

### 3.2 How to manage the "cultural clash" between science and business in knowledge transfer

*Jan Šedivý, Technology Transfer Manager, Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University*

The activities on technology transfer at the Czech Technical University are much more limited than the previous case. Jan Šedivý has worked within a university for two years so far, his previous experience was in industry. Thus he is able to comment on the KT process from both a university and an industry based perspective. From an industry based view universities can appear very difficult to work with, but industry can be the difficult party when viewed from the university. The Department of Cybernetics' mission covers three core areas: education, research and entrepreneurship. In terms of education the aim is to create and deliver excellent curricula for informatics and cybernetics and to encourage and motivate research and entrepreneurship education. Regarding research the goal is to drive a national education and research centre committed to discovery and the application of science and technology. When turning to entrepreneurship the aim is to make a difference through education, research services, technology development, and dissemination of the results to industry and create and cultivate an entrepreneurial environment to help new, high tech startups.

Work is only just beginning in the area of entrepreneurship, although national **partnerships** have already been established. Many of these relationships have occurred due to presentations given by the department at events where industry was impressed by what was presented. From these partnerships the need to direct research in response to company requirements has been learnt. It is important to understand the visions of leaders of partnership companies in order to target research accordingly. The department also has partnerships with governmental institutions although these are mainly with institutions from outside the Czech Republic.

The department is proud of the several **spin-offs** it has produced. The oldest spin-off is CERTICON which is a typical university company focused on research with only one sales person. Eyedea is a spin-off which the university has a share in. The department recognises the need to strengthen co-operation with industry and produce more new jobs. The largest portion of the department's funding comes from industry, not from the university. The department supports 120 university and research staff and has created 250 new jobs through spin offs and other activities.

The situation for KT in the Czech Republic today has both **positive and negative elements**. The positives aspects concentrate on the linking up of the start-up movement. There are seed funds which will stimulate new start ups and Czech eco-funds are available for start-ups. Some students at the masters level are already starting to think about start-ups. Throughout the country there are many incubators and accelerators similar to what is in place in the United States. However, despite these initiatives and interest there are a very low number of courses on starting up companies. There is a risk aversion culture in place, whereby people are not prepared to give up steady jobs and incomes in order to work on or invest in a start-up. Added to this there is a lack of business angels. Local SMEs are also not interested in working with universities instead



they just want to take the best students. The difficulty for the promotion of KT is that universities' performance is measured by the number of scientific articles they produce in certain journals. While the accolade this attracts is nice it does not generally lead to licenses or patent applications. Persuading people of this is difficult as academics are not business people. A difficulty limited to universities in Prague is that EU funding does not apply for any KT initiatives as Prague is considered too well developed to be eligible. A difficulty which faces all Czech universities is that procedures for IPR are ill defined and it is not common knowledge. Greater education and promotion of IPR is required.

There are **steps towards improving KT**. One such step is the Czech Technical University's eClub. eClub brings together students enthusiastic about new technologies and innovation. It includes weekly motivational and educational presentations which are streamed to nine universities in the Czech Republic. It also includes a competition for the best start-up project. The number of downloads from the eClub site indicates that people are interested in the initiative.

A **change to university climate** is required in order to make it more open. This could be achieved through the use of more open spaces rather than closed offices. This openness is required for better information exchange and co-operation. Jan Šedivý also suggested more international co-operation, focusing on excellence and actively advertising research results. Motivation models also need to be changed. Governmental funding does not motivate entrepreneurial behaviour which is why venture capital needs to be brought in. Other methods to motivate include researchers not relying entirely on grants, discovering how to motivate industry to cooperate with universities and privatising technology transfer. Education programmes should be introduced to create experts in technology transfer as well as entrepreneurship for startups and education on innovation and business development. Aside from the introduction of new educational programmes the barrier between students and teachers also needs to be dismantled in order to encourage innovation.

## Discussion

As regards suggested **privatisation of technology transfer**, Jan Šedivý advised that TTOs should stay outside of universities. Perhaps they could be partially funded by either universities or government but they should be external so as to provide a link or stepping stone to industry.

Jan Šedivý advised to **develop TT from the roots**, involving companies and students. Step by step TT needs to be developed further. Research department may serve as small institutes for small and medium-sized enterprises, enabling students to be paid for working on projects.

Establishing **shares in companies**, as the department did in the case of Eyedea, was not easy – negotiations took about one and half a year. Investing small amounts of money in the right spin-off companies may bring money back to the university, as Stanford University invested a little money in Google and received large returns.



## 4 Panel Discussion

### Participants

- Attila Varga, Head of Technology Transfer Office, Eötvös Loránd University (Budapest, Hungary)
- Dr. Špela Stres, Head of Technology Transfer and Innovation Centre CTT - Jožef Stefan Institute (Ljubljana, Slovenia)
- RNDr. Arpad Nagy, Director, Institute of Technology of the Slovak Academy of Sciences (Bratislava, Slovakia)
- Jan Buriánek, Legal Officer, Ministry of Education, Youth and Sports (Prague, CZ)

### Introduction and general experiences with the interaction of PROs and businesses

**Attila Varga** explained that Eötvös Loránd University is one of the oldest in Hungary. However TT activities are very young in Hungary, their TTO was founded in 2006 and is a small office of three and a half people (FTE). The university enters into 70-100 research contracts per year (most of them are handled by the TTO), which is mainly through personal connections made by the university's scientists. TT also arises through journal articles which sometimes result in collaborative research. Framework contracts are also made with the university, mainly by large pharmaceutical or engineering companies. There are about 5-7 invention disclosures every year and the university generates 3-5 patent applications every year.

When **Spela Stres** started working in the field of KT she had a lack of knowledge as she was still primarily a researcher. At first, she considered that an economic background would be required for KT, but then she realised legal knowledge is also required. There is much more that needs to be done on KT at EU level. Government policies affect how KTOs behave. Last year seven different contract possibilities arose for the CTT, seven patents were granted, three licences were carried out and two spin-offs emerged. Once you have the trust of the researcher they will work with you.

Earlier in his career **Arpad Nagy** worked as an assistant professor before he went into industry. This allowed him to see the patent process from the other side. Dr. Nagy then moved from a large company to a small one and then to the academy. The academy focuses on the field of development of new technologies with grants from EU structural funds. Smaller grants have also been received for KT. Academy personnel visited different departments of institutes and identified possible research findings which could be patented. From these findings 5-6 patents were submitted to the patent office. Regulations on how to manage IP were also created and it was recommended that research institutes implement them. Market research was carried out alongside this.

**Jan Buriánek** explained that the Ministry of Education, Youth and Sports (MEYS) deals with matters of IP and KT only indirectly. Although it is the main provider of the funding for PROs (along with the Academy of Science and the Ministry of Industry and Trade), PROs are largely independent in their decision-making and in spending money. The role of MEYS lies mainly within the field of supporting, promoting and monitoring the efforts in KT activities. Therefore, MEYS offers programmes and projects aimed at enhancing the awareness of IP and KT issues, for example the EF-TRANS project. An audit of R&D in the Czech Republic past year revealed that most PROs have some guidelines for KT, however they vary in quality.

### Professionalisation of IP relationships between universities, PROs and enterprises

**Attila Varga** stated that his university is just at the beginning of the KT development process. They first have to learn what knowledge is available within the university. The



outcome could be a “knowledge map” – a database which could be a point of reference for industry, university’s decision makers and researchers. Once a connection with industry is in place the TTO can delegate tasks to competent researchers. It is also important that the connection with industry is trustworthy. He also suggested that the research infrastructure of his university could be partly outsourced to industry.

**Špela Stres** pointed out that one first needs to define the scope of KT. The entities involved include the European Commission, national and regional governments, PROs, SMEs and multi-national enterprises. If the parties involved only agree in certain parts what KT is, their relationship is likely to be subject to misunderstandings. For example, SMEs may not want licenses – it would then be wrong to force license agreements while a research co-operation would be the better option. Hence, PROs should be aware of the “full package” of KT (e.g. patenting, licensing, spin-outing, contract, collaborative research) when seeking to commercialise their knowledge. A second important issue is that enough people well-trained in IP matters are needed. KTOs should be built with a critical mass, which in her view is normally at least five people. Their expertise should combine technological, legal and economical understanding (e.g. for market assessment). Next, the KTO should develop a proper procedure for collaboration with business: It should have clear answers to several questions: What steps are needed for successful co-operation? What support is needed? What are the objectives? It is important that a KTO recognises that it has customers at both ends, i.e. in research and business, and it needs to meet the needs of both. In turn, both the researchers and the company need to be willing to co-operate on the path to the market.

**Arpad Nagy** advised that much more has to be done on the side of PROs. First, the attention of companies has to be attracted. Often companies are well established and in a better position to negotiate. A company will generally approach a transfer as an investment and assess the efficiency of the investment, envisioning income for the next five to six years. The company needs a lot of data for this assessment so a university needs to be ready to provide that data. It is unlikely that a university will be able to provide all requested data, but both sides need to be willing to collaborate to extend related boundaries. With educated staff and all available data in place to prove that KT can be successful, the collaboration can really start.

**Jan Buriánek** suggested that the only efficient solution is to convince the PROs to focus more intensely on IP and KT issues, educate staff, hire the right people, properly assess their IP and learn how to choose the best options of utilising it. PROs should get more in touch with industry and make targeted offers. On the other hand, the enterprises should get rid of their prejudices towards PROs and for the mutual benefit start more actively seeking cooperation opportunities. Limited resources are not the only obstacle; it is also difficult to find qualified KT advisors who are knowledgeable about research and also IPR.

### **Three wishes to policy makers about IP protection in knowledge transfer**

**Špela Stres** described her *first* wish to be that PROs’ would be evaluated based on KT criteria, not only assessing researchers on scientific criteria such as the number of articles and citations produced, but also on how much revenues (e.g. patenting, licensing, spin-outing, contract, collaborative research) the PRO generates. Once PROs take this responsibility they will become more aware of KT problems, meaning such problems would be more likely to be resolved. Her *second* wish would be that the EC realises that although the Enterprise Europe Network is successful in how they communicate, the level of education of members about IP and other services EEN is supposed to offer, is not sufficient. There needs to be a realisation that PROs and SMEs belong together as SMEs are often the end users of innovations from PROs. This would mean that SMEs and KT professionals were educated to an effective and consistent standard. Dr. Stres’ *third* wish relates to the fact that KT is actually an optimisation of activities already in place in Europe. As long as the situation in Europe remains the same then the optimisation



processes will stagnate. However, if the economic crisis were to worsen then the optimisation process would have to be pushed further. Therefore Dr. Stres hesitantly wishes for deterioration in the economic crisis – as they say “never waste a good crisis”.

**Attila Varga** wished that the government should plan for longer distance (while making calls for grant applications). He observed that the amount of grants from the Hungarian government to support universities has been fluctuating, culminating in the most recent amount being too high which resulted in too much being spent in the rather short time span of two years. Two years is much too short to commercialise an innovation, in fact it is the length of time it would take just to get a patent. Therefore, many TTOs spend the money on hiring staff which they then have to let go after the projects end. Under such conditions TTOs are not able to plan, whereas more planning would produce better results. Mr. Varga’s second wish concerned the scientific promotion of researchers. At present promotion is based on the number of publications within journals. He suggested that an alternative measure could be patents. His final wish was a good example at the university, which can be shown as a precedent to follow; e.g. a successful researcher after successful KT should drive his brand new sports car into the university parking lot, providing an incentive for other researchers.

**Arpad Nagy** described the high turnover of staff in his institution in its four years of existence. He observed that well educated staff is missing. Hence his first wish is for national curricula for students in entrepreneurship, KT, marketing and technology management. This should be introduced even if it will take time before the courses “bear fruit”. Courses for KTO professionals also need to be introduced. In his second wish, Arpad Nagy agreed that there may be too many patent applications, but governments should nevertheless invest reasonable funds to sustain some level of patenting. His final wish was for financing KTOs. Extra financing is required for developing contacts in industry rather than the current allowance which just covers database maintenance. Another area which could benefit from more financing is marketing research.

**Jan Buriánek**’s first wish concerned more flexible legislation. He observed that in the Czech Republic it is difficult for legislators to react appropriately to scientific practices due to parliamentary instabilities. Mr Buriánek wished for parliamentarians to listen to researchers’ needs and respond appropriately. For instance, at present establishing a spin-off from a PRO takes an unacceptably long time. Mr Buriánek’s second wish is for patience from companies. The companies often want short term solutions but PROs are generally longer term based. Some of the projects may not bring rewards immediately but are promising in the long-term prospect. His final wish is for better targeted research. The major barrier to KT is the mismatch of knowledge needed and knowledge produced. If research is carefully aimed at the needs of industry and society, it would be more fruitful and would spare time and resources.



## Annex

### *Annex 1: List of participants*

<b>No.</b>	<b>Title</b>	<b>Name</b>	<b>Organisation</b>
1		Zuzana Belohradska	Industrial Property Office of the Czech Republic
2		Lubomir Bilsky	Slovak Centre of Scientific and Technical Information
3		Denisa Brighton	Institute of Management, Slovak University of Technology
4		Jan Buriánek	Ministry of Education, Youth and Sports of Czech Republic
5		Ondřej Daniel	TC AV ČR
6		Kees Eijkel	Kennispark Twente
7		Jakub Hadam	Science and Technology Park, Palacky University Olomouc
8		Jess Heywood	empirica GmbH
9		Marcela Holečková	MŠMT
10		Jan Kozisek	VSCHT
11		Jana Kratěnová	Technology Centre AV CR
12	Dr.	Pavel Krecmer	University of Pardubice
13		Dana Kreizlova	UTB Zline
14		Jan Kříž	MSMT
15		Zdenek Kucera	TC AV CR
16	Dr.	Květa Lejčková	CTU in Prague
17	Dr.	Stefan Lilischkis	empirica GmbH
18		Lucie Machantova	CVUT
19		Vera Mansfeldova	J. Heyrovsky Institute of Physical Chemistry of the ASCR, v. v. i.
20		Patrick McCutcheon	European Commission, DG Research and Innovation
21		Zdeněk Mrázek	ÚMCH AV ČR, v.v.i.
22	Dr.	Arpad Nagy	Institute of Technology of the Slovak Academy of Sciences
23		Gábor Németh	Innovation and Information Centre, Hungarian Intellectual Property Office
24	Dr.	Jitka Nováková	CESNET, a.l.e.
25		Michal Pazour	Strategic Studies Department, Technology Centre ASCR
26		Martin Podaril	EF-TRANS
27	Dr.	Jan Polecha	Ministry of Education, Youth and Sports of the Czech



			Republic
28		Jan Radoš	Ministry of Education, Youth and Sports of the Czech Republic
29		Eva Schneiderová	Patent Department, Czech Industrial Property Office
30		Jan Šedivý	Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University
31		Jiří Sedlák	PatentCentrum Sedlák & Partners s.r.o.
32		Jaroslav Sip	University of West Bohemia
33		Barbora Šmídová	Ústav fyzikální chemie J. Heyrovského AV ČR, v.v.i.
34		Přemysl Strážnický	Tomas Bata University in Zlín
35	Dr.	Špela Stres	Technology Transfer and Innovation Centre CTT - Jožef Stefan Institute
36		Alena Stupková	Tomas Bata University in Zlín
37		Václav Suchý	TC AVČR
38	Dr.	Josef Svoboda	ČVUT - FEL
39		Petr Synek	Technology Transfer Office of Charles University
40	Prof.	Ján Turňa	Slovak Centre of Scientific and Technical Information
41		Jaroslav Urban	Jihočeská univerzita v ČB
42		Ondrej Vanek	KTTO PuF UK
43		Attila Varga	Technology Transfer Office, Eötvös Loránd University
44		Naděžda Witzanyová	Ministry of Education, Youth and Sports of the Czech Republic

**Annex 2: Programme**

<b>Time</b>	<b>Sessions</b>
09.15 – 09.45	<p><b>Welcome and introduction</b></p> <ul style="list-style-type: none"> <li>Naděžda Witzanyová, Director, Department of International Cooperation in Research and Development, Ministry of Education, Youth and Sports (Prague, Czech Republic)</li> <li>Eva Schneiderová, Director of Patent Department, Czech Industrial Property Office (Prague, Czech Republic)</li> <li>Stefan Lilischkis, Senior Consultant / Knowledge Transfer Study Manager, empirica GmbH (Bonn, Germany): the European Commission's Recommendation on knowledge transfer</li> </ul>
09.45 – 10.45	<p><b>Country profiles</b></p> <p><b>Knowledge transfer at universities and other public research organisations: current situation, good practice and challenges</b></p> <ul style="list-style-type: none"> <li><i>Slovakia</i>: Prof. Ján Turňa, Director, Slovak Centre of Scientific and Technical Information (Bratislava, Slovakia)</li> <li><i>Hungary</i>: Gábor Németh, Director, Innovation and Information Centre, Hungarian Intellectual Property Office (Budapest, Hungary)</li> </ul>
10.45 – 11.00	<i>Coffee and tea break</i>
11.00 – 12.00	<ul style="list-style-type: none"> <li><i>Slovenia</i>: Dr. Špela Stres, Head of Technology Transfer and Innovation Centre CTT – Jožef Stefan Institute (Ljubljana, Slovenia)</li> <li><i>Czech Republic</i>: Michal Pazour, Head of Strategic Studies Department, Technology Centre ASCR (Prague, Czech Republic)</li> </ul> <p>Discussion after each presentation</p>
12:00 – 13:00	<i>Lunch break</i>
13.00 – 14.30	<p><b>Case studies</b></p> <p><b>Knowledge transfer and IP management at the Kennispark Twente</b></p> <ul style="list-style-type: none"> <li>Kees Eijkel, Director, Kennispark Twente (Enschede, Netherlands)</li> </ul> <p><b>How to manage the "cultural clash" between science and business in knowledge transfer</b></p> <ul style="list-style-type: none"> <li>Jan Šedivý, Technology Transfer Manager, Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University (Prague)</li> </ul> <p>Discussion after each case</p>
14.30 – 14.45	<i>Coffee and tea break</i>
14.45 – 16.00	<p><b>Panel discussion</b></p> <p><b>Fostering IP management in public research – policy implications</b></p> <ul style="list-style-type: none"> <li><i>A university's view</i>: Attila Varga, Head of Technology Transfer Office, Eötvös Loránd University (Budapest, Hungary)</li> <li><i>A research organisation's view</i>: Dr. Špela Stres, Head of Technology Transfer and Innovation Centre CTT – Jožef Stefan Institute (Ljubljana, Slovenia)</li> <li><i>A technology development view</i>: RNDr. Arpad Nagy, Director, Institute of Technology of the Slovak Academy of Sciences (Bratislava, Slovakia)</li> <li><i>A governmental policy view</i>: Jan Buriánek, Legal Officer, Ministry of Education, Youth and Sports (Prague, Czech Republic)</li> </ul> <p>Questions from the audience</p>
16.00 – 16.05	<p><b>Conclusions</b></p> <p>Stefan Lilischkis, Senior Consultant, empirica GmbH (Bonn, Germany)</p>
Moderation: Dr. Stefan Lilischkis, empirica	