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TRANS³Net
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REPORT ON

National understandings of transfer processes and Reference model of transnational transfer

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Introduction

The following report documents and summarises the discussion process of the project TRANS³Net developing an own understanding of transfer processes based on existing regional respectively national understandings.

Therefore, in the first parts (chapter 1-3) the report describes the regional understandings of the participating countries/ regions in terms of knowledge and technology transfer and its influencing factors. In the second part (chapter 4), a common understanding defined as TRANS³Net reference model of transfer is depicted which will be the working basis for all future activities of TRANS³Net project.

1. Understanding of transfer in Lower Silesia region

1.1. Description of environmental factors for transfer

Lower Silesia is one of the fastest growing regions in Poland. Gross Domestic Product (GDP), the share in national GDP and annual income growth rate prove the region to have high development potential. Wrocław, the capital of the region, is the 3rd biggest academic centre in Poland (after Warszawa and Kraków) with University of Wrocław, Wroclaw University of Science and Technology, Wroclaw University of Economics, Wroclaw University of Environmental and Life Science, Wroclaw Medical University as most important institutions responsible for research activities.

In Lower Silesia region there are many institutions and companies, which provide services supporting Research and Development (R&D) sector and transfer of technology:

- technology transfer centres (Wrocław Transfer Technology Center, Wrocław Research Center EIT+, Universities Transfer Technology Centers),
- industrial parks (Wrocław Industrial Park, Nowa Ruda Industrial Park, Głogów Industrial Park, Regional Industrial and Technological Park in Polkowice),
- science and technological parks (Wrocław Technology Park, Data Techno Park, Lower Silesian Technology Park (T-Park), KGHM Letia),
- business incubators (IP DAWG, Academic Business Incubators, Lower Silesian Business Incubator, Dzierżoniów Business Incubator, Nowa Ruda Business Incubator),
- clusters (for ex. Nutribiomed, CINNOMATECH, SIDE-CLUSTER, Cluster Wałbrzyski Resources, E-Health Cluster),
- loan funds (Lower Silesian Regional Loan Fund, Lower Silesian Economic Fund, Wałbrzych Region Fund).

Such institutions offer at least one of the following services:

- assistance in setting up spin-off companies (academic entrepreneurship),
- consulting services in the field of knowledge commercialisation,
- technology audit,
- assistance in applying for financing of innovative ventures (venture capital, loans),
- assistance in applying for programmes supporting innovation,
- consulting services in the field of intellectual property protection,
- patent clearance search,
- broking services for business – science cooperation,
- providing access to laboratories and research facilities,
- consulting/support in the process of implementation of eco-innovations.

1.2. Description of regional understanding/progress of transfer

Nowadays, the term "knowledge transfer" is usually applied to transfers between universities and industry, or between experts and non-experts. The focus is frequently on "science management"[1]. **Technology transfer is the process of transferring skills, knowledge, technologies, methods of manufacturing, samples of manufacturing and facilities among governments or universities and other institutions to ensure that scientific and technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new products, processes, applications, materials or services**[2]. Technology transfer can also be defined as "assignment of technological intellectual property, developed and generated in one place to another through legal means such as technology licensing or franchising"[3].

The process typically includes: identifying new technologies; protecting technologies through patents and copyrights; forming the development and commercialisation strategies, such as marketing and licensing to existing private sector companies or creating new startup companies based on the technology.

The importance of creating networks between business entities, public administration, non-governmental, scientific and research institutions is growing steadily. Such networks help merging ideas, exchanging information and establishing cooperation methods between the above. The innovation and entrepreneurship centres, which have been developing in Poland since the early 1990s of the 20th century are gaining in importance in these processes. Currently, the entrepreneurship support infrastructure in Poland consists of different types of innovation and entrepreneurship centres: technology parks and incubators, business incubators, pre-incubators, technology transfer centers, training and advisory centers, loan funds, guarantee funds, seed funds etc. These institutions are generally intended to enhance human creativity, entrepreneurship and innovation leading to more effective use of the local growth factors.

Since the beginning of system transformation, the number of innovation and entrepreneurship centres has been systematically growing. The process of developing the entrepreneurship supporting system is still running. New initiatives and new areas where the innovation and entrepreneurship centers operate are appearing. The changes observed and analysis of the experience acquired by "knowledge economy leaders" show an increasing role of support infrastructure in the process of the Polish economy innovation development. In the era of technological changes and dynamic expansion of the innovation to the services, organisations, marketing and social issues, the enterprises are looking for new solutions and this is where the innovation and entrepreneurship centres may have important contribution[4]. Nowadays, company competitiveness is based on components like knowledge, technological capabilities and skills. This led to a theoretical discussions on knowledge-based economies. In order to create this knowledge, which will eventually be transformed into new products and services, companies have internationally began to form increasing numbers of knowledge-based strategic alliances, thus creating a new form of competition. Nevertheless, the creation and transfer of knowledge and best practices through cooperation have proven to be quite difficult. Knowledge transfer is neither an easy nor a costless task.

Crucial for attracting investors to the region is the research and scientific potential of Wrocław academic centre and the work on creating a knowledge-based economy. Wrocław University of Science and Technology, as the only technical university in the region, has become a leader of active cooperation with the industry. Collaboration with the economy allows providing a comprehensive offer for companies looking for innovative solutions. Tens of long-term, many-sided collaboration agreements signed prove that this is the

[1] V. Lipphardt and D. Ludwig, "Knowledge Transfer and Science Transfer", in: European History Online (EGO), published by the Institute of European History (IEG), Mainz 2011-12-12

[2] R. Grosse, "International Technology Transfer in Services". Journal of International Business Studies 27, pp. 782, 1996.

[3] Business Dictionary, http://www.businessdictionary.com/definition/technology-transfer.html

[4] Innovation and entrepreneurship centers in Poland. Report 2012, pp. 5, http://www.pi.gov.pl/PARPFiles/file/OIB/IOB_Raporty_po_angielsku/2012_BSI_in_Poland_Report.pdf [retrieved: 14 October, 2014].

right approach to business partners. These agreements cover a wide range of activities, from providing training for the employees of Lower Silesian companies to joint research aiming at introducing new technologies and products, and increasing company competitiveness on Polish and international markets[5]. Following figures present general model of commercialization process (Fig. *1*) at the University and four paths of indirect commercialisation (Fig. 2, Figure 3).

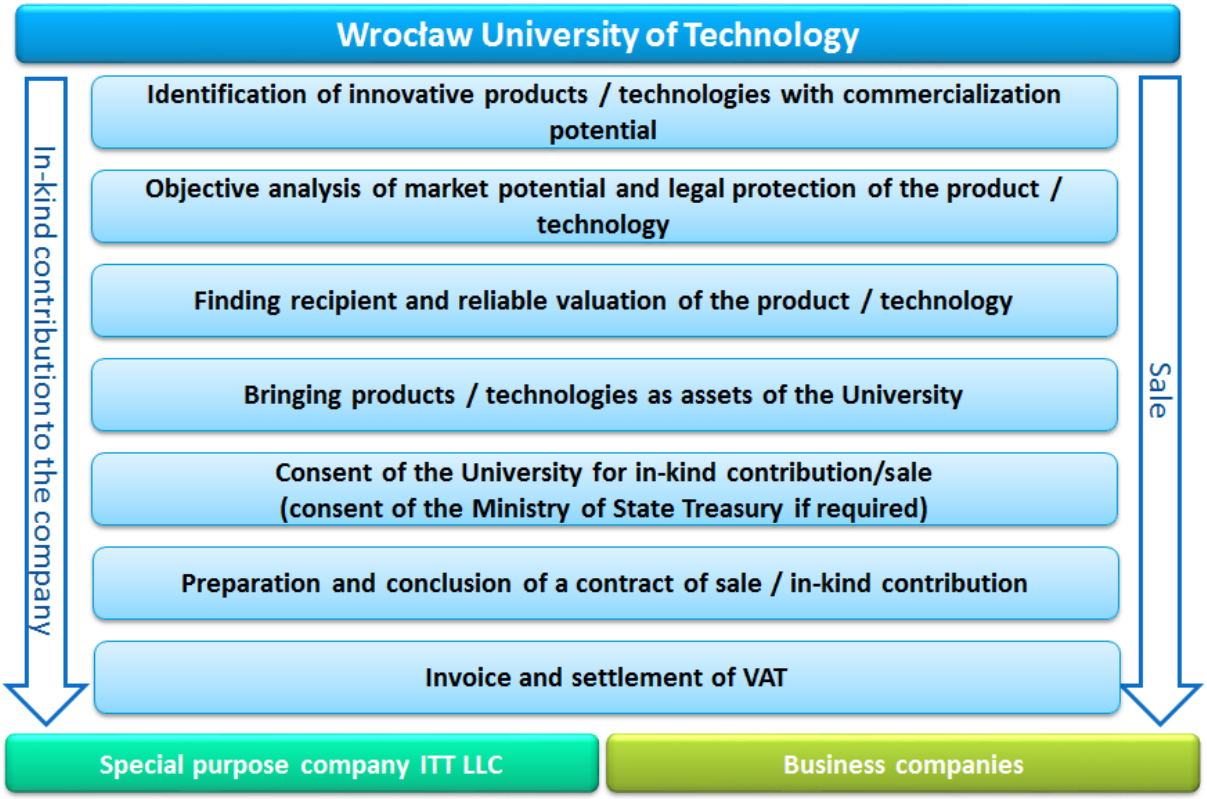

Fig. 1: Model of commercialisation process

[5] Research. Wrocław University of Technology, http://www.portal.pwr.wroc.pl/346196,242.dhtml, [retrieved: 1 October, 2014].

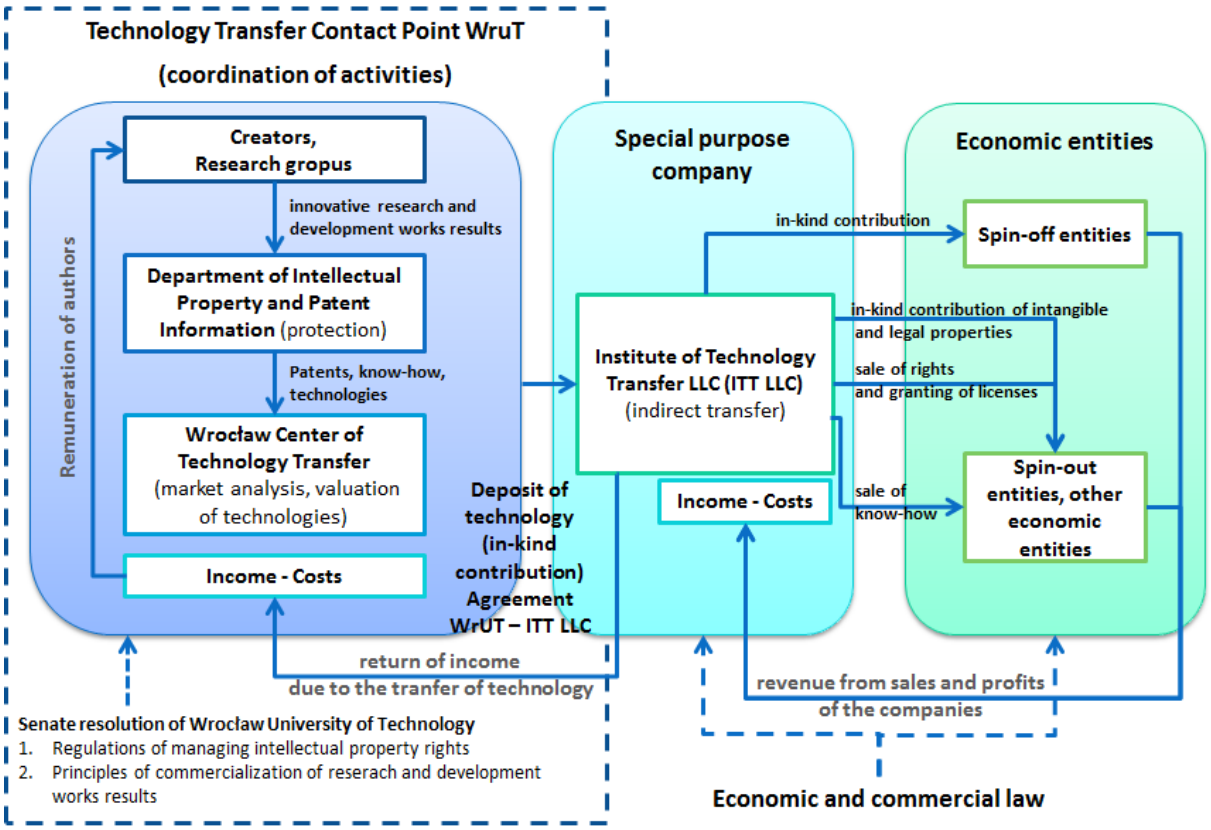

Fig. 2: Model of indirect commercialisation process in WrUST (Path 1 and 2)

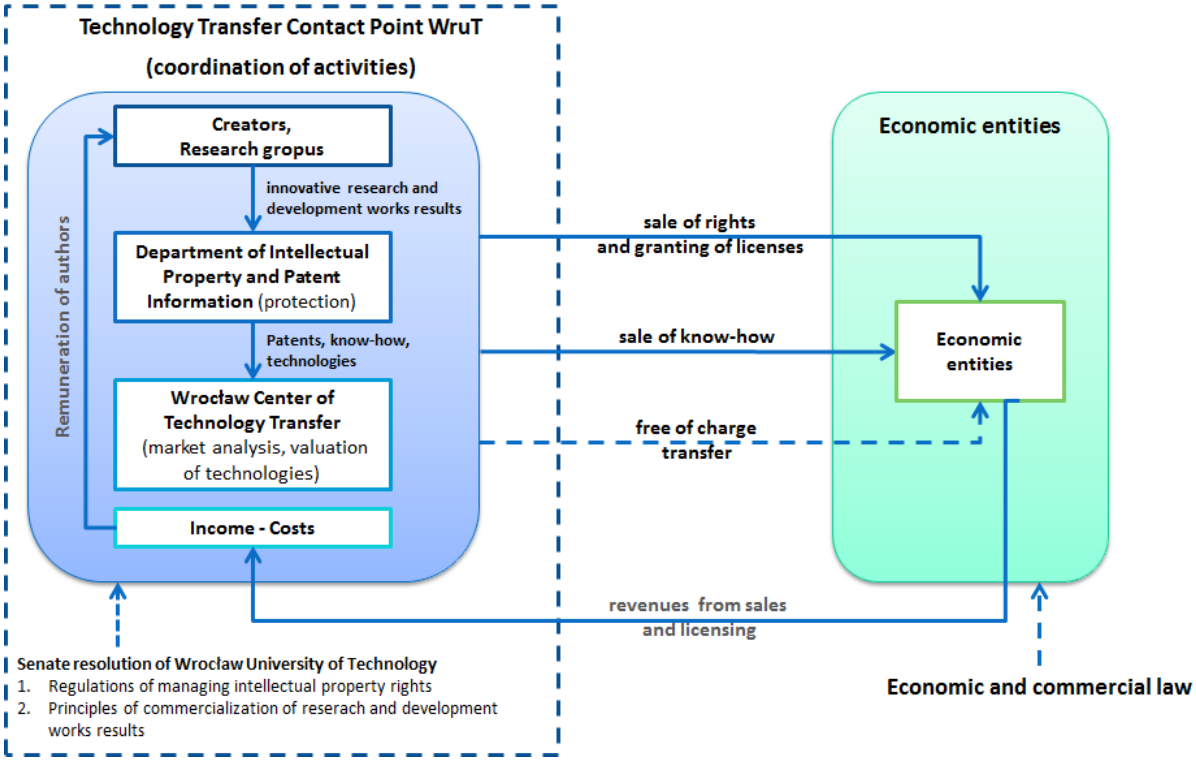

Figure 3: Model of indirect commercialisation process in WrUST (Path 3 and 4)

1.3. Definition of regional challenges In terms of transfer

Nowadays, in the globalised economy, companies must be innovative in order to be competitive. Transformation of knowledge into new products, technologies and services has become one of the most important and crucial factors to develop entrepreneurship. In the region of Lower Silesia the transfer of technology has come into force after the political transition in the 1990s and Poland's accession to the EU. With emergence of numerous SMEs as well as lots of foreign companies entering the Polish market increasingly greater competition has become a driving force behind growing competitiveness – first in terms of costs and subsequently in terms of greater value added.

Transfer promotors' role consists of assisting partners from science and business world to overcome obstacles resulting from their different needs and priorities. It is particularly important in Poland where during the communism years science and economy remained totally separated. This heritage still impedes the process of technology commercialisation with such challenges as: insufficient communication, insufficient flow of information between two sides and different working style.

The other factor making the transfer of technology difficult is bureaucracy. Complexity of Polish regulations works definitely against the development of entrepreneurship in the country. Starting up a new company generally requires a lot of time and oblige future businessmen to confront themselves with unfriendly procedures. The tax system in Poland also does not encourage young entrepreneurs to try their luck on the market.

The transfer of technology requires also an implementation of changes in Polish universities' working models. The Polish scientists employed by universities generally play roles of teachers and lecturers. As a result their activities as researchers are set aside.

The above mentioned problem is strictly connected with low financial investments on research, development and innovation from the national budget. In Poland the expenditures on research and innovations amount to 0,9% of GDP.

One of the main problems, which definitely impede the transformation of technology in Poland is a mutual mistrust between scientists and businessmen as far as financial and ownership aspects are concerned. Both sides are afraid of being deceived and defrauded.

The next challenge to overcome in order to facilitate the transfer of technology in Poland is of cultural nature. Commercialisation of new technologies is a risky, costly and long-term investment. In many cases the fear of potential failure does not allow scientists and businessmen to undertake the effort and to try to engage in the collaboration. The potential bankruptcy does not let innovators to freely enter the road of commercialisation. The possibility of financing commercialisation of technology from European funds does not solve this problem.

Moreover, projects that can be financed by European funds have to be after all profit-oriented and risk-free. The realisation of such projects mostly consists in fulfilling imposed regulations and index. Under such circumstances, the innovative ideas set aside and leave place for red tape. The paradox is that the most innovative projects are at the same time the most risky and unpredictable. It is impossible to anticipate their success. As a result, European funds are not usually spent on innovative projects but rather on projects designed for an easy and quick financial success. The real innovation cannot to be classified in any imposed category.

1.4. Short description of regional funding situation in terms of transfer

European funds are one of the determining factors of the model of technology transfer in Poland and there will be about 360 million Euros provided for financing of projects under Priority Axis 1 Entrepreneurship and Innovation in the Regional Operational Programme 2014 - 2020 for Lower Silesia region. In this model SMEs (innovation takers), being beneficiaries of European support, are the initiators of the transfer. With requirement for a new product, technology or service, which will make them competitive in the market, they search for an scientist partner (the innovation giver). In other words, they order a specific service from universities or other scientific institutions.

It is worth emphasizing that in the new EU financial perspective (the 2014-2020 EU Financial Framework) projects with commercial potential are of overriding importance. This regulation places businesses in the center of innovative process when it comes to the EU support. Taking into consideration that SMEs have limited financial resources, they will have to apply for European funds and by that they will actually become the initiators of technology transfer in their sector.

In the case of large companies the transfer of technology can be initiated by these companies themselves or by universities which present their offers to large companies in order to sell them their scientific results. The chosen large companies have financial, human and organisational resources to purchase them and to take full advantage of them. The model of transfer of technology in which the transfer taker is a large company with its own financial resources is much more flexible than the model in which the technology transfer is financed by European funds. Regulations of Cohesion Policy in general determine largely the model of technology transfer initiated by SMEs.

Another model of transfer consists in creating spin-off companies usually by scientists who have decided to commercialise their own innovative ideas. The financial resources for such initiatives can come from European funds or business angels and venture capital, which provide capital usually in exchange for convertible debt or ownership equality.

On June 21st 2016, Programme of financial support for micro, small and medium-sized enterprises from Lower Silesia has been launched. The program is implemented by the Lower Silesia Development Fund, the Company which is 100% owned by the Lower Silesia. The mission of the fund is to promote the economic development of Lower Silesia, by supporting micro, small and medium-sized enterprises including financing technology transfer initiatives.

In the long term Lower Silesia entrepreneurs will be able to count on the support of up to 1 billion zl, consisting of two funding streams, ie. 450 million zl are funds that have been loaned to entrepreneurs in the previous financial perspective in the framework of the EU Jeremie initiative. By contrast, 530 million zl will be allocated for the programme to support entrepreneurs from the Regional Operational Programme 2014-2020.

2. National understanding of the Usti-Region

Scientific and technological transfer flow, particularly in the character of scientific cooperation that takes place between enterprises and scientific research institutions, is seen as a complex and long-term process. That contains everything from liaison potential partners from industry, science and research, through the implementation of a joint research purpose, alternatively the transfer of existing solutions into practice with final positioning of a particular product to commercial level.

Transfer Objects:

- Invention/contraption in the field of research and science, which can be utilised in industry (radical innovation). The aim of the transfer in this case is a faster industrial application and reducing the time to market application.
- Outcomes of research of products and procedures and gained know-how. The aim of the transfer in this case is to start a research collaboration between science and industry, as well as improving manufacturing processes in value chains (incremental innovation).

Benefits from the scientific and technological transfer:

Directly	Implementation of new processes and products in the economy
	Improving market position, improving procedural and organisational elements
	Support of innovation capability of enterprises
	Businesses´ better access to other experts in the field
	Faster exploitation of inventions and research results, and the indirect funding of expenditure in further research and development activities
Indirectly	Stakeholder cooperation in the field of science, research and in application sphere
	Support regional development through a stronger economy of local businesses
	Supporting endogenous regional factors
	Increase capacity, better use of resources and reduced time of innovation processes in industry
	Adoption of more complicated and more complex interdisciplinary topics

Explorations show, that the readiness of both sides to realise transfer processes does exist. In recent years, enterprises have cooperated with research organisations, but so far the transfer of innovation does not work in practice so well as both parties would desire. Therefore, the aim of our participation on the project TRANS³Net, is to strengthen the international cooperation and to involve all groups of actors into collaborative innovation processes in all three areas - Czech, Polish, German.

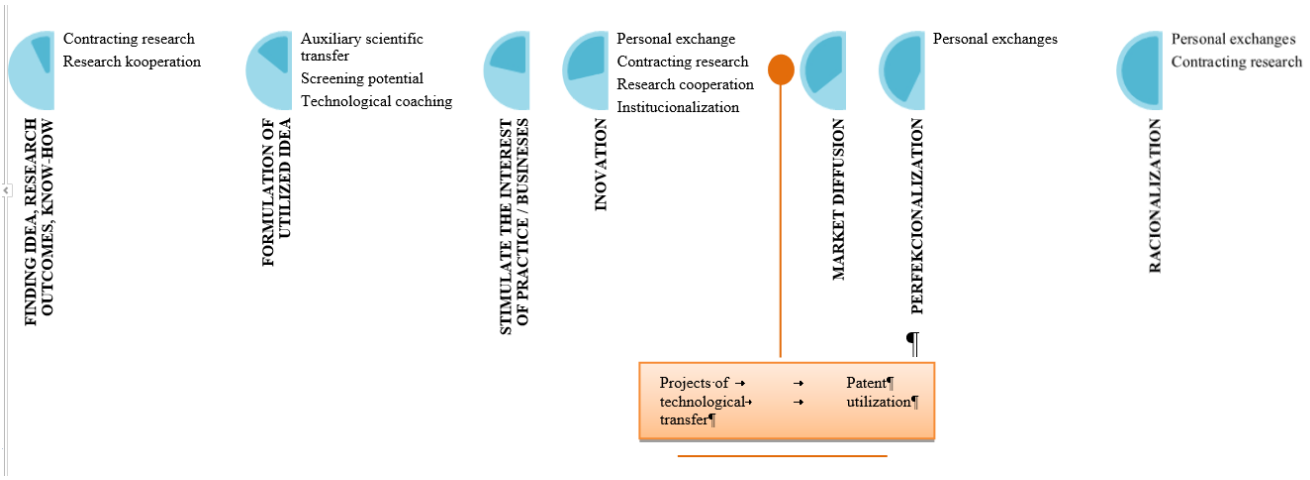

Fig. 4: Innovation process with transfer activities

2.1. Participants and principle conditions

On the business level we are talking especially about small and medium enterprises, which enter into cooperation with scientific and research institutions because of deficiency capacity and lack of competences for research activities. On the other side the scientific and research institutions enter into cooperation with regional enterprise sphere in order to support development of innovation and new knowledge. Among participants, who promote impulses to innovation processes, belong customers, suppliers and competitors. Last but not least, there is an important role of legislative and public administrative, who should establish and support suitable environment for cooperation of all participants (including regional strategies, source of support, infrastructure, educational institutes etc.) Success of the cooperative innovation process is influenced by many principle conditions.

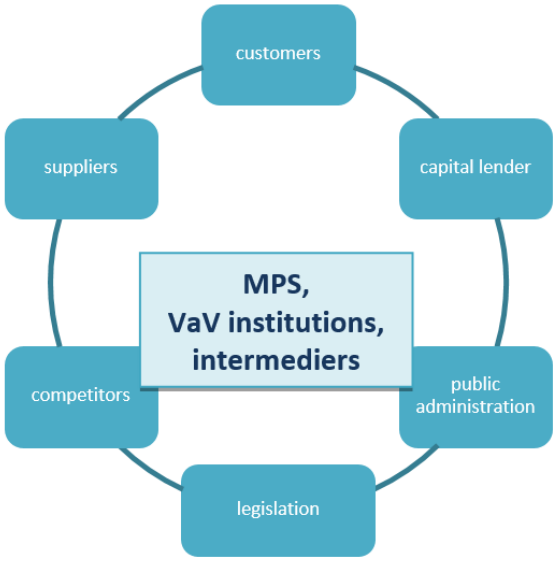

Fig. 5: Group of participants in a transnational innovation area

The structure of main Czech participants we consider as follows*:

Science institutions	Univerzitní centrum VŠCHT Praha – Unipetrol UniCRE Materiálové centrum Ústí nad Labem Vědecko-technický park Ústí nad Labem Výzkumný ústav pro hnědé uhlí Technologický park Chomutov
Enterprise sphere	CzechInvest CzechTrade OHK ICUK CzechMat Chmelařský institut
Finance	Banky ICUK (Innovationvoucher)
Science/Research	UJEP VŠ Báňská v Ostravě Technická univerzita v Ostravě Institut kombinovaného studia Most ČVUT Děčín VŠCHT
Public administration/Other	OHK HSR-ÚK

*this list will be completed in context of creating the map of 'transfer promotors'

2.2. Intermediaries/Mediators

These participants play an indispensable role as the intermediary link between main participants. Thanks to its fiction and position, these actors are close to both parties - science and practice - and can arrange a lot of indispensable activities. They can provide meetings with all the participants, they can identify currently support options, they facilitate the involvement of other potential partners and experts, organise other supporting services (e. g. project management), they can mediate potential conflicts and they help to overcome barriers such as a state of "not-know", "not-do" or " not-want " and thereby they promote scientific and technological transfer.

Despite many efforts made in recent years, there are still many barriers, that obstruct or complicate cooperation of the scientific and application area (e.g. deficiency of qualified staff, deficiency of infrastructure and time for transfer activities, or deficiency of practical applicability of academic research results/outcomes).

In this context, the transfer process is affected by many internal and external factors of the institution, including regional aspects of the business and research institutions' environment. Overview of all significant factors is to find in the following figure 6:

Internal factors of organisations
Readiness for research collaborations
Innovation culture (risk taking, openness to new solutions, readiness to learn)
Internal innovation impulses
Absorptive capacity for science and technology application
Management of research cooperation
Position of knowledge and technology transfer
External factors of organisations
Regional cooperation climate (trust, openness and exchange of knowledge in the transnational area)
Innovative impulses through customers, research institutions etc.
Obstacles to cooperation
Infrastructure
Financial support of scientific research projects and transfer
Availability/presence of qualified staff

Fig. 6: Factors influencing the transfer process

2.3. Concept of solution

The support of innovation environment, research and development can be viewed as a key premise for economic prosperity of an area and it is in everyone's interest to create a pro-innovation climate for enterprises. Large companies usually have their own source of innovation, but small and medium enterprises often do not have such good conditions for development of the innovation.

The project will focus on the support of more intensive cooperation between research/innovation activities of universities and enterprises, support for creating clusters and innovation fairs, for promoting of innovation policy in individual enterprises and on gathering the supply and demand for technologies of Czech or foreign origin, which were made in a private company or public research institution. An integral part of these transnational cooperations is the effort to balance intercultural habits (everyone has a different way of solving problems, different approach to the problem, different mentality, different language), therefore it is necessary to find a common solution that will reflect the vision of various individual partners.

2.4. Network of innovation partners

The project partners bring their know-how for knowledge and technology transfer from position close to businesses (OHK, HSR-UK), science (UJEP) or from position of regionally active partners (OHK, HSR-UK). Transnational cooperation on the Czech side will be focused on the Usti region, but the whole team of project partners will focus on creating a template to build up a transnational innovation network in all three areas – Czech Republic, Poland, Germany. The activities of innovative networking and cooperation will be based on interconnected regulations, in the form of cooperation agreements and/or business planes.

As the target groups of the transnational innovation network, we can identify the research institutions on one side and small and medium enterprises on the other side. The innovative network should focus on a wide spectrum of fields, which will be supported by the participation of representatives from intermediary organisations and public administration.

The main tasks of networking are: contributions to support the innovation capacity of enterprises, development of concepts for innovative cooperative projects and networking of resources of companies and research institutes for the realisation of cooperative research activities and development of projects in the Czech-Polish-German borderland.

3. Understanding of transfer in Saxony

3.1. Description of environmental factors for transfer

Saxony is located in the Eastern part of Germany. The 18.500 km² big region borders in the South on Czech Republic and in the East on Poland. 4.05 million inhabitants are living in this area. Since several decades (especially intense since 1990), the population is decreasing due to a natural caused decline as also by a negative migration balance.

The economic situation in Saxony is influenced by its historical development (industrialisation as well as the consequences of the fall of the Iron curtain). Originally based on textile manufacturing, Saxony has a long tradition of industrialisation. To date, manufacturing industry has a strong impact on the economic power of the region. 17% of the economically active population is working in this sector. Structurally dominant in the region regarding the manufacturing industry are the branches manufacture of fabricated metal products, mechanical engineering, automotive and plant engineering. In addition, new innovative branches established over the last decades as e. g. microelectronics, environmental technology, and biotechnology.

Even if the unemployment rate declined in the last years, the regional labor market as well as the regional economy are still struggling as a result of the transformation process following the fall of the Iron curtain; as evidenced by unemployment rates considerably above the German average (6.9% vs. 5.9%). Saxony has a GDP of 112.66 billion €, thus the GDP (gross domestic product) per inhabitant is with 27776 € below the German as well as the EU27-average. Most of the companies are oriented on a regional market. Nonetheless, the region achieves an export surplus of 16.4 billion € and has therefore the highest export capacity in Eastern Germany.

Characteristic for the region is a strong dominance of small-scale companies: 99.7 % over all are small and medium sized enterprises (less than 250 employees). This goes along with the absence of headquarters of larger, research intensive corporations and therewith their typical high value-focused functions. But then, Saxony comes with excellent universities (the high quality is shown by its success in the German Universities Excellence Initiative in 2012) and an above average density of non-university research facilities. The innovative capabilities have grown distinctly during the last years. Thus, in 2012, Saxony reached the rank 15 in a summary Innovation Index calculated on the basis of the "Regional Innovation Scoreboard 2012" of the European Commission.

The Free State of Saxony, the German federal government, and the European Union provide a considerable promotion of the Research and Development (R&D) sector in the region. About 66% of all R&D-active companies participated in funding programmes; this support quota is clearly above the German average of 52%. The ratio of high qualified R&D-staff in those funded companies is almost twice as high as in not funded companies. The public funding is concentrated on certain fields as e. g. microelectronic, nanotechnology, biotechnology, automotive and plant engineering what corresponds with the prevailing economic key areas in Saxony. This intense support is a strategy to compensate the low rate of R&D activities in the business sector.

Notwithstanding the low R&D activities in the business sector, innovation rates reach a high level almost equal the German average and are considerable above the Eastern German average. In the year 2009, 38% of all Saxon companies realised product innovation; the percentage considering only industrial companies is 60%.

One of the exceptional attributes of Saxony is the quantitative and qualitative high level of public financed R&D facilities. The public financed R&D expenditures for the 26 institutions of higher education (public universities, universities of applied sciences and arts, art and music colleges) and the large number of non-university research facilities amounted 2.66% of the regional GDP in 2014 (in comparison: Germany 2.9%).

The amount of third-party research funding is regarded as an important indicator of the quality and competitiveness of the research sector. For those investments notably TU Dresden is one of leading universities in Germany according national grants (e. g. grants of DFG German Research Foundation rank 10, direct R&D-funding by the Federal Government 2008-2010 rank 2) as well as European funding (rank 5 for EU-Grants).

Saxony is one of the leading educational and research locations in Germany, in particular for engineering and natural sciences. This ensures the availability of well educated, high qualified employees in those fields. Currently, the number of graduates lies above the demand of Saxon enterprises. Together with the high diversity of non-university research facilities the institutions of higher education shape the regional research profile.

Here is a list of universities as well as research facilities located and working in Saxony:

- four public universities,
- five public universities of applied sciences,
- five schools of art,
- six institutes of The Gottfried Wilhelm Leibniz Association (WGL) and two outposts of the Senckenberg Gesellschaft connected with the WGL,
- two Helmholtz-Centres, one Helmholtz-Institute,
- 14 facilities of the The Fraunhofer Gesellschaft,
- six institutes of The Max Planck Society and
- nine research institutes financed by Free State of Saxony.

3.2. Support of knowledge and technology transfer by ‘transfer promotors’

As mentioned above, Saxony is characterised by a high proportion of micro-enterprises that are - due to a lack of financial as well as staff capacities – predominantly are not able to implement R&D on their own means. Here, the cooperation between SMEs and research institutions in terms of knowledge and technology transfer is one way to compensate for this deficiency. But these collaborations have to supported, because there are still many barriers, that hamper transfer between science and especially SMEs. These barriers are to find for example in different ‘languages’ as well as target horizons that are of importance in the two spheres.

To overcome these barriers, CIMTT Centre for production engineering and organisation at Technische Universität Dresden follows the approach of working with ‘transfer promotors’ as boundary spanners between science and economy. ‘Transfer promotors’ operate in the initiation, implementation, and support of projects for knowledge and technology transfer between science and SMEs. They are located in research organisations (e.g. transfer offices), associations close to economy (e.g. chambers of commerce), regional administrations and various intermediary institutions (e. g. technology parks and centres). An own investigation in 2014 proved, that currently 68 ‘transfer promotors’ in various organisations and with different content orientation are active in supporting knowledge and technology transfer between science and economy.

3.3. Regional understanding of transfer

Due to the fact, that transfer in Saxony is characterised by an extensive need for support on most of the part of the micro-enterprises, CIMTT orients it work on an advanced definition of transfer including services offered by transfer promotors.

Knowledge and technology transfer is understood as a target-oriented, conscious transmission of innovative knowledge, idea and/ or innovative technologies between technology givers (e.g. universities, research facilities) and technology takers (e.g. SMEs) and its economic exploitation.

From CIMTT´s point of view, transfer process of innovative knowledge and/ or innovative technologies ends with their market diffusion. The mutual exchange process of transfer includes the following 'transfer activities':

- identification, formulation and dissemination of an economically applicable and innovative idea,
- initiation of contacts and networks between potential technology givers and technology takers as well as transfer process supporters
- patenting of an idea respectively preparation of an idea´s economic exploitation (including startups) as well as
- joint advancement of the research fields including initiation of networks by future technology givers and technology takers, wherein the economically applicable idea is originated.

4. Reference model of transfer as working basis for TRANS³Net activities

4.1. Reference Model of transfer

Based on the presentations and discussions held during Kick-off Meeting of TRANS³Net in August 2016 all project partners agreed with the definition of knowledge and technology transfer proposed by the lead partner (TU Dresden, CIMTT).

Therefore, the future works and achievements of TRANS³Net are based on the reference model of transnational transfer processes defined in chapter 3.3 and displayed in figure 7.

'Transfer activities' are transfer specific operations corresponding to the different stages within the development of a transfer object/ innovative idea – starting from its invention until its market diffusion. 'Transfer activities' are underpinned by concrete *'transfer services'*. Transfer activities as well as transfer services are carried out respectively accompanied by 'transfer promotors'.

The *'gates'* are points of assessment in the transfer process for checking its present success respectively making decisions for further progress of the process. Outcomes describe the countable impact of the transfer process on technology givers, technology takers as well as on the region or society.

'Outcomes' define an indicator counting the impact of transfer processes on technology givers, on technology takers as well as on the region/ society, e.g. knowledge spillovers, economic effects.

'*Environmental factors of transfer*' describe the framework conditions of transfer processes like laws and regulations, scientific and economic infrastructures or political strategies (vide chapter 1.1, 2.1, 3.1).

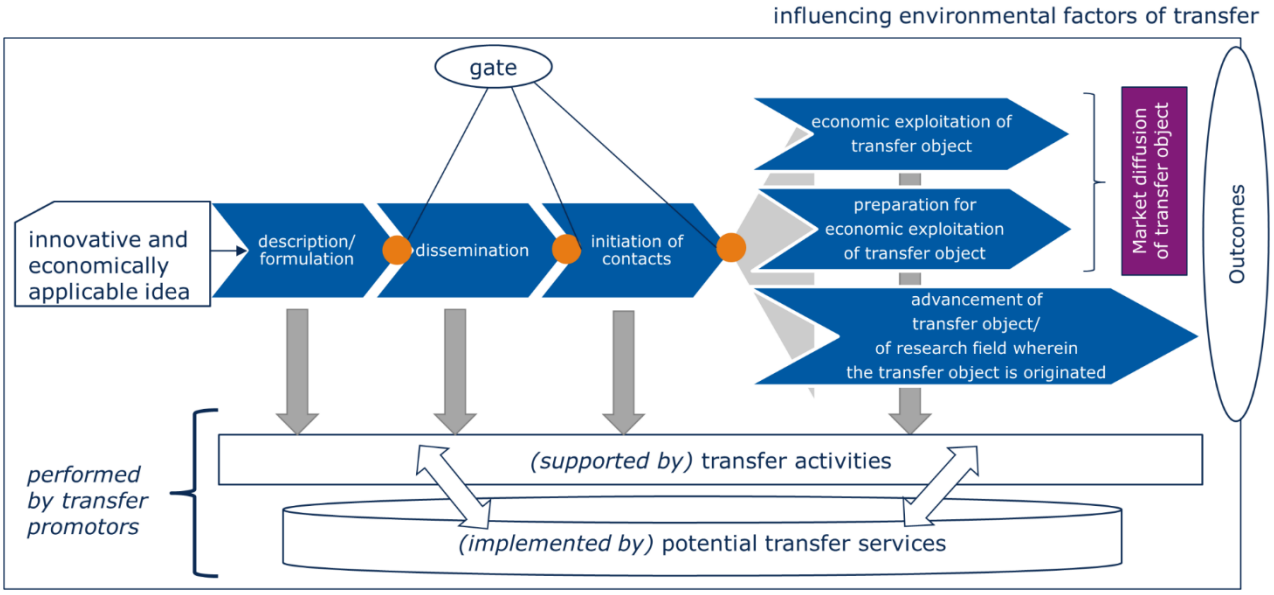

Fig. 7: Reference model of transnational transfer process as working basis for TRANS³Net

4.2. Transfer activities and transfer services performed by 'transfer promotors'

The following tables (1-3) deliver an overview of 'transfer activities' with related 'transfer services' in accordance with the defined reference model of transfer. The described activities and services constitute the basis for the identification tool of transfer promotors.

Transfer activity	Transfer service	Examples
description/ formulation of an innovative and economically applicable idea	identification in current research results	technology scouting
	support in terms of describing/ formulating an innovative idea in an economically oriented way	technology dossiers
	technology assessment (technically, legally, economically)	technology readiness level
dissemination of the innovative and economically applicable idea	initiation, preparation of print media	books, papers, guidelines, field manuals
	internet (technically permitted): publication of economically oriented technology descriptions conception, implementation of data-bases, online platforms, websites introducing innovative ideas Publication of newsletters/RSS	technology dossiers, online innovation, platforms
	face-to-face: organisation, implementation of events/ meetings introducing economically applicable research results initiating, marketing of demonstration devices/ infrastructure	innovation fairs, exhibitions, show rooms, living labs, demonstrators

Table 1: transfer activities, transfer services according to TRANS³Net reference model

Transfer activity	Transfer service	Examples
advancement of economically applicable and innovative ideas or research fields	institutionalisation (endowed professorships, joint research institutions, associated institutes)	management, initiation
	informal networks, discussion groups, alliances, clusters	
initiation/ establishment of contacts	generel/ universal: ▪ newsletters ▪ visits of research institutes or enterprises ▪ meetings, workshops, conferences ▪ post-processing of discussions	organisation, implementation, post-processing of initiated contacts
	specific/ more conrete: ▪ subject-specific workshops, fairs ▪ initiation and moderation of bilateral and subject-specific discussions between science and economy	
economic exploitation	▪ patent exploitation/ licensing ▪ spin-offs based on innovative ideas/ technologies	mediation of contacts, patent research, market analysis, foundation consulting

Table 2: continuation of transfer activities, transfer services according to TRANS³Net reference model

Transfer activity	Transfer service	Examples
preparation of economic exploitation of innovative ideas/ technologies	contract research	initiation, mediation, project management
	research cooperation	
	implementation consulting ▪ in terms of contents ▪ in terms of required resources	initiation, mediation, implementation
	qualification concerning implementation of innovative ideas/ technologies	conception and implementation of trainings (e.g. e-learning, seminars)
	student theses	mediation, supporting supervision
	financing	consulting, mediation
	staff exchange	initiation and supervision of staff exchange

Table 3: continuation of transfer activities, transfer services according to reference model of transfer