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Mission of knowledge a unique model for technology transfer

WORKSHOP 4 - Unusual experiences in clustering science and technology initiatives

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Introduction

Scientific discoveries, such that are held in high esteem and enjoying prestige in society, create new knowledge, which goes into international circulation on a non-commercial basis. When applied commercially they enrich the economy. Apart from being an element of scientific policy, innovation should also be regarded as part of economic and social policy because its main goal is to intensify the process of applying new technological and organizational solutions in the sphere of production and services. The aim of this lecture is presenting a unique model for regional integration of science and technology and simultaneously its transfer to innovation firms realized mainly by Poznań Science and Technology Park- the oldest ST park in Poland.

Wielkopolska (Great Poland) is among the leading academic centers in Poland and one that harbors a great R&D potential. The essence of the comprehensive knowledge transfer model generated and pursued in the city of Poznań, the capital of Wielkopolska region is building an effective relationship between invention, pursued at universities and research institutes, and innovation, such as it is the case at the Poznań Science and Technology Park of Adam Mickiewicz University Foundation, by creating all elements necessary for the effective transfer of knowledge, especially Polish scientific and technological achievements, to business practice .

At the core of the model is the development of the Wielkopolska Center of Advanced Technologies (WCAT) in Poznań, a multi-disciplinary center of high international status focused on new materials and biomaterials of multiple applications and many other branches of industry and technology (see Scheme 1.).

Scheme 1. Poznań model of knowledge transfer

Wielkopolska Center of Advanced Technologies (WCAT) – Cluster of Science and Technology

The WCAT brings together the best specialists in exact, natural and engineering sciences and is an infrastructural venture of the Poznań scientific community. The Center is a consortium of five universities: the Adam Mickiewicz University, which is the project coordinator, Poznań University of Technology, Poznań University of Life Sciences, Poznań University of Medical Sciences and Poznań University of Economics; four institutes of the Polish Academy of Sciences: the Institute of Bioorganic Chemistry, Plant Genetics, Human Genetics, and Molecular Physics; Institute of Natural Fibers and Medicinal Plants; and the Poznań Science and Technology Park of the Adam Mickiewicz University Foundation and City of Poznań.

The entire scientific community of Poznań is involved in this pioneering undertaking clustering science and technology to be a very important part of the knowledge-based economy that Wielkopolska is keen to build. WCAT will bring

together renowned scientists and engineers who will do research into multiple-use materials and biomaterials .

The objective of the multidisciplinary activity of the center is to develop original methods for synthesizing chemicals, biochemicals and agrochemicals, called fine chemicals, and a new generation of biomaterials and nanomaterials and their precursors, formulated in cooperation between the chemists specializing in synthesis and the recipients commissioning the target products of specific properties followed by the development of advanced technologies and biotechnologies for the production of these fine chemicals and precursors of materials with the aim of using them in optoelectronics, ceramics, medicine, pharmacy, agriculture (see Scheme 2.) and other fields of high-tech industry .

Scheme 2. Mission of chemical and biochemical synthesis

The purpose of the research is also to create a technological basis for a number of applications for bioorganic chemistry and biotechnology in healthcare, that is molecular and cellular therapies and medical diagnostics, as well as applications in agricultural engineering and in the food industry – DNA tests in plant and animal production, biodegradable packaging and so on.

The problems studied are going to be related to the strategic programmes of European platforms (e.g. EC Framework Programmes) for technologies of new materials, designing of new processes and industrial biotechnology. The vision of the Centre is to include existing organizations such as: universities, research institutes, technology parks, to act as one independent entity, and generate synergies by combining together the work of the best scientists in an integrated fashion.

Such a integration of the city' s scientific community offers a chance for creating a research and technology center of high international standing (the European Centre) combining the best experts in exact, natural and technical sciences who would work on design and development of unique (nano)materials and biomaterials of wide use.

The multidisciplinary center will carry out major research and research-and-development projects. Some of these will be pursued in cooperation with other businesses and institutions as part of Technology Platforms and EU framework programs. The center will also implement strategic programs coordinated and managed by the National Center for Research and Development. WCZT will offer jobs to over 200 research workers as well as 400PhD and MD students recruited mainly from universities and institutes based in Poznań. There will also be jobs for experts from other European countries.

To reach the complex goals mentioned above, we committed to ensure permanent

cooperation between all units of WCAT i.e. Centre of Chemical Technology and Nanotechnology (B), Centre of Industrial Biotechnology (A) with a Greenhouse (A1), Centre of Medical Biotechnology (A) with an Animal House (A2), Centre of Material Sciences (C) with a Regional Laboratory of Unique Equipment, functioning as one research organism (see Photo 1.). As emphasized, the Regional Laboratory of Unique Equipment should be of service to all other units of WCAT as well as irrespectively, to SMEs from the region.

Photo 1. Infrastructural model of WCAT

The Laboratory will have highly specialized equipment which will be available for use by the scientific community and small and medium enterprises. The Service and Technical Facilities with the Technology Transfer Center (D) will ensure efficient collaboration among all parts of the WCAT

In terms of an international cooperation with foreign R&D partners the members of the WCAT have already started to cooperate with well recognized initiatives, such as RAMIRI (Realizing and Managing International Research Infrastructures) and RAMIRI2 projects, coordinated by Imperial College London and Elettra Synchrotrone Trieste. In consequence, this cooperation will lead to a strong position of the Regional Laboratory of Unique Equipment as a part of the European Road Map of R&D infrastructures.

The WCAT project is co-financed (85%) by the European Regional Development Fund under the Operational Programme Innovative Economy 2007-2013 with total budget 63 million EUR. The construction of the WCAT infrastructure (buildings) started in the fall of 2010 and the operational phase of the research centre is scheduled for the beginning of 2014 .

WCAT - Poznań Science and Technology Park (PSTP) cooperation

The WCAT is going to cooperate with the research and development centers of Polish and European corporations but the Poznań Science and Technology Park of Adam Mickiewicz University Foundation (PSTP) with its departments presented below is playing the key role in the transfer of technologies and their commercialization. The Park, with R&D and Innovation and Promotion Centers as well as group of business and technology incubators for innovative spin offs and start ups, is the necessary link needed for the efficient transfer of new materials technologies to practice, especially to industrial parks and high-tech industry (see Scheme 3.).

Scheme 3. Model for Cooperation of WCAT with PSTP

PSTP made a very unique proposition for academic researchers which is the ability to create R&D centers within the park. Their activity is based on an agreement between the university and the park. These projects supported with PSTP offer to the market research and development services conducted by experts from universities, using research facilities of the park or university. It's a simple way that the researchers could use their knowledge and experience not only for scientific purposes, but also to support the business. This does not require the participation of the university, on the other hand, does not require the company. Examples are:

- Advanced Chemical Technology Center offering design and facilitate the existing technologies of the synthesis of chemical compounds and solving synthetic, technological and analytical problems for different companies from a chemical sector.

- Waste Management Center " Waste Park" – offering complex consulting services related to environmental preservation

- Poznań Radiocarbon Laboratory – carrying out 14C tests with the most modern accelerator technique (AMS).

- The Center for Optics and Optometry – offering optical and optometric measurements and trainings

Of special significance in presented model is support to the development of relations between universities and business, that is transfer of innovation and technologies at national and European level. Spin-offs in the PSTP have been supported by Centre of Innovation and Promotion. The Centre employs specialists in IPR strategies, technology transfer, market studies, research funding and project management. It is involved in international networks of Enterrise Europe Network and European Research Programmes national contacts points having a large regional (not only STP intramural tenants) clients base and helping them to participate in the international knowledge flows and collaboration. This PSTP' s department has developed comprehensive services to promote entrepreneurship among scientists and residents of the city, and to support businesses - both those operating in the Park and throughout the region of Wielkopolska.

For example, the InQbator developed wide range of instruments designed for supporting start-ups, promoting entrepreneurship and underlining the potential of joining science and business. One of them was a training and advisory programme leading towards investment readiness, aimed at promoting funding new businesses. Some of them joined incubees and were provided with furnished office space with decreased renting terms and a basic appliance set: computer, printer and telephone.

In terms of contact with local business environment, the InQbator builds frameworks for incubees and exterior institutions cooperation by providing essential support, for example during ' Poznań Enterprise Days' which gathers the incubees together

for a series of meetings and conferences in order to promote start-ups among students and academics. InQbator developed on four departments of Poznań Adam Mickiewicz University entrepreneurship classes for students. As for creating a network of contacts, the InQbator plays a role in organizing cooperation between companies from polish science and technology parks and academic incubators. The InQbator provides also an additional support in form of: classes on knowledge-based entrepreneurship, Erasmus for Young Entrepreneurs, e-learning platform aimed at the entrepreneurs in the initial phase of company-building process, Innovation Audit (a nationwide, proinnovative consulting service, led together with Science and Technology Park Technopark Gliwice) or capital support for aspiring entrepreneurs and companies.

The other element of the presented model is Incubator of Chemical Technologies which offers the infrastructures to carry out technological studies on an enlarged bench scale and to work on the development of various industrial processes. Moreover, a wide range of services is offered for fundamental technological processes, syntheses under atmospheric and reduced pressures, simple and fractional distillations, concentration, drying and grinding of precipitates, preparation of solutions of specified concentrations, etc. (see Photo 2.).

Photo 2. Infrastructure of ITC

Incubator of Chemical Technologies is a spectacular example of successful commercialization of technologies in UNISIL (abbreviation of " university silanes – organosilicon compounds) – the first in Poland university spin-off company, established in 1989 and started operations in production premises leased from the Tarnow-Moscice big chemical factory on the South of Poland. UNISIL is the innovative firm in which Adam Mickiewicz University Foundation has main shares.

The latest initiative of PSTP is the implementation of the Complex of High Technology Incubators (HTI), i.e. is the largest laboratory complex in Poznań intended primarily for the spin-offs that deal with materials and biomaterials as well as information and communication technologies project under the Innovative Economy Operation Program of EU (Photo 3.).

Photo 3. Complex of High Technology Incubator

The Complex of HTI provides entrepreneurs, on preferential terms, with professional laboratory and office space equipped with advanced IT facilities. Along with the

complex of incubators, PSTP is an entity that plays a key role in the transfer and commercialization of technologies developed in the Wielkopolska Centre for Advanced Technology.

The InQbator Seed is a recent undertaking intended for those who conduct research in the field of chemistry, biotechnology and IT, and have an idea and unique know-how. As a part of this project, PSTP offers a service which makes it possible to receive up to PLN 600,000 and help from experts for original and modern undertakings.

Apart from modern infrastructure, our business tenants gain access to a package of pro-innovation and business services designed to support their expansion. These include advisory services, training, workshops, promotion, technological audit and assistance in acquiring funding from EU research projects.

It is an essential factor of the efficient diffusion of new technologies across technology parks and high-tech industry. The Park lies several kilometers from Adam Mickiewicz University campus in the district of Morasko, which is called the Poznań Science District and where the WCAT is located. This proximity is very important in the transfer of technologies to innovative firms based in the Park (Photo 4.).

Photo 4. Map of Poznań

PSTP – SCIENCE – BUSINESS COOPERATION

Turning ideas into business reality for over 18 years, the Poznań Science and Technology Park (PSTP) has actively worked to facilitate the process of commercialization of knowledge and to support the development of innovative companies, including spin-offs. An important element in creating the Poznań model for the transfer and commercialization of knowledge is the city' s centuries-long tradition of private enterprise and small business, and the 90-year history of Poznań International Fairs, which have been a genuine forum, in different political periods, for international trade and a place where one could get familiar with the European model for relationship among science, innovation and business.

There are very different stories of innovative start ups in PSTP. Some of companies started as PSTP research centers leaded by university researchers. After some period of operation the research center turns into a successful spin out company obviously present in PSTP as tenants. In another model of start ups formation, entrepreneurial scientist created spin out companies based on knowledge and technology their created during their scientific career. One of them (Future Synthesis) is a technologically advanced biotechnology company specializing in the synthesis of nucleic acid

fragments of DNA / RNA molecular probes containing fluorescent labels and other useful modification of nucleic acids useful in biotechnological research. They also carry out chemical synthesis of other requested bio-molecules. The other spin-off (AdvaChemLab) is an innovative chemical company working on the development of technology to receive highly specialized chemicals (fine chemicals) for the pharmaceutical industry. Another example of chemical spin-off has been created to sale own organosilicon compounds based on the unique solutions developed at the Adam Mickiewicz University in Poznań (Innosil). Of international R&D centers is it necessary to mention European R&D Laboratory of American Company W.R.Grace working on development of new innovative technologies in the field of concrete additives, cement admixture and waterproofing.

The latest model of science – business cooperation presented in PSTP is Waste Cluster which brings together companies interested and working in the field of waste management technologies and non-waste technology. It offers comprehensive solutions in the field of waste management, laboratory analysis, environmental monitoring, research and commercialization of research results.

To provide the comprehensiveness, high quality of services and internationalization to all parties participating in the presented unique cluster system in the Park – as a substantial player translating science to business – maintains international partnerships with counterparts all over the world. One of the examples is a Memorandum of Understanding signed with the University Technology Park of the Illinois Institute of Technology at Chicago, USA. This partnership allows for knowledge and experience exchange between the Parks stakeholders, but what is more important it gives mutual exposure to international scientists, capital and markets for all institutions and businesses involved in activities of both systems: PSTP-WCATT in Poland and UTP-IIT in the United States. The PSTP has been created based on American model of science-technology parks and still maintains that unique and comprehensive approach providing complex services for both the scientists and entrepreneurs. From the research perspective the partnership with the US Park allows for scientists exchange and academic collaboration. Thanks to the signed partnership both: American and Polish businesses may benefit from an easy access to new markets, office and lab space. It gives a tremendous potential for business expansion to companies in both cluster system.

Prior to their physical presence and expansion it is possible to provide market reports to companies willing to invest in a partnering country. With a use of business professionals and experts both Parks provide preliminary market study and reports that will ease the investment decision of their clients as well as will reduce their risk in undertaking expansion to international markets.

Another partnership agreement has been signed with the WISTA Science and Technology Park in Berlin-Adlershof. Again a large scope of activities and comprehensiveness of both Parks provide services and internationalization opportunities to both Polish and German scientists and entrepreneurs.

Conclusions

- The comprehensive model of knowledge transfer being pursued in Poznań is designed to build an effective relationship between invention (at universities and

research institutes but not only WCAT consortium) and innovation (in the Poznań Science and Technology Park run by the Adam Mickiewicz University Foundation and other industrial and technological Parks and innovative SME as well as by international industry) by putting in place all the necessary elements indispensable for an effective transfer of knowledge, in particular the transfer of Polish scientific and technological achievements to business practice.

Scheme 4.

- Whole clustering system proves its comprehensiveness and care towards its stakeholders; including tenants, academic institutions, business support institutions, local government and others. By providing such vest services and potential the Poznań Technology Transfer Model with its cluster system plays a very important role in economic development of the region but also serves as one of the strongest scientific centers in the country; delivering high level transformation via innovation, inventions, investments and jobs to the community and society.

- This showcase institutional solution to the relationship between invention and innovation offers a great chance of keeping in Poland and in Poznań the most outstanding young people, those who pursue their ambitions in science and high-tech business. It seems that the “ science of the future” designed in this way has finally got its big chance to pursue its mission at a world-class level on the basis of the latest technologies in disciplines which are of key importance for the sustainable development of the region and Poland.