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# Introduction to Science and Technology Park Activity – Case Study That Focuses on Complementary Support

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Abstract: The article focuses on the activities of Science and Technology Park, "TECHNOPARK GLIWICE" Ltd. which is one of the best parks in Poland. The park operates for only four years. The article describes the most important projects which has been and are being implemented in Technopark Gliwice. The projects are mainly aimed at students and PhD students of the Silesian University of Technology and the employees of SMEs. The paper also presents the best companies located in the Park and the cooperation between the Park and other institutions of this kind in Poland. Moreover, the paper describes the laboratory equipment of the Park and the services which the Park provides to SMEs with the use of this equipment.

Keyword: Science and Technology Park, Incubator, Operational program, Training, Cooperation

1. INTRODUCTION

Science and Technology Park "Technopark Gliwice" is one of 17 major initiatives of this kind in Poland. The Park was created in Silesia - the most industrialized Polish Region (it has more than 4.6 million inhabitants and has experienced the highest growth of GDP in Poland in recent years, from 2005 to 2010 it was over 35%), struggling with the problems of the post-industrial era, the transition from traditional economic sectors to new technologies and services. Region for decades was associated with heavy industry and coal mining. As a result of theeconomic transformation of the Silesia region retained a significant impact of the economy based on heavy industry, but there has also been rapid development of modern technologies and the service sector.

Accordingly to the commercialization of research results Silesian University of Technology has developed the model of Science and Technology Park. The creation of "Technopark Gliwice" was the result of an agreement Silesian University of Technology in Gliwice (region's largest technical university), City Gliwice (city inhabited by 186,000 people) and Katowice Special Economic Zone. Park operates in the Silesian University of Technology campus and the infrastructure is closely connected to the faculties of the university.

### 2. SCIENCE AND TECHNOLOGY PARKS IN POLAND

In most cases, the Science and Technology Parks in Poland formed a company related to the shareholder or personally with universities and local and regional self-government authorities. So far in our country parks as the dominant was a model of non-profit organizations, businesses which are qauzi-NGO-s allocating the prospective gains to its statutory objectives. Formation and its dynamic development in recent times is largely due to the fact support these initiatives with various Operational Programs subsidized by

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This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License(http://creativecommons.org/licenses/by-nc/3.0) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited public funds, and the European Union (the structure of the development and infrastructure, published in 2011 by Parks in Poland is presented in Fig. 1). Recently, you can see the tendency of parks formation as private initiatives, it is difficult at this stage to assess their effectiveness and real orientation to the technological and scientific aspects or the desire to be used by businesses to obtain endowment under the Operational Program co-financed by the European Union. At present, it is difficult to fully assess the functioning of market opportunities while maintaining Parks activity in the field of science and technology without any public support.

The history of Science and Technology Parks in Poland operation is relatively short - the first park in Poland -Poznan Science and Technology Park was established in 1995. In the last ten years, we are witnesses of the dynamic development of parks. With the development of science and technology parks in Poland in recent years there were created numerous systematic research devoted to such models and strategies for the operation of parks and their benchmarking (this activity is strongly supported by the central government and its various agencies such as the Polish Agency for Enterprise Development - www.pi.gov.pl/eng). Currently Parks in Poland face a number of dilemmas including its further development in the era of reduced public support (they already have received funds for the creation and development as well) need to develop an effective system of commercial services, which during the crisis is also difficult. It should also be noted that Parks in Poland are in a different phase of development. The character of Polish economy is very strong involvement of many parks in the process of education, inspiration and aggregation of entrepreneurship among students, graduates and researchers, as there is little involvement of universities and their environment in the process, and often Parks are forced to create the future of human resources for innovation and entrepreneurship. There is lack of the subjects related to teaching students even the basics of entrepreneurship. Technopark Gliwice from Poland is in this area one of the most active institutions, which combined a network of many projects that complementary support creating the conditions for the commercialization of knowledge.

In June of 2012, four years have passed since "Technopark Gliwice" received technical capabilities. In June 2008, available in a building built over 3,000 m² area for companies operating in the area of advanced technology. As expected, from that moment until today the entire area of the park is

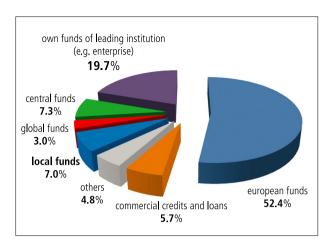


Fig. 1. Structure of expenditure on infrastructure and development on average technology park by managing institutions of the park in 2011. (in %)

Source: A. Bąkowski, M. Mażewska: "CENTERS OF INNOVATION AND ENTREPRENEURSHIP IN POLAND Report 2012."

constantly occupied by entrepreneurs. During the past four years the park was linked to 40 companies, which used the facilities office and workshop (with machines). More than 1/3 of companies prepared to work on the basis of the companies in the initial phase (incubation), which was reflected in reduced operating costs and additional support services, counseling and training. Since the inception of the Park established a cooperation with strategic partners, which have become the company like: FESTO Ltd., WASKO Inc., Eurol Ltd. and i3D Inc. The activities of the Park resulted in many awards from institution of national importance. Among the most important are worth mentioning title for "Innovative Company of 2008," "Innovative Project of 2009," "Regional Leader of Innovation and Development of 2010," "Business Partner of 2010," "The best local- government company in Poland in 2011" and "The highest quality of services 2012." The culmination perceive "Technopark Gliwice" on the national arena when Professor John Kosmol was rewarded to in the category of "A person supporting academic entrepreneurship" given by the AIP (Academic Business Incubator) Wroclaw University of Technology.

# 3. "TECHNOPARK GLIWICE" – SHORT DESCRIPTION

Science and Technology Park "Technopark Gliwice" is a business environment institution. The activities of the Park focus on implementing governmental programs of entrepreneurship support both centrally and locally. 'Technopark Gliwice' is an organization established by the local authorities, the Silesian University of Technology and the Katowice Special Economic Zone Co. Our mission covers the areas of entrepreneurship support and promotion, incubation of new technology companies and technology transfer to small and medium enterprises. The activities of Science and Technology Park bring the following benefits: closeness to the University, access to modern, fully equipped rooms and innovative appliances, numerous trainings and consultancy prepared and conducted by the scientific staff of the University, experience in obtaining EU founding and implementation of large-scale projects.

Furthermore, 'Technopark Gliwice' provides not only an access to innovative equipment and the assistance from highly qualified specialists, but also an access to technical and personal resources of the Silesian University of Technology. As far as the Park's history is concerned, the Science and Technology Park in Gliwice came into being in April, 2004. In July, 2005 we signed a co-financing agreement with the Polish Agency for Enterprise Development and in October, 2006 we signed another agreement with the Agency. The latter agreement concerned the first small project. Moreover, 'Technopark Gliwice' is highly engaged in cooperation with Science. The cooperation covers the following: the agreements that have been signed between the Park and various science and technology institutions, inclung universities, fellow Parks and foreign organizations. Another area of cooperation applies to the academic environment. This specific field, among other activities, includes technology data base promotion, support of academic entrepreneurship, and joint development projects for the science.

In our park we also focus on supporting academic entrepreneurship. The term can be understood in two ways: either in the terms of involvement of scientific institutions, academics, scholars in an economic activity or in the terms the establishment of new business entities by graduates or companies established by researchers. The support for academic entrepreneurship provided by 'Technopark Gliwice' Science and Technology Park includes trainings for students who participate in implemented projects, consultancy for scientists and students, co-financing of 60 newly established business entities and 16 incubated enterprises established on the premises of the Park.

One more activity that our Park is engaged in is the close

cooperation with its tenants. The number of residents on the premises of 'Technopark Gliwice' is 23 companies. Each company employs graduates of the Silesian University of Technology. Nearly all owners of the companies are scientific workers employed either by the Silesian University of Technology or by other higher education institutions in Poland. The cooperation, also works on the level of subsidizing business entities and other institutions, including the University with the aid of the European Union structural funds and other grants including financial resources of the Ministry of Science and Higher Education.

However, the fundamental activity of the Science and Technology Park 'Technopark Gliwice' concerns the implementation of numerous projects. The projects are implemented either on the basis of cooperation with the Silesian University of Technology, other partners or individually. 'Technopark Gliwice' Science and Technology Park operates on the basis of close partnership with the Silesian University of Technology. The cooperation includes, among other, services the organization of CNC and WATERJET machine trainings. The trainings are conducted in close cooperation with the academic staff of the University and partially use its infrastructure. The Park is expanding its infrastructure and will continue to perform its hitherto activities and implement new ones.

# 4. THE CHARACTER OF TECHNOPARK GLIWICE IN THE BACKGROUND OF OTHER SCIENCE AND TECHNOLOGY PARKS

It is worth noting that the Technopark Gliwice is a relatively small park from the perspective of the surface (3,000 m²), resulting in limited ability to absorb new forms and corresponding economies of scale in their operation. In Polish literature is assumed that the effective area of the hiring and management (including the economically efficient cost structure common in the building) is at least 8-10 thousand m². This limitation has become a determinant to find new areas of activity to support innovation and entrepreneurship among others building a network of associated companies which has no possibility of locating their headquarters in the park, enjoy the synergy of being in the network, and a multitude of support proposed by the Park for their environment. The motivation for searching new activities in addition to the typical activity requires a specific management style because

even realizing many projects at the same time and properly developed fundraising. Management by projects in 'Technopark Gliwice' ensures that ideas for new activities effectively Park are transformed into projects, meet with sponsors and acceptance are efficiently implemented and accounted for. Implementation of many projects at the same time requires the effective functioning of the Park as a selflearning organization, and effectively operating within a matrix structure with horizontal management system. Gliwice Technopark tenants are diverse sectors (although for some time, a growing IT companies, which is in line with the national trend - which is confirmed by Fig. 2), the board is trying to find Park synergies for the entire Park (despite of limited space) when deciding which company to enter the park in place of the outgoing to the presence of a new tenant has given the benefit of the whole TECHNNOPARK from the perspective of the ecosystem and the possibility of cooperation with tenants.

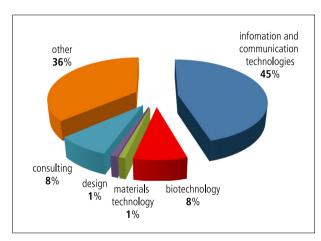


Fig. 2. Structure of tenants of technological parks according to in 2012. (in %)

Source: "CENTERS OF INNOVATION AND ENTREPRENEURSHIP IN POLAND Report 2012." By Bąkowski, A., and Mażewska, M.

#### 5. CURRENTLY IMPLEMENTED PROJECTS

"Technopark Gliwice" involves in the implementation of projects subsidized from domestic sources and European Funds (Operational Program Human Capital and the Innovative Economy Operational Program). Successfully has completed the implementation of 13 projects and 11 are currently under way. Pool of funds allocated exceeded PLN 42 million, of which infrastructure project - to set up the build-

ing — the headquarter of "Technopark Gliwice" and all specialized facilities consumed almost PLN 24 million. As part of the activities financed by Park 60 micro-enterprises was created, is currently at the stage of equity participation (recapitalization) 6 companies based on innovative technological solutions. Total direct contribution to the creation of a group of companies to be listed was PLN 8.5 million. The possibility of the emergence of such a high number of valuable projects was related to the extensive preparation of potential projects promoters.

As part of the realized activities during multi-day meetings more than 2,600 students of Silesian University of Technology and the other universities from Silesia were trained, having also over 2,000 hours of counseling. Support was provided from its own resources as well as projects that have been funded under The National Centre for Research and Development, Ministry of Science and Higher Education and European Funds (Operational Program Human Capital, Operational Program Innovative Economy).

Along with Incubator Science and Technology Park University Foundation of Adam Mickiewicz in Poznan, developed proprietary, dedicated to academic entrepreneurship training system along with the manuals and audio-visual materials, which will be offered to other units supporting entrepreneurship in Poland. Park also supports the initiative of PhD students who receive the scholarship project. Selected scholars are trained in the direction of particular importance for the development of Silesia Region. 16 people were supported for up to 1.5 years in the total amount of PLN 860 thousand. Payment of the scholarship is complemented by the support that is associated with in-house and off-site training, mentoring and experts counseling.

"Technopark Gliwice" owns highly specialized hardware and software. The Park has equipment for machining - machining center DMU 60MB, Accura ZEISS measuring machine, a device for rapid prototyping and a device for processing a stream of water - abrasive at high pressure in 3D - WATERJET. "Technopark Gliwice" has also software for conducting tests, analyses and simulations by means of ANSYS Finite Elementary Method (FEM) as well as CATIA software and Solid Edge for 3D design. To date, using equipment and software "Technopark Gliwice" has made more than 150 services.

By conducting a numerous trainings, both commercial and subsidized, maintenance of these machines, "Technopark Gliwice" supports the implementation of innovative projects and the creation of enterprises-oriented for product development, manufacturing methods or services in high-tech industries. Currently on the market this type of courses are offered very rare, due to the value of highly specialized equipment and the high cost of software. Therefore, trainings organized by "Technopark Gliwice" enjoy a huge interest among company employees and their employers. It enables them to develop and increase competence by gaining new skills in specialized technologies. For existing businesses and their employees 2 projects were completed and another 2 are currently in progress. Within the framework of two projects in the Measure 8.1.1 Support for development of professional skills and consultancy services for enterprises (HCOP) was almost 2000 hours of training. Support has been covered more than 350 people, and at the end of 2013 their number will reach nearly 1,000.

Nowadays in partnership with the oldest and most recognizable of the Polish science parks - Science and Technology Park University Foundation of Adam Mickiewicz in Poznan is carried out the author proprietary program to assist businesses by offering free of charge services for the diagnosis and support of innovation in enterprises (A service called "Innovation audit"). As a part of the ongoing projects for enterprise support will be provided for more than 300 companies subject to audit, and more than 1.100 employees of companies in the framework of the training. The audit results allow to assess the effectiveness and efficiency of the innovative activities of the company and also help to stimulate the development and improvement of enterprise innovation strategy. For companies prepared also 50 positive reviews for technology innovation solutions ready for implementation in companies.

"Technopark Gliwice" optimally selected business projects that are transformed into operating companies. "Technopark Gliwice" helps fledging enterprises in starting a business and taking their first steps in business and the companies already existing favors in a dynamic development. New, well-equipped facilities, favorable rental rates and access to a wide range of business services is undoubtedly a great asset to the institution that makes the space since the creation of the building, until today it is filled with 100%. There are 23 firms located, employing over 150 people. One of the first companies that located its headquarters in the Park was the Eurol company, which consists of only 4 employees. After three years of rapid growth the company started its operations outside the Park and currently employs nearly 30 people. Similar success can boast i3d company, which started its

activities in the "Technopark Gliwice" in June 2008 with the team of several people. Currently, the company consists of 5 companies, including 59 employees. Huge success of the company is to raise capital for development, through the issue of shares on the New Connect on the Warsaw Stock Exchange.

Among the fastest growing companies in the Park could be also included "EMT SYSTEM" company - running by an employee of the Silesian University of Technology, Dr. Gregory Wszołek. It is a flourishing training company, which began its activity as a winner of the "My idea for a business," and the beneficiary micro grant "Technopark Gliwice" to start a business. Another example of expanding the basis the knowledge and skills of a scientist is a company Profis @ Work was founded by PhD of Silesian University of Technology Michael -Swiderski. The company specializes in software development.

#### 6. COOPERATION

"Technopark Gliwice" in a joint initiative of the Academic Incubator of Entrepreneurship in Zielona Gora, Science and Technology Park in Wroclaw and the Science and Technology Park University Foundation of Adam Mickiewicz in Poznan in 2012 and 2013 years will organize trip for about 12 selected companies from their organizations to Silicon Valley in the U.S. and Finland, in order to obtain financial support and establish business contacts. Companies will present themselves on the investment forum for investors in the United States.

One of the most important tasks "Technopark Gliwice" is to promote scientific and technological innovation and the implementation of measures aimed to develop the entrepreneurship. These aspects were the inspiration to organize in the Park open event "The Day of Science and Industry." The idea behind this project is to present innovative companies, research and development units as well as their achievements. This year "The Day of Science and Industry" will be organized for the fourth time. So far, fair attracted nearly 100 exhibitors and the number of visitors is estimated at more than 6,000 people from the Silesia region and the surrounding area. This is a great opportunity to get the knowledge about the latest achievements in science and industry, whereas companies from Silesia region and university research units have an unusual opportunity to showcase

their innovative solutions on a wider forum.

In March 2011, the "Technopark Gliwice" joined the ranks of the members of Polish Business and Innovation Centers Association and the National Association of Industrial Parks Forum and Technology Parks. In May "Technopark Gliwice" in cooperation was co-organizer of XXII Conference SOOIPP "Internationalization of knowledge-based entrepreneurship the role of Innovation and Entrepreneurship." During conference occurred many visitors from Poland and abroad, this event was under the patronage i.a. President of European Parliament Jerzy Buzek-and Marshal of Silesia Voivodship. "Technopark Gliwice" is also affiliated with the International Association of Science Parks and Areas of Innovation (IASP), the Chamber of Advanced Technology and the Regional Chamber of Commerce and Industry in Gliwice.

"Technopark Gliwice" from the beginning of its activity is open to all kinds of activities that can contribute to the development of innovation and the informed economy, and as a result to increase the economic potential of the region. Therefore, in 2011, as a partner of Silesia Marshal's Office have joined the third edition of the "Management, implementation and monitoring of the Regional Innovation Strategy of the Silesia Voivodeship." In addition to a number of activities carried out within the project, such as the promotion of RIS in the region, "Technopark Gliwice" workers are members of the Expert Group for the Elaboration of the Model implementation of PRT (Technology Development Program) and RIS. During regular meetings they are working on updating the document. An important element of the project is to develop an integrated model of cooperation network of specialized observatories. Thus, the "Technopark Gliwice" actively participates in conducting and updating web platforms Silesia INNOBSERVER. "Technopark Gliwice" in this platform will perform the observatory in the information technology and telecommunications. Technology Observatory will answer the demand from individual companies, local authorities, and also scientific teams for specific information regarding global trends, technological trends and attempts to diagnose and monitor the situation in the region. Additionally, within the Silesia INNOBSERVER "Technopark Gliwice" completes the innovation potential of the region in Multimedia Library. "Innovation map" - graphical, attractive presentation of the position of regional innovation centers in Silesia will be created. Map is a web application that allows the user to locate easily all the institutions of business environment, companies, research centers engaged in innovation activities in the region.

"Technopark Gliwice" is not only an ideal place for the development of innovative companies and to promote academic entrepreneurship - it is also a place that creates a favorable climate for art lovers. The institution has a unique infrastructure that allowed interior design the creation of a new initiative — setting up "Atrium" Gallery where the works of famous artists are presented. In May of this year, "Technopark Gliwice" in cooperation with the Polish Visual Artists Association Gliwice-Zabrze District organized an exhibition for the third time.

Science and Technology Park "Technopark Gliwice" conducts a number of information and promotion activities on the function of innovation in the development of modern business. Therefore, the Institution has taken the initiative of organizing "study visits" in its headquarters. These visits are intended to present the relevant technology park and private companies (tenants), whose common denominator is innovation. In addition to guided tours of the building "Technopark Gliwice" employees give participants response to any questions related to the possibility of commercialization of research and the purchase of a license and developed technology. An important element of such visit is to explore the studio and the machines which are inside.

#### 7. SUMMARY

"Technopark Gliwice" is also an extensive, constantly expanding network of contacts and relationships between companies operating in the same areas. Thanks to several years of business park operations has a huge ever growing database- both technological and expertise. "Technopark Gliwice" is a platform for cooperation between science and business as well as individual entrepreneurs. Innovative, creative, original ideas and solutions to be quickly and efficiently processed in useful products market, so it's an important goal of the park is the transfer of new technologies into the economy, and with the use of huge intellectual potential, inherent in a society living in our region.

In 2011, the "Technopark Gliwice," acquired the land for new infrastructure. Obtained areas are to be built in the near future. It is planned to build an office building with an area of 10,000 m² which will eventually be made available to businesses in the ICT industry, and can also become a place for the incubation of foreign companies from EU countries and

the Far East. Park has also started to work on the construction of the IT incubator building with an area of 1,000  $\rm m^3$ , which should be completed in 2013.

At this point, the Technology Observatory in the ICT industry and Smart City was established, which has a proposed project merits support. Observatory will focus on the analysis of global trends within these industries. It is also planned to establish another business alliances with partners from Poland and foreign countries. The current Park policy in this area has brought measurable success and significantly strengthened the perception of "Technopark Gliwice" in the country.

The multitude of tasks performed and the challenges facing Technopark Gliwice affect the need for continuous development of human resources, including management. The barrier is the lack of a universal model and methodology for Parks Management, a major challenge is the efficient utilization of available solutions from other areas and general methodologies. The multiplicity of actions carried out, it is important to have effective management of their knowledge and gaining a new one. Our challenge today is to create a park dedicated IT solutions that promote and systematize the process.

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