Transfer of knowledge and technology: Experience of the University of Belgrade, Serbia

Activities of knowledge and technology transfer at the University of Belgrade are performed through two innovation centers and one incubator. The innovation centers are located at the schools of electrical and mechanical engineering, while the incubator is founded by four technical schools (for civil, electrical, mechanical engineering and the school for technology and metallurgy).

The Business Technology Incubator of Technical Faculties Belgrade has been established as a partnership between the four technical faculties of the University of Belgrade (Civil Engineering, Mechanical, Electrical and Technological/Metallurgical), the Municipality of Palilula and the Democratic Transition Initiative, and the establishment has also received support from the Organization for Security and Cooperation in Europe (OSCE).

Establishment of Incubator based on international experiences and best practices has the following goals:

- To encourage and support students in starting up their own businesses and keep them stay in Serbia
- To develop a pool of young and well trained entrepreneurs who will in the future create a new business core of the city
- To create the conditions for practical application of the results obtained through science and research activities of university professors and their associates, by spinning-off private enterprises and transfer of knowledge and technologies.

The aim of the Incubators is to give support in the early stages of business development in the form of subsidized overhead (office and research space and technological and telecommunication infrastructure), administrative assistance (legal, accounting, etc.), as well as business counseling (planning, management, marketing, etc.).

The Incubator has been given its own space in the Campus of Technical Faculties Belgrade, Ruzveltova 1A.

Innovation center of the School of Mechanical Engineering, Belgrade, founded in Jun 2006, represents organization that applies scientific results in order to produce new or improved existing products, processes and services.

The main task of Innovation center is to implement scientific technical and technological knowledge, invention and creativity in order to improve the technological resources of Republic of Serbia. The Innovation center is capable of taking a part in diversity of scientific areas of research. In order with requirements of modern research methodology, it provides high professional human resources, adequate premises, equipment, internet, communication connections, labs and other resources necessary for proper projects' management.

Presently, Innovation center consists of Center for quality, Regional center for energetic efficiency, Network for energetic efficiency, Center for factitious, Center for transfer of technology and 11 laboratories.

Their activities include realization of various projects, as well as consulting related to quality control, expertise, certification of products etc. The plan includes faster training of scientists which will be able to participate in scientific and development research. The goal is continual improvement of the knowledge base, focusing on acquirement and use of the latest scientific results and technologies. Realization of the research will allow direct influence of knowledge in faster industry development and creation of innovative and attractive products, which will lead to improvement of quality and competitiveness of domestic products and services on the international market, as well as development of infrastructural systems in Serbia.

Technology transfer is essential for successful relationship between research organizations and industry. In order to comply with current trends in National development plan and integration into European standards, the program of Innovation center includes the following fields: Informatics linking of designers, manufacturers and users in mechanical industry ; IT in product development - CAD (product design, analyses and function simulation, elastomechanical simulation with FEM, simultaneous engineering, VR/AR technology in product development); IT in planning and management of production systems (configuration and simulation of production systems, VR/AR technology in production systems planning); IT in production processes (planning of production processes - cutting, deformation, nonconventional processes, handling of materials, parts and products, planning of assembly processes, optimization of production processes and production chains); IT in production of automatic production equipment (CNC machines, industrial robots and other flexible production automatization, management of production lines - transfer systems for processing and assembly, adaptive systems of production processes management, RLS systems of process management, intelligent handling systems and soft computing techniques in production processes management); Computer integrated production processes and application of IT in management of business functions of production company as well as the whole business system; IT in production metrology, system quality, measurement and inspection, measuring machines, TQM and related ISO standards; Expert systems for design of construction, transport and mining systems and mechines; Expert systems for optimization of equipment disposition; Simulation of warehouse and distributive systems etc.

Innovation Center of School of Electrical engineering (ICEF d.o.o.) was established in 2005, as an independent R&D organization where scientific results are applied in a systematic and original way, as well as modern technological processes in order to create innovations, new products, technologies, processes and services or to alter already existing ones to follow the needs of the market.

ICEF d.o.o. provides technical services in the area of measurement, research and testing of machines, installations and facilities (with and without destruction) for both international and domestic customers.

This Center offers adequate facilities and working conditions to postgraduates and to the employees, working on innovation projects at ICEF. Talented postgraduates are allowed to

express in full their creativity and provide for their existence, without having to work in various commercial companies or leave the country. This is very important having in mind the development of information technologies (including telecommunications, automatics, electronics and other areas) as well as the strategy of technological development of Serbia. In this way it is possible to directly monitor and implement contemporary achievements in this area.

Activities and area of work performed in Innovation center are the following: Development of prototypes, technology and software, as well as scientific-research projects in the area of electrical engineering (basic and applied research) in the Center or in cooperation with other scientific-research institutions funded by the Ministry of science, Republic of Serbia and/or 3rd parties; Support to innovation programs; Participation in research projects realized in the European Union (through international cooperation and bilateral relations); Providing equipped vacancies, expert and technical support to PhD, postgraduate and master students of the School of Electrical Engineering; Implementation and realization of the internship for students in the framework of required and facultative programs at the School of Electrical Engineering; Technical services in the area of measurement, research and testing of machines, installations and facilities (with and without destruction) for both international and home users; Production of investment/technical and project documentation for studies and other documentation for NGO users and other users on the market; Participation in the production and compiling of technical standards and regulations, proposition of legislation through cooperation with relevant Ministries of the Republic of Serbia; Research, development and realization of projects in the area of energy efficiency (alternative energy sources, new technology, production management and energy consumption); Production cooperation with international and home companies in the area of innovation, transfer of knowledge, and technologies, management, software, electric machines, tools and instruments (launching of patent and industrial rights, consulting services); Organization of practical training, seminars and knowledge innovation in specific areas of applied electric engineering (high voltage, machines and installations in explosive environments, extreme conditions, etc.); Technical and business cooperation with acknowledged systems in the area of electric engineering and communications in Europe and worldwide (ABB, Siemens, GE, Fluke, Manesmann, Ericsson and others through various forms of cooperation such as internships for students, participation in R&D projects, equipment of University laboratories, etc.); Cooperation with institutions in the country that are important for the work of the Center (institutes, government agencies, public enterprises, large business systems)