

Co-operative research centre for information technology in Debrecen (ITCRC)*

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Abstract

Our ITCRC works as glue that brings together research providers and research users in a common research umbrella program which has theme specific sub-programs. The cover idea is the Service provider university to enhance the Quality of Services by the development of the related information processing. In this frame five subprograms have been developed with the partner firms (International System House Ltd., ORGWARE. Ltd., T-Systems RIC Ltd., Geoview Systems Ltd., Debrecen City Holding Inc.). Medical Centre Project aims to prepare standard treatment protocols discovering the relationships of knowledge and supporting decision making process, Service provider university project to prepare the prototype of a standard service of an administrative decision model, Agriportal project to give help to the entrepreneurs of agriculture to exploit their opportunities and to help them fit to the environment of the market, E-learning project to develop the methods of computer supported tools on different levels of education, Intelligent community card project to develop a multifunctional card as a result of the security and digital signing research. The ITCRC helps to involve the results of research objectives into the education of different majors, on the other hand, will play an important role as the knowledge base of the region, in the education of industrial experts. The accumulated knowledge can increase the opportunities of the information technology of the region.

Keywords: budget allocation, expert systems portal, e-Learning, health care administration, multifunction cards

1. International history and background

The European Commission has taken a position on how best to modernize Europe's universities. (Higher education in the Lisbon strategy, 10, May 2006.)

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This is fundamentally important for them to make their contribution to the EU's objective to become a leading global and knowledge-based economy. European universities have enormous potential, much of which unfortunately goes untapped because of various rigidities and hindrances. Freeing up the substantial reservoir of knowledge, talent and energy requires immediate, in-depth and coordinated change: from the way in which systems are regulated and managed, to the ways in which universities are governed. The Commission's ideas are presented in a Communication cover all activities of Europe's universities: their delivery of education, their research activities, and their potential as drivers of innovation. Each institution should find the balance of education, research and innovation which is best suited to its role in its region or country. The aim is to create a framework within which universities can become stronger players in the global knowledge society and economy. The Commission stands ready to support the modernization of EU universities through a process of identifying and sharing good practice, and through its funding programmes for education, research and innovation. In order to investigate the opportunities to achieve this goal we can discuss about "Multi Actors and Multi Measures" funding Programmes (MAPs) which are special tools of RTDI (research, technological development and innovation) policy with a focus on co-operation between science and industry. Nevertheless a huge variety of features and management practices can be observed depending both on the National Innovation Systems and on the problems addressed. Although the way of approaching different actor settings can be very different and distinct (network or cluster oriented, centre programmes, etc.) the two properties of "multi measures" and "multi actors" are always necessary preconditions. The function of all MAPs is to change actor settings and trajectories via temporarily funded projects or centres within programmes. The advantages of programmes is their temporary, direct and adaptable character and their ability to influence institutional and systemic settings. All forms of MAPs can be used: - as a kind of glue, linking together important parts of an innovation system, strengthening the science - industry co-operation. - as a kind of solvent, changing rules, habits and incentives within subcultures. Organizations find themselves locked in routines and need an incentive to change. - as a kind of bypass, building roads around traditional blocks. Typical examples are strong departmental structures within universities which will not perish overnight. MAPs can establish new forms of long-term co-operations.

Consortia of applicants for MAPs should formulate joint projects, goals and work plans aim at bringing the allocation of matching public and private funds. In general partnerships consist of disparate institutions, like research institutes, universities, industrial companies, banks, technology centres, etc. To plan, promote, manage, run and evaluate such programmes is a considerable challenge for all actors involved, including ministries and funding agencies. MAPs encourage interdisciplinary co-operations, which is more and more important for a number of industries facing complex innovation challenges. From a procedural point of view firms and research institutions have to adapt routines, traditions and portfolios of each others, so MAPs foster the management orientation in research, provide new

forms of careers within a well funded term frame. In the same time MAPs have the advantage to give a strategic push for whole fields without the need to build up everlasting institutions. Some examples:

- U.S. NSF Engineering Research Centres (1985)
The 41 Engineering Research Centers (ERC) established since program initiation in 1985 are at the forefront in helping NSF achieve its strategic goals.
- German Nanotechnology CC Programme (1998)
The financing of six competence centers is primarily through the means of venture capital (risk capital). (kompetenznetze.de)
- Australian Co-operative Research Centres Programmes
The Australian Government funds CRCs for up to seven years. Since the Programme began in 1990, 158 CRCs have been funded between them more than 55 active actually and they have maintained over 2600 patents in Australia. (www.crc.gov.au)
- Sweden Competence Centres (1995)
The 28 Competence Centres are specialized in specific research fields (Energy, Transport, and Environmental Technology (8 Centres), Production and Process Technology (7 Centres), Biotechnology and Biomedical Technology (5 Centres), Information Technology (8 Centres)).
- Austrian K'plus Competence Centres (1998) programme
The focus lies on pre-competitive and high-level research. Inspired by the Swedish Competence Center Programme, K'plus in particular places special emphasis on infrastructure (meeting places, laboratories etc.) Increasingly, European aspects become an integrative part of Austrian programmes.
- Finnish Technology Programmes
General principles defined by Tekes, rules are flexible, giving orientation. (www.tekes.fi)
- Hungarian Competence Centres (2000)
- Estonian Competence Centre programmes (2003)
Not enough skills in strategic planning and management in both science and enterprize sector, no entrepreneurial culture at universities.

The making of typical Competence Centre funding programmes is a story of its own. The mother of all them is the Engineering Research Centres programme issued by US National Science Foundation (CRC) programme and the Swedish CC Programme. The Hungarian KKK programme based on US model primarily, taking into account Swedish, Australian and Austrian experiences.

2. The Debrecen model

2.1. Basics and ancestors

Historical roots of the University of Debrecen reach back to the foundation of the Reformed College of Debrecen (1538), whose three academic sections later served as the base for the Hungarian Royal University of Sciences, created by Statute no. 36 in 1912. With this past of more than 450 years, the University of Debrecen is the oldest institution of higher education in continuous operation in Hungary based in the same city.

The quality of teaching and especially research is indicated by the fact that more than half of the instructors have academic degrees, and 26 professors are members of the Hungarian Academy of Sciences. According to the yearly complex report of the Hungarian Ministry of Education, which serves as the base for the amount of research funding available to institutions of higher education, it is the best institution outside Budapest and is in the top three in the country, possessing 14-15 percent of the research volume carried out in Hungary.

The Faculty of Informatics is very new, having been formed in 2004 as the result of a long process of organic growth. The teaching of information technology began in 1972 at the Kossuth Lajos University of Sciences, one of the predecessors to the University of Debrecen, as the Computer Science Department, established as a sub-division of the Faculty of Mathematics. According to the evolution of computer science, the numbers of IT students, instructors and departments at the University have multiplied, and the range of offered courses has also expanded.

Currently the Faculty of Informatics offers the following main training programmes and specializations:

- software engineering major (BSc/MSc)
- system engineering major (BSc)
- business management major (BSc)
- library informatics major (BSc)
- informatics teacher training major (MSc)

The faculty plays also an active role in the founding and running of the *Mathematics and Computer Sciences Doctoral School*.

The scientific basis (RTD background) for the ICTCRC could come from the Faculty of Informatics mainly on the following research areas and core competence topics: Software Technology, Database Management, Automatic theorem proving, Knowledge based representation and reasoning, Cryptography and Data security, Formal Languages and Automata, Stochastic modelling, Queuing and reliability theory, Computer graphics, Digital signal and picture processing, Syntactic and structural pattern recognition, Numerical methods, Operation research, Financial

mathematics, Coding problems, Computer linguistics, Decision making and psychological modelling, Characterization of information measures, non-smooth and non-convex optimization problems. It should be noted, that some of the above topics have been maintained in strong cooperation with the Institute of Mathematics of the Faculty of Sciences.

Another significant management pillar of the cooperative IT research in Debrecen is the *Debrecen InfoPark (DIP)* founded by the Debrecen University, the county Chamber of Commerce, the Local Municipality (of city Debrecen) Regional Municipality (of County Hajdú-Bihar) in 2003. Its main aims are: Contributing to the amelioration of the economic competitiveness of the Region. Establishing and facilitating the development of the information technology sector in the North Great Plain Region. Establishing the conditions required for sustainable socio-economic development. Supporting the establishment of technology-intensive micro (start-up, spin-off) and small-sized enterprises and encouraging their innovation activities. Stimulating investments and strengthening the loyalty of companies that have already settled down in the region.

It should be also remarked that the University of Debrecen is a *complete university* in the classical sense. With its numerous faculties it not only provides very good chances of interdisciplinary, but also its size and complexity can provide case examples for a lot of governmental and organizational problems having state level significance. That is why the study and modelling the university processes could serve and help the solution of general problems of the higher education system in Hungary. This principle played a fundamental role in the formulation of the cover idea of the ICTCRC project.

The key note in setting up an appropriate strategy can be the acceptance of the assertion that “operational data constitutes a special kind of resource for the related enterprise”. Namely it possess all the main attributes of any traditional resources: it needs costs, it is limited, the rational use improves the enterprise’s effectiveness. This has a very serious consequence: an integrated (enterprise level) data management is necessary! The main tools for solving this problem are the data modelling and database management. The database management can be interpreted in this sense as resource management.

2.2. Organization

In January 2004 a tender for establishing cooperative research centers (CRC’s) in the frame of GVOP (Operative program of economic competitiveness) was announced. The idea and conditions were very simple and conforming with the international practice mentioned above: universities/research institutions together with companies/industry partners have to set up a joint organization (like a consortium) to solve some RD problems of common interest. At least the half of the costs had to be shared by the participants, the rest would be covered by the state (using mainly the EU Community Structural Fund). In December 2004 the University Debrecen application got into the group of 14 winners and, the ICTCRC of the university was established.

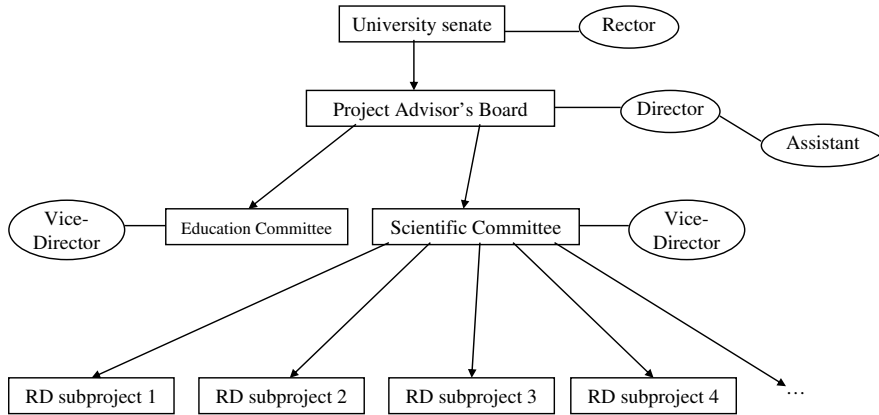


Figure 1: ICTCRC organization scheme

3. Projects at the ICTCRC Debrecen

3.1. Medical Centre Project

The goal of the project is to investigate the risk management of the local health data and to prepare standard treatment protocols discovering the relationships of knowledge and supporting decision making process.

3.2. Service provider university project

The aim of the project is to prepare the prototype of a standard service of an administrative decision model, and to establish their integrated model.

3.3. Agriportal project

The prototype of Agriportal could give the answer to the relation of process of sol-fauna- agro economy. This system can give help to the entrepreneurs of agriculture to exploit their chances and to help them fit to the environment of the market.

3.4. E-learning project

The main goal of the project is to develop the methods of computer supported tools on different levels of education.

3.5. Intelligent community card project

A multifunctional card will be developed as result of the security and digital signing research. The environment and the conditions of introducing will be investigated.

4. Future vision

The ICTCRC intends to help the establishment of a *Regional Informatics Competence Centre (RIT)* in the future. The frames of this development are settled in the *Hungarian National Development Plan II*. According to this, the city Debrecen is planned to be one of the “*Developing Pole*”s in the county. A regional ICT industrial basis, referred as “*Silicon Field*” would be established including the “*Debrecen Communication and Internet Exchange*” interregional info-communication network, many information technology projects hosting in an industrial park, which provides incubation as well.

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