

Bridging the Gap between Higher Education, Academic Research and Romanian Business Community

BRANDUSA PREPELITA-RAILEANU

Department of Communication in Modern Languages
University *Politehnica* of Bucharest
Splaiul Independentei 313, 77206 Bucharest
ROMANIA
brandusaraileanu@yahoo.com

OANA MARIA PASTAE

College of Letters and Social Sciences
Constantin Brancusi University
Grivitei Street 1, Targu Jiu, Gorj
ROMANIA
oana1978ro@yahoo.com

Abstract: The paper explores the connections between higher education, academic research and Romanian business community in their technological activities. It is emphasized that the collaboration enables firms to learn about technological change, and it enhances their ability to deal with novelty. It refers to a recent forum for debating - *Strategic Partnership between Academic Research and Romanian Business Community* - organized at the University *Politehnica* of Bucharest which has revealed the importance of a successful collaboration of high levels between scientists, engineers and managers. Using two examples of highly successful technological collaborations – CPRU (Human Resources Training Center) and AMCSIT (The Management Agency for Research, Innovation and Technology Transfer), it is argued that the linkage between higher education, academic research and Romanian business community provides a framework for understanding the imperative for collaborative research partnerships, particularly those involving government, university and industry actors.

Key-Words: higher education, academic research, business community, life long learning, living laboratories, strategic partnership, cross-domains research

1 Introduction

Universities everywhere are being forced to carefully reconsider their role in society and to evaluate the relationships with their various constituencies, stakeholders and communities. Universities are increasingly expected to assume a *third mission* and to engage in interactions with industrial and regional partners. While incentive schemes and government programs try to encourage universities to reach out more to external communities, some important barriers to such linkages still remain [5]. To fulfil their obligation towards being a socially accountable institution, universities will have to carefully select their stakeholders and identify the right degree of differentiation. For the university, thinking in terms of partnerships has important implications for its governance and accountability arrangements. In order to further explore some of these concepts and to empirically investigate the tendencies suggested here, this paper proposes a research agenda for tackling the emerging issues of governance,

stakeholder management and interaction of higher education with society.

The 3rd forum for debating *Strategic Partnership between Academic Research and Romanian Business Community*, organized by University *Politehnica* of Bucharest, the Romanian Society of Automation and Technical Informatics (SRAIT) and the Human Resources Training Center (HRTC) took place on 29th of March 2010 in Bucharest. The Forum brought together participants from higher education institutions and associations, enterprises and business associations, and from both national and EU-level authorities. It was an opportunity to facilitate the exchange of good practice, to foster mutual learning and networking and to inspire further activities. The Forum represents the Romanian response to calls from the academic and business communities for regular and sustainable dialogue, exchange, sharing and learning. Its aim was the increasing knowledge and technology transfer as well as marketing of research results via increased university-business cooperation.

2 The Knowledge Triangle: Education, Research and Business

Higher Education is a key element in the golden triangle which also includes academic research and business community. The Lisbon strategy mentions that the universities must consider the employability of their graduates, equip them with the skills for public and private sectors, and ensure that the unemployed can improve their skills for work. Also in the domain of research, universities are essential to create, improve and share knowledge. In this context the employability and innovation require commitment. Universities must foster and encourage entrepreneurship. One way to achieve this is through cooperation with businesses. Universities must set up structures for life long learning. Companies must be proactive in the cooperation process, and one key to achieve this cooperation is mobility. For students themselves, mobility and business cooperation ensure that they develop a more entrepreneurial mindset. The challenges facing the relationship between industry and higher education in an adverse economic climate have revealed several important issues:

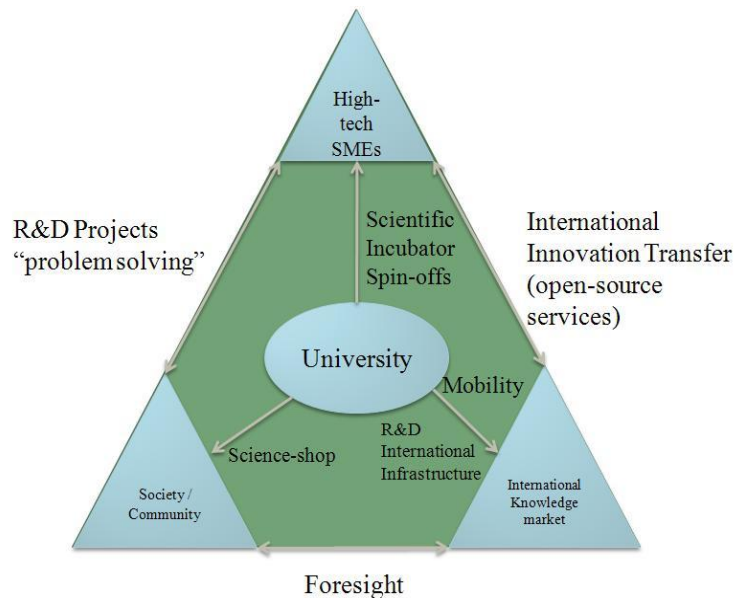
- Curriculum development as a domain to foster employability and a more entrepreneurial mindset among graduates
- Entrepreneurship, as an aspect of both, institutional activity and the curriculum, with the assistance and guidance of the business community
- Continuing education/Lifelong Learning and the promotion of university-business partnership in the field of provision of training/retraining programs
- Knowledge Transfer, concerning methods and models of the translation of knowledge from the research mode to the enterprise mode as innovation
- Development of mobility, including student mobility, but also mobility of researchers and teaching staff, between academia and businesses, and vice versa

As prof. PhD. eng. Ioan Dumitrache emphasized [1], the main purpose of the 3rd edition of the Forum for debating *Strategic Partnership between Academic Research and Romanian Business Community* is to give an in-sight look to the state of the art of innovation best practices in common Europe, but not limited at, to reach the goal (2025) of Knowledge

Society consolidation in EU. Beyond 2009, the new complex, fast reactive mission involves new synergetic multi-role as the following items show:

- Knowledge broker within knowledge society;
- Promoter of advanced complex projects involved in both National competitions (CNCSIS, ANCS, AMCSIT, CNMP, FSE) and European contest (FP7, Socrates Erasmus, Mondus, Tempus, etc);
- Catalyst to synchronize the Romanian academic research with EU advanced research as: Digital Business Ecosystems, Living Laboratories (e-healthcare, e-Government, etc), FInES Future Internet Enterprise Systems involving the following triad: Internet of Things (IoT), Internet of Services (IoS), Internet of Knowledge (IoK), Internet of People (IoP);
- Business incubator – RENIT network
- LLL (life long learning) paradigm oriented coach & trainer

The core competences (expertise) imply multi / inter disciplinary cross-domains research: Concurrent Engineering / Robotic systems / Embedded control systems / FInES (IoT/IoS/IoK/IoP) enterprise complex, adaptive systems / Virtual / extended enterprises (multimodelling multipurpose) / Business process modelling, monitoring, management / Collaborative Networks / Digital Business Ecosystems / Interoperability versus integration / Concurrent innovation [1].



3 The Global Competition and Markets

Universities and businesses need to communicate to supply the relevant skills for the labour force. The

forum has opened dialogue and communication for these two worlds to come together. The interest of the students will prevail – more relevant curricula, more common projects, and mobility with business, to help students and professors to become more enterprising; this can stimulate work in interdisciplinary teams. Cooperation with companies can contribute to universities becoming actors in lifelong learning. Companies can identify their needs and communicate them to universities. The challenge is to find the right balance [3]. The next step is to decide what topics to work on in the future in the given conditions of globalization, sustainable development of regional economy, digital business ecosystem, interoperability to support new wave of integration, interoperability service commodity, utility, facility, etc.

Human Resources Training Center (C.P.R.U.) is an educational and academic research centre for postgraduates, organized in the University *Politehnica* of Bucharest.

According to the reformation program of the higher education system in Romania and to the economic reform requirements, Human Resources Training Center (C.P.R.U.) is specialized in training professionals through training programs for scientific research in the domain of inter- and multidisciplinary advanced technologies.

The managing director of *Human Resources Training Center*, Prof. PhD. Ioan Dumitrache [2] has highlighted that to respond to the new set of grand challenges that maximizes the resource allocation and minimizes the complex problem, the socio-technological-economical-organizational System of Systems (SoS) should promote the only holistic approach to address the societal challenges of the global competition and markets. The *Human Resources Training Center* has been selected since 1994 (RO to EU pre-adhesion phase) as partner to complete the complex projects within Framework 4, 5, 6, 7 (like: Concurrent Engineering NoE Phase 1 (1996-1999), Concurrent Engineering NoE Phase 2 (2002-2003), COIN-IP-EEU, Apollon Living Lab (2010), UNITE).

The *Human Resources Training Center* is involved in activities such as:

- Training programs in advanced science and technology
- Active member in European Programs: FP5, FP6, FP7, Concurrent Engineering

- Active promoter of the Partnership between the University and Companies
- Active support for continuous education and training in advanced and emergent technologies
- Living Lab project -> member of ENoLL
- Business Incubator project -> member of ReNIT

Its objectives are:

- Optimal use of modern training facilities as well as involvement in programs for interdisciplinary education, training and research
- Creation and development of a stimulating framework for the capitalization of partnership relations with the industrial and business environments
- Setting up a favorable framework for promoting the international and regional cooperation concerning human resources development
- Confirmation of innovative concepts and solutions concerning education, promoted for and through high technology, including management of the training programs on economical basis
- Implementation of the concept of quality in professional training

The University *Politehnica* of Bucharest is an important resource network for high technology firms. In order to develop stronger links with industry the *Human Resources Training Center* has established, as prospected activities, practical and theoretical training in vanguard domains for students in the final years of higher education. Academic programs include master programs such as:

- Business Systems Engineering and Management,
- Integrated Information Systems,
- Innovation and Technology Transfer Management,
- Summer courses,
- Training of trainers,
- The design of curricula for continuous and long distance education,
- Technology transfer.

Some prospected benefits are estimated:

- Immediate impact on economic environment through improvement of professional and managerial competences of the participants in programs, including those for SME management

- Creating job opportunities and increasing wage level for the participants in the Center programs
- Capitalization of professional competences of academics in interdisciplinary activities
- Reduction of the "brain drain" effect of high qualified professionals
- The education commitment in change and restructuring processes
- New active partnership formulas

Motivational factors are:

- the deep structural change of Romanian economy;
- the necessity to harmonize professional training in Romania with standards imposed by the competition in the context of internationalization of all economical activities;
- the emphasis on the importance of systemic approach in technological education and training;
- professional mobility because industrial and economical sectors need professionals with multidisciplinary education.

4. A Quality Management System

Recent national and international studies into the work of academics reflect that they fall into two approximately equal groupings: teachers and researchers [4]. However, the distinction becomes more marked when considering older and newer universities; academics at older universities focus on research.

The question that is normally raised is: *which approach is the correct one?* The answer to this question is explicitly recognized in the philosophy and strategy of the *Management Agency for Research, Innovation and Technology Transfer (AMCSIT) - POLITEHNICA*, which reflect particular positions within the teaching/research nexus. Dependent on the nature of the structure and its emphasis on teaching/research that typifies a particular educational institute; academic staff is expected to meet few or many requirements in relation to teaching and research. Further, these requirements may change as the institute re-positions itself within the teaching/research nexus adopting a different structure, and hence a different understanding of what it means to be an academic. This is precisely what has occurred in Romania with the emergence of *Management Agency for Research, Innovation and Technology Transfer – POLITEHNICA*. This public institution operates

under the leadership of the National Authority for Scientific Research by the Government Decision No. 983/1999.

The main mission of *AMCSIT–POLITEHNICA* is the financing, management and marketing activities for scientific research, innovation and technology transfer aiming to the efficient promotion of the R&D results in the society by new products, technologies, and services. The Quality Management System according to ISO 9001/2001 has been implemented and certified by SRAC.

Since 1999 *AMCSIT–Politehnica* has coordinated the *RELANSIN R&D* program which has included more than 2300 projects. The agency was then strongly involved in the management of the national program of "Excellence Research".

Since 2006 the main activity field has become the financing and the management of the *INNOVATION* program. Other 27 national and international research projects were processed by the agency staff. Nicolae Vasiliu, the General Director, professor, PhD, outlined in his speech (*AMCSIT-Politehnica – a Promoter of Partnership in Innovation Projects*) [6] the objectives of the agency's activities:

- coordination of the *INNOVATION* Program from the National Research Development and Innovation Plan – PN II;
- promotion of the transfer of the technology and innovation for sustaining the efficiency of the Romanian economy;
- coordination of the multi-disciplinary programs of development, innovation and technological transfer projects, starting from the national priorities;
- guide the human resources towards the research, development and innovation activities and improve their competence by training and instruction programs;
- disseminates of the professional results and innovative knowledge at local, national and international level.
- edit and publish the technique and scientific documents.
- organize conferences to disseminate the project results.

The *Management Agency for Research, Innovation and Technology Transfer* has many types of activities:

- it organizes competitions of projects;

- it prepares and refines the documentation for the project competitions;
- it offers support for preparing project proposals for R&D Programs;
- it evaluates and selects the valuable projects proposed for the competitions
- it prepares legal contracts with the selected companies and covers the value of all eligible activities and acquisitions;
- it improves the knowledge of the leaders and their research teams by periodical training seminars and continuous expertise improving;
- it monitors the projects evolution and evaluates the technical, economic and social results;
- it identifies the economic effects of the finalized projects;
- it manages the scientific information through development of data bases, documentation centers with Internet access and other international communication grids.

5 Romanian Living Lab Initiative

The research program of the Virtual Professional Community for Automatic Control & Robotics & Computer Science (VPC-ARC LL) addresses the relations and communications between companies, stakeholders, governments, international institutions and civil society. These interfaces are studied from several different perspectives, such as a normative, institutional, strategic, and communicative perspective. It is hypothesized that if these interfaces are managed effectively this will improve the functioning of companies, stakeholder relations, markets, governments, and thus, the functioning of society in general in a considerable manner. Although the Romanian Living Lab initiative is very young its activity generated the creation of a consortium between academic and private entities focused on developing a government to citizen and government to business sustainable communication platform.

The research undertaken by the members of the consortium is in the process of being evaluated as to be elected for a Government founded Romanian project.

The objectives of the living lab as stated by the VPC-ARC LL are:

- Focusing on research & development of regional or European projects to sustain the Romanian active role as a reliable partner

- being able to deliver holistic solutions that can be implemented on a global market.
- Developing pilot implementations focused on gaining practically useful, high added-value solutions for additional and innovative businesses in Romania and neighbouring countries.
- Providing for Enterprise Interoperability and for an effective and efficient Technological Transfer and Breakthrough of Romanian industry focused on the proprietary areas: Car-Manufacturing (Renault-Dacia, Ford, General Motors), Aero-Spatial Industry, Tourism , IC & Microelectronic, Forestry & Furniture Manufacturing.
- Extending the collaboration & cooperation with the European Partners within the new EU paradigm of Collaborative Network Organizations.
- The involvement of academic, research, business and political entities, for the accomplishment of the initiative, both where and when it is needed.
- Developing pilot initiatives focused on local problems, within the country-wide Living Lab initiative. (Living Lab initiatives in other Romanian cities)
- Joining regional (Greece, Bulgaria, Slovenia, Poland etc.) projects for the envisioned cooperation (Balkan region) as well as developing country-to-country (eg: Romania – Germany, Romania – Finland) initiatives.
- Sectoral and/or regional coverage, development strategies.
- The local coverage is ensured by the Partnership Agreements signed with Actors from the main areas involved in the innovation process: Academic Research, Research Institutes, Private Sector and Government Entities.
- The intent of the Romanian Living Lab initiative is to develop into a system for building future economy in which real-life user-centric research and innovation will be a co-creation technique for new products, services and societal infrastructure.
- The final goal is to offer services which enable the users, identified as citizens, to take active part in research and innovation.

The main focus areas for the Romanian Living Lab initiative are regional and local.

Regional initiatives:

- collaboration and cooperation;
- support innovation in bringing together government, business and research entities with focus on implementing a citizen oriented relationship;
- encourage the innovative process and support the technology transfer towards industry partners or towards the development of business ideas and business incubation;
- clustering approach for Balkan – development region;
- innovative business;
- government;
- technology transfer;
- supporting action to promote young researchers;
- sustaining the Business Incubator National Network.

Local initiatives involve entities in solving metropolitan problems in the Bucharest Metropolitan Area such as: metropolitan traffic, metropolitan pollution, pollution effects on health.

6 Conclusions

The business world and society are increasingly ready for sustainability. But it is still unclear how this should be achieved. The path that is chosen largely determines the outcome, and that path is determined by interactions between businesses and their societal stakeholders. In the past, conflict and debate dominated those interactions, but proponents of a

dialogue are gaining ground. A strategic *stakeholder dialogue* between businesses and their societal stakeholders maps divergent interests; it identifies opportunities and reduces risks.

Cooperation between universities and businesses has a number of subsets, the most important of which are: key competences/skills of graduates, student entrepreneurship, knowledge transfer, private investment in tertiary education, innovation development, utilization of young people's knowledge. New approaches to problem solving can be essential to the business world. When brought together the worlds can bring benefits, but the question is how to achieve this.

The ever increasing worldwide integration creates an array of opportunities and threats for higher education, academic research and business community. All over the world communication has increased. Technological developments change the corporate environment, governments and societal organizations. Especially in the last decades, enterprises have had to be seriously concerned with technology and innovation in order to be successful. The most successful enterprises are those that do not only react most adequately to changes in their environment caused by technological change, but that are also able to initiate such changes to create competitive advantages. Therefore, dealing with technology and innovation is an essential skill for a manager.

References:

- [1] Dumitrache Ioan, Lecture about Human Resources Training Center, 3-rd edition of The Forum for debating *Strategic Partnership between Academic Research and Romanian Business Community*, University Politehnica of Bucharest, 29 March 2010.
- [2] Dumitrache Ioan, *Knowledge and Technology Transfer to Companies Acting on Romanian Functional Market*, 3-rd edition of The Forum for debating *Strategic Partnership between Academic Research and Romanian Business Community*, University Politehnica of Bucharest, 29 March 2010.
- [3] Heather Stonyer, Ahmed Al-Jumaily, *Beyond Teaching and Research: Changing Engineering Academic World*, *Global Journal of Engineering Education*, vol. 4, nr.1, 2000, New Zealand.
- [4] Joan E. van Aken, Management Research Based on the Paradigm of the Design Sciences: The Quest for Field-Tested and Grounded Technological Rules, *Journal of Management Studies* 41:2 March 2004
- [5] Rui Yang, Globalization and Higher Education Development: A Critical Analysis, *International Review of Education*, ed. Springer, Netherlands, Vol. 49, No 3–4, July, 2003, pp.269 – 291.
- [6] Vasiliu Nicolae, *Management Agency for Research, Innovation and Technology Transfer (AMCSIT) – Politehnica a Promoter of Partnership in Innovation Projects*, 3-rd edition of The Forum for Debating *Strategic Partnership between Academic Research and Romanian Business Community*, University Politehnica of Bucharest, 29 March 2010.