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**EDUCATION, RESEARCH AND BUSINESS –
A STRATEGIC STAKEHOLDER DIALOGUE.**

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Abstract

The paper explores the connections between higher education, academic research and the Romanian business community in their technological activities. It is emphasized that the collaboration enables firms to learn about technological change, and enhances their ability to deal with novelty. It refers to a 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. 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: strategic partnership, higher education, academic research, business community, lifelong learning, cross-domains research

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 creating, improving and sharing knowledge.

A major problem of any contemporary reform of higher education is represented by the organization of the educational offer so as to match the diversification of the educational demands of students, in the circumstances of growing financial difficulties. The solution of organizing and reforming education from the perspective of permanent education appears to be a realistic one as it allows for the creation of certain flexible bridges between levels and routes of education.

A real reform of education has as a major aim the development of the free and creative personality, its social function being integration in social order and change. Such a reform starts from reality and from traditions, secures equal chances of access to and success in education, answers the challenges of the contemporary world, of the new economies, based on computer technologies of communication, on knowledge and creativity, changes consumerist mentalities into creative attitudes.

A challenge comes from the difficulty of achieving at the same time and to the same extent an equality of chances at the highest qualitative level of education. Another comes from the processes of globalization and integration and refers to the preserving of national identity and dignity, the developing of national heritage, the assertion of the national creative spirit. The reform of education will have to take into account: the major aims of the social, economic, political project, the needs and aspirations of young people, the cultural and pedagogical level of society, the resources of the system, the adherence of social agents to change, the succession of stages in the logic of the reform.

In this context, the employability and innovation require commitment is important. Universities must foster and encourage entrepreneurship. One way to achieve this is through cooperation with businesses. Universities must set up structures for lifelong learning. Companies must be proactive in the cooperation process, and one key to achieving 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 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.

The main purpose of the 3rd edition of the Forum for debating *Strategic Partnership between Academic Research and Romanian Business Community* (Polytechnic University of Bucharest) was 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, 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 (lifelong 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].

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.

Recent national and international studies into the work of academics reflect that they fall into two approximately equal groupings: teachers and researchers. 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 reflects 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. From 1999 *AMCSIT–Politehnica* has coordinated the RELANSIN R&D program which included more than 2300 projects. The agency was then strongly involved in the management of the national program of "Excellence Research". From 2006 the main activity field became the financing and the management of the INNOVATION program. Other 27 national and international research projects were processed by the agency staff. Professor PhD Nicolae Vasiliu, the General Director, outlined

in his speech (*AMCSIT-Politehnica – a Promoter of Partnership in Innovation Projects*) [5] 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;
- guidance of the human resources towards the research, development and innovation activities and improvement of their competence by training and instruction programs;
- dissemination of the professional results and innovative knowledge at local, national and international level.
- editing and publishing of the technical and scientific documents.
- Organization of 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;
- prepares and refines the documentation for the project competitions;
- offers support for preparing project proposals for R&D Programs;
- evaluates and selects the valuable projects proposed for the competitions
- prepares legal contracts with the selected companies and covers the value of all eligible activities and acquisitions;
- improves the knowledge of the leaders and their research teams by periodical training seminars and continuous expertise improving;
- monitors the projects evolution and evaluates the technical, economic, and social results;
- identifies the economic effects of the finalized projects;
- manages the scientific information through development of data bases, documentation centers with Internet access and other international communications grids.

The reforms in education must be a step in front of the economic ones - without being isolated from them – in order to develop the tendencies of stability and economic growth. If the revival of the economic growth is a condition of a lasting social and educational

development, the success of the education reform is a premise for the macro-structural economic reforms that primarily aim at the development of certain sectors (tertiary - from the sphere of services, health, education) new professions and jobs, new attitudes towards performance, competition, merit, risk, the new social middle class that encourages economic, social and political pluralism [4].

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 the new set of grand challenges that maximizes the resource allocation and minimizes the complex problem, 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 supporter 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

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 competencies 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.

The research programme 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 that 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 neighboring 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 of innovation in bringing together government, business, and research entities with focus on implementing a citizen oriented relationship;
- encouragement of the innovative process and support of 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.

Changes in education will be submitted to a triple impact: cultural traditions, the current problems of the world, the problems of the future. The reforms of education, by

extending the duration of compulsory education, encourage the democratization of society as they reduce the dependence of the social position of a person on his/her social origin. From this perspective, the priorities of educational reforms are:

- the securing of equal chances of getting education,
- the improvement of the quality of education,
- the assertion of the organizing principle of continuous education - at all ages and along all alternative educational routes (formal, non-formal and informal).

If education does not succeed as a factor increasing professionalism and stimulating the freedom of creation, then the costs will be higher as we will have to spend more on public services or the social protection of those who are not easily adaptable to social and professional and cultural integration. The problem of striking a balance between the demand for social and professional training and the educational offer will be solved both by prognoses about the labour force market and, mainly, by training extremely adaptable graduates (multiple skills).

The current trend in educational reform must be preserved and adjusted on the way, so that the process of European integration be a constant attribute of this approach. In this context, the coordinates of future efforts might be:

- securing the equality of chances of getting education by a judicious organization of the education network, by a pluralist educational offer;
- eliminating the difficulties created by the inappropriate quality of economic infrastructure and local services, by the insufficiency and non-uniform distribution of funds, by the quality of the equipment and human resources;
- compensating the disadvantages created by the social and economic context in which the educational system operates, by restoring confidence and interest in the social and professional success through education;
- becoming part of the European Higher Education Area;
- realization of lifelong learning for all, with increased role of ICT.

Since October 2006 university accreditation issues have been dealt with by the Romanian Agency for Quality Assurance in Higher Education.

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, 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, the use 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 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.

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