

**ACADEMY OF ROMANIAN SCIENTISTS**



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## FOREWORD

Information Technology and Communication characterize more and more our contemporary society and are on the base of the integrated processes in engineering. Modern technology is becoming more present in scientific activities without limiting it without imposing any limitations; it dominates with authority on all the other fields of human presence and activity. At the same time, the revolution in informatics and technology determines fast and profound changes in the premises of our lives.

Under these circumstances, in the last years, on the specialists' language, a new term called "Integrated Manufacturing" has begin to be more and more used; the term actually comes from combining two concepts: "manufacturing" and "informatics".

In a broad acceptance / definition, *Integrated Manufacturing* regroups all the methods and manufacturing systems used in cost management, deadline / time management and quality management. At the same time, Integrated Manufacturing takes into account the components' manufacturing (machining, casting, etc.), the production management, the optimization of the manufacturing systems and profitability, the work-pieces control, etc. Thus, Integrated Manufacturing targets the staff's professional specialization in production, the organization of the resources (human and material), flow optimization and industrial process efficiency.

Taking into account all the above, in 2009, the Polytechnic University of Bucharest has organized a scientific session using *Innovation and manufacturing* subject under the patronage of AOSR (Academy of Romanian Scientists). During this scientific session, in Technical Sciences section, The Working Group "*Productica*" was presented for the first time. *Productica* was the affiliated to the Centre for Creativity Development - AOSR.

A first step in this direction was made in 2010, when, based on the 12<sup>th</sup> research themes set by the working group members, several research cores were formed by a scientific coordinator and one or more PhD / MA / students. Each research theme was presented in the form of an article and has been discussed during a videoconference that took place on April 2010, at the AOSR. Moreover, in September 2010, the *Productica Group* was invited to participate with 25 scientific papers in the autumn scientific session of the Academy of Romanian Scientists.

Due to the outstanding results, in 2011, The Working Group "*Productica*" has developed and becomes **Commission "PRODUCTICA – DACIA RENAULT"** (CPDR). This commission operates under the auspices of the Academy of Romanian Scientists, on Technical Sciences section, and aims to coordinate the research activities, engineering and technology transfer in different areas such as industrial engineering and management, through a network of university research centres, laboratories and research institutes, local boards of industrial centres and profile companies.

The results of the research that were obtained in 2012 by the **Commission "PRODUCTICA – DACIA RENAULT"** have materialized in 27 articles that were presented in the spring scientific session of the CPDR called "*A universe of science: past, present and future*" that took place on May 24-25, 2012 in Bucharest. These articles are included in these proceedings.

Scientific Session PRODUCTICA 2013 will address a research topic of the *Green Industry Innovation*.

*President of the Commission CPDR - Professor Miron ZAPCIU*  
*Scientific secretary of the Commission CPDR – Lecturer Dana TILINĂ*

## TABLE OF CONTENTS

Foreword .....	5
Table of contents .....	7

### PAPERS

#### Plenary

Joe ENGLISH

<i>SME University collaboration – A roadmap to success .....</i>	<i>11</i>
--	-----------

Ovidiu-Dorin ALUPEI-COJOCARIU, Alexandru MARIN

<i>Opening a market for innovative ideas stock for innovative and entrepreneurial projects .....</i>	<i>17</i>
--	-----------

Cristina MOHORA

<i>Students' multidisciplinary team – an innovate approach in education.....</i>	<i>25</i>
--	-----------

Cristina-Mihaela COSTACHE

<i>Risks identification in an automotive development project. Identifying the level of innovative systems .....</i>	<i>35</i>
---	-----------

Florea Dorel ANANIA, Radu Marian CANARACHE

<i>Milling techniques based on CAM and virtual machine simulation in advanced specialized software .....</i>	<i>43</i>
--	-----------

Constantin Adrian ALEXE

<i>Maximizing the product lifecycle management efficiency.....</i>	<i>49</i>
--	-----------

#### Section 1 “Modern manufacturing and control systems”

Andreea BRODEALĂ, Bogdan MIHĂILESCU, Alexandru VASILE, Paul SVASTA

<i>Supercapacitor-battery electric system for powering a reversible electric motor .....</i>	<i>57</i>
--	-----------

Gheorghe IACOB, Gabriela POPESCU, Mihai BUZATU, Adina UȘURELU-CRISTEA <i>The characterization and compacting of the Al/Al<sub>2</sub>O<sub>3</sub>/Gr composite powders through powder metallurgy</i> .....	67
Viorel-Cristian DINA, Sorin-Constantin BOTEZ, Constantin DUMITRAȘCU, Gabriel Marius DUMITRU <i>Thermography - a tool for assessing the properties of the layers deposited by thermal spraying</i> .....	75
Valentin CIMPOERU, Costin CEPIȘCĂ <i>Investigations on batteries used in automotive industry</i> .....	83
Sorin-Constantin BOTEZ, Viorel-Cristian DINA, Alexandru DUMITRACHE-RUJINSKI, Gabriel Marius DUMITRU <i>The nondestructive examination of the deposited layers through thermal spraying</i> .....	89
Iulian BĂȚROȘ, Elena BĂȚROȘ <i>Multi-frequency GNSS receiver for train control applications</i> .....	97
Dan Florin NICULESCU, Alexandru Daniel TUFAN, Florin IORDACHE, Miron ZAPCIU, Adrian GHIONEA, Adrian OLARU <i>Evaluation of vibratory behavior and maintenance of centrifugal pumps</i> .....	103
Valeriu MIRONESCU, Aurelian VLASE <i>Optimal preloading allowed for ball bearing</i> .....	111
Valeriu MIRONESCU, Aurelian VLASE <i>Internal clearance of the bearings</i> .....	119
Marian COCUZ, Dumitru URSULEAN, Cătălin Gabriel DUMITRAȘ <i>Study upon surface quality in hard turning</i> .....	125
Bogdan PASTORCICI <i>Study regarding centering and fixing solutions of various parts</i> .....	131
<b>Section 2 “Process design and simulation”</b>	
Corina CONSTANTIN, Sorin Mihai CROITORU, George CONSTANTIN, Eugen STRĂJESCU <i>Comparative modeling and simulation of the cutting process</i> .....	137



---

Bianca SZASZ	
<i>Numerical study of supersonic flow around a flight configuration .....</i>	<i>145</i>
Constantin STAN, Miron ZAPCIU, Dana TILINĂ	
<i>Team engineering of complex structures for mass production with target for time, quality and costs .....</i>	<i>153</i>
Mihail UNGUREANU , Miron ZAPCIU, Ana-Maria ONU	
<i>Virtual identity in educational platforms used to increase quality of human resources specialized in machines and production systems .....</i>	<i>161</i>
Claudia ȘERBOI, Ștefan VELICU, Philippe DARNIS, Raynald LAHEURTE	
<i>Experimental study for determination of the cutting moment model for milling of titanium alloy (Ti-6Al-4V).....</i>	<i>169</i>
Ciprian SANDU, Paul Dan CRISTEA	
<i>Reinforcement learning in a traffic fluidization application.....</i>	<i>175</i>
Ovidiu MUNTOIU	
<i>The optimization process using Esprit CAD/CAM software .....</i>	<i>183</i>
Savin Dorin IONESI, Cătălin DUMITRAȘ, Luminița CIOBANU	
<i>Modeling the low velocity impact of composites reinforced with 3D knitted sandwich ....</i>	<i>191</i>
Laurențiu Florin CUȚARU, Florina CHISCOP, Costel Emil COTET	
<i>Using WIP buffer to increase manufacturing systems productivity .....</i>	<i>197</i>
Dumitru URSULEAN, Marian COCUZ, Cătălin Gabriel DUMITRAȘ	
<i>A finite element analysis of the 100Cr6 alloy steel turning operation .....</i>	<i>203</i>



## **SME UNIVERSITY COLLABORATION A ROADMAP TO SUCCESS**

Joe ENGLISH<sup>1</sup>

**Keywords:** SME University SUPORT Collaboration Roadmap

### **1. Introduction**

The "European Paradox" [1] refers to the perceived failure to translate scientific advances into marketable innovations. This paradox suggests that investments in R & D at the university level alone are no panacea for curing stagnant economic growth and high levels of unemployment. Rather, mechanisms are needed to ensure that such costly investments in new knowledge actually spill over into commercialisation and business activity.

Knowledge, technology transfer, licensing and the resulting product development are complex processes. University researchers and commercial entities, especially small and medium enterprises, frequently experience barriers to their effectively engaging in, and benefitting from, such projects. Partners involved often get discouraged by the complexity of the steps involved, and the lack of understanding of each other's motivations and impulses. Barriers to co-operation need to be understood in order to be abolished.

To encourage more spin-outs and licensing arrangements it is necessary to 'plan for success'. A structured framework for developing and implementing successful collaboration projects between industry and research departments is necessary and a number of roadmaps and training materials supporting successful collaboration – highlighting the benefits, challenges and preparatory stages – have been developed by the SUPORT project team.

### **2. The SUPORT Project**

The SUPORT project examines the current knowledge and technology transfer scenarios between Small and Medium Sized Enterprises (SMEs) and Higher Education Institutes (HEIs) in six different regions of Europe (Ireland, UK, France, Germany, Poland and Spain). Based on these studies the project developed resources (roadmaps, training courses, on-line materials) to enable

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<sup>1</sup>Eng., Assistant CEO, Louth County Enterprise Board, Dundalk, Co Louth, Ireland.  
(e-mail: joe.english@lceb.ie).

SMEs to break down barriers and gain access to dormant research at HEIs. Universities are facilitated to find outlets for current and previous research, making them more responsive to current market needs.

The following outlines the SUPORT project which forms a part of the actions under the European Commission's Erasmus Lifelong Learning Programme. (Further details at [www.suport-project.eu](http://www.suport-project.eu))

### **2.1. Methodology**

The overall methodology followed was to use the resources of the project partners in each country to access directly owner/managers of SMEs, university researchers and business support intermediaries to understand the current situation regarding university and small business collaboration. These direct contacts were interviewed and questioned about their experiences with collaboration projects. The results of these interviews was then analysed, collated and used to determine the deficiencies in the collaboration area and lay the groundwork for developing training and other resources to assist HEIs and SMEs execute more successful collaborative projects.

To ascertain the current 'status of SME/HEI collaboration throughout Europe each partner was asked to contribute examples of regional good practice in technology transfer. The collected good practices were concentrated into a set of fifteen exemplary items that demonstrated the 'state of the art' [2]. These best practices were then used to guide the development of subsequent studies and questionnaires.

The next step in the process of research was a methodology report along with a review of the submitted good practice examples. The report included prepared interview guidelines for each of the three target groups (SMEs, HEIs and Business Intermediaries). The sets of questions were designed to uncover the different barriers SME and HEI face in order to cooperate. [3]

The methodology applied included face-to-face interviews and focus groups in each region. By incorporating participants with diverse backgrounds the partners were able to examine what the preferred levels of transfer might have been and if the applying barriers differed. The guided interviews determined if the participants had ever engaged in transfer activities, whether it was a good experience and the factors leading to that perception. Another area of interest was, which benefits the parties involved perceived or expected. It was important to learn in detail about the way SMEs and HEIs perceive each other. Mental barriers were to be unveiled and emphasized by the personal experience of the interview participants.

After the initial interviews had been conducted and results analysed, the second interaction-based layer of the needs analysis survey was prepared. The intention of the focus group sessions was to discuss and specify the major findings of the first set of interviews. Also, this process was an opportunity to develop a strategy on how to implement the findings and lessons learned into a Roadmap and E-Learning material that were to be created. The partners had multi-hour concentrated sessions with target group representatives.

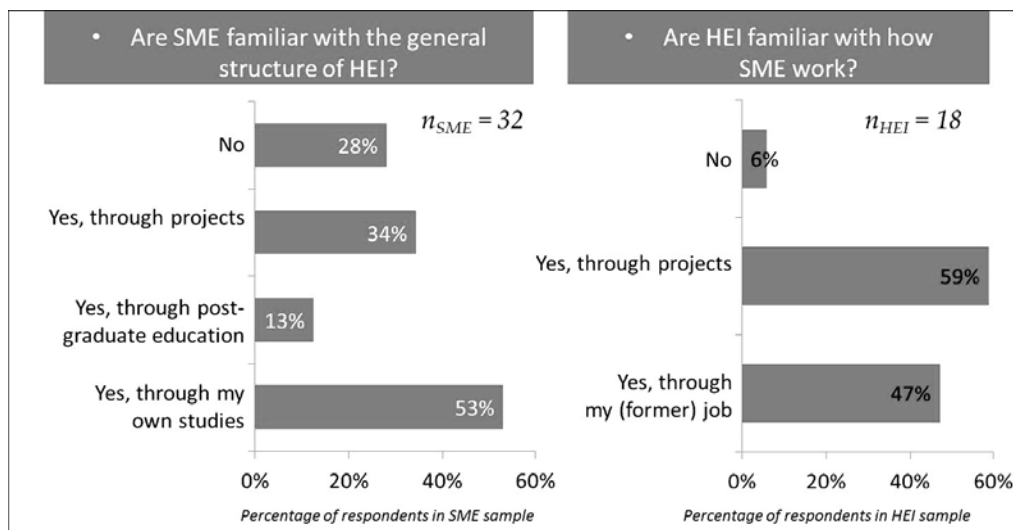
Based on the results of this research a series of collaboration roadmaps was developed. On these roadmaps a training programme for HEIs and SMEs was developed and the project partners are currently preparing on-line ‘bite sized learning’ modules for each group.

## 2.2. Summary of Results

Details of the project results can be found in the published report [4], with the major findings detailing:

- Personal experience with the different possible types of transfer activities
- Reciprocal perception of the parties in connection with transfer activity
- Personal experience of the participants in reflection to the other party
- Motivation/possible benefits of transfer for the parties involved
- Existing barriers that participants face when engaging in transfer activities
- Expectations of the participants about the transfer process and interaction

An example of the findings is shown here:



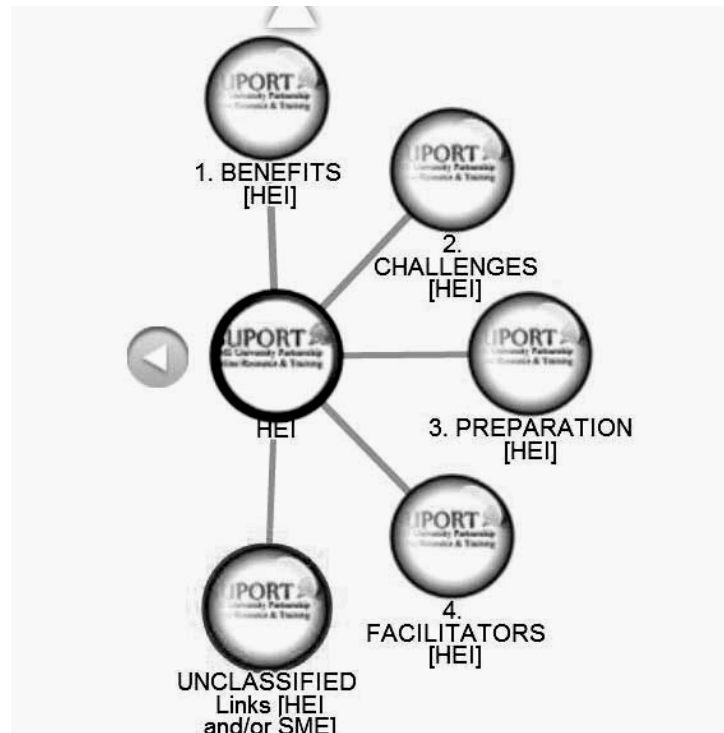
**Table 1.** SME/HEI Familiarity

The studies showed that the major areas of disconnect and concern between the SMEs and the HEIs centred on four key areas:

- The **BENEFITS** that can accrue to an organisation through collaboration projects
- The **CHALLENGES** organisations face when engaging in collaboration
- **PREPARATION** required for a collaboration project
- The role of outside **FACILITATORS** in successful collaboration projects.

Based on these results the project team constructed graphical roadmaps to guide participants in collaboration projects – one map specifically for HEI personnel and another for SMEs [5]. These roadmaps are designed as ‘aides memoire’ for researchers and owner/managers as they embark upon, and deliver collaboration projects. See Table 2, as an example.

The team are also developing ‘bite-sized’ learning modules to facilitate researchers and business people to gain deeper understanding of the collaboration process. These modules will be delivered using an innovative internet tool (see Figure 1) and will be available through the project website [www.suport-project.eu](http://www.suport-project.eu)



**Figure 1** On Line Bite Sized learning - PearlTree

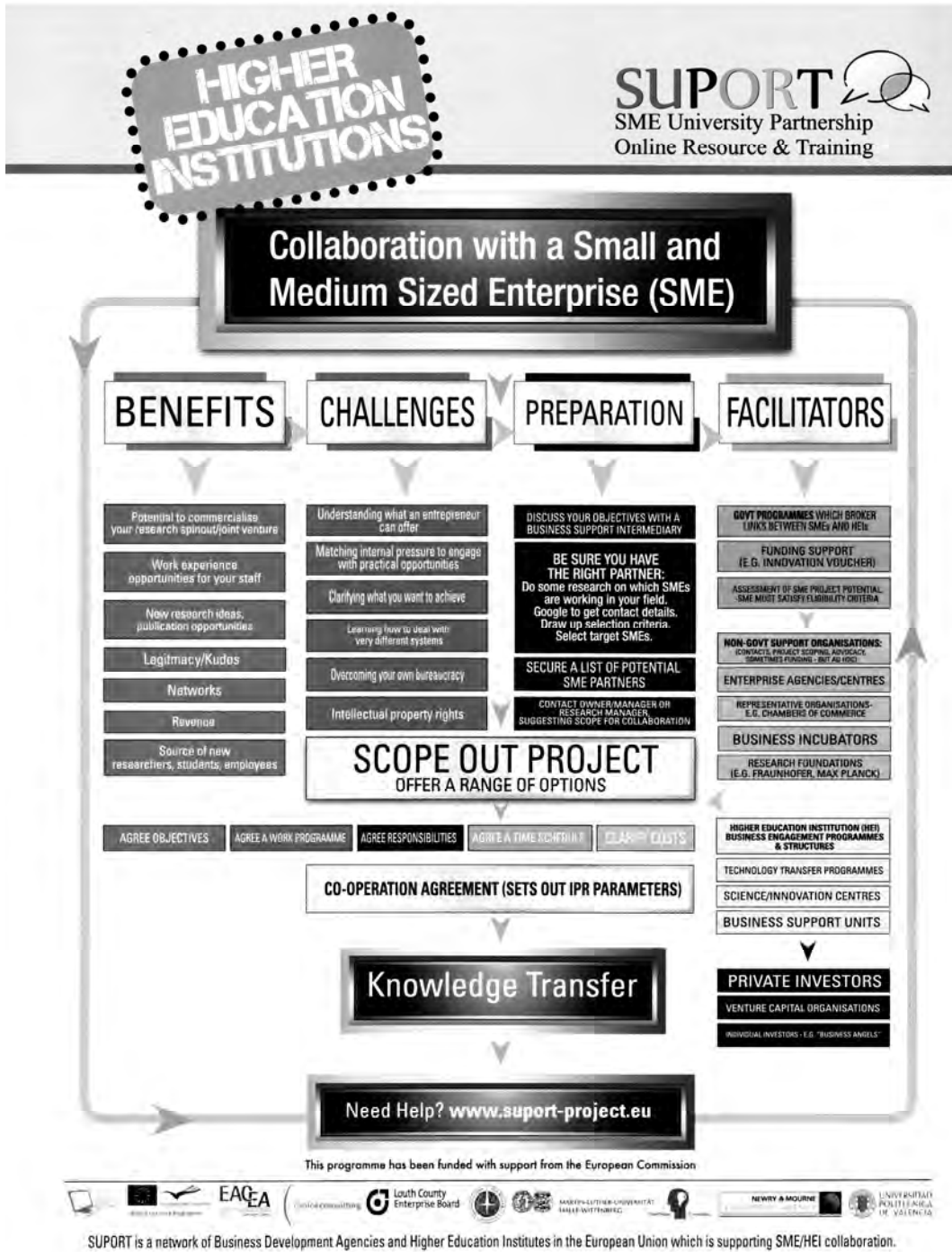


Table 2. Collaboration Roadmap – For HEI personnel.

**Conclusions**

There is good practice across Europe in collaboration projects.

SMEs and HEIs need to understand the Benefits and Challenges in working together.

SMEs and HEIs need to structure their Preparation for collaboration and need to investigate the use of Business Intermediaries to support their work.

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**Notations and/or Abbreviations**

SME – Small medium Sized Enterprise

HEI – Higher Education Institute

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