Project:	I3E-Promoting Innovation in the Industrial Informatics and Embedded Systems Sectors through Networking
Workpackage 5:	Networking
Activity 5.2.:	I3E Workshops
Responsible partner:	JSI

Report on the 1st I3E Workshop - Ljubljana 7-Oct-2010

Ljubljana, 26. October 2010

1. INTRODUCTION

The 1st workshop on presentation of the current results of the project "I3E-Promoting Innovation in the Industrial Informatics and Embedded Systems Sectors through Networking" was organised as a Session 2 of the 3rd international "Technology Transfer Conference" held on 7th and 8th October at Jozef Stefan Institute, Ljubljana, Slovenia.

The conference is traditionally organized by two I3E partners JSI and UOM (Jožef Stefan Institute and University of Maribor) in cooperation with the National Institute of Chemistry, National Institute of Biology, University of Nova Gorica and University of Ljubljana. The conference targets researchers of public research organizations (PROs) in Europe with the aim of increasing awareness and knowledge about technology transfer processes and their necessity. It is also targeted at enterprises, seeking collaboration with public research organizations. AS the scope and aims of the conference fit well into the scope of the I3E project the organisers of the 1st I3E workshop decided to perform the workshop as a stand alone session within the conference.

At the 1st SEE-I3E Workshop, particular attention was given to the presentation of current results of WP3P: Transnational Strategic Research Agenda Formulation and WP4: Methodology Guideline for Innovation Elaboration.

2. DATE & PLACE

7th October 2010 at Jozef Stefan Institute, Ljubljana, Slovenia

3. PARTICIPANTS

There were 102 participants of the 1st I3E Workshop, about 2/3 from Slovenia ant the rest from abroad, mostly from the neighbouring countries. The workshop participants can be divided into three major groups:

- the participants from public research and academia institutions dealing with technology transfer of their research results,
- the stakeholders from different public agencies, technology parks, centres of excellence, technology centres, consultants, capital providers(venture capital, agencies, angels) and
- the audience from the industry.

4. I3E WORKSHOP AGENDA

Introductory lectures

1. **Innovation and product development:** Iva B. Vukelja, MBA, EMC Boston, USA (Session Leader)

2. **EIF's role in the Tech Transfer market:** Yannis Tsakiris, European Investment Fund
3. **Role of a Development Bank in Commercializing IP:** Nazmin Alani, Development Bank, Canada
4. **Development and technology transfer - experience of Trimo:** Danijel Zupančič, Deputy General Manager for Technical Sector, Trimo d.o.o.

Presentation of the current results of SEE project "I3E-Promoting Innovation in the Industrial Informatics and Embedded Systems Sectors through Networking"
Matjaž Colnarič-UOM, Vladimir Jovan-JSI, (I3E Workshop Leaders)

5. **Presentation of scope and aims of I3E project**: Vladimir Jovan, Jožef Stefan Institute, Matjaž Colnarič, University of Maribor, Slovenia
6. **Presentation of I3E Strategic Research Agenda:** Dejan Gradišar, Jožef Stefan Institute, Slovenia
7. **Short presentation of the methodology and process for selection and ranking of "good practice" projects**, Vladimir Jovan, Jožef Stefan Institute, Slovenia
   Presentation of a "good practice" project: System for automatic end-quality assessment of vacuum cleaner motors, Andrej Biček, Domel d.d., Slovenia
8. **Presentation of a "good practice" project**: The new generation of HVAC valves for Danfoss, Damir Vrančić, Jožef Stefan Institute, Slovenia
9. **Presentation of a "good practice" project:** PLC Batch: a solution for batch process control, Igor Steiner, Inea d.o.o., Slovenia
10. **Discussion & Conclusions**

5. REPORT

The aim of the 1st I3E Workshop was a presentation of the current results of the international project "I3E-Promoting Innovation in the Industrial Informatics and Embedded Systems Sectors through Networking". I3E project is funded under the Interreg IV South-East Europe Initiative with an aim to help towards the transformation of the South-East Europe (SEE) area into a knowledge-based innovation-driven economy. The project places emphasis on two leading edge technology sectors that may create a competitive advantage for the area, namely industrial informatics and embedded systems. The main technical deliverables include a Strategic Research Agenda in the aforementioned sectors making possible the alignment of research efforts in the area and a Methodology Guideline for Innovation stemming from best practices relevant to the transformation of research into innovation.

After four introductory lectures and the presentation of general scope and aims of I3E project the main ongoing activities and results of the two project's work-packages had been presented. The first presentation was dealing with the current results on Strategic Research Agenda (SRA) definition for industrial informatics and embedded systems sectors. A transnational SRA is the major output of the I3E project, which is dedicated to improvement of innovation transfer between researchers and industry relevant to the industrial informatics and embedded systems sector in the SEE area. The purpose of the SRA is to show the directions in which the industrial informatics and embedded systems technologies and their related markets are moving and presents potential technologies and products that will be relevant in the foreseen future. It will help developers and researchers to focus their research plans on relevant topics as well as to avoid barriers in transforming their ideas and research

results into innovations. After the presentation of the strength and potentials of the SEE region, the identified relevant research domains for SEE region were presented: Flexible Manufacturing, Green Energy, Health support, monitoring, diagnostics and living assistance and Public infrastructures. Each of relevant research domains has a number of application areas which were also briefly presented.

The next presentation was a description of the selection of "best practice" projects on the industrial informatics and embedded systems sectors chosen from the set of in I3E collected 120 good practice projects. The methodology, allocation and the process for final ranking of the list of good practice projects were briefly described.

The I3E workshop concluded by three presentations of Slovenian good practice projects which illustrated successful transformation of research to innovations in industrial practice.

The first presentation was the description of a diagnostic system for end-quality assessment of vacuum cleaner motors that relies on innovative mechatronic solutions, which combine custom designed handling of units under test, vibro-acoustic and electrical measurements as well as advanced signal processing. Processing of the measured signals results in the so called features which serve to detect and localize the faults either in electrical or mechanical part of the motor. Thus the accurate, reliable and sensitive diagnostic procedures allow for entirely fault-free final products. The implementation part of the project was funded directly by the customer Domel d.d., the biggest European producer of vacuum cleaner motors. However, the necessary applied research activities for the new control system were co-funded by the Slovenian Ministry of Science and Technology via research projects of the Department of Systems and Control. The system has been by now installed on three technological lines at Domel d.d. and in one company owned by Domel d.d. in China. The project has been assigned as the "good practice" mainly due to the following reasons. Firstly, the innovative ideas were implemented during every stage of its life-cycle, resulting in an adaptable and high precision measuring system. Secondly, the interdisciplinary approach allows the system to be easily adopted in various types of electric motors. The transformation of the research results into innovative final quality control system is proven to be the success as by now more that 10 million motors have been on-line tested of these systems and by the report of Domel's representatives the number of delivered motors having the parameters out of prescribed values has drastically lowered since the implementation of the final control systems on Domel's production lines.

The next "good practice" project was a project of development of a new generation of motor driven valves used for HVAC applications. The project was initiated by the customer, Danfoss Trata, and carried out by Jozef Stefan Institute, Department of Systems and Control. The implementation part of the project was funded by the customer, while research activities were co-funded by the Slovenian Ministry of Science and Technology. In comparison to the existing solution, there were four key objectives and expected improvements from designing a new generation electronic controller for motor driven valves. Firstly, the new system should utilize an efficient, versatile and inexpensive type of motor. Secondly, the valve positioning should be as precise as possible. Thirdly, the switch-off force on the valve should be detected by measuring the motor current instead of relying on mechanical components. Finally, the new controller should enable the implementation of advanced control algorithms. Overall, the designed system meets all the requirements and has successfully passed all customer evaluation and qualification tests. The development and implementation of the described product was classified as a "good practice" mainly because of the following reasons. Firstly,

new technology and improved materials are used for the new generation of valves. Additionally, innovative ideas were implemented during the development of advanced control algorithms. Overall, the main benefits of the new product are enhanced reliability and energy efficiency.

The third presented “good practice” was a SW solution for batch process control named PLCBatch. The purpose of the development of the PLCbatch tool is to simplify the batch process control systems without loss of expressive power and to move the execution of the recipes from the PC to the more reliable programmable logic controllers (PLC) platform. The properties of the tool are two-level recipes, general unit-class based recipes, concurrent execution of more recipes and execution of an extended and flexible phase state machine. Innovative elements are the tabular presentation of the SFC chart, allowing the execution of recipes with parallel phases on the PLC platform, and the concept of the extended state machine phase behaviour model. The effect of the development is the availability of a simple yet powerful tool for batch process control on PLC platform, which enables a better mastering of batch control systems development and increases the reliability of these systems. This product has been qualified in “good practice” because of its simple concept, reliability and supportability of widely accepted S88.01 standard.. The programming tool PLCBatch is sufficiently powerful for most cases of batch process control.

6. RELATED DOCUMENTATION

Technology Transfer Conference homepage: http://tehnologije.ijs.si/technology-transfer-conference-2010/index.html

Technology Transfer Conference programme: http://tehnologije.ijs.si/technology-transfer-conference-2010/program.html

Video recorded presentations of the Technology Transfer Conference are accessible on: http://videolectures.net/ttconference2010_ljubljana

Video recorded presentations of the 1st I3E Workshop are accessible on: http://videolectures.net/ttconference2010_i3eworkshop