I-RAMP³

Intelligent Network Devices for fast Ramp-up

NEWSLETTER

No.2

Content

Editorial

Dear Reader,

Networking is one of the today's major success factors when doing business and research. Within **I-RAMP³**, 12 industrial and scientific partners coming from 6 European countries started a cooperation in order to tackle the challenges of future manufacturing, especially in the field of fast ramp-up and commissioning of production lines. The more intensive the networking activities are, that better the **I-RAMP³** consortium is able to benefit of it. In the second issue of the **I-RAMP³** newsletter we therefore focus on the illustration of the different networking activities of the project consortium - in very different terms. The reader is informed on the TRANSPARENCY project, which targets on the development of a collaborative design environment for machine tools. The **I-RAMP³** consortium already established close collaboration with the TRANSPARENCY partners. Also this issue contains a report on the **I-RAMP³** presentation at a networking workshop in Brussels aiming at clustering of project activities and creating synergies among related projects. Furthermore, upcoming fairs and conferences, in which **I-RAMP³** will be presented, are outlined. It is our pleasure to present to our readers an interview with a representative of one of the **I-RAMP³** partners, the Faculty of Engineering of the University of Porto. Learn about sensor networks and communication, and also how networking and cooperation impacts one of **II-RAMP³** 's university partners.
Hooking up once more on the networking activities, this newsletter also reports on the **I-RAMP³** 6 month meeting which has been held in Porto, Portugal. Even after a project run time as short as 6 months, the partners had the opportunity to gaze an impressive bunch of results, which have already been obtained within this time frame.

Happy reading! **I-RAMP³** consortium

I-RAMP³ ID

Title

Intelligent Reconfigurable Machines for Smart Plug&Produce Production

Programme

Seventh Framework Programme, Collaborative Project, Theme FoF.NMP.2012-3 – Factories of the Future in the Nanosciences and Nanotechnologies, Materials and New Production Technologies (NMP) Programme

Project duration

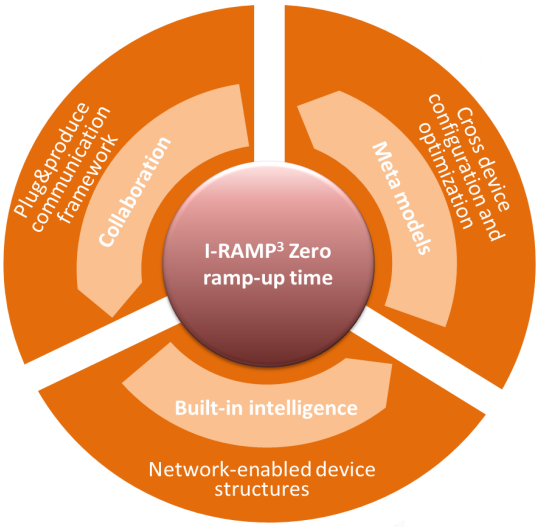
01/10/2012-30/09/2015

Main objective

I-RAMP³ aims at enabling the European manufacturing industry towards smart manufacturing systems in conventional production. This goal will be reached by a novel concept for fast, optimized ramp-up and operation of production lines. Therefore **I-RAMP³** proposes the transformation of conventional production equipment into **Network-enabled Devices (NETDEVs)**.

Partner countries

Germany, Hungary, Portugal, France, Netherlands and Greece



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Workshop on Impact of the Factories of the Future Public-private partnership in Brussels on 11th -12th March 2013

The European Commission with the support of the European Factories of the Future Research Association (EFFRA) organized the 3rd Workshop on Impact of the Factories of the Future (FoF) Public-private partnership (PPP), which took place in Brussels on 11th-12th March 2013. The purpose of the workshop was to enhance the cooperation links and clustering within the PPP.
Furthermore, the workshop aimed at assessing the implementation of the initiative during the past four years. In this regard, the covered topics can be summarized under 3 main keywords:

"Impact" → What is/can become the economic benefit of the funded projects on EU economy and industry?
"Synergies" → What and where is there added value through joint work?
"Learning" → Which are the lessons drawn from 4 years of implementation of PPP?

I-RAMP³ together with two other projects (SkillPro and Prime) were all funded under the FoF 2012 call topic: "Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems" and invited to participate in this 2-days workshop.

The 3 parallel sessions of Day 1 ("Sustainable Manufacturing", "ICT for Manufacturing" and High-Performance Manufacturing") addressed crosslinking efforts in the areas of innovation and exploitation in the running projects, as well as the added value of cluster activities. On Day 2, success stories were presented and two panel discussions were held. Last but not least, there was room for networking and personal contact between the representatives during these two days, which was appreciated by all participants.

I-RAMP³ team led the elaboration of a short profile of the 3 projects' commonalities and potential areas for future joint activities in the very spirit of the commission's efforts to push clustering and exploit synergies. Jointly, the representatives of **I-RAMP³** (SEZ), SkillPro (Karlsruhe Institute of Technology KIT) and Prime (University of Nottingham) attended the workshop, where SEZ had the chance to present the common view to the audience during the *High-Performance Manufacturing* session. In particular, **I-RAMP³**, SkillPro and Prime agreed on planning common dissemination and exploitation activities such as mutual publicity, joint events or sharing of best practices. Also technical cross-cutting issues were identified and the feasibility of technical sharing decision criteria will be jointly evaluated as the projects evolve.

In conclusion, the workshop was a good opportunity to learn more about thematically related projects in the area of manufacturing. For **I-RAMP³**, SkillPro and Prime the preparation of this event was a launch pad for a hopefully fruitful and close collaboration in future months. Last but not least, the chance for networking and personal contact between the representatives was appreciated by the participants.
In this newsletter, **I-RAMP³** takes one of the first steps in the common activities of this young project cluster by introducing **I-RAMP³**'s fellow projects to our readers. Find out more on page 6.

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I-RAMP³ partner meeting in Porto, Portugal 6th – 7th May 2013

At the beginning of May, the entire **I-RAMP³** consortium came together for two days to hold the first semi-annual **I-RAMP³** partner meeting (M6) in Porto, Portugal. We take the opportunity to once again thank our partner FEUP (the Faculty of Engineering at Porto University) for organizing the meeting in the beautiful city of Porto.

Seven months after the **I-RAMP³** kick-off meeting in October 2012 in Hamburg some important work has already been undertaken by the partners at this early stage of the project. The results were presented by the consortium in various working sessions during the 2-days meeting.

Day 1 was organized as an internal, interactive meeting, taking advantage of the get together of all partners for lively discussions, exchange, workshops and joined planning of future activities. So, for example the six industrial partners (HWH, AWL, IEF, INOS, Technax, and CMF) presented their scenario suggestions for **I-RAMP³** set-up and integration in the different areas of application. Moreover, three workshop sessions for the work packages four, five, and six were held with the objective to identify and clarify current open issues regarding the implementation of the proposed industrial scenarios.
Last but not least, the day was round off with an interactive session on **I-RAMP³** dissemination roadmap. The important role of spreading information about **I-RAMP³** and the project's achievements was emphasized and an action plan for future dissemination activities was developed with the input of all partners.

The second day was regarded as the more official part of the meeting, where **I-RAMP³**'s Project Technical Adviser of the European Commission (PTA) Mr. Dimitris Karadimas was also present. During the course of the second day, partners gave an overview on the project progress in the respective work packages outlining performed activities, planned vs. achieved results and the implementation plan for the upcoming six months period.
The general feedback of the PTA was very positive. Mr Karadimas emphasized the sound progress that the **I-RAMP³** consortium has already made in such a short period.

Freshly motivated and inspired for the upcoming project period, **I-RAMP³** partners left Porto and are looking forward to discussing the newest developments during the 12 months partner meeting in October 2013, which will be organized by partner INOS HELLAS in Athens, Greece.

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Interview with Gil Gonçalves, Universidade do Porto

Which is the main area of activities of your department?

Instituto de Sistemas e Robótica - Porto (IRSP) is a research unit hosted at FEUP - Faculdade de Engenharia da Universidade do Porto to carry out R&D activities in advanced systems and control concepts, tools and technologies for a wide range of areas encompassing robotics, automation, networked vehicles and systems, and, in particular, new emerging network centric systems with high societal impact.

The mission of this group is to contribute to the advancement of the state-of-the-art in concepts, methods and tools for network centric control systems, with emphasis on two large classes of applications: networked vehicles and devices, and networked enterprises.

How did your group become involved in the I-RAMP³ project?

We have been involved in several European research projects in this area – examples are VIDOP and XPRESS – where we worked with some of the **I-RAMP³** partners. We were involved in the preparation of the proposal from the start, actively involved in the definition and writing of the proposal.

How important/strategic are industrial collaborations for your department? Is there a strong relationship with local industries as well, which – I imagine – could be beneficial for both sites?

Industrial collaborations are strategic to guide research and define new challenges; we have been working with several industrial partners in the area of wireless sensor networks and wireless sensing with some interesting results for both sides. An example is our collaboration with FreedomGrow, also partner in **I-RAMP³**, with whom we already have collaborated outside this project, for example with students doing their thesis in the company.

Your role in I-RAMP³ is to provide scientific input for sensor development and for complex data analysis. Could you explain briefly what this means concretely?

Short profile Gil Gonçalves

Gil Gonçalves received the Engineering Degree in 1993 and the M. Sc. degree in Electrical and Computer Engineering in 1996, both from Porto University. In 1994 he joined the Instituto de Sistemas e Robótica - Porto (IRSP) as researcher and is lecturer at the Engineering Informatics Department, Faculdade de Engenharia da Universidade do Porto, since 1998.

Since 2011 he is also Chief Scientific Officer at INOVAMAIS, a Portuguese SME, where he is responsible for the technical and scientific coordination of the overall group and for identifying technologies and know-how resulting from research projects with high spin-off potential.

Gil backs his experience in collaborative projects through participation in more than 15 R&D Portuguese and International projects, in which he is responsible for the Systems Engineering efforts.

Industrial processes are complex, with a large number of variables and control parameters. And sometimes these variables cannot be measured directly and have to be estimated from other measurements. This means that in a single process step you may need many sensors and many actuators. This is also the case in the **I-RAMP³** approach, where the interoperability and communication of various devices is a core element.

In **I-RAMP³** we are working on bridging this gap between the real time domain on the one hand, where huge amounts of data are produced by many different sensors in different parts of the industrial process, and the business domain on the other hand, where information is needed to take the right decisions at the right time. More concretely this means that a huge amount of real time data needs to be processed, analysed and, with the help of process knowledge, transformed into information so that it is useful and meaningful in the all-day business systems.

Follow the interview on the next page!

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Interview with Gil Gonçalves, Universidade do Porto

As a research institute and in contrast to industrial project partners you don't have direct commercial customers for a product that could potentially emerge from the project. So, who is your main target group to address in order to make I-RAMP³ have an effect even beyond the project run time?

Actually, there are a couple of potential customers, although the focus is not directly commercial.

First of all, the research community: the wireless sensor community has been working in the development and deployment of applications for monitoring and sensing all sorts of activities. This has been the focus of research for several years but still some challenges persist which we will address in **I-RAMP³** (e.g. sensor data to business information). And for sure that we will contribute to finding new challenges that will keep this community working.

Students are a second target group: challenges and results brought by our work in previous projects were already used in courses and in theses.

And last but not least, industry: although we do not create direct solutions for industry, we hope to contribute to promoting the wide-spread and market take-up of wireless sensor networks and machine-to-machine applications in industry through, for instance, new case studies and concepts. Also, the knowledge on the system development itself that we intend to acquire in the project may be exploited as a marketable output.

You already indicated that point: A particular opportunity of FEUP as University/Research institute is the direct access you have to students, who are tomorrow's engineers. Is there room to include the approach of I-RAMP³, basically an example of highly topical applied research, in your lectures or seminars? And if, to which extend do you believe would this be feasible and meaningful?

One of the reasons of involvement of universities in research projects is the possibility to develop and demonstrate new concepts and cases that later can be used as input for course materials.

The case of FEUP is no exception. We thrive to use research projects as much as possible in the classroom, not only to show our students the potential application of all those "strange" and sometimes difficult to grasp concepts, but also to involve them in some of the research work.

I-RAMP³, as a whole or specific areas of research of the project, could be the subject of lectures and seminars in courses such as "Project Management Laboratory", "System Analysis and Project Management", "Discrete Event Systems" and "Programming". Moreover, master and PhD thesis can also be developed around the project research topics.

Actually, this possibility has already been discussed with one of the industrial partners, who is interested to host students during their master thesis work.

Networking is a major issue in I-RAMP³. In technical terms several devices shall be able communicate smoothly across different levels. But another success factor is also the internal communication within such an interdisciplinary consortium. What is your personal perception of this aspect of networking at this rather early phase of the project?

The fact that many of the partners have previously worked together makes this internal communication, this interoperability between organisations, very easy. Usually, the get-to-know each other is something that can take a few months, but in the case of the **I-RAMP³** consortium this was happening even before the first consortium meeting. We had a considerably decreased ramp-up time, in **I-RAMP³** language ;-). Seriously, the relationship among the partners is very close and the communication really effective – an advantage we should play on.

Thank you very much, Gil!

The interview was led by Patricia Wolny
from partner Steinbeis-Europa-Zentrum (SEZ).
wolny@steinbeis-europa.de

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Related projects

TRANSPARENCY - Adaptive Business Collaboration by progressive knowledge sharing and engineering

The TRANSPARENCY consortium consists of 11 industrial and scientific partners from six European countries (Germany, France, Hungary, Italy, Spain, U.K.) and is coordinated by Fraunhofer IPA. A number of TRANSPARENCY partners are also involved in **I-RAMP³** underscoring the relationship between these two projects.

TRANSPARENCY aims at a vertical integration of management, design and operation of machine tools to provide long-ranging transparency throughout the whole lifetime of the machine tool. This will enable European machine tool builders to establish a knowledge-based collaboration with end users and component suppliers providing optimum knowledge sharing ranging from requirement engineering, design, manufacturing, operation and upgrading. Sustainable and targeted design, development and re-use of complex, customer tailored and improved machine tools are facilitated if the various stakeholders in the supply chain, also acting in different moments of the life cycle, can easily access and exchange the pertinent knowledge domains. Ultimately, involved actors are expected gain competitive advantages in their sector.

A core component of TRANSPARENCY is the development of a *Distributed* ***Collaborative Co-Design Environment (CDE)***, which is based on a semantic middleware. It provides a coherent and well structured web-based user interface for all different stakeholders and, more importantly, it ties together the main information items of the project.

Special attention is paid to the conceptual system design stage, *the feed-back of knowledge* from the *operational life-cycle stages* and extension of the core CDE by *advanced assessment and prediction tools*. Life-cycle performance, knowledge about produced products, and experiences of human personnel are constantly incorporated into the set of knowledge.

To date, the technical developments of the projects have been successfully accomplished. These developments include a transparent Human Machine Interfaces (HMI), the core CDE module and extensions to it by a number of early design estimation and simulation tools, such as tools for Life Cycle Cost (LCC), predictive Overall Equipment Effectiveness (pOEE), Life Cycle Analysis (LCA), static stiffness and damping and material removal rate. The actual project activities on the technological side concentrate on the demonstration (WP7) of the overall integration of those tools and models into the CDE. Furthermore, horizontal activities cover all intellectual property, knowledge management and exploitation aspects, since the transparent co-design knowledge base bears a specific complexity in terms of access rights, authorization, security and ownership interests.

Check out the website:

www.transparency-project.eu

TRANSPARENCY
collaborative machine-tool design and operation

Two other I-RAMP³ related projects are PRIME (coordinated by University of Nottingham) and SkillPro (coordinated by the Karlsruhe Insitute of Technology). These two are funded under the same call as **I-RAMP³** , and, following up the European initiative will coordinate their efforts in future activites (see also article on page 2)

♦ **PRIME**: *project website coming soon.*
PRIME focusses on a multi-agent control system and on information rich development tools for manufacturig sytems

♦ **SkillPro**: **http://www.skillpro-project.eu/**
SkillPro focus is on combining Asset Management Systems (AMS), Manufacturing Execution Systems (MES) and Production Components/Controllers via Skill-Descriptions and Skillbased Execution concepts.

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Passed events

Partner Fraunhofer IPA actively promoted the institute's participation in the **I-RAMP³** project during the Hannover Fair in April 2013.

Partner IEF Werner also attended the 2013 Hannover Fair with a company booth and promotional material on **I-RAMP³**.

CeBit March 2013: **Partner Freedom Grow** attended the CeBit fair, where flyers of the **I-RAMP³** project were distributed, too.

Future events

14th CIRP Conference on Modelling of Machining Operations Conference , 13.-14.06.2013, Torino, Italy

The 14th CMMO Conference has the aim to gather, in a city of long-lasting manufacturing tradition, experts from Academia and Industry to share their experience with their results, to stimulate discussion and to foster the knowledge in the field.

Further info: http://www.cirp-cmmo2013.com/

MESIC 2013 - Manufacturing Engineering Society International Conference, 6. - 28.06.2013, Zaragoza, Spain

The 5th edition of the congress will be held in the Paraninfo Building at the University of Zaragoza, Spain and its main objective is to offer a meeting point for professionals, researchers and educators from industry, research centers and academia to present and discuss recent advances in the field of Manufacturing Engineering.

Further info: http://mesic2013.unizar.es/index.php

FAIM 2013 Conference , The International Conference Flexible Automation and Intelligent Manufacturing, 26.- 28.06.2013, Porto, Portugal

FAIM is the leading international forum to disseminate, to all branches of automation and manufacturing, information on the most recent and relevant research, theories and practices.

The focus of the FAIM'13 conference is to discuss the theme: The Challenge of Sustaining Global Competitive Manufacturing Systems.

Further info: www.faim2013.org/

Seventh International Precision Assembly Seminar (IPAS) 2014, 16.-19.02.2014

This is a major event for international scholars in the areas of Precision Assembly held in Chamonix, France.
The first call for papers was already published.

Further info: http://ipas2014.org/

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