

*Covers the Second Period of the EPES Project
(September 2012 – September 2013)*

Message from Coordinator

New products often benefit from cutting edge technologies, but the highest impact lies with upgrading existing products in operation, towards the “long life eco-products” concept. Continuous upgrading of industrial operating products has a very significant impact on environmental aspects like energy consumption and wastage.

The EPES Project (“Eco-Process Engineering System For Composition of Services to Optimize Product Life-cycle”) aims at supporting manufacturing companies to enter a continuous process of upgrading their products along their life-cycle within the frame of the Virtual Factory and Product Service System concept, through a configurable and adaptable set of optimization services. The new eco-engineering system developed by EPES goes far beyond traditional

maintenance systems, incorporating sustainability knowledge in the maintenance and upgrade activities along the life-cycle of the product.

Actors in three Business Cases (windmill engineering, power cables provider, aircraft manufacturing) represent the proving grounds for the new EPES solution. But the work within the project will be generic and widely applicable to many European industrial actors.

In this edition of the EPES project newsletter, we highlight some of the results obtained and challenges faced by the consortium. Furthermore, the activities towards gathering a set of “lessons learned” are described.

We hope this newsletter will raise interest in the EPES work and results, and we welcome suggestions for cooperation opportunities with projects tackling similar issues.

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Results & Objectives

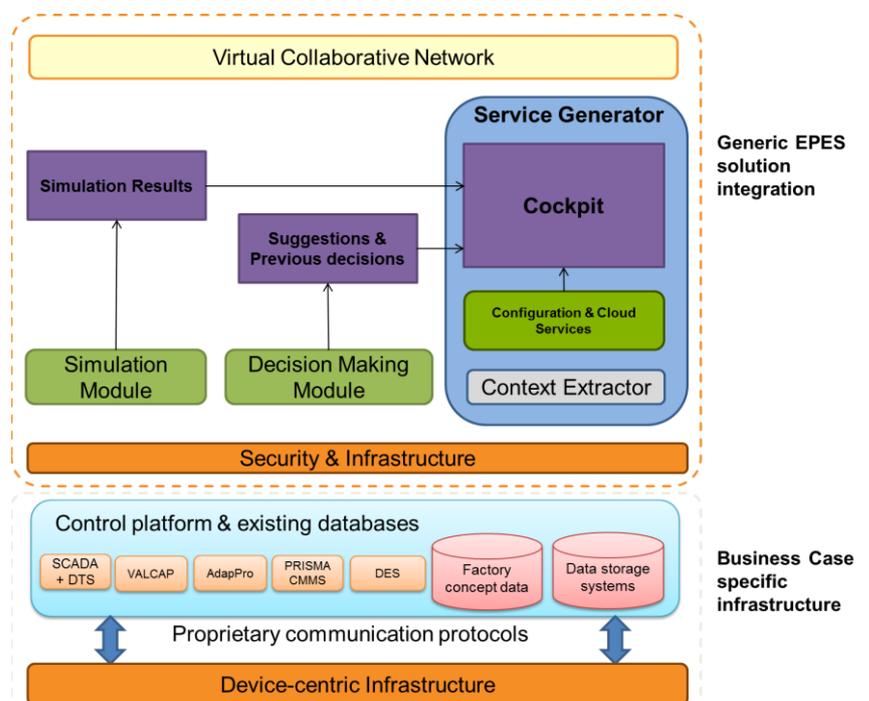
The EPES project is nearing a very important milestone in month 24 (August 2013). At the moment of writing this newsletter, the development of the Full Prototype of the eco-engineering system is nearly finished. The next activities will be the iterative refinement of the prototype, together with its testing and assessment.

The EPES solution is split into a Business Case specific part, which deals with the specific technologies of the respective industrial partners, and a generic part. It supports the concept of continuous improvement of products in operation with a comprehensive platform in which the generic four main modules contribute as follows:

- **Virtual Collaborative Network:** allows the tracking of business optimization opportunities through a networked infrastructure. It also provides collaborative web content and document content management capabilities.
- **Service Generator:** allows configuring optimization services specific to different products and operating conditions; it also provides a GUI cockpit to access the Simulation and Decision Making Modules, and context aware functionalities for improving the configuration of a service with help of its context.
- **Decision Making Module:** allows decision-makers to optimize and to analyze business processes through dedicated tools.
- **Simulation Module:** enables the execution of external simulations and provision of parameters for calculation of key performance indicators.

The final version of the EPES methodology will be finalized in month 24. It provides a comprehensive approach on how to use the EPES solution, and, as such, it will include aspects like business process modelling, collecting sustainability intelligence sources, as well as classifying and structuring the gathered information. The overall way of working and scope of the modules' functionalities are also included in the methodology.

After the successful integration of the Full Prototype, the EPES Consortium will focus their efforts on performing testing and assessment of the prototype, as well as on detailing the BC-specific infrastructure which will support the showcasing of the EPES Demonstrators at the end of the project.



High-level Architecture of the EPES Solution

Collecting Lessons Learned

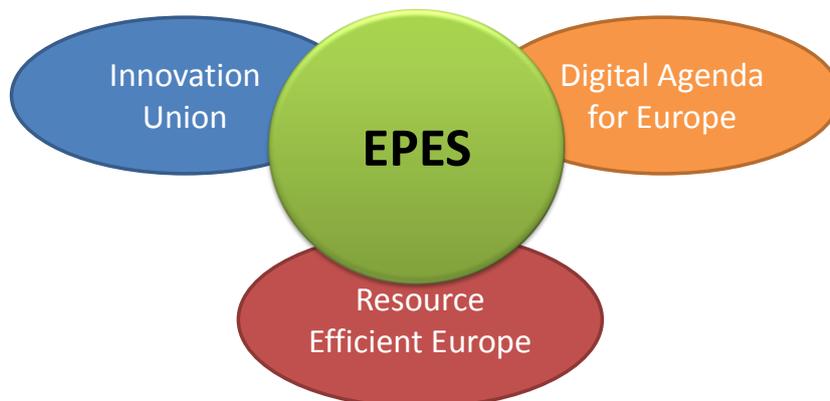
To support a more efficient transfer of project results and lessons learned to policy makers, the EPES Consortium has analyzed three key Initiatives of the EU Commission within the frame of the “Europe 2020” strategy:

- **“Innovation Union” Initiative** (aims to achieve a strategic approach to innovation, being closely aligned with and mutually reinforcing EU and national/regional policies)
- **“Digital Agenda for Europe” Initiative** (aims to deliver “sustainable economic and social benefits from a digital single market based on fast and ultra-fast internet and interoperable applications”)
- **“Resource Efficient Europe” Initiative** (supports the shift towards a resource-efficient, low-carbon economy to achieve sustainable growth)

As a result of this analysis, challenges within actionable areas relevant for the EPES project have been identified, and a broad strategy was devised for tackling them. The most relevant actions in the strategy are briefly presented here, together with their goals for the improved transfer of knowledge gained in the course of the project.

INTEROPERABILITY – EPES GOAL: recommend the most appropriate standards and tools to policy makers.

1. **Identify open standards and platforms in use**, taking into account how industry specific they are.
2. **Investigate tools used by industrial Consortium users** with a special focus on their licensing model and generic functionalities.



FRAGMENTATION – EPES GOAL: support the building of modular systems, which can be used as generic components, instead of developing them from scratch for new industrial settings.

1. **Specify EPES modules as components**, thinking of their usage in the industrial business cases and of future possible applications, as well as focusing on their generic and specific I/O.
2. **Apply principles of modularity and loose coupling while developing EPES modules**, paying special attention to “bad” types of coupling.
3. **The possibility of releasing a common, generic library** containing EPES components is investigated.

SOCIETAL CHALLENGES – EPES GOAL: extract generic sustainability metrics.

1. **Identify specific sustainability metrics** and Key Performance Indicators, both specific to the EPES business cases, from which generic metrics will be abstracted.

Cluster Activities

The EPES project is part of the "Future Internet Enterprise Systems" Cluster (**FInES**). Future Internet Enterprise Systems has emerged as a field of activity that aims at enabling enterprises, including Small and Medium Enterprises, by means of Information and Communications Technology, to exploit the full potential of the Future Internet.

Given the focus of EPES, the cluster's Task Forces "**Manufacture and Industry**" and "**Collaborative Networks**" are of special relevance to the project. More details about the FInES Cluster are available at their webpage <http://www.fines->



EPES Coordinator attended the 3rd Workshop on Impact of the Factories of the Future PPP, held in Brussels on 11-12 March 2013 and organized by the European Commission with the support of the European Factories of the Future Research Association (EFFRA). The purpose of the workshop was to enhance the cooperation links and clustering within the PPP and to facilitate the assessment of its implementation. The parallel sessions of Day 1 addressed innovation and exploitation issues 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, focused on the benefits of clustering to increase the impact, and on lessons learnt from the 4 years of implementation of the PPP initiative.

EPES Coordinator attended the joint dissemination conference imagine_FOF2020 "Factories of the Future towards HORIZON 2020", held in Geneva on 11-14 June 2013. This event was hosted by the 12th international trade show EPHJ-EPMT-SMT and was organized by the FP7-FoF project "FOFdation" consortium. The event was organised as a Cross-Dissemination event of currently on-going projects that firstly addresses the European companies who are interested in research in the domain of ICT for manufacturing under the aegis of the FP7 PPP FoF programme.

With the recent publication of the FInES Cluster position paper "**Embarking on New Orientations Towards Horizon 2020**", the EPES Consortium has re-aligned its goals with those of the Cluster. The aims of the project situate it ideally for supporting the "asset utilization" pillar of the Internet of Everything Value at Stake, as defined in the Cluster position paper. As such, EPES activities can contribute to the following recommendations:

- **Collaborative Awareness** theme
 - Promote enriched content & knowledge management platform
- **Digital Enterprise** theme
 - Develop novel sustainable / adaptive business framework, constantly aligned with the reality along the to-be born and innovative enterprise life cycle
 - Fortify the perspectives of Business Innovation, through the capability to simulate enterprise decisions & novel business models towards innovation and success

To ensure the effectiveness of EPES' contributions to these recommendations, the EPES Consortium will intensify its dissemination activities in the third period of the project. Exploitation activities will also be aligned with Horizon 2020 goals and activities.

Dissemination & Events

Past Dissemination Events 2012 – 2013

- **24-26 September 2012:** Juhani Heilala et al., "*Discrete Part Manufacturing Energy Efficiency Improvements with Modelling and Simulation*", in Conference Proceedings of APMS 2012 International Conference on Advances in Production Management Systems "Competitive Manufacturing for Innovative Products and Services", Athena Research and Innovation Center, Rhodes, Greece.
- **9-12 December 2012:** Juhani Heilala et al., "*Simulation with Sustainability Aspects in the Manufacturing System Concept Phase*", in Proceedings of the 2012 Winter Simulation Conference (editors S. Jain, R. Creasey, J. Himmelspach, K. P. White, and M.C. Fu), Berlin, Germany.
- **26-28 June 2013:** Sebastian Scholze et al., "*Context-sensitive Decision Support for Improved Sustainability of Product Lifecycle*", in 5th KES International Conference on Intelligent Decision Technologies, Sesimbra, Portugal.
- **26-28 June 2013:** Mikel Sorli, Alberto Armijo, "*EPES: Engineering System for Optimization of Product life-cycle through Adapted Eco-services*", in 5th Manufacturing Engineering Society International Conference, Zaragoza, Spain.
- Chapter in book "*Revolutionizing Enterprise Interoperability through Scientific Foundations*", Editors: Yannis Charalabidis, Fenareti Lampathaki, Ricardo Jardim-Goncalves, to be published in 2013 by IGI Global, <http://www.igi-global.com>.

Upcoming Events 2013

- **July 2013:** IEEE International Conference on Industrial Informatics, Bochum, Germany, <http://www.indin2013.org>
- **September 2013:** Presentation of a specially prepared EPES brochure oriented to engineering domain in the modeFRONTIER Users' Meeting organized by ESTECO North America.
- **September 2013:** 14th European Conference on Knowledge Management - ECKM 2013, Kaunas, Lithuania.
- **September 2013:** Energy for Sustainability 2013, Coimbra, Portugal.
- **November 2013:** ERP Future 2013, Vienna, Austria.
- **December 2013:** PerCAM 2013: 3rd International Workshop on Pervasive and Context-Aware Middleware, Dublin, Ireland.
- **December 2013:** SDMCMM 2013: Secure and Dependable Middleware for Cloud Monitoring and Management, Beijing, China.
- **April 2014:** European Conference on Computer Systems (EuroSys) 2014, Amsterdam, The Netherlands.
- **July 2014:** SysInt 2014: 2nd International Conference on System-Integrated Intelligence, Bremen, Germany.
- Upcoming FinES Cluster Meetings