

Objective FoF-ICT-2011.7.4

Digital factories: Manufacturing design and product lifecycle management

EXTRACT FROM WORK PROGRAMME 2011



Challenge 7: ICT for the Enterprise and Manufacturing

The Factories of the Future (FoF) initiative is part of the European Economic Recovery Plan launched in November 2008 to respond to the global economic crisis. This Public-Private-Partnership (PPP) aims at helping EU manufacturing enterprises, in particular SMEs, to adapt to global competitive pressures by improving the technological base of manufacturing across a broad range of sectors. The ICT contribution to this initiative aims at improving the efficiency, adaptability and sustainability of manufacturing systems as well as their better integration within business processes in an increasingly globalised industrial context. Challenge 7 is fully dedicated to supporting the FoF PPP.

The Challenge includes the areas:

- 'Smart factories' including application experiments of control and sensor-based systems, laser systems and industrial robots.
- 'Manufacturing solutions for new ICT products' addressing manufacturing processes for Organic Large Area Electronics (OLAEs) and organic photonics.
- 'Virtual factories and enterprises' addressing end-to-end integrated ICT allowing for innovation and higher management efficiency in networked operations and supporting the emergence of 'smarter' virtual factories and enterprises.



'**Digital manufacturing**' including products life cycle management, modelling, design and optimisation.

Research addressing this Challenge in particular will encourage international cooperation under the Intelligent Manufacturing Systems (IMS) scheme.

Digital factories: Manufacturing design and product lifecycle management

The work addresses the early stages of manufacturing and engineering through interoperable models, engineering platforms, computer-assisted product and process development and analysis, and virtual prototyping and testing environments to reduce the need for physical mock-ups.

Projects are expected to be industry-driven and to contain a strong validation element with quantifiable targets.

Target Outcomes

a) **Comprehensive engineering platforms** that enable cross-disciplinary information sharing, workflow integration and the capture of product-relevant knowledge (e.g. manufacturing process knowledge embedded in the models and the engineering tools),

supporting the re-use of knowledge across stakeholders and the product lifecycle (e.g. from use to design). Projects should also contribute to ongoing international cooperation activities (e.g. IMS) on sustainable engineering and on standardisation for long-term archiving of product information.

b) **User-intuitive tools for simulation and virtual prototyping with forward and backward compatibility** (e.g. from use to engineering) using finer digital models to increase accuracy and integrating aspects such as functionality, forming, painting and assembly. The work should also aim at interoperable models enabling the use of various aspects of design and engineering, model auto-generation and robustness (e.g. automated meshing and optimisation) as well as the use of CAD-, CAE-, VR-, volume-, fluid-, structure-, polygonal- and process models in the various engineering stages. The adaptation

and scaling of engineering codes to next-generation high-performance multicore computing clusters should also be addressed.

c) **Tools for holistic modelling and simulation of full complex products and processes** using multi-physics and support for tolerance changes in the models. Digital modelling and simulation of product and process behaviour, e.g., regarding material properties from micro to macro scale (from the atomic level upwards) should also be considered.

Expected Impact

- Reinforced European leadership in knowledge-driven platforms, tools, methodologies, product development and manufacturing.
- Accelerated product design and manufacturing, enabling new products to be realised with a considerably shorter time-to-production and time-to-market.
- Drastically improved accuracy, reliability and speed of simulation techniques for manufacturing processes and/or full complex products permitting design decisions earlier in the design process.

Funding Schemes

a) - b) IPs, STREPs

c) IPs, STREPs, CSA

Indicative Budget Distribution

IP, STREPs: EUR 33.5 million with a minimum of 50% to IPs and 30% to STREPs

CSA: EUR 1.5 million

Call (published July 20, 2010; deadline for submission of proposals: December 2, 2010)

FP7-2011-NMP-ICT-FoF

For further information:

- INFSO-FOF@ec.europa.eu
- http://ec.europa.eu/research/industrial_technologies/lists/factories-of-the-future_en.html
- http://cordis.europa.eu/fp7/ict/micro-nanosystems/ict-for-fof_en.html
- http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.FP7DetailsCallPage&call_id=3339&act_code=ICT&ID_ACTIVITY=3