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Strategic Research & Innovation Roadmap and Business Opportunities for ICT in Manufacturing

Road 4 FAME

SEVENTH FRAMEWORK PROGRAMME

Steinbeis-Edition

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Content

Introduction

The Road4FAME project has developed a strategic research and innovation roadmap for IT architectures and services in manufacturing. The project focused on architectures and services which facilitate agile and flexible manufacturing processes, ease interoperability in distributed manufacturing environments, support effective collaboration in context-aware enterprises, and provide the foundations for sustainable manufacturing. The key aims were to align future ICT (information and communication technology) research with the needs of European manufacturing businesses, and to provide European manufacturing businesses with a reference against which they can derive innovation strategies and identify novel business opportunities.

ICT Solutions

Eleven ICT solutions were identified and evaluated with respect to their ability to provide support for current manufacturing trends and drivers. Critically the aim is to assist European manufacturing companies optimise their business operations, remain competitive, maximise the value they get from their networks and utilize existing and future ICT systems to improve operations.

Strategic Vision for the Future

The Road4FAME vision contains a future where companies come together as virtual enterprises comprised of associations of companies that cooperate ad-hoc to complement strengths, attain the capacities of large enterprises, gain the ability to react to market opportunities, perform research together, innovate products and minimizes costs and risks for approaching new markets with new products. In this vision large companies may bring capacity, and small companies may bring flexibility and innovation power. Going a step beyond this vision, in the near future manufacturing could be provided as a service (MaaS). Here, there is a need to reconfigure quickly and scale up production at short notice, to establish close information exchange with customers, i.e. integrate with other businesses and enter into business agreements, and cooperate with the new partners in order to fulfil new orders appropriately. Strategically companies will need to anticipate changes in demand using data mining on a variety of data coming from many sources, e.g. social networks.

As customers and companies become more environmentally aware, environmental sustainability will be introduced as a key parameter in all steps of the product life-cycle, including sourcing and recycling. Real-time information about the source of raw materials and the footprint of manufacturing processes will be used to steer production towards minimal environmental impact. The environmental implications of design decisions, process decisions, and buying decisions will become completely transparent allowing a company to promote a “green” image. Looking further into the future new business models based on buyback of products for recycling, or product rental and return for recycle, will become more common.

Finally, the Road4FAME vision sees increased demand for customisation, which could eventually lead to high volume “mass customisation” with short product life cycles. This requires both long-term and ad-hoc cooperation in the supply chain and high levels of automation, short reconfiguration cycles, including tests/experimental production, fast reprogramming of machines and frequent updates of information for more highly skilled and IT literate workers. Supporting this appropriate IT provision is required for the human who is embedded in the digital factory, in the form of context-relevant information and on-the-fly knowledge provision supported by