A Roadmap for Future Architectures and Services for Manufacturing

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Road4FAME in a nutshell

- **Road4FAME** = Development of a Strategic Research and Innovation Roadmap for Future Architectures and Services for Manufacturing in Europe
- Coordination Action, co-financed under the Factories of the Future PPP, FP7-ICT: ICT for the Enterprise and Manufacturing
- Project duration: June 2013 - Oct 2015, 29 months
- Total budget: EUR 1,216,272
- Total EC contribution: EUR 859,968
- GA No. 609167
Road4FAME in a nutshell

Principal players in manufacturing IT, leading manufacturing research centers, and strategy and roadmap developers
Road4FAME in a nutshell

Selected representatives from industry, associations and the FoF roadmapping ecosystem for:

- Strategic advice
- Link to expertise
- Validation of project results
- Act as multiplicators
Road4FAME in a nutshell

Around 100 selected representatives from industry and academia for:

- participation in expert consultations / interviews
- participation in workshops
- involvement in deliverables
- involvement in orientation paper
- development and review process
Road4FAME in a nutshell
Road4FAME in a nutshell

Main products:

- **Roadmap** in manufacturing IT, focusing on future Architectures and Services in the Manufacturing Domain

- **Catalogue of Business Services and Business Opportunities** enabled by future architectures and services, tailored to manufacturing businesses in industry and service sector

- **Recommendations for Future Research Priorities and Innovation Strategies** tailored to the EC, policy makers, academia and manufacturing businesses
Priorities & Recommendations
Overall Priorities

Research/Technology/Engineering Priorities:
- Seamless **integration** of systems and components
- Acquisition and use of **big data in real time** & handling of complexity
- Visualisation, virtualisation, situational awareness & **decision support**
- **Modelling and simulation**
- Human machine interfaces

Implementation
- **Interoperability**, standardisation, **reference architectures** and tools
- **Platforms** (organisational, technological, operational, customer,..)
- **Security, privacy, trust** & regulatory issues, IP
- **Demonstrations**, living labs
- **Business models**

Funding strategies
- Open platforms, reference architectures & tools
- De-fragmentation, cross-fertilisation
- Raise awareness & education
- Commitment of large industries & enhance involvement of SMEs
For more information contact the Road4FAME Consortium:

www.road4fame.eu
Enabling Technologies:

1. **Big Data** capture (live streaming for situational awareness), storage (event-driven databases) and analysis (data mining – ideally in real time)

2. Distributed **processing algorithms** for data and systems in real time supported by resilient “industrial strength” cloud computing for the plant floor

3. **Visualisation techniques** and specifically context-aware responsive visualisation of data
Recommendations for research priorities identified by Road4FAME

1. **Integration**: Integration approaches for existing ICT systems and information as well as of new smart components for data collection, analysis and visualisation

2. **Data/information and decision making**: Improved forecasting and advancement of autonomous decision-making capabilities. Decision support systems to reduce operator load

3. **Multidisciplinary modelling**: Modelling of factories & virtual enterprises, information modelling and work domain modelling of socio-technological systems

4. **Network-centric communication and collaboration**: Between players, humans and systems across the entire value chain

5. **Scalable Cyber-Physical System architectures**: For adaptive and smart manufacturing

6. **Machine learning and adaptive systems to enable flexible and adaptive manufacturing**: Environments and infrastructures for machine learning, self-adapting and reconfigurable manufacturing, including intra- and inter-machine communication standards

7. **HMI**: Human-centric adaptive interfaces to enhance usability
Main barriers:

1. Concerns on safety, security and privacy
2. Lack of interoperability / standards: Manufacturing IT landscape is a ‘wild garden’.
3. High implementation costs
Recommendations for CPS implementation

Advancements needed for successful CPS implementation:

1. **Interoperability /standardisation:** Development/promotion of standardisation and reference ICT architectures as well as interoperability and harmonization of different interfaces

2. **Demonstrators:** To convince the conservative manufacturing sector of the cost/benefits of new ICT architectures and services

3. **Security and privacy:** Affordable security (Machine-to-Machine (M2M) security protocols) and privacy (especially within manufacturing supply networks)

4. **Business models**

5. **Awareness raising, training & education:** cross domain, cross disciples
Recommendations for future funding strategies

- Funding of open platforms / reference tools and architectures
- Facilitate funding to SMEs
- Fund CSAs / task forces on business models, standardisation