

Cloud-based Situational Analysis for Factories providing Real-time Reconfiguration Services

AT A GLANCE

Project: SAFIRE – Cloud-based Situational Analysis for Factories providing Real-time Reconfiguration Services

Project Coordinator:

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Partners:

- ATB (Germany)
- IK4-IKERLAN (Spain)
- The Open Group (United Kingdom)
- University of York (United Kingdom)
- Electrolux (Italy)
- OAS (Germany)
- ONA (Spain)

Duration: 36 months – project runs through September 2019

Total cost: 3.1M€

Programme: Horizon 2020 Call FOF-11-2016 – Digital Automation

Further information:

www.safire-factories.org



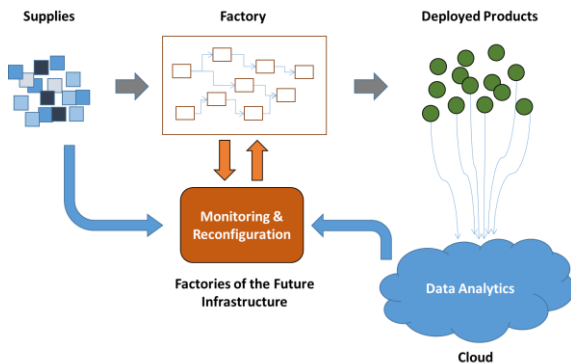
The SAFIRE project will develop technologies and infrastructure to enable Reconfiguration-as-a-Service for dynamic smart factory systems and manufactured smart products that exploit cloud-based services and computing power to continually optimise performance of production systems and products focusing on throughput, power consumption, usage, maintenance, utilisation levels, and others factors.

Scope

Manufacturing of products has become increasingly complex and driven towards greater flexibility due to an increasing diversity of product portfolios, demand for more customised products, and shorter time-to-market requirements. To face these challenges there is a need for rapidly adaptive smart manufacturing systems with features for intelligent reconfiguration of production processes and of smart products.

In traditional models of manufacturing, the information flow from product design, through production processes, to the manufactured product has been unidirectional as information flows from the

product and process design tools into planning tools and on to production equipment control systems.



In order to improve the manufacturability and re-configurability of products, the product designers need to have more information about how product use affects the lifecycle of a product, and how product design affects the production processes. Currently, product use and product production activities are often separated, leading to low efficiency and higher costs for both users and manufacturers. Some of these required optimisations can be carried out by adjusting production control parameters (e.g. improve production quality by adjusting parameters), while others require the reconfiguration of manufactured products.

Project Objectives

The primary objective of the SAFIRE project is to develop cloud-based analytics and reconfiguration capabilities that provide:

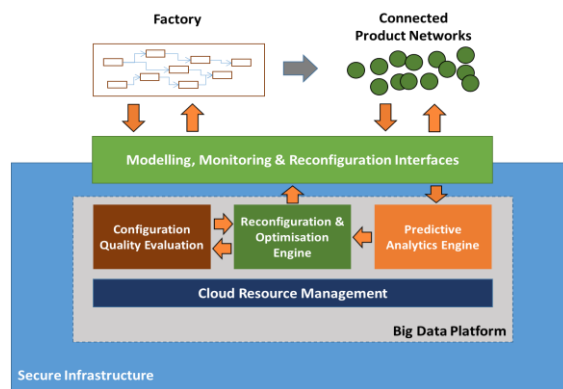
- Both reactive and predictive reconfiguration for both production systems and smart products
- Flexible run-time reconfiguration decisions during production rather than pre-planned at production planning time
- Real-time reconfiguration decisions for optimisation of performance and real-time production and product functions

The advanced analytics and reconfiguration capabilities will be based on mastering big data challenges associated with manufacturing (sensor and process data), enterprise data and smart product data to provide advanced analytics that allow manufacturers to address production system behaviour forecasting and to establish optimisation methods that are integrated in the design and product chain.

Technology Innovations

The SAFIRE project targets two related technology challenges for smart factories presenting new opportunities for improving production, products and services:

- Interconnected Systems of Production Systems (SoPS) within smart manufacturing environments where production systems have hardware and software requirements to be addressed to achieve specific business objectives such as scheduling, power usage, throughput, and maintenance.
- Connected Product Networks (CPNs) where networked smart products collect data, can be adapted in the field, and can deliver extended services to through optimisation of smart product parameters and customisation of products to environments, usage patterns and other dynamic factors.



SAFIRE will use big data gathered from manufacturing (sensor and process data), enterprise systems and smart products usage to meet the challenges of providing manufacturers with advanced analytics for forecasting production system behaviour and targeting optimised and integrated methods in production design and product lifecycle. The big data analytics capabilities will meet real-time requirements so dynamic reconfiguration decisions are made during production time rather than pre-planned at production planning time.

Industrial Demonstrators

In order to assure that the methods and tools to be developed meet the needs of European manufacturers, the project will be driven by three industrial business cases from Electrolux, OAS and ONA within globally distributed enterprises, and who participate in the consortium and will validate the technologies in multiple manufacturing and product scenarios.