

InAml: eCollaborative services for manufacturing and assembly industry

InAml will explore how a combination of existing technologies, namely ambient intelligence and semantic-based knowledge management, can promote collaboration to support industrial installations and manufactured products. Industrial experience will be collected in Portugal, Germany and Spain.

At a glance: InAml

Innovative Ambient Intelligence Based Services to Support Life-Cycle Management of Assembly and Manufacturing Systems

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Strategic Objective:

IST-NMP-1 Integrating Technologies for the Fast and Flexible Manufacturing Enterprise

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InAml aims to develop an innovative methodology and platform to support collaborative working environments in manufacturing industry. The objective is to enable an optimal use of industrial manufacturing installations, and the manufactured products. InAml will provide methods and collaborative services that will especially support collaborative decision-making in industry.



Manufacturing companies need to improve competitiveness and strengthen market position. This pressure demands strong collaboration from all actors involved in the product or production value chain. However, manufacturing industry is still missing the necessary support, in methods and tools, to achieve efficient collaboration strategies.

Background

To remain competitive, organisations have to decide what their core competencies are. Manufacturers outsource the development of parts of their products to suppliers, requiring collaboration with the suppliers during the development process. Suppliers are becoming responsible for complete subsystems of one or more of their clients' products in certain application areas. Moreover, manufacturers try to ascertain how their products are used, in order to improve them, obtaining information to create services. In summary, manufacturers see themselves needing to develop strategies to establish tight collaboration with all actors involved in the supply and value chain.

InAml is based in a human-centric approach involving all actors of the extended enterprise

eCollaboration

InAml is focused on *eCollaboration*: collaboration among individuals engaged in a common task using electronic technologies, to provide services supporting access to relevant information and knowledge through a common interface for different agents along the production process. The project's rationale consists in a human-centric approach, involving all the actors interacting with a product: parts or machines suppliers, producers, service providers and customers. This approach is based on an effective use of information and knowledge, in virtual and/or distributed environments, i.e. for all actors in the extended enterprise.



InAml Results

The InAml project will produce the following exploitable results:

- **InAml methodology** on how to set the most appropriate collaborative working environment in manufacturing companies.
- **InAml Collaborative Platform** for efficient creation of new and update of existing collaborative services to support assembly and manufacturing systems and products.

i) InAml Methodology

The InAml methodology will provide an innovative approach on how to apply a combination of ambient intelligence and semantic-based knowledge management technologies integrated in manufacturing processes and products to provide services and support decision-making through all actors in the extended enterprise. The methodology will be addressed to vendors of assembly and manufacturing systems, end-users (i.e. manufacturing companies), service providers and consumers.

The methodology will serve as guidelines for companies, especially for manufacturing extended enterprises, which intend to apply the new approach to provide collaborative services based on the InAml platform. However, it will be applicable for companies which do not want to apply InAml system but intend to improve collaboration.

ii) InAml Collaborative Platform

The **InAml Collaborative Platform (ICP)** is based on the effective collection of information and knowledge to a *knowledge base for collaborative work*. This common but distributed repository will be the main source of information and knowledge for the platform. It will enable a proper structure to store all knowledge related to ambient intelligence, assembly and manufacturing systems, products and collaborative services.

A set of *semantic-based knowledge management tools* is necessary to support acquisition, capture, retrieval and presentation of knowledge. This toolbox includes: ontology creation and maintenance, context-sensitive search, case-based and rule-based reasoning, knowledge acquisition, modelling and presentation, and context-sensitive acquisition of ambient intelligence information.

The platform needs general functionality and services to support collaborative work in manufactur-

ing environment. The *core collaborative services* provided by the ICP will enable the efficient collaboration, ensuring a human-centric approach. These include: resource discovery, team composition, product/process knowledge provision, ambient intelligence information provision, collaboration call, collaboration traceability, and communication services.

Besides enabling the creation of new services, the ICP comprehends three *collaborative application services*: collaborative reconfiguration of assembly and manufacturing systems and products, intelligent monitoring and collaborative problem solving.

Business Cases

The user driven approach of InAml is ensured by three business cases, involving one

manufacturing company, two vendors of assembly and manufacturing systems, one network services provider and one control systems provider.

i) Business Case 1

Business case 1 considers relations between a manufacturing company and its clients, regarding product improvement and associated services. By creating collaboration between the company's departments and with clients, a better knowledge of product and production behaviours will be possible. This insight will provide means for improved after-sales services and to reconfigure products.

ii) Business Case 2

In business case 2, the service and control suppliers intend to establish a tighter collaborative relationship with the industrial clients and among themselves, to improve services currently available. The objective is to use current services offered by the control provider, with the added value of human-centric, collaborative processes in the ICP. Another issue is the interfacing between InAml and the middleware of data-collecting tools, namely the one from the control provider.

iii) Business Case 3

Business case 3 resides in a time-sensitive context, where a machine vendor intends to provide intelligent monitoring and maintenance support. For this, collaboration between the machine vendor and the clients' maintenance departments must be set, so that services are flexible and work according to the different clients' needs, regarding strategy and maintenance.

