SPIA

Strutture **P**ortanti **I**nnovative **A**eronautiche

Methodologies and Technology enabling the Smart Factory

PON MIUR 03

Approvato con Decreto del Direttore Generale del Ministero dell'Istruzione dell'Università e della Ricerca, prot. n. 1552 del 06/05/2014. Codice progetto: PON03_00067_3.

The **scope** of SPIA (Innovative Aeronautic Primary Structures) project is to investigate innovative solutions to optimize the design and the related manufacturing process of horizontal stabilizer of a regional aircraft. To increase competitiveness, innovative manufacturing processes that allow realizing highly integrated monolithic composite parts will be developed.

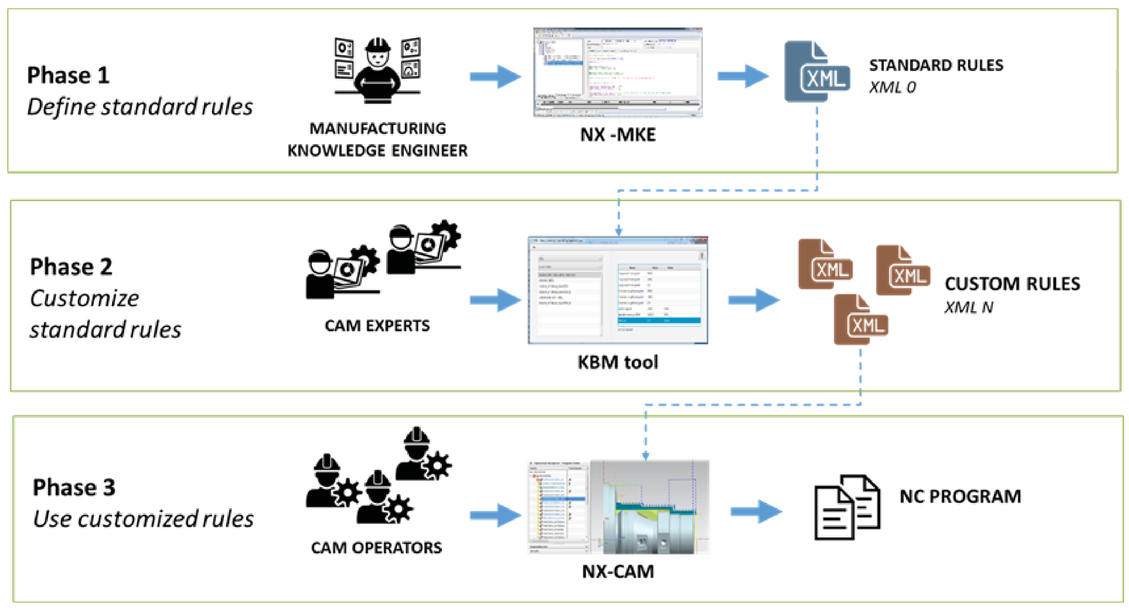
One of the aims of the project is to dramatically improve production process performance through the design, development and testing of SMART FACTORY methods and technologies.

In particular the **objectives** are:

- to define knowledge-based methodologies to support the manufacturing process by the application of FBM (Feature Based Manufacturing) approaches
- to develop a framework able to ensure availability and access to manufacturing data directly from the production line.
- to develop an integrated platform to support multi-disciplinary simulation and production processes, based on digital mock-up technologies (DMU), virtual reality and digital manufacturing.
- to define methodologies and knowledge based management tools to integrate simulation and test data.

Knowledge-based Manufacturing

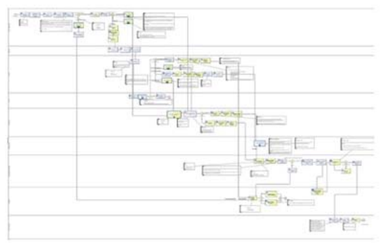
Prototype of a KBM (Knowledge-based Manufacturing) system based on a set of a priori rules (defined from standards and industrial best practices) and geometry recognition on the CAD model (feature) that automates the creation of manufacturing processes, enabling a strong link between design and production.



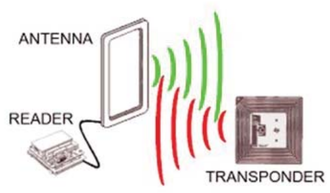
Manufacturing Data Distribution

Design and development of a technological solution able to make available complete and accurate information, at the right time, where needed, with a considerable reduction of assembly errors and related scraps, with the elimination of misalignment between process data managed in company information systems and the actual state of the process in the physical world of the shop floor

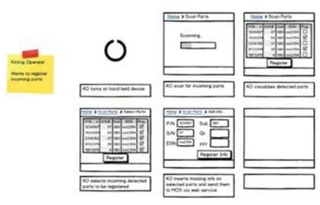
Processes modelling



RFID Technology Benchmanrking



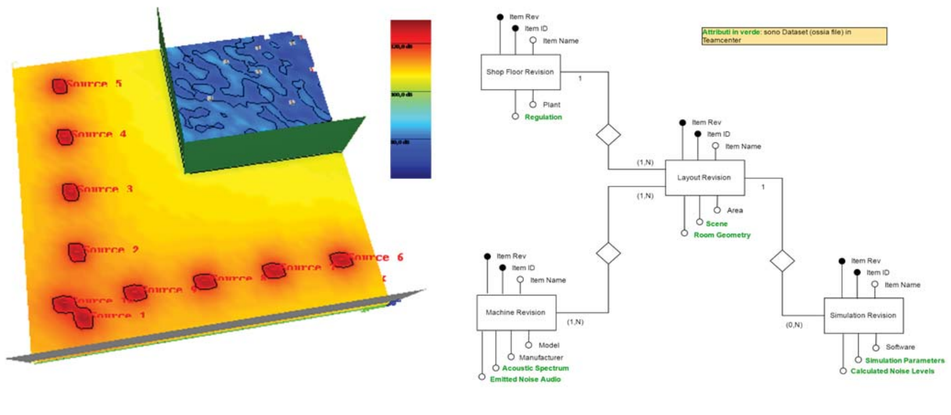
Storyboard and Usecases development



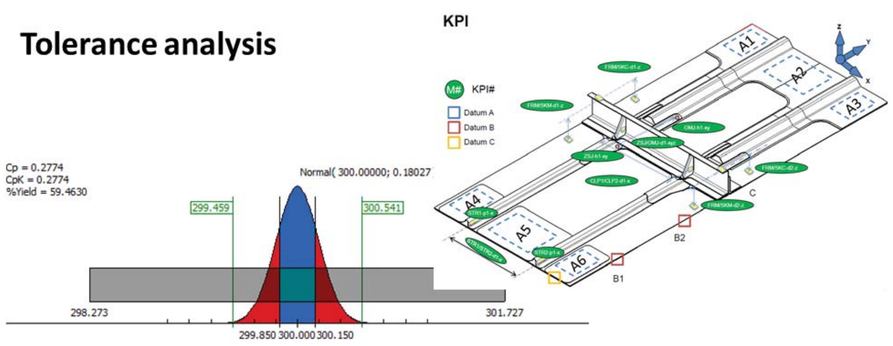
Mobile and Web application development

Manufacturing Optimization

Noise analysis in the shopfloor



Tolerance analysis



Simulation & Testing Data Integration

Design and Development of a Knowledge-based technological solution for management and integration of test and Simulation data