



2018  
8 - 9 OCTOBER  
Vicenza Convention Centre  
@Fiera di Vicenza  
Vicenza, ITALY



Governo Italiano - Presidenza del Consiglio dei Ministri

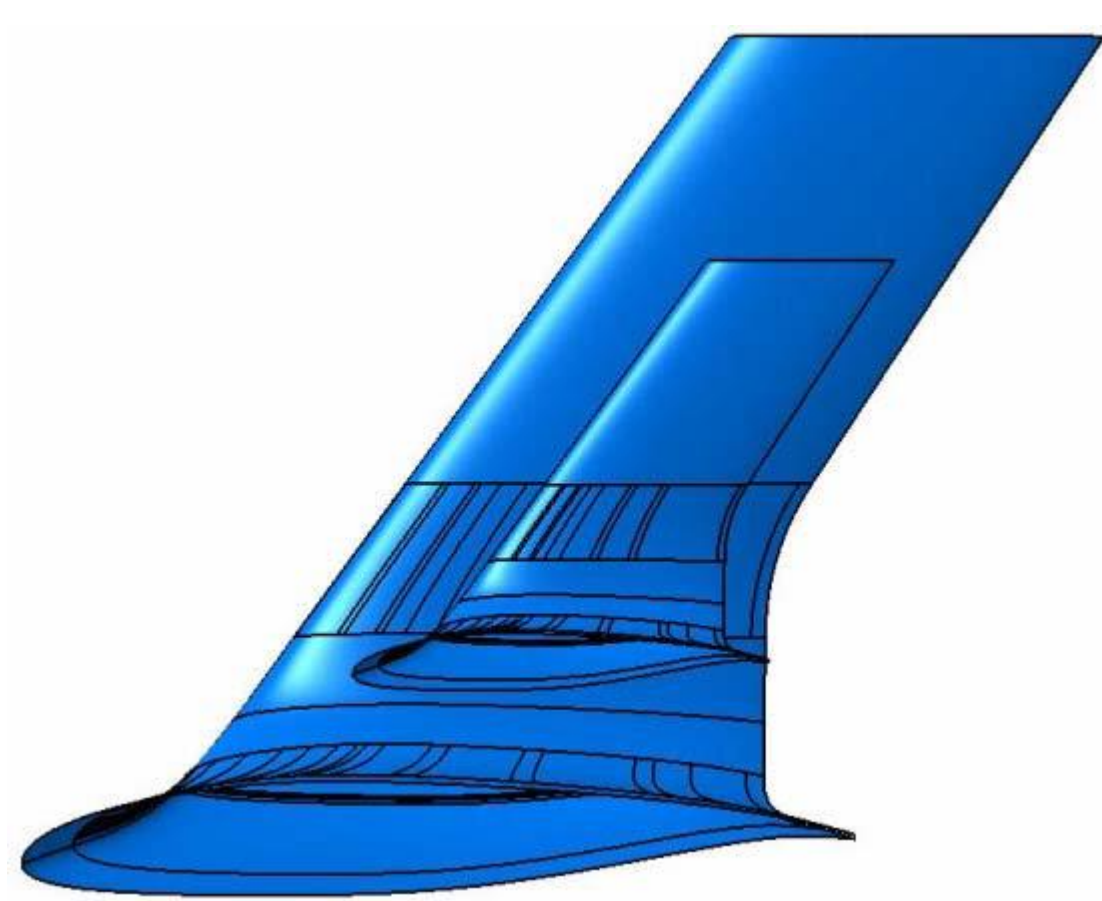
Ministro per la Coesione Territoriale

MIUR - Avviso n. 713/Ric. del 29/10/2010

Titolo III – "Creazione di nuovi Distretti e/o Aggregazioni Pubblico Private"

# SPIA

## Innovative Aeronautic Primary Structures



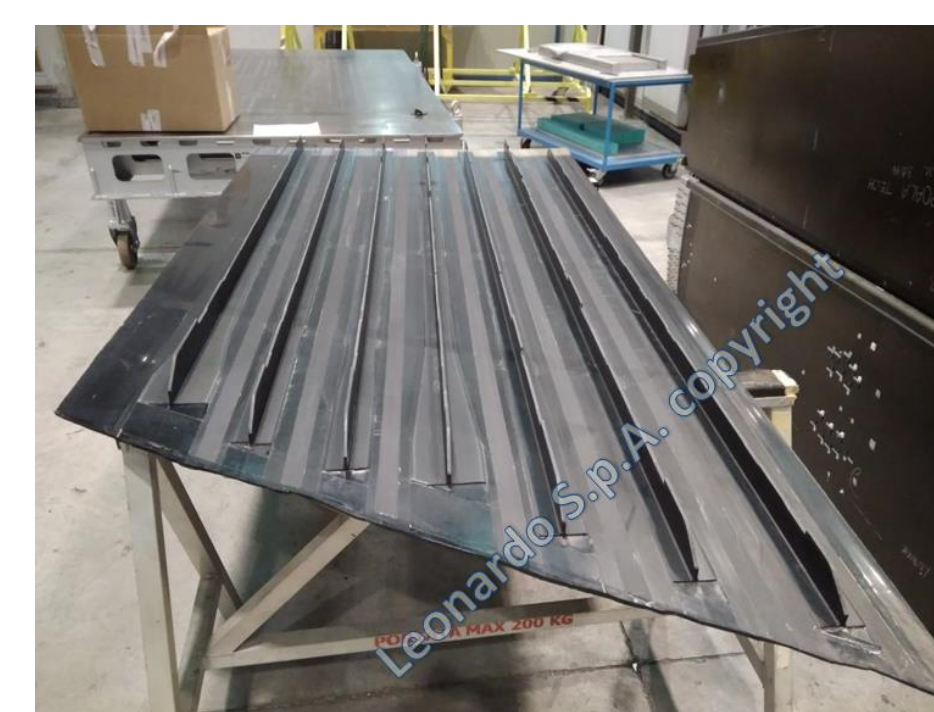
**Objective of the research project:** **SPIA** project aimed to investigate innovative structural solutions (both from design and manufacturing point of view) to be implemented on empennages and rear fuselage of a regional aircraft. This has been achieved starting from material properties and using a scale up approach, through the design, manufacturing and testing of details and sub-components, till the fabrication of completely representative demonstrators. Another objective was to improve production process performance through the design, development and testing of SMART FACTORY method and technologies.

**Objective of the educational program:** create design engineer for aeronautical composite structures manufactured with innovative process.

### Activities and Results

- Innovative configuration of cocured multispar box
- Development & Validation of composite components (e.g. vertical stabilizer stiffened panels, movable surface, ...) by means of innovative manufacturing processes and tailored numerical tools
- Development of a software for fast comparison of different alternative manufacturing process costs
- Improvement of production process performance by SMART FACTORY method

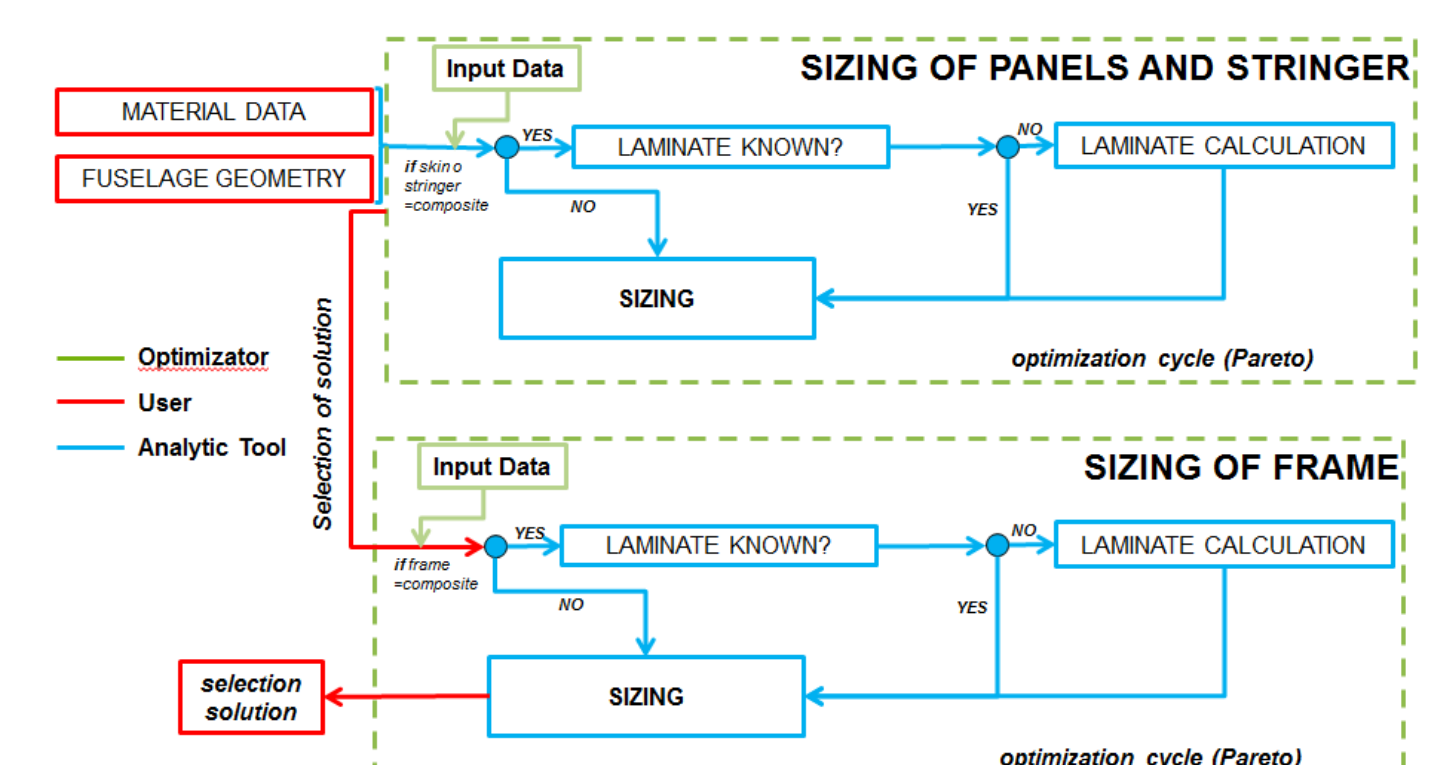
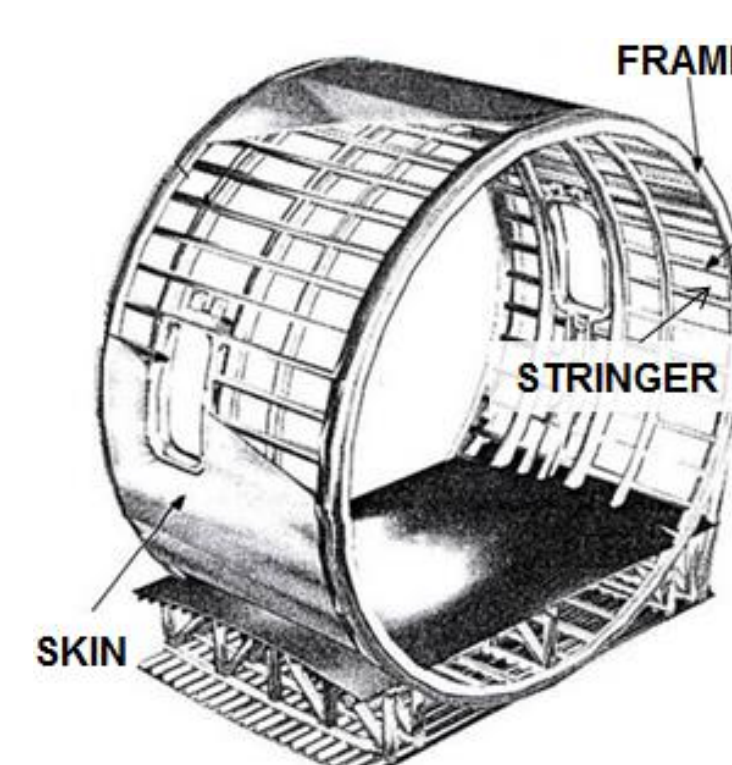
### Development of manufacturing processes vs. several components like fin & fuselage sections



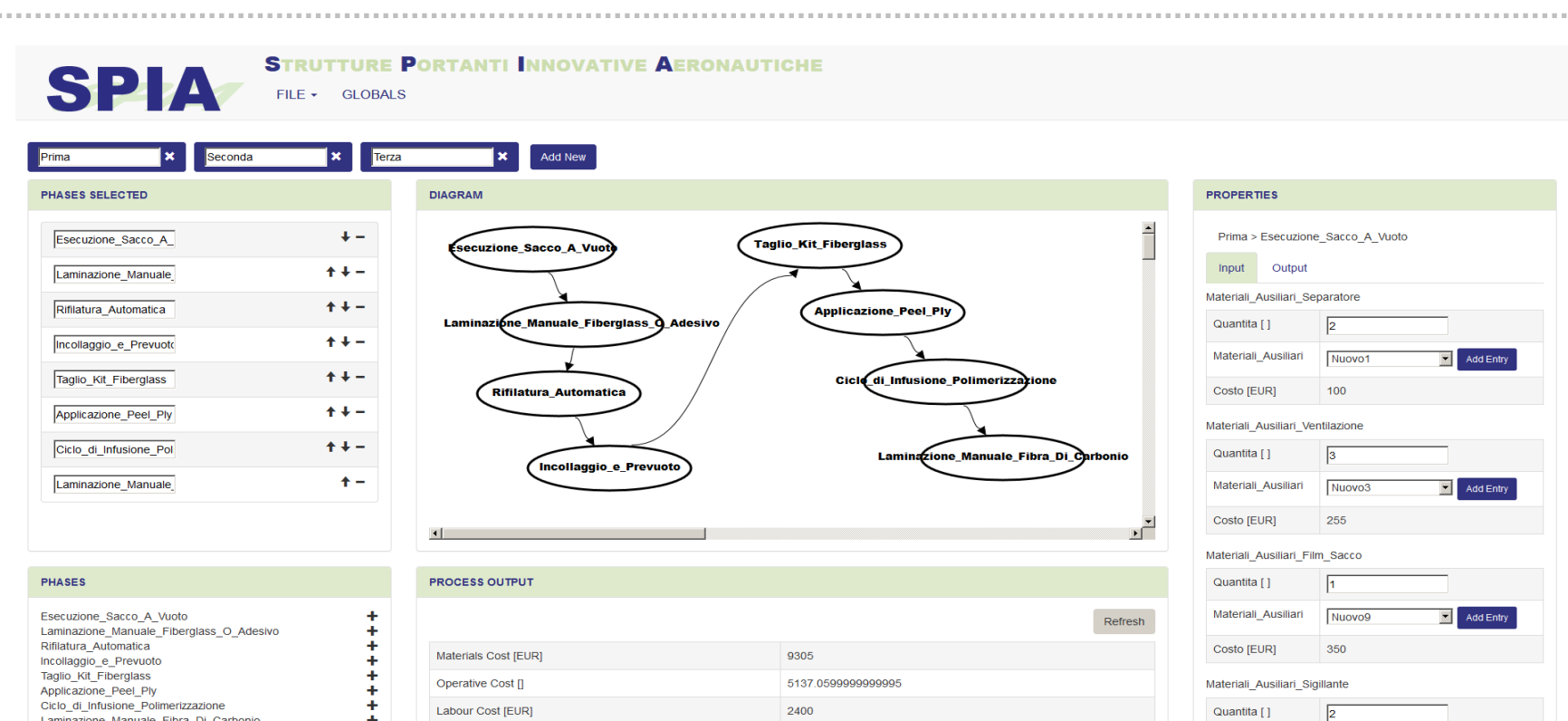
Manufacturing innovation due to:

- usage of AFP (automatic fiber placement) tool coupled with an anthropomorphic arm
- unique cocuring with stringers and skin assembly before polymerization

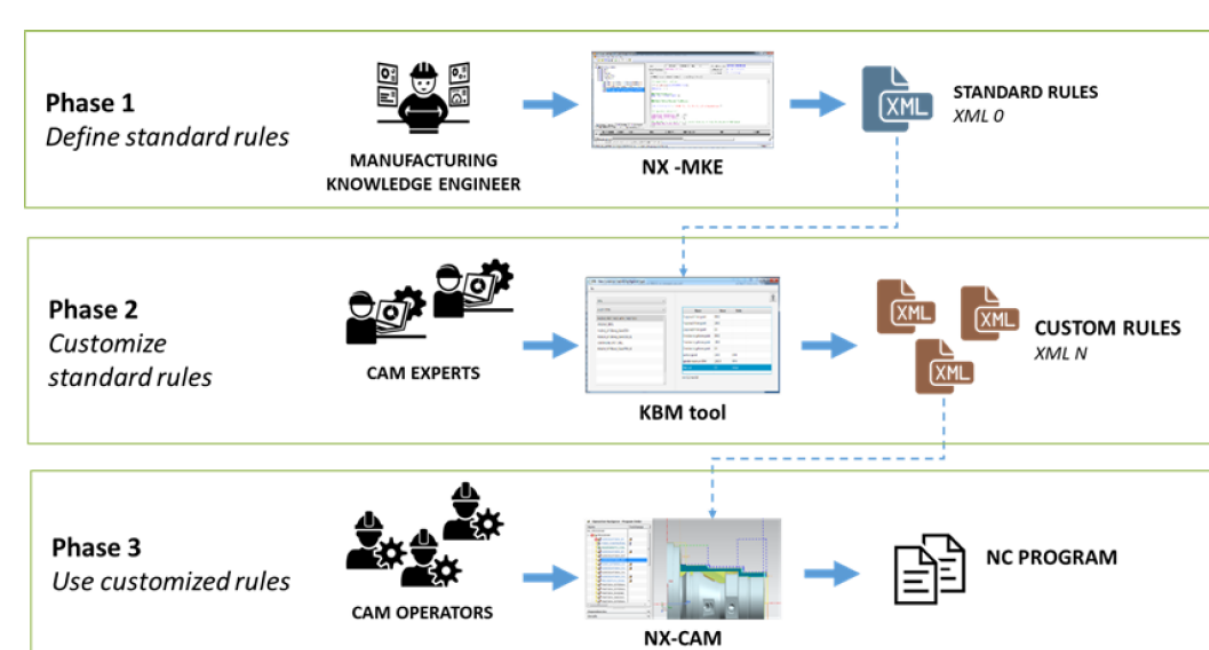
### Development of an analytic tool for preliminary design and dimensioning of fuselage sections



### Software for fast comparison of alternative manufacturing costs



### SMART FACTORY



#### Knowledge-based Manufacturing (KBM)

Prototype of a KBM system based on a set of a priori rules (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.

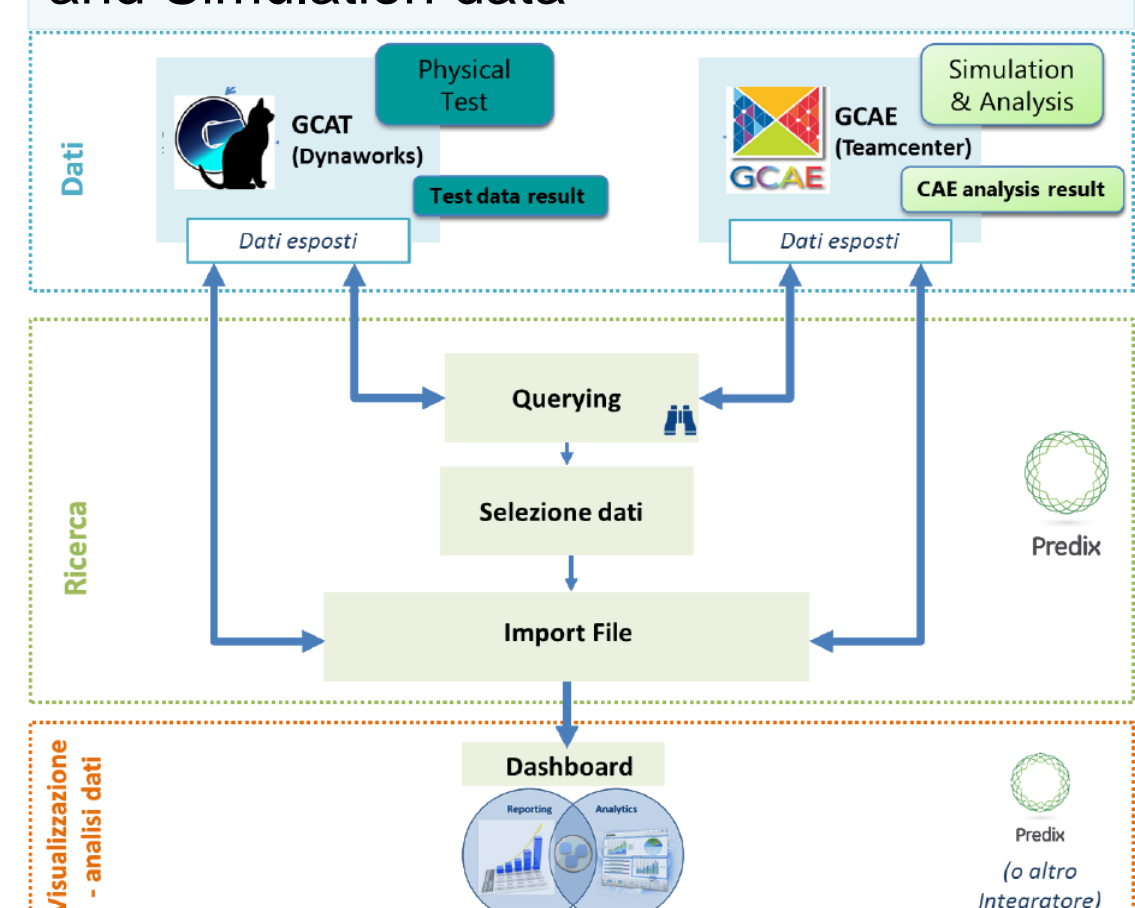
#### Manufacturing Data Distribution

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

#### RFID Technology Benchmarking

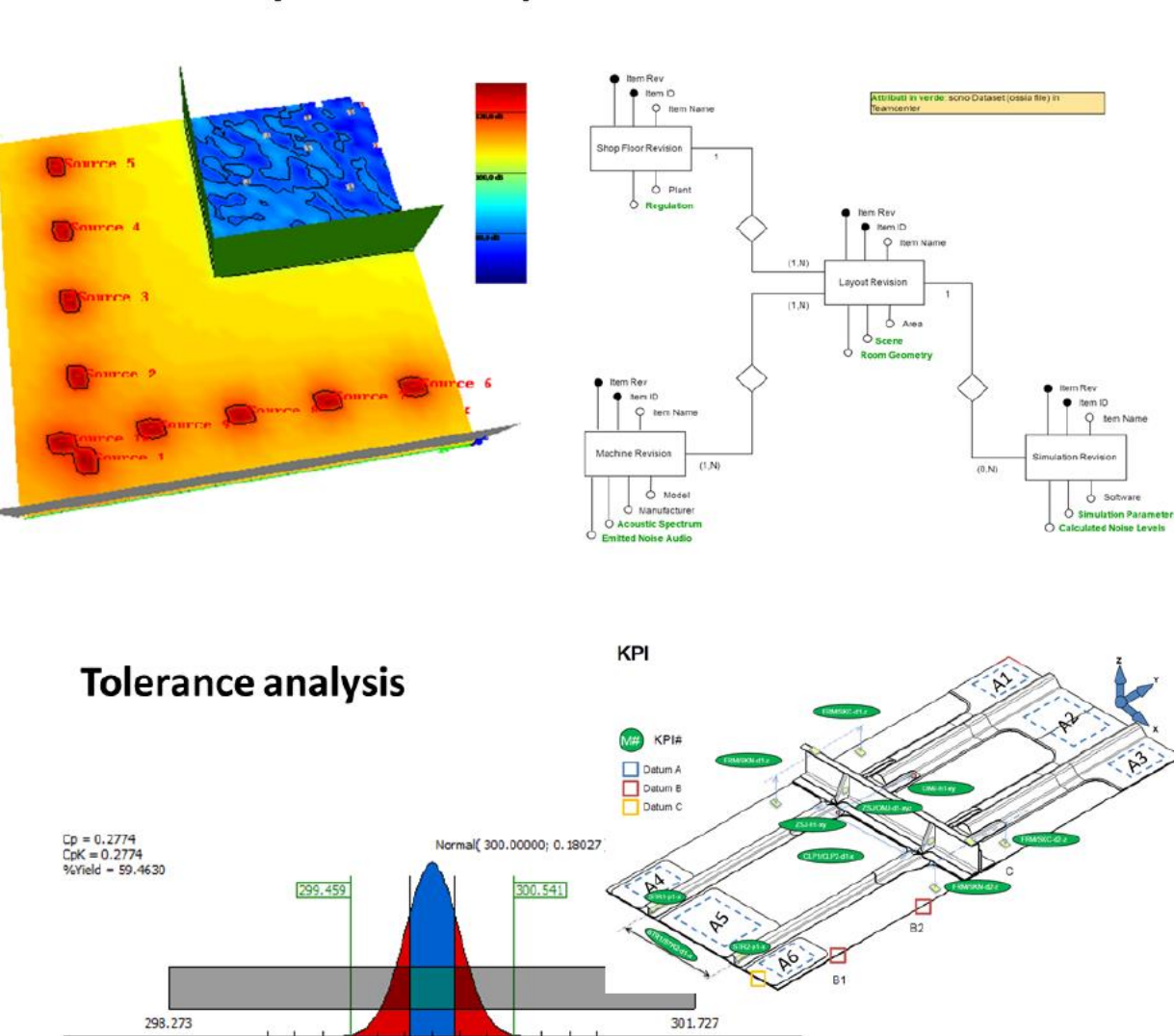


#### Simulation & Testing Data Integration



#### Manufacturing Optimization

Noise analysis in the shopfloor



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DTA scarl is a non-profit making consortium society joined by the main aerospace enterprises, the universities, as well as the public and private research centres of Apulia. The society, which is recognized by the Ministry of Education, University and Research as technological district, operates to increase competitiveness of the regional productive system.

Projects are characterized by their meaningful orientation towards the productive and economic spin-offs, and leverage the integration of the competences of participants.