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Università degli Studi di Napoli Federico II
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Grant Agreement number: 636202
Project acronym: AGILE
Project title: Aircraft 3rd Generation MDO for Innovative Collaboration of Heterogeneous Teams of Experts
Start date of the project: 01/06/2015
Duration: 36 months
Total Budget: ~9 M€
Total Manpower: ~900 Man-Months

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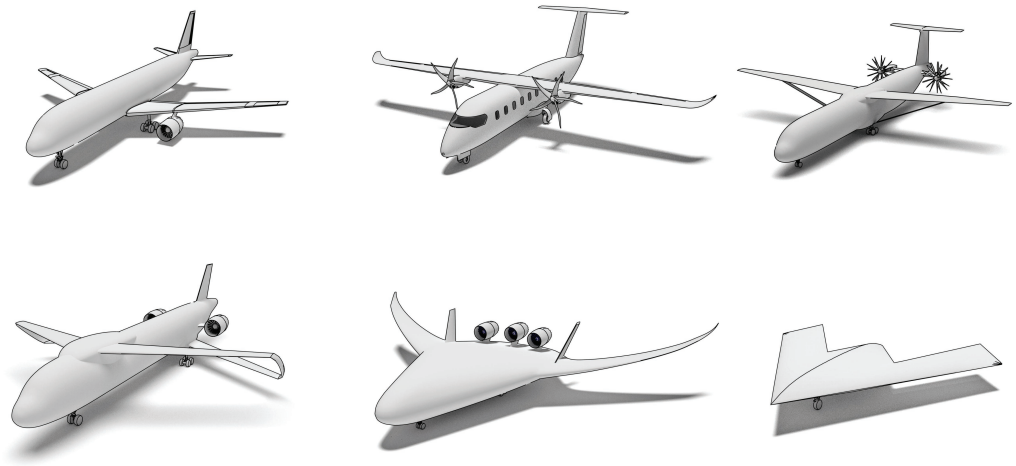
This project has received funding from the European Union's Horizon 2020 research and innovation framework programme under grand agreement No 636202

AGILE

Aircraft 3rd Generation MDO for Innovative Collaboration of Heterogeneous Teams of Experts



"AGILE *is developing the next generation of aircraft Multidisciplinary Design and Optimization processes, which target significant reductions in aircraft development costs and time to market, leading to cheaper and greener aircraft solutions.*"

www.agile-project.eu

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AGILE next generation aircraft design and optimization

When a project for a new aircraft is initiated, designers need knowledge and competences from many different disciplines in order to make the right decisions on the aircraft's systems and functions. From the start of the aircraft design process computer simulations play a major role in the prediction of the physical properties and behavior of the aircraft. A major challenge arises in aircraft design as the properties from different disciplines (aerodynamics, structures, stability and control, etc.) are in constant interaction with each other. It is therefore important not only to connect the simulation models but also the corresponding experts to combine all competences and accelerate the design process to the best possible solution.

This is at the core of AGILE, the EU funded Horizon 2020 project coordinated by the Institute of Air Transportation Systems of the German Aerospace Center (DLR). AGILE has set ambitious performance targets to achieve by the end of the project in 2018: a reduction of 20% in time to converge the optimization of an aircraft and a 40% reduction in time needed to setup and solve the multidisciplinary optimization in a team of heterogeneous specialists. This will lead to improved aircraft designs and a 40% performance gain, compared to aircraft in service today, is expected for large passenger unconventional aircraft configurations.

AGILE is implementing the 3rd generation of multidisciplinary design and optimization through efficient collaboration among international multi-site aircraft design teams. The project builds on key technologies that have been developed over the last 10 years at DLR, one example being the common data format for aircraft design CPACS.

Understanding complex systems and products as aircraft and the underlying design process depends highly on the exploitation of knowledge. New technologies to exploit and/or re-use available engineering knowledge have become available with the potential to substantially accelerate the multidisciplinary aircraft design optimization process. Knowledge Based Engineering for multidisciplinary aircraft design is one of the key innovations that AGILE promises to deliver.

To meet the challenges of the AGILE project a team of 19 industry, research and academia partners from Europe, Canada and Russia are collaborating together.

The composition of the Consortium reflects the heterogeneous structure that is characteristic for today's aircraft design teams.

The budget of the project is close to 9 Million Euro, with around 7 Million Euro provided by the European Commission.

Objectives

AGILE's four technical objectives

1. Notwithstanding the availability of powerful software systems to integrate complex computational design processes, today there is a lack of quantified knowledge on how optimization workflows involving simulations of multiple disciplines, should be set up in the most effective and efficient manner. To this purpose, the first objective of AGILE is the structured development of advanced multidisciplinary optimization techniques and their integration, to reduce the setup and the convergence time in aircraft optimization tasks.

2. Today's advanced analysis codes and software tools are mostly discipline-specific and well understood by disciplinary experts. However; the operation of the system of tools as a whole and the interpretation of the results are additional challenges in the collaboration between the disciplinary specialists and the overall aircraft generalists. Therefore, the second objective of AGILE is the structured development of processes and techniques for efficient multisite collaboration in the overall design teams.

3. Mastering complex systems highly depends on the exploitation of knowledge. Besides the interaction of experts, it is seen of high potential in smart handling of data, information and knowledge using information technologies. Thus; the third objective of AGILE is the structured development of knowledge enabled information technologies to support interdisciplinary design campaigns.

4. The fourth objective of AGILE is to develop and publish an Open MDO Test Suite, enabling the access to the project technologies by other research activities, and providing a reference database for future aircraft configuration research.