THE AGILE METHOD APPLIED TO AIRCRAFT DESIGN AT UNIVERSITY OF NAPLES

PIERLUIGI DELLA VECCHIA[*]

Department of Industrial Engineering, University of Naples Federico II, Via Claudio, 21, Naples, 80125, Italy
pierluigi.dellavecchia@unina.it[*]
http://wpage.unina.it/pierluigi.dellavecchia[*]

FABRIZIO NICOLOSI[+], AGOSTINO DE MARCO, LUCA STINGO, GIOVANNI NARDONE

Department of Industrial Engineering, University of Naples Federico II, Via Claudio, 21, Naples, 80125, Italy
fabrizio.nicolosi@unina.it[+]
http://wpage.unina.it/fabrnico/DAF

Abstract

At University of Naples Federico II (UniNa) the AGILE paradigm has been assumed as guideline to develop new methodologies, tools and software applied to the aircraft design. A heterogeneous team work cooperates to find and develop more reliable methods, updating the older, implements them into state-of-the-art framework and software language, and integrates these new procedures into a cluster of partners in order to perform MDO on innovative aircraft configurations, such as in the AGILE European project context. Methodologies have been well tested and validated for several aircraft configurations and they have been applied into the Design Challenge Level 0 (DC-L0) and Design Challenge Level 1 (DC-L1) of the AGILE project. Results have been useful to set-up the 1st stage of the 3rd MDO framework creation, which is the main goal of the AGILE European project.

1. Introduction

At University of Naples Federico II (UniNa) the AGILE paradigm has been assumed as guideline to develop new methodologies, tools and software applied to the aircraft design. A heterogeneous team work cooperates to find and develop more reliable methods, updating the older, implements them into state-of-the-art framework and software language, and integrates these new procedures into a cluster of partners in order to perform MDO on innovative aircraft configurations, such as in the AGILE European project context (Nagel and Ciampa, 2015). In general, the AGILE paradigm consists in a set of principles in which both requirements and solutions evolve through the collaborative effort of self-organizing cross-functional teams (Collier, 2011). It promotes adaptive planning, evolutionary development, early delivery, and continuous improvement, and it encourages rapid and flexible response to change (Agile Alliance, 2013). At UniNa has been created a team work well versed in different disciplines. The supervision of the workflow is entrusted to the "Architect", which is an aircraft designer or an aircraft design team. The architect points out the requirements, solutions and procedures to the team specialists. Subsequently the specialists elaborate the methodologies, implement them into software algorithm and finally integrate into the design loop framework (see Figure 1). In particular, the architect aircraft design specialist elaborates an analysis method which is implemented in an executable tool (for instance .jar in Figure 2) by the software specialist; subsequently the integrator specialist assembles a workflow into the framework in order to perform analyses on a specific aircraft or for instance MDO calculations. All the implemented methodologies can be easily modified, improved and reviewed adopting a typical AGILE procedure.