**Analyse new Agile methods capabilities to improve ArianeGroup SPACE CODE® Concurrent Engineering Framework .**

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1. **Abstract**

The recent focus on agile frameworks in Systems Engineering is a manifestation of the increasing speed at which new products and systems are designed and introduced into the market place. In the frame of this growing necessity for Agile approaches in the hardware industry, it is important, not only to embrace those approaches as cleverly as possible and to correctly define what is agile, but also to ensure that good practices that already lay results and are building on Agile principles, such as Concurrent Engineering, don’t go to waste for the sake of novelty.

In this context, and to prevent any internal competition between several methods that, in fine, want to and achieve similar results, we initiated this project of improving our Agile capabilities in our ArianeGroup SPACE CODE® concurrent engineering environment to benefit from the best of both worlds by improving on concurrent engineering through the help of what Agile approaches achieve best, and in the other hand, improve on the deployment of Agile approaches by making the teams working with those approaches adopt best practices of systems engineering that are key to the success of any complex project of the space industry.

The goal of this study, related in this paper, is to propose an improvement of our ArianeGroup SPACE CODE® concurrent engineering environment by enhancing its subscription to the 4 pillars of Agile which are:

* Individual interactions over processes and tools;
* Working Product over comprehensive documentation;
* Customer collaboration over contract negotiation, and;
* Responding to change over following a plan.

The first iteration of this work presented here focuses on the last two pillars of Agile with the scope of the study being the following: “**How to improve our capabilities to review and update the scope of a project that uses concurrent engineering?**” The study will focus its perimeter to projects in their preliminary phases (0, A, B) since it is in these phases that we make the most use of concurrent engineering.

To answer this problem, we first focused our work on clearly defining and analysing our concurrent engineering environment and the most known agile frameworks used in the industry (SCRUM, SAFe). We then performed an extensive feedback activity with ArianeGroup systems engineers to capture their experience on scope shifting projects and find solutions to address the identified pains. Finally, we tested those solutions on voluntary projects to assess the relevancy and performance of this upgrade

The resulting upgrade can be outlined as follow: Our first iteration of a more Agile approach to concurrent engineering is to improve on customers and stakeholders involvement in the iterative design process in order, not only to ensure robustness in the initial high level requirements but also, and especially, to be able to anticipate and respond efficiently and relevantly to scope shifts in the project.

This paper depicts, in addition to the definition of all relevant concepts to properly align the understanding of this essay, the history, methods and steps followed to deliver on an upgrade of concurrent engineering. It also presents the upgrade and its integration into the ArianeGroup’s SPACE CODE® Concurrent Engineering environment.