# EFFICIENT METHODOLOGIES FOR AN EFFICIENT CONQUEST OF SPACE

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**Abstract:** The space industry currently experiences a revolution driven by the increase of launchers and launch sites. Due to the high decrease in spacecrafts' size, access to space is now reachable to small organizations such as educational institutions or private companies. Whereas launch prices -and costs- are on a decreasing trend, launch frequency has exponentially increased during the last five years.

To achieve these new challenges, the industry is reinventing itself and, with this aim, the door has been opened for the introduction of cheaper technologies, largely qualified in industrial environments where the RAMS and cybersecurity requirements are still not so relevant. The development plans and methodologies have, however, not evolved at the same tempo. The European agencies stick to the old management requirements (ECSS and derived) which ensure the delivery of highly reliable products in an also highly long development time and un-flexible process.

Engineers in these agencies do not seem to feel so comfortable with these methods, since they lack flexibility and any change in the input needs constitutes an important impact on the schedule and cost of a project, therefore they begin to request the application of Agile methodologies.

Nevertheless…are Agile methodologies appropriate for the space world? Is "the space population" ready to manage a project with barely a few documents or should the documents production be integrated in the Agile iterations? How can hardware and software manufacturing be Agile? Is Agile applicable to huge projects involving tenths of stakeholders or should it only be reserved to small ones where all participants are close to each other. How can one ensure the configuration management, the regression avoidance, the effectiveness of the validation cycle, and specially the scope of the different project reviews, with an Agile methodology without exploding the effort that has to be devoted by the developers?

GTD is now finishing the development and deployment of the Ariane 6 control benches family which was first conceived as an Agile and paperless project and this paper presents a good opportunity to perform an ordered assessment about the efficacity of the Agile practices in large scale projects. It exposes, among others, where the main difficulties where encountered, which were their causes and what alternative practices were applied to overcome them. It also provides a detailed description of the applications and technologies that were deployed to streamline the design and the development tasks while ensuring full traceability of the product and its production.