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Lessons Learned in Space Systems: Achievements, Challenges, Best Practices, Standards. (5)

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LESSONS LEARNT IN THE DEPLOYMENT OF SCRUM IN SPACE HARDWARE DEVELOPMENT PROJECTS

Abstract

Scrum is an agile approach to engineering development that structures projects into rapid, adaptive iterations. While the method is well known in software its use in hardware development is not widely explored, let alone in the space engineering domain. The New Space industry started accelerating projects and development schedules. The 2017 ESA Small Satellite Challenge, for example, requested participants to propose and deliver a satellite mission in 12 months. According to their website, the US Earth Observation company Planet launches new spacecraft every three to four months. It is clear therefore that new schedule demands require new approaches to the development of space missions. At the same time, engineering teams need to learn what advantages could be gained in terms of schedule acceleration while avoiding pitfalls derived by the departure from classical development approaches.

This paper describes the lessons learnt in observing from a scientific perspective the deployment of Scrum in a hardware development project. We describe the initial challenge undertaken by the hardware development. We discuss the approach we adopted to provide a scientific characterization of Scrum and the initial results we gained in investigating Agile development approaches. We underline the challenges we have identified in the deployment of Scrum.

We finally draw lessons learnt from the experience in using Agile for a space hardware development and benchmark with the results obtained in the in-space demonstration of the hardware. This paper will be useful to spacecraft developers in industry and academia interested in exploring new approaches in the development of space hardware under accelerated schedules.