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SCRUM METHODOLOGY IN AEROSPACE PROJECTS

Abstract

Small satellites are currently becoming even more popular in the commercial sector due to their wide range of applications in such fields as Disaster Detection and Monitoring, Internet of Things and Remote Sensing. Due to a steadily increasing complexity of satellite payloads and, as the result, of the satellite projects, new questions arise: how to ensure high reliabilities while maintaining the low costs and the short development cycles, which are typical for small satellite projects; how to decrease life cycle cost even more and how to improve the planning and control processes.

This work proposes a SCRUM based method to manage satellite systems development and shows that this approach can be scaled up from a simple CubeSat to a more sophisticated SmallSat mission. The paper covers the details of SCRUM implementation on the stages of mission planning and requirements definition, design, MAIT and operations. Based on the comparison of several projects timelines, the present work shows how the SCRUM methodology decreased the life cycle costs while keeping the projects on schedule. Originally, the SCRUM methodology was applied to software development; however, this paper illustrates how helpful an adapted version of this approach is in small satellite projects. It optimizes the whole mission development process and saves resources through constant prototyping, frequent functionality demonstrations as well as the right team selection.

As an example, several projects developed by German Orbital Systems (GOS) are reviewed and aspects of requirement definition and project planning based on SCRUM methodology are covered. Later, the paper illustrates the design process adaptation for joint hardware and software development with timely fixed milestones. Finally, a comparison between parameters, such as reliability and costs of several projects developed with and without SCRUM is made and efficiency of the adapted SCRUM approach is proved.