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CHALLENGES IN THE DEVELOPMENT PROCESS FOR SMALL SATELLITE MISSION

Abstract

As the lower cost and increased launch opportunities provide more accessibility to space, the development of small satellites including CubeSats, NanoSats, MiniSats, and MicroSats have undergone a rapid change over the last few decades, and their importance in scientific research, technology demonstration and exploration are more vital than ever. The project, Seamless Radio Access Networks for Internet of Space (SeRANIS), is the first and one of its kind small satellite mission by the Universität der Bundeswehr, München (UniBw M).The characteristics of this unique satellite project require for a different approach to systems engineering techniques than what is common deployed within industry. Satellite mission of this scale in an academic environment are complex, but an affordable way to demonstrate new technologies and methodologies also provides for several opportunities to innovate on different conventional methodologies for processes, work-flow, management, resource utilization, work organization but this also comes with its own set of unique challenges

This paper outlines the challenges in the development process in a large satellite, small satellite and CubeSat mission. The addressed challenges from the different missions are compared using relevant criteria to identify the commonalities in comparison with, and as well specific issues in a small satellite mission, SeRANIS. The analysis of the challenges will be the central point in developing a suitable development process.

Keywords:Development process, Small Satellite Mission, NewSpace, In-Orbit Demonstrator, Experimental Payload