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MANAGEMENT OF SMALL SATELLITE PROGRAMS

Abstract

This paper discusses the management of a small satellite program, especially for countries that are new to the field. The discussion shows how an original Systems Architecture framework can be used as a tool to support decision making and management in small satellite programs. The Systems Architecture Framework organizes key tradeoffs and alternatives that are often left tacit; this allows leaders of small satellite programs to consider what approaches best fit their needs. The framework uses four steps to analyze management issues for small satellite programs. The first step identifies the context surrounding the satellite program; this leads to an understanding of the opportunities and constraints that influence the program. The second step identifies the primary stakeholders, which include people or organizations that participate in the program, provide funding and give oversight to the program. Stakeholders have objectives that define the requirements the program should fulfill. At a high level, objectives might include applying satellite services, building technological capability, enabling economic activity, inspiring technology applications, and building scientific knowledge. More specific goals may include operating a systems with given technical specifications; training people to achieve a particular level of technological capability; or establishing an organization. The third step of the framework considers what functions the program will execute in order to meet stakeholder requirements. The functions may span many programmatic areas, but this paper focuses on functions in three illustrative areas: technology, capability building and management. The technology functions define what the systems produced by the small satellite program will achieve. The capability building functions define how the program will seek to advance individuals, groups and organizations in their level of technical autonomy or technical complexity. The management functions define organizational approaches such as selecting partners, suppliers, team members and incentive structures. The fourth step of the framework considers alternative approaches for executing the functions from step three. This step compares approaches by considering how they align with the context, stakeholder objectives and program requirements. The paper gives examples showing how alternative approaches for executing capability building functions lead to different program outcomes. For example, capability building can be pursued via theoretical training, practical training and on-the-job experience. Each approach leads to different types of short and long term learning. The research uses evidence from past satellite programs to provide insight about architectural decisions.