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Training, Achievements, and Lessons Learned in Space Systems (5)

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ON THE VARIETY OF ENGINEERING APPROACHES WITHIN A MICRO-SATELLITE COMPANY

Abstract

Technology evolved in various ways, driven by great inventors such as Leonardo da Vinci, Thomas Edison or Henry Ford as well as by well-planned and structured invention with problem solving techniques such as Altschuller's theory of inventive problem solving (TIPS). The latter approach relies on a rigid transparent and repeatable framework that is founded on a set of historical solution principles. Da Vinci and Edison could rely on intuition and individual genius. As different as these two examples are the various engineering approaches in the space industry, in the micro-satellite branch and even within micro-satellite companies. In this paper approaches of three micro-satellite projects within one company are described. The projects are categorised and key characteristics such as team rationale and size, supplier relationship, major product measure, requirements management, documentation approach and project duration as well as environments such as customers are described. By analysing strengths, weaknesses, opportunities, and threats of the approaches conclusions for future projects in the company are drawn. This analysis is neither comprehensive nor finalised, but it is a crucial step in a continuous evolution process of a learning organisation. Within the current paper, selected instances of this analysis and its outcome are presented. Here, we focus on one of the key differences in engineering approaches: the relationship between project entities such as contractor and subcontractors. There are two opposite models for the contractor-subcontractor relationship: a) a consortium that builds on mutual trust, therefore reduces legal and formal burdens to the minimum and b) a consortium that relies on formal and legally detailed contracts. The latter option necessitates an engineering approach that concentrates on pre-defined documentation and contractually agreed deliverables whereas the trust-based consortium requires a more intensive informal interaction and coordination. These two opposite models of project-entity relationships also appear in the relationship between customer and contractor. Being aware of these differences and identifying the best fitting engineering approach is essential for mission success.