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ASSESSING THE RELATIONSHIP BETWEEN SYSTEMS ENGINEERING MPTS AND INTEGRATED PRODUCT TEAM PERFORMANCE

Abstract

Systems engineering has been identified as a key enabler to support the development of complex systems. Drawing on years of best practices from the defense and aerospace industries, practitioners have developed systems engineering models, processes and tools (MPTs) that are designed to support Integrated Product Teams (IPTs) dealing with related and often conflicting technical and programmatic requirements. Project failures are, however, still common. Part of this disconnect may be caused by a reliance on qualitative rather than quantitative data that is used to support MPT use. This research attempts to better understand this relationship by focusing on the understanding and use of specific systems engineering tools and comparing them to both individual and team performance.

The United States (US) National Aeronautics and Space Administration (NASA) supported two multi-institution projects as part of this study: Radio Astronomy on the Moon and a Science Mission to Europa. The design teams were comprised of engineering and science students from UAHuntsville (Huntsville, Alabama), Alabama A&M (Huntsville, Alabama), the College of Charleston (Charleston, South Carolina), California State University Los Angeles (Los Angeles, California), and ESTACA (Paris, France). Data was collected on team member understanding and use of three significant systems engineering tools: requirements management, functional analysis, and decision analysis. The data was then correlated with individual and team performance as determined by both internal and external assessments. Positive relationships were found between both individual and team performance. The paper also reports on ongoing plans to extend this research with additional product teams and practical applications.