

66th International Astronautical Congress 2015

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Space Technology and System Management Practices and Tools (4)

Author: Ms. Suparna Mukherjee

George Washington University, United States, suparna@gwu.edu

Prof. Zoe Szajnarber

George Washington University, United States, zszajnfa@gwu.edu

INFLUENCES AND IMPACT OF FUNDING PARADIGMS IN ADVANCED TECHNOLOGY
INFUSION**Abstract**

New technology adoption or infusion has been a significant challenge across many aerospace applications. Both mission-enabling capabilities and technologies providing incremental improvements to existing systems face obstacles to successful implementation at various phases of mission development. Differing paradigms for flight technology development have been proposed and used to encourage infusion, however it is often difficult to answer the question of how well a particular approach actually fares over mission infusion timelines that may exceed the lifetime of early technology funding entities. Shifts in organizational priorities or funding constraints also limit the value of considering simple tallies of successfully adopted technologies as metrics to evaluate the efficacy of early technology development approaches. Additionally, for more complex, and highly-coupled missions with new system capabilities, considering only infusion rates of component technologies may not reflect the true improvement to mission performance.

This paper explores the impact of a technology development program beyond the metric of simple infusion rates. The objective of this effort is to examine this broader technology development and infusion ecosystem including the individuals and teams who successfully infuse new hardware and software systems into flight missions. Specifically we look at new technologies developed for Mars Science Laboratory (MSL) mission by NASA's Mars Technology Program (MTP). Process histories were built from in-depth interviews with technologists and program managers, and triangulated with archival data that includes publications as well as program and project documents.

Analyzing this information allowed us to gain a more complete view of the value of MTP with respect to the MSL mission and the Mars Program. We present this data and identify specific factors of impact not previously considered. Using these observed concepts, we propose improved approaches to new technology planning, investment and development.