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NASA'S CAPABILITY-FOCUSED PROCESS FOR PRIORITIZING NEW TECHNOLOGY INVESTMENTS

Abstract

The NASA Space Technology Mission Directorate, with a charter to develop cross-cutting technologies needed for future space missions, has embarked on a new effort to enhance the formulation processes that it uses to identify and prioritize technology investments. The organization currently has eleven separate programs and each has evolved its own unique processes for determining how to invest its limited resources. Each separate program calls on a largely common set of experts for consultation and review, which overtaxes the time of those individuals.

The technology programs are principally organized by technology development stages: early stage innovation, maturation, and demonstration. In addition, some programs relate specifically to different types of implementing individuals and groups such as: university students and faculty, independent researchers and inventors, NASA employees, private companies under contract, and private companies or others in funded or unfunded partnerships with NASA. Also, in some cases different programs employ particular acquisition mechanisms including: grants, fellowships, contracts offered to small businesses, contracts offered to all through full and open competition, directed in-house projects, prizes and other competitive challenges, flight opportunities, internal or external studies, workshops, institutes, Cooperative Agreements, Space Act Agreements, and other types of partnerships.

While the space technology organization is expected to maintain its separate programs, the new formulation process shifts the emphasis from a program orientation to one which focuses on the outcome of technology development efforts, namely new capabilities. Using a Steering Panel of technology development experts, a set of key capability challenges for NASA were identified. These capabilities were defined as the most important and compelling capabilities that could be realistically and meaningfully advanced with the anticipated resources in the timeframe of the formulation cycle. Capabilities could involve work in early stage innovation, maturation, and/or demonstration.

The paper will further describe the process by which the Key Capability Challenges were developed. It will describe the steps in the formulation process that followed including the open solicitation of proposed new technology development content from across the agency, the process for selecting the most relevant and compelling proposals for further consideration, and the allocation of that proposed new content to the appropriate programs for implementation. The outcome of this process through its first year of implementation will be described along with lessons learned and expectations for how it will be improved for application in subsequent years.