

Predicting USMC SBIR Phase I to II Transition Success by Evaluating Use of Systems Engineering Capabilities

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Abstract: Defense research and development budget cuts, increased pressure from the acquisition community to find research funding, and a congressional directive enforced by the under secretary of defense for acquisition and technology have created a climate where the U.S. Marine Corps Small Business Innovative Research (SBIR) program must improve its ability to transition technology it develops into acquisition programs. One approach to accomplishing this is by applying systems engineering to the SBIR process. Though no formal systems engineering process exists for its SBIR program, the Marine Corps wishes to understand the relationship between the systems engineering capability of Phase I SBIR projects and the likelihood of transition to Phase II. This study seeks to shed light on this relationship.

Technical organizations face increased pressure to produce more with less resources. Reductions of Department of Defense (DoD) budgets over the last several years have increased competition for defense-related research, development, and acquisition (RD&A) funding (Petee and Compton, 2000). That has forced many DoD agencies to change their practices to adapt to the leaner fiscal climate. One program indirectly affected by these changes is the SBIR program. The SBIR program is managed by the Small Business Administration (SBA) and made available to several agencies within the government, one of which is the DoD (Wessner, 1999).

In spite of defense RD&A budget restrictions, congress continues to strongly support the SBIR program. However, the focus of the SBIR program, especially within DoD, has changed significantly. In February of 1999, in response to congressional

legislation, Under Secretary of Defense for Acquisition and Technology (USD for A&T) Gansler submitted a plan that required SBIR programs to be sponsored by and be in direct support of defense acquisition programs (Gansler, 1999). Pursuant to the plan outlined by USD Gansler, the United States Marine Corps (USMC) SBIR projects office at Marine Corps Base Quantico set out to improve their SBIR process by determining what factors contributed to successful SBIR projects.

Generally, SBIR projects are divided into three phases (SBIR Program, 2001). Phase I and Phase II are funded by the SBIR programs office; Phase III is not funded by the SBIR programs office. Phase III is the responsibility of the program manager. Each phase has a specific purpose, with Phases I and II having specific cost and schedule limitations. Within the USMC, SBIR Phase I is defined as the concept feasibility study and engineering design, lasting no more than nine months and expending up to \$100,000. If a concept proves acceptable, then the project transitions to Phase II. Phase II continues Phase I with the goal to develop a working prototype, lasting up to 30 months and costing up to \$750,000. Systems developed in Phase II can be produced in quantity, with modifications if necessary. Phase III is defined as an acquisition process in which both government and industry can benefit. Phase III has no specific limit on project life or cost, instead these are based on user requirements (MARCORSYSCOM SBIR Program, 2001).

As stated, Gansler's plan required DoD SBIR projects to directly support defense acquisition programs. In the early 1990s, congress passed acquisition reform legislation. One of the central components of acquisition reform was using system engineering throughout all phases of a project life cycle. The connection of SBIR projects to acquisition programs increased

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Refereed research manuscript. Accepted by John V. Farr, special issue editor.