"Evolutionary Acquisition" Is a Promising Strategy, But Has Been Difficult to Implement

I n 2003, the U.S. Department of Defense (DoD) specified evolutionary acquisition (EA) as the preferred approach to weapon system acquisition, and spiral development as the preferred means of implementation. EA strategies aim to develop new capabilities in multiple increments, as opposed to the traditional strategy of developing a full capability in a single, lengthier step. EA strategies are meant to reduce the time it takes to field operationally useful equipment, control technical risk and cost growth, and make cost estimates more reliable for each stage of development, while allowing greater flexibility to evaluate and improve a program based on experience in the field. This greater flexibility arises in part from the fact that, with the spiral development approach, the end-state requirements are not known at program initiation, but rather emerge and evolve through an iterative process of phased development and operational testing. However, there is little documented evidence to assess the policy.

RAND Project AIR FORCE (PAF) has performed research to help the U.S. Air Force acquisition management community formulate cost analysis and program management policies that anticipate and respond to more widespread use of EA strategies. As part of this effort, PAF studied the implementation of EA concepts in five defense space acquisition programs. Space programs were chosen because they have recently grown in importance for the future of the Air Force, they are central to DoD's plans for transforming the U.S. armed forces, and they reflect the Air Force's recent review and overhaul of space acquisition policy to include the use of EA concepts. The case studies suggest the following conclusions:

- **The existing acquisition environment is not conducive to the uncertainties inherent in EA programs.** Political, bureaucratic, and regulatory influences favor more detail about the end stages of a program, including its estimated cost at completion, than EA strategies using spiral development can provide. These pressures have forced program managers to seek larger technical advancements in the early phases of a program, map out longer-term technical plans in greater detail, and attempt to reduce up-front uncertainties about end-state requirements, thereby mitigating the benefits of lower risk and greater flexibility.

- **EA programs require an evolutionary costing approach.** Analysts must update their cost estimates at each stage of the program, requiring substantial interaction with engineers and contractors. Long-term program life-cycle cost estimates at the early stages of a program are impractical given the intentional uncertainty involved in spiral development.

There is a strong consensus among the cost analysts interviewed that EA is an important and useful tool that can benefit program managers if handled with care. Further research is needed to determine how EA can be implemented most effectively given the political, bureaucratic, and regulatory realities of the current acquisition environment. ∎

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