Evolutionary Acquisition and Spiral Development

To clear up confusion about evolutionary acquisition strategies and the spiral development process, the under secretary of defense issued a memorandum in April 2002 defining these processes. That information is repeated in this article.

The publication of Department of Defense (DoD) Directive 5000.1 and DoD 5000.2 established a preference for the use of evolutionary acquisition strategies relying on a spiral development process. Since those directives have been published, there has been some confusion about what these terms mean, and how spiral development impacts various processes such as contracting and requirements generation that interface with an evolutionary acquisition strategy. The purpose of this article is to address these questions.

Evolutionary acquisition and spiral development are methods that will allow us to reduce our cycle time and speed the delivery of advanced capability to our warfighters (Figure 1). These approaches are designed to develop and field demonstrated technologies for both hardware and software in manageable pieces. Evolutionary acquisition and spiral development also allow insertion of new technologies and capabilities over time.

These approaches provide the best means of getting advanced technologies to the warfighter quickly while providing for continual improvements in capability. Evolutionary acquisition and spiral development are similar to pre-planned product improvement but are focused on providing the warfighter with an initial capability that may be less than the full requirement as a trade-off for earlier delivery, agility, affordability, and risk reduction.

Evolutionary Acquisition

Evolutionary acquisition is an acquisition strategy that defines, develops, produces or acquires, and fields an initial hardware of software increment (or block) of operational capability. It is based on technologies demonstrated in relevant environments, time-phased requirements, and demonstrated manufacturing or software deployment capabilities.

These capabilities can be provided in a shorter period of time, followed by subsequent increments of capability over time that accommodate improved technology and allow for full and adaptable systems over time. Each increment will meet a militarily useful capability specified by the user (i.e., at least the thresholds set by the user for that increment); however, the first increment may represent only 60 percent to 80 percent of the desired final capability.

There are two basic approaches to evolutionary acquisition. In one approach, the ultimate functionality can be defined at the beginning of the program, with the content of each deployable increment determined by the maturation of key technologies.

In the second approach, the ultimate functionality cannot be defined at the beginning of the program, and each increment of capability is defined by the maturation of the technologies matched with the evolving needs of the user.

Spiral Development

The spiral development method is an iterative process for developing a defined set of capabilities within one increment. This process provides the opportunity for interaction between the user, tester, and developer. In this process, the requirements are refined through experimentation and risk management, there is continuous feedback, and the user is provided the best possible capability within the increment. Each increment may include a number of spirals. Spiral development implements evolutionary acquisition.

Increment or Block

An increment or block is a militarily useful and supportable operational capability that can be effectively developed, produced or acquired, deployed, and sustained. Each increment of capability will have its own set of thresholds and objectives set by the user.

Pre-Planned Product Improvement

Pre-planned product improvement (P3I) is a traditional acquisition strategy that provides for adding improved capability to a mature system.◆

Additional Information

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Figure 1: *Evolutionary Acquisition, Spiral Development, and P3I*