

Time Phase Requirements
In Support of
Evolutionary Acquisition

Context

Present Acquisition and Requirements encourage the use of EA. However, the difficulties begin when trying to generate time-phased requirements. The following slides will describe the challenges and benefits, and provide some examples of how to work requirements for an evolutionary acquisition program.

The CJCSI 3170.01, Requirements Generation System series provides the guiding policy for preparing and processing mission need statements, operational requirements documents, key performance parameters, capstone requirement documents, and presenting requirements and programs to the Joint Requirements Oversight Council (JROC).

The DoD 5000 series (DoD Directive 5000.1 and DoD Instruction 5000.2) set forth the Department's policy relative to acquiring and upgrading weapon systems, command and control systems, decision support systems, and information technology systems.

Challenges

- Identifying the “time-phased” requirement
- Overall program vision
- Collaboration – Warfighter/Acquirer/Industry
- Money – Color/Category
- Management Intensive – Grow better PMs (Both Gov’ t and Industry)
- Evolving Requirements (New threats/System experience)
- Total Life cycle management
- Remaining flexible (don’ t lock in requirement until last minute)
- How/When to do you re-compete or move to another system

EA Attributes

- Identifies the Warfighter's needs versus time
- Deliver new technology sooner
- Collaboration is paramount
- Provides a process or avenue to incorporate technology advancements

Tools and Processes

- EA is the Strategy
- Spiral Development is one of the Processes
- Configuration Management is critical to success of EA strategy

Considerations

- Requirements Generation is the front-end of the Acquisition Process
- Evolutionary Acquisition must be supported by the early planning of time-phased requirements
- Must be the strategy from day-one, not a fall-back plan when the traditional single product delivery can't be met
- Each increment shall meet a threshold key performance parameter set by the user
- Each increment shall provide an acceptable level of military utility in case no further program funding is approved

Time-phased requirements in support of Evolutionary Acquisition (EA) must be a strategy developed from the onset. By doing so, it necessitates the requirements developer to think in achievable incremental capabilities.

To have an effective EA strategy, it must be the strategy from day-one. Some programs run into problems because they cannot meet KPP Thresholds, and the strategy quickly becomes EA. While this may be inevitable, it is not the desired method of planning.

Each increment will have a threshold value. The “core” capability shall be interpreted as the minimum acceptable value, i.e. Threshold value.

Because of funding uncertainty, the requirements developer must define an acceptable set of threshold KPPs for the Warfighter. If no more money becomes available, then the Warfighter must feel comfortable that whatever is available will in fact have significant military utility.

Cautions

- Don' t front-end load capabilities because of a fear of only funding the first increment
- Block 1 or Increment 1 should be achievable utilizing mature technologies
- Carefully perform Logistics Support Planning. Multiple variants can result in added: spare parts, user training, and maintenance training

Given funding uncertainty, don' t try to out-fox the system by front-end loading performance capabilities. This can add performance complexity and drive cost of development upward which may jeopardize the program.

Focus should be on mature technologies, in order to reduce acquisition cycle time.

When adopting an EA strategy, it acknowledges fielding multiple variants. This means that each weapon system in the field will be different from its earlier delivered system. Note: This presumes that older models are not retrofitted to the current configuration.

Storage of spare parts will be a factor as will the training of users and maintainers of the different models of the system.

Benefits

Government:

- Warfighter receives a militarily useful product sooner
- Replacement of old systems may be achieved more rapidly – spend less on O&M because new systems are put into use
- Because mature technologies are being used, less time and thus less money should be spent on product development

Industry:

- Because mature technologies are being used, production can start sooner
- Opportunity for more production quantities because less is spent on R&D and more on producing the product
- Less likely for program cancellation, since mature technologies are used

Government:

The obvious benefit should be the faster delivery of the weapon system to the Warfighter. The next benefit should be less expensive systems development, since mature technologies are being employed. Also contributing to cost savings can be the removal of obsolete and maintenance intense systems with modern weapon systems. Hopefully the newer systems will last longer and have greater mean-time-between-failure rates.

Industry:

By using mature technologies, production should start sooner. If manufacturing of a systems depends on developing a technology it will take a longer time to start the production line. If unit costs are lower because technology risk is lower, program offices may be able to get more funding for production items rather than spend it on development and risk reduction.

Manufacturing a product with known technology should allow stable production quantities. This should reduce the chance of cancellation or termination-for-default because the weapon system struggles to meet threshold KPP values because of immature technology.

Operational Requirements Document (ORD)					
Sample Format					
ORD 1		ORD 2		ORD n	
KPP	ORD T/O	KPP	ORD T/O	KPP	ORD T/O
Range	1000/ 3000 miles	Range	2000/3000 miles	Range	2500/3000 miles
Endurance	30 hours with 4 UAVs	Endurance	24 hours with 3 UAVs	Endurance	30 hours with 3 UAVs
Interoperability	Tracking info to AWACS and JSTARS – 100% of critical IERs	Interoperability	Tracking info to Navy, Army UAV systems – This is 100% of critical IERs	Interoperability	Tracking info to all military satellites – This is 100 % of critical IERs
Explosive	200/500 pounds	Explosive	300/500 pounds	Explosive	400/500 pounds

This example uses a variation of the AFIT Unmanned Aerial Vehicle (UAV) to assist with presenting incremental development and delivery of a weapon system. Some modifications were made to the AFIT model to emphasize our points supporting an Evolutionary Acquisition strategy.

Section 4 of the ORD will recommend that the Key Performance Parameter (KPP) Threshold and Objective values be presented for increment or block 1, increment or block 2, and increment or block “n”.

ORD 1 should have established values. Where feasible subsequent ORDs will also reflect Threshold and Objective values. This approach recognizes that the 100% solution is technologically difficult to achieve and the Warfighter has accepted a less-than 100% solution, perhaps an 80% solution.

The table format compels the requirements generator to think beyond the initial deliverable. Since in many instances, as ORD 1 products are being produced, it is time to start developing ORD 2 KPP Thresholds and Objectives.

The table format will also allow the reader to view the progress from ORD 1 to the final full-up product. It will show progressive increases in performance capabilities.

Conclusions

- Evolutionary Acquisition (EA) is a preferred approach.
Question not using an EA approach.
- Used correctly, products can be acquired and delivered to the Warfighter in a shorter time
- EA should significantly reduce technical risk because products would reflect the state-of-the-possible rather than leading edge technologies.
- Both the Warfighter and Industry can benefit from EA

Guiding Documentation

<http://www.dtic.mil/doctrine/cjcsdirectives.htm>

CJCSI 3170.01, Requirements Generation System:

Time-phased requirements are essential to evolutionary acquisition and are strongly encouraged as a preferred approach to establishing and documenting operational needs.

<http://www.dtic.mil/whs/directives/corres/dir2.html>

DoDD 5000.1, Defense Acquisition System:

Evolutionary Acquisition strategies shall be the preferred approach to satisfying operational needs

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