

# Critical Thinking

## An Overview of the Defense Acquisition System

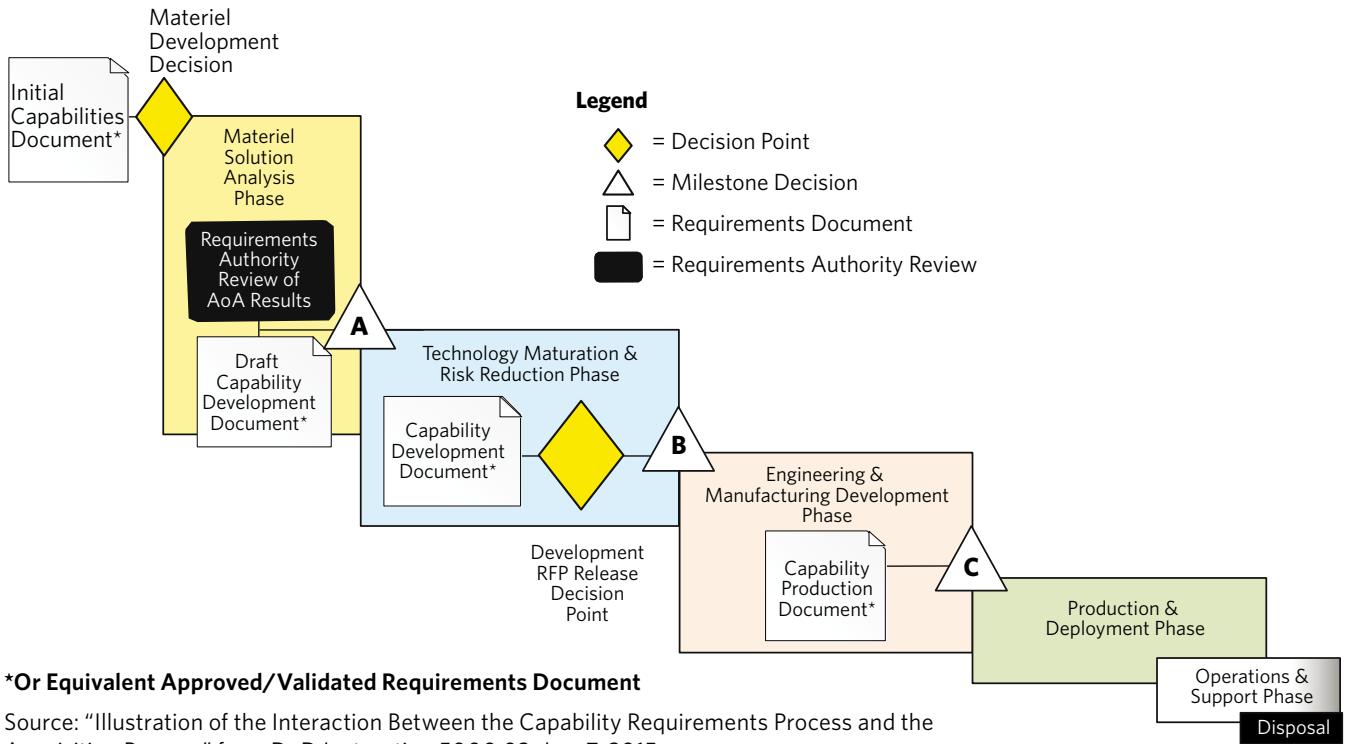
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What is critical thinking as it relates to acquisition in the Department of Defense (DoD)? I think most of us understand critical thinking in our daily lives as the use of deep thinking to tackle problems. But what does it really mean in terms of DoD acquisition? I believe it is related primarily to understanding the “why” of what we do on a daily basis rather than focusing on the “what” of what we do. In other words, we need to fully understand the thinking that went behind the policy and procedures that we follow regularly. Most of us go through the processes and procedures because we have to, not because we understand fully why we should be doing them.

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**Figure 1. Progressing from High-Level to Technical Requirements and Specifications**



### The Defense Acquisition System Models

Let's think about the Defense Acquisition System (DAS) that we work in every day. We follow six models when we acquire defense systems. This is the new approach to acquisition. We formerly had but one model. The reality, however, is that we have and always have had an infinite number of models to follow, depending on what makes the most sense for our programs. We never were supposed to adhere rigorously to just one model or six models to meet all our programmatic needs for acquisition. The models always were supposed to serve as notional guidance that could be tailored to meet the specific needs of the program being developed. All programs are different and need to reflect that difference in how they are developed so they can efficiently acquire the systems our warfighters need.

If we want to tailor a system model to make it unique to our programmatic needs, we need to understand the rationale behind the models. We also need to understand the "why" behind all the piece-parts that make up each acquisition model. Ultimately, the thinking is very easily understood.

Basically, the DAS models are designed primarily for major acquisition programs that have a long production line and/or a long Operations and Support phase. The models then are designed to reduce the risk of not meeting the agreed-upon Milestone B affordable cost, achievable schedule and operational performance. Everything in the DAS hinges on Milestone B in one way or another, as I will explain.

The purpose of each phase in the DAS models is as follows:

**The Materiel Solution Analysis (MSA) phase** primarily is used to scope the problem defined by the user in the Initial Capabilities Document (ICD). The MSA phase is focused on scoping the solution through the user's Analysis of Alternatives (AoA). The AoA is a user-led refinement and scoping of capability needs against available and achievable technologies and affordable cost.

**The Technology Maturation and Risk Reduction (TMRR) phase** is used to solve the problem and determine a buildable solution as ultimately defined by the design solution that results from the Preliminary Design Review preceding Milestone B. Another way to look at the first two phases of the DAS models is that the MSA phase leading to Milestone A involves the coarse tuning of the system design solution, and the TMRR phase leading to Milestone B involves fine tuning the system design solution. We need to have a buildable solution leading into Milestone B in order to be able to fully determine a low-risk relationship between affordable cost, achievable schedule and operational performance that will be agreed upon and defined at Milestone B in the Acquisition Program Baseline (APB). The APB is informed by the Capability Development Document (CDD). The user develops the CDD to explain the capabilities the system solution needs to meet and the Initial Operational Capability (IOC) need date for the ultimately deployed system

solution. The success of the program will be based on the APB agreement for the remaining phases of the DAS models.

**The Engineering and Manufacturing Development (EMD) phase** now makes more sense in terms of its name. We are not using this phase to solve the problem or to design a buildable solution but rather to design a producible, maintainable solution. In other words, we use the EMD phase to design from the buildable solution, a solution that can be affordably manufactured on a production line for reduced cost and a limited defined schedule without sacrificing operational performance quality. This producible, maintainable design is the result of the Critical Design Review (CDR). The producible, maintainable design also is focused on determining the manufacturing methods required to efficiently produce the system solution on an affordable production line.

**The Production and Deployment phase** is focused on production, assembly and deployment of the system solution within the parameters defined by the APB as informed by the Capability Production Document (CPD). The user develops the CPD to define the capabilities that the production items must meet, as well as the necessary production line to meet the user's needs. It is an update and refinement to the CDD with additional information focused on production and delivery of the system solution.

**The Operations and Support phase** focuses on using and supporting the system solution in the operational environment. In this phase, we also focus on maintaining the system and upgrading or refining the system based on additional user needs as defined in the field. In using and maintaining the system, the user will discover additional needs that arise from changing threats and field conditions. Additional work may be required to support the system solution in this phase.

### Summary

When all of this information is taken into account, it is easy to see how the big picture for the DAS fits together. Once you understand how it all fits together, you can see where and how to tailor and configure the DAS models to fit the specific needs of an individual and unique program. In this case, as we have said before, critical thinking is related primarily to understanding the "why" of what we do on a daily basis rather than focusing on the "what" of what we do. By fully understanding the thinking that went into the processes and procedures that we follow regularly, we can use that critical thinking to tailor those processes and procedures. In this way, we can reduce risk in our programs by making the processes and procedures as unique as the programs themselves and can reduce waste and overhead in the program structure and models. &

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