

Today's Complexities Demand More Chefs, Fewer Cooks!

David Riel





IF YOU'RE A COOK, YOU HAD BETTER BECOME A CHEF! DO you know the difference? A cook can follow a recipe and prepare a nice meal, but a chef can take a variety of wide-ranging ingredients, understand how they complement each other, and create a gourmet feast. Have you ever watched "Chopped" on the Food Network? Each chef contestant is given a basket of eclectic ingredients and a challenging schedule to fix an epicurean dish that their customers, the judges, will fawn over. Sound familiar? We live in an increasingly complex acquisition world where just following a Department of Defense Instruction (DoDI) 5000.02 recipe will not suffice to provide your customer, the Warfighter, with the "dish" needed for success. For example, if you were to have taken the Defense Acquisition University's Intermediate Systems Acquisition course 10 years ago, you would have been shown a single, phased-approach model, the Defense Acquisition Management System (Figure 1).

Five years later, with a recognition that software is developed and procured differently than hardware, DoDI 5000.02's refresh would have exposed you to six different models, a combination of hardware and software-dominant paths. An appreciation that the break between phases is not a smooth process led to the revamping of the hardware model, as well (Figure 2).

Today, our acquisition world's complexity has expanded even more, recognizing that different situations require different urgencies, tools, and solutions. This has resulted in the Adaptive Acquisition Framework, whose latest draft includes the 2019 DoDI 5000.02 process as only one of the six potential paths to acquiring the best Warfighter solution (Figure 3).

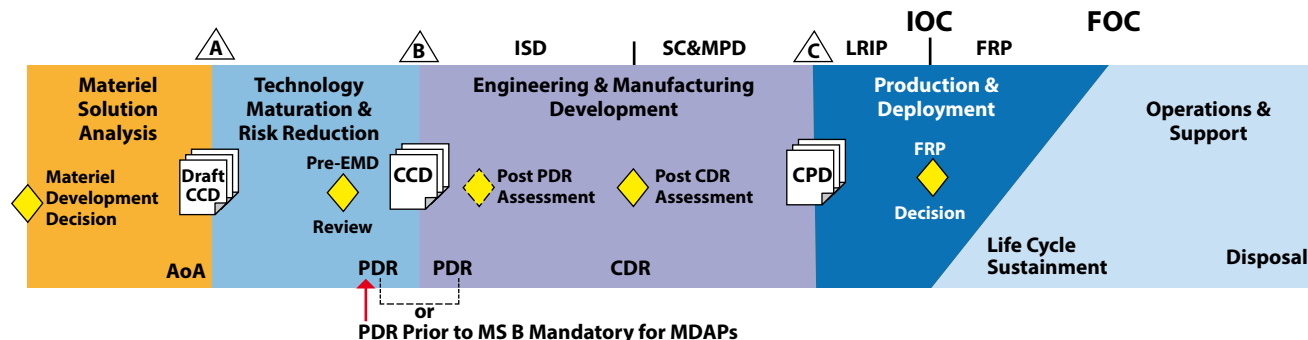
You need to become a chef! Gone are the days of being able to simply follow the prescribed Milestone A, B, C recipe. But how to make the change? First, you need to understand the circumstances presented to you. What is the "speed of relevance" for your program? How flexible and/or stable are the requirements? Have you established an enduring conversation with your customer to discuss requirements options? Then you will need to apply a thorough understanding of the major ingredients that will spell success or failure for any program. What are they? Let me suggest the following as a start.

Acquisition Pathway

Where does your effort fit into the new Adaptive Acquisition Framework? Are you trying to exploit some new innovative technology and provide the Warfighter with residual operational capabilities? Explore the Middle-Tier Acquisition (MTA) Rapid Prototyping path. Is there some

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Figure 1. Defense Acquisition Management System (2008–2013)



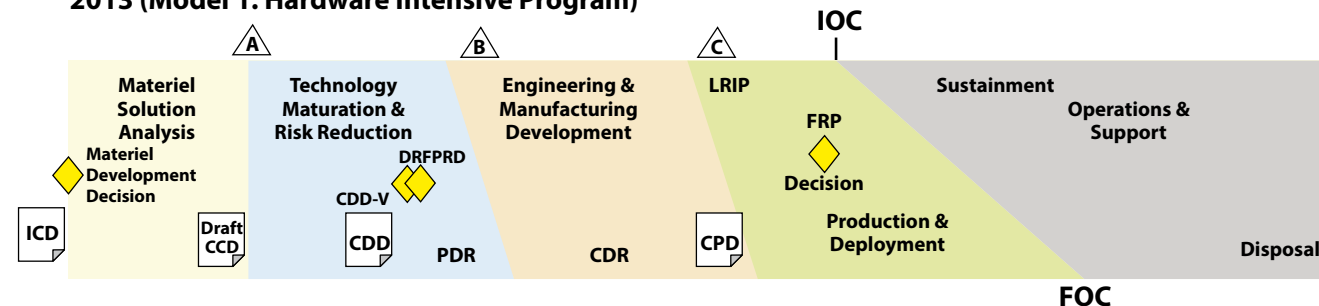
KEY TO ABBREVIATIONS, ALL FIGURES

AoA=Analysis of Alternatives; ATP=Authority to Proceed; CCD=Contract Completion Date (CCD-V=CCD-Verification); CDD=Capability Development Document (CDD-V=CDD-Validation); CDR=Critical Design Review; CPD=Capability Production Document; DD=Disposition Decision; DRFPRD=Decision Review, Preliminary Design Review; EMD=Engineering and Manufacturing Development; FOC=Full Operational Capability; FRP=Full-Rate Production; I=Iteration; ICD=Initial Capabilities Document; IOC=Initial Operational Capability; ISD=Integrated System Design; LCC=Life-Cycle Cost; LRIP=Low Rate Initial Production; MDAPs=Major Defense Acquisition Programs; MDD=Materiel Development Decision; MS=Milestone; MVCR=Minimum Viable Capability Release; MVP=Minimum Viable Product; MSC=Milestone C; O&S=Operations and Support; OD=Outcome Determination; PDR=Preliminary Design Review; R&D=Research and Development; SC&MPD=System Capability and Manufacturing Process Demonstration.

Source for Figures 1-3: DoD Instruction 5000.02.

Figure 2. Defense Acquisition System, Model 1 (2013–Present)

2013 (Model 1: Hardware Intensive Program)



proven technology, perhaps exploiting a commercial use, that you can produce quickly and field within 5 years? If so, then, MTA's Rapid Fielding path might be right for you. Is software the major acquisition product, perhaps an upgrade to a command and control product? Why not follow the Software Acquisition path? Of course, there is nothing evil about the traditional Major Capability Acquisition path, which can and should be tailored to meet your specific needs. But it is crucial that you understand the requirements and benefits, along with the risks, of taking these different acquisition pathways, and then choose the pathway most appropriate for your program.

Contracting Strategy

Congress recently expanded some tools for finding and getting the right defense industry contractor on-board for our programs. Beyond traditional contracting vehicles based on the Federal Acquisition Regulation, Other Transactions (OTs), and Commercial Solutions Openings (CSOs) have provided some great additional options. Are they right

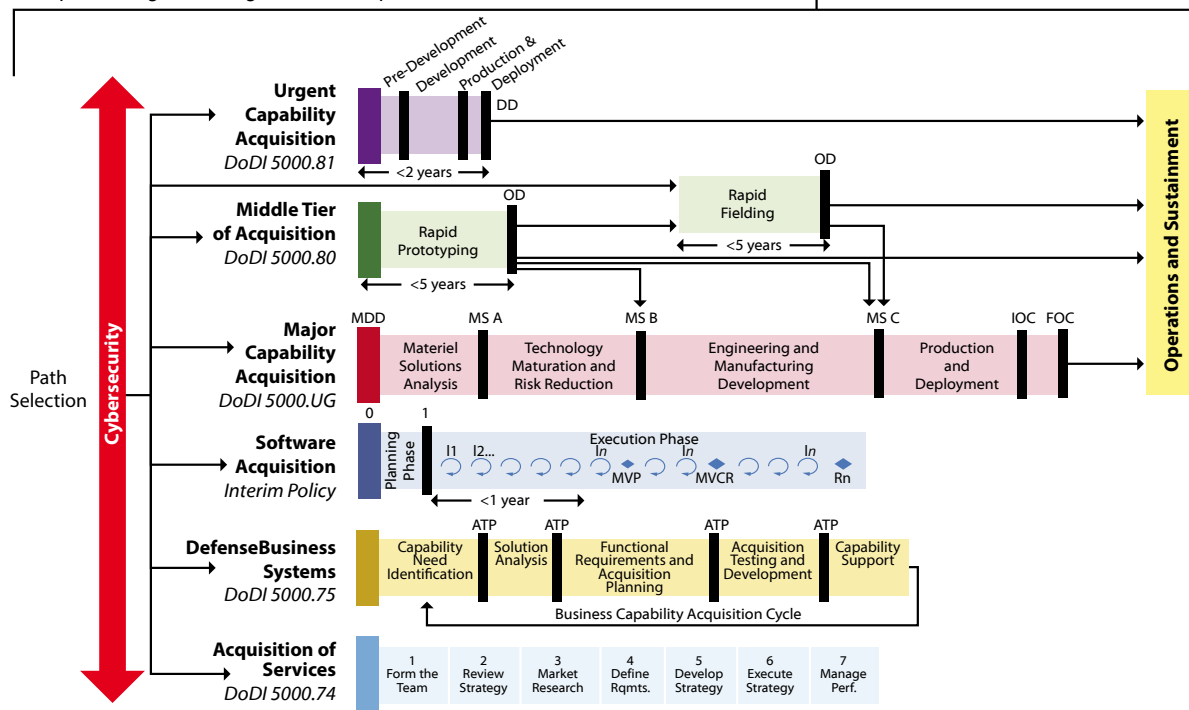
for your program? Does your program meet the Three Ps of OTs—purpose, prototype, and participation? Many of your colleagues have embraced these contract vehicles, as evidenced by a rapid increase in OT use over the past several years. However, beware of statements that imply one contract vehicle is superior to all others. Some dishes need salt, and some need sugar. Just because both flavorings are white granular substances doesn't mean it is appropriate to use them interchangeably. A good understanding of contract strategy differences can mean the difference between success and failure. If risk is too high and you've demanded a fixed price contract, industry proposals will reflect that. In such a case, you can likely gain flexibility and save money using a cost-reimbursable vehicle. You can often save time using an OT, but not always. The experts say that if you're using OTs for the sole purpose of saving time, don't! Always remember the reason you choose a particular contracting vehicle is to properly incentivize the contractor to provide your end users with the product they need, when they need it.

Figure 3. Adaptive Acquisition Framework

Tenets of the Defense Acquisition System

- 1. Simplify Acquisition Policy
- 2. Tailor Acquisition Approaches
- 3. Empower Program Managers
- 4. Conduct Data Driven Analysis
- 5. Actively Manage Risk
- 6. Emphasize Sustainment

DoDD 5000.01: The Defense Acquisition System
 DoDI 5000.02: Operation of the Adaptive Acquisition Framework



Funding Strategy

How will you get the money to run your program? Beyond the traditional Planning, Programming, Budgeting and Execution (PPBE) system that requires 2 years of foresight for acquiring funds, are there other sources of more immediate funding? Are you aware that the DoD has a Rapid Prototyping Fund administered by the Under Secretary of Defense for Research and Engineering? Could that bridge the 2-year gap between a great technological opportunity now and establishing your long-term funding line through PPBE? If you can go faster via additional funds, have you explored getting on your service's Unfunded Requirements List or pursued Reprogramming Requests? You need a thorough grasp of all of your options to get the required money, in the right appropriations, at the right time. Depending on your total budget, you will have a variety of reporting and accountability requirements. Have you accounted for those in your timelines? Can they be waived, when appropriate? Understanding your program deeply enough to predict the funds needed, in the appropriations category needed, will allow your team to ensure the money is available in time.

System Engineering, Metrics, and Risk/Opportunity Management

What is your path to getting the technical solution to work? Are you prototyping the hard stuff first—i.e., “the quickest path to failure,” as Dr. Bruce Jette, the Army’s

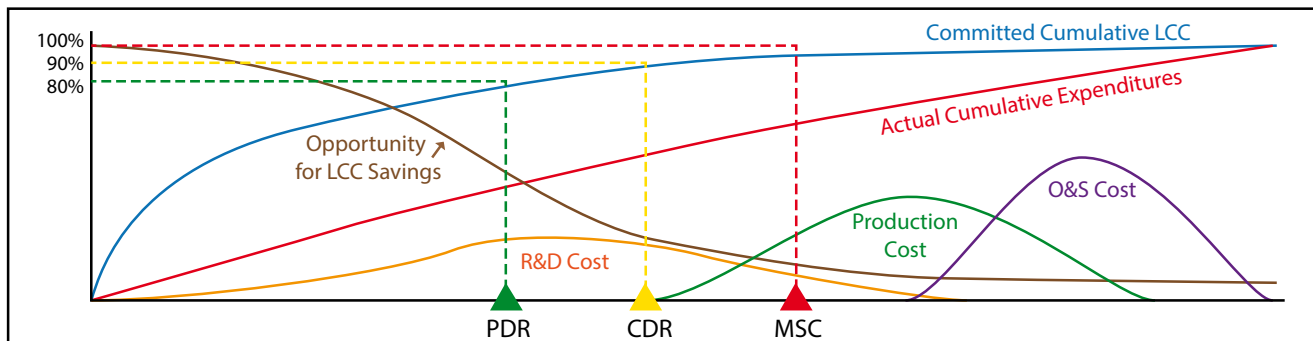
Acquisition Executive would say. One of the most important system engineering tasks is to develop and maintain a rigorous risk and opportunity management plan. With today’s need for products to be delivered at the speed of relevance, it is essential that your team thoroughly recognizes the risks facing the proposed solution. How can those risks be mitigated? Will they be assumed, transferred, controlled, or avoided? And don’t forget about opportunities. Are any available that would increase speed or performance? What resources are needed to enable pursuit of those opportunities?

This risk/opportunity management plan is not to be built and put on a shelf, but to serve as a steady guide as the product matures. If your product is software, do you understand the Risk Management Framework and how to best exploit its virtues to improve your software product? Is agile software development the right methodology for getting your software matured and in the users’ hands? If not, why not? A good strategy for developing the technical solution for the warfighter’s requirement is essential to your program’s success.

Integrated Testing

Employing a collaborative effort with the warfighter and tester, have you established a test and evaluation plan to ensure that your product meets that customer’s needs? What

Figure 4. Life-Cycle Cost (LCC) Savings Opportunities



Source: Defense Acquisition University course: PGM 201B—Intermediate Production, Quality, and Manufacturing, Part B.

type of testing does your product and chosen acquisition path demand? A program manager's worst nightmare is to contract for a product and successfully execute that product, only for the warfighter or tester to find it inadequate. If you follow a rapid prototyping pathway, you should engage in a test-learn-fix-test approach with multiple user test points in a series of small, targeted events, while maximizing modeling and simulation to increase your speed. A Test and Evaluation Master Plan will be required for the traditional Major Capability Acquisition approach; however, you should tailor it to increase testing's influence on your development efforts. Like many of the functional offices, these vital activities can appear to program managers as impediments. However, they serve a vital role. Engaging with them early and developing a common understanding of schedule and technical requirements can foster an environment of mutual support toward the common goal of getting war-winning technology faster into the hands of the warfighters. Still, you also need to ensure that it stays in their hands. So, it is crucial that you track sustainment and producibility, starting early in the design process.

Sustainment and Producibility

One of the potential pitfalls of the rapid prototyping path could be the neglect of production and sustainment costs in the effort to ensure that the product reaches residual operational capability within the 5-year window dictated by Congress. Studies have shown that, by the time the Preliminary Design Review is conducted, approximately 80 percent of the program's life-cycle cost (LCC) is determined, even though only a small percentage of the program's cumulative costs has been spent. This early design work is the place where the team has the best opportunity to impact LCC. By the time of the Critical Design Review, the LCC commitment is approximately 90 percent (Figure 4).

Production, logistics, and other considerations must be exhaustively understood and prioritized early or your program could easily become unaffordable. Prototyping

emphasizes an experimental philosophy in order to get innovative technology to work. Without a strong program manager emphasis, there is little incentive to focus on future LCC drivers—i.e., production, operations, and support. Also, award fee contracts, which allow for profit margins to be influenced subjectively, and to include consideration of items such as affordability and sustainability, are highly discouraged. This may dissuade the government/contractor team from paying much heed to these longer-term factors. Like a chef who has visualized the flavor and presentation of the final dish early in the cooking process, your team must emphasize sustainment and producibility early in the design process to ensure that the final product is technologically superior, producible, and affordably sustainable.

As a former senior manager of manufacturing at one of our industry partners, which produced the interiors of the canceled VH-71 Presidential Helicopter, I can testify how early design decisions can subvert manufacturing's ability to produce an affordable product.

Yes, a number of other factors must be decided on, managed, and tracked in order to produce a successful product for our warriors. Your team cannot forget to ensure the myriad other elements—such as environment, safety, and occupational health, spectrum certification, airworthiness, unique identifiers, energy policy, etc.—that must all be addressed for the program to succeed. However, the thorough understanding and vetting the above six major ingredients will allow you to master the complexities of today's acquisition world. With that mastery, you will no longer feel the need to open up the DoDI 5000.02 cookbook to find the recipe for creating a good product. Instead, when you open up the basket of ingredients that the requirements and acquisition community has handed you, you'll be able to create a gourmet, masterful acquisition strategy. Bon Appétit!

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