Integrated Master Plan Analysis

The PMAG Approach

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It has been widely recognized that there is room for improvement in the Department of Defense's program management, program control, and acquisition design review processes. DoD can improve the success of its acquisition workforce by providing acquisition professionals with a better framework from which to work, by instilling passion and understanding in them from an early point in their careers, and by putting the focus on content-based program management execution. The Program Management Assistance Group (PMAG), located within the Space and Missile Systems Center, Los Angeles Air Force Base, Calif., helps promote

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the success of programs by instilling improved methodologies and mindsets into new program/project managers.

Refining Competency in Communities

The improvement process starts by providing acquisition professionals and support contractors with a full understanding of not only what they are doing, but why they are doing it. They need to understand their programs with a holistic view, seeing not only the engineering aspect of how Tab A fits into Slot B, but also how the functions of program management interrelate and how content-based execution enables the acquisition professional to make better integrated technical, cost, schedule, and management control decisions.

On-the-job training is crucial to developing expertise in content-based and holistic program management. Classroom lectures teach processes; but actually performing the tasks, working with others, and seeing how a program fits together develop true integrated program management expertise. Hands-on training helps the program manager understand the framework. It also develops skills and knowledge that will be programmatically crucial and professionally rewarding throughout the program manager's career. A program manager can then better understand what programmatic activities he or she is managing at any given moment, why those activities are important, what events made the activities necessary, and why the activities will be necessary for the future state of the program—all contributing to an understanding of the importance of developing a thorough knowledge of the life cycle acquisition program assurance framework, including the integrated master plan (IMP), which is the blueprint of the program.

Criticality of the IMP

An IMP is crucial to successful execution of any program. An IMP should be crafted as early as possible in a program's life to ensure an understanding of the program's events, significant accomplishments, accomplishment criteria, and associated tasks. Such a top-down perspective should not be detailed to the control-account level, but it should provide an excellent opportunity for greater knowledge and understanding of the program by all personnel involved. It also provides the perfect vehicle for clear understanding of a program's scope before the IMP's framework is expanded into an integrated master schedule to reflect appropriate, manageable, and executable tasks. Underscoring the benefit of such planning, the Defense Acquisition Guidebook states: "When documented in a formal plan and used to manage the program, this event-driven approach can help ensure that all tasks are integrated properly and that the management process is based on significant events in the acquisition life cycle and not on arbitrary calendar events" (Chapter 4.5.2, <https://akss.dau.mil/dag/welcome.asp>).

Integrated product teams can develop an appropriate IMP according to program requirements as they become appar-

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ent. The IPTs' roles become clearer as the program's scope of work comes into focus and the program structure becomes well-defined. Dependencies are defined as program managers become more skilled in the nature of their work, and their place in the program's scope is made clearer. And most important, the process of forming an IMP is one of collaborative team effort, ensuring the flow of knowledge and understanding among IPTs (vertically and horizontally) and individual program participants, mitigating risk at the earliest stages of the program.

The formation of a hierarchical, event-based IMP structure is an essential element of life cycle acquisition program assurance framework. As the *Integrated Master Plan and Integrated Master Schedule Preparation and Use Guide* of 2005 explains, the development of an IMP and integrated master schedule gives "offerors flexibility in performing detailed program execution planning, organization, and scheduling within any existing Request for Proposal (RFP) constraints." An IMP is a cornerstone document that should be in the foundation of any acquisition program. It is an important management tool from the beginning of the life cycle acquisition program assurance framework through source selection, program execution, and up to program selloff activities, including functional configuration audits and physical configuration audits. Though the IMP is detailed to only three levels (program events, significant accomplishments, and accomplishment criteria), it affords crucial help to the remainder of the program's life cycle.

The program's integrated master schedule can be formed easily by loading tasks into the IMP and digging deeper into the task level to determine sub-tasks and work packages. If the first three layers of program detail—program events, significant accomplishments, and accomplishment criteria—are not properly established in the IMP, the fourth layer—task or activity—displayed in the integrated master

schedule will be predictably inadequate and will inevitably result in poor program execution. Proper review points are established, and criteria for their successful completion will have been put into place via a proper IMP. That leads to a viable initial baseline review that will establish and verify an accurate performance measurement baseline, including cost, schedule, and performance aspects of work scope. The integrated baseline will be the pulse of the program, verified at key events by accomplishments and by criteria throughout the program's life cycle.

The Role of the PMAG
As the PMAG has seen in multiple programs, developing an IMP as early as possible in a program's life can significantly reduce and minimize later problems. To briefly sum up the purpose of the PMAG, it is an assistance group, not an oversight or independent readiness review group. PMAG brings management control processes together with integrated technical, schedule, and cost expertise through dynamic, interdisciplinary, and interchangeable teams composed of senior subject matter experts. Its purpose is to supplement the acquisition efforts of program offices in facing their unique challenges. Though chartered to assist space-based acquisitions, the success of its paradigm has been advocated throughout the Air Force, bridging both space and non-space acquisition programs. As such, the PMAG has assisted numerous programs at various stages of development, often staying engaged through years of a program's acquisition life cycle. That has provided the PMAG with an uncommon view into programs' unique cultures and has provided an organic repository of lessons learned and exceptional methodologies, including with the development of IMPs. Although the group is an Air Force-based organization, it provides an example that can be applied across the Department of Defense. (Note: You can read more about PMAG in Kwon's article "The Relentless Pursuit of Program Management and Acquisition Excellence," *Defense AT&L*, July-August 2009.)

The PMAG provides a functional and educational bridge, supporting program offices and providing valuable assistance to improve the performance of current programs and provide opportunities for learning to improve future programs. Support can be provided at any point in the program's life cycle, but notably at the creation of a program's IMP.

PMAG Experiences
Having worked with multiple programs on IMP creation, the PMAG has seen how program team culture, IMP formation methodology, and timeliness of IMP creation can affect creation of the IMP and the entire execution of a program. Although no names or programs are mentioned in the following examples, they are real examples experienced by PMAG staff members.

When Things Go Wrong
One program started its IMP creation early in its life cycle, and the acquisition wing commander collaborated and

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worked closely with the contractor. One would think that a viable and logical product would be the end result of such a collaborative effort; however, the contractor was intransigent, arranged IPTs around the room in small groups, and encouraged discussion without focus on action to develop the IMP structure. The contractor's IMP creation plan was to place Post-it® Notes on the walls according to how each IPT saw the program events, significant accomplishments, and accomplishment criteria for the program. The notes would then be compiled into a single consolidated IMP, to be reviewed and edited by the large team. Most groups had very few inputs. Only those groups with strong leadership and focus were able to produce more than a few inputs.

When it came time to compile the data into a single IMP structure, most groups did not have enough inputs from which to form even the bare skeleton of an IMP. The exception was one group that truly achieved the initial goal. Its members had worked hard and developed an IMP for the

assigned scope while the contractor personnel continued to talk. However, when that group began laying out assigned program events of an IMP structure, the leadership of that contractor's office was livid. One of the prime contractor's subject matter experts walked up to the materials that a lieutenant colonel created with inputs from his superior officer and attached to the wall and, in front of the entire room of program staff, removed the materials and threw them away. Such a disrespectful act was shocking, and the subject matter expert continued to shock people when the lieutenant colonel, protecting his and his superior officer's inputs and working for the benefit of the program, picked the inputs out of the trashcan and began putting them back on the wall—and the contractor's subject matter expert threw them away again! The contractor demonstrated that, at that time, he was not prepared to handle true program content or a realistic IMP structure. After the tension subsided, the PMAG team was able to work side by side with members of the program team, guiding them in developing well-articulated program events, significant accomplishments, and accomplishment criteria.

That example shows how a program can craft an IMP at the right time (before the contract was established), but still face an impractical IMP as a result of applying wrong methodologies and experiencing dysfunctional cultures. In the example, there were some important lessons learned for the government and contractor personnel. Firstly, all program managers—from the lowest levels to the contracting company—need to know how to create an IMP. Secondly, it is challenging to create an IMP when the program is in flux and not measuring its performance at the standard level.

It's Never Too Late
In a more amicable IMP creation experience, dramatically different results were seen. A program was years into its life, but severe schedule slips and arguments over scope necessitated the creation of an IMP late in the program's life. The PMAG requested relevant program documentation and read the entire set of documentation to develop a deep understanding of the program's scope and requirements. In order to successfully assist the program, it was essential that all PMAG members were acutely aware of the current status of the program and the direction in which it was headed. The PMAG team worked separately from the program office for three weeks, and from halfway across the country, produced a 1,600 line-item IMP for the program office. It was not meant to be a final document; the idea was to provide a starting point for the wing's IMP creation efforts.

The PMAG team joined the wing commander in person after the draft IMP was delivered to the program office; and the group conducted IMP training workshops, assisted the IPTs in crafting their respective IMP inputs, and facilitated collaboration and discussions to increase understanding of program dependencies among the IPTs. Representatives from each IPT gathered at specific times each day to merge the IMP details into a coherent and logical program IMP. The PMAG team kept the process moving by simultaneously developing integrated program risks and providing questions for the wing commander to seek clarification on program structure.

A surprising lesson learned from the teamwork exercise was that the collaborative discussions fostered mutual respect and enabled the program team (including less-experienced program/project managers) to develop a holistic programmatic understanding of the program. The daily, focused, and collaborative team execution is what made the IMP workshop successful. The use of application-oriented training created a real-time, interactive workshop in which understanding could be fostered, materials created, and results evaluated almost instantaneously. It was fascinating to see different IPTs approach the program from different perspectives then stand up for their pieces during the integration of the IMP details. The IMP integration process consisted of talking through opinions among individuals from different IPTs and choosing different IPT representatives each day for IMP integration. That bottom-up IMP integration process enabled the program office to develop a better understanding of dependencies among the IPTs and what the program truly required.

That example occurred as the program was undergoing the turbulence of funding and was late in the program's definitization (it was finally definitized approximately two years into development and after a major program realignment); however, it is never too late for the program office to understand its own program. Indeed, the program realignment may not have been necessary if an IMP had been created earlier in the program's life with clearly defined program events, significant accomplishments, and accomplishment criteria. The creation of the IMP is integral to the program's future success, even if it is created late in the program's development.

Importance of Application-Oriented, Hands-On Touch Time
It is important to note in those examples that true understanding of a program came from actual application-oriented touch time instead of didactic learning. Although some augmentees to the PMAG team had never seen an IMP before in their prior work experience, they demonstrated that they can learn the essentials of IMP generation through disciplined reading of the materials and guides available, through detailed training by experts on the PMAG team, and after long days of diligent preparation.

In the second IMP example, the wing commander was the program subject matter expert; and the PMAG simply brought focus, drive, content knowledge, and disciplined consultation through an understanding of the process. By doing so, the initial creation of the IMP was a struggle (a generous term!), and it wasn't perfect the first time around. But there are no failures in our business; only lessons learned

that can be shared between programs so we do not make the same mistakes twice. Mistakes and misunderstandings, especially between people, are to be expected; technology-based acquisition is, after all, rocket science.

The lessons learned from the examples given are applicable to other programs. The production of an IMP was relevant and necessary for both programs, despite the fact that the programs were at different points in their respective life cycles and had different needs. Both programs had problems—internal and external—that could be solved by proper planning and detailed execution. Any program acquisition officer in either wing could have picked up a guide or a program statement of work. But it was only through disciplined, focused activity and touch time did the program acquisition officers truly get involved and understood the program, and the entire program office benefitted as a result.

The second IMP example was in a much better position as a result of the proper execution of IMP creation activities. Because the PMAG continued to push for improvement, the learning opportunities did not stop; risks were raised, questions were developed, and the wing was in a better position to fine-tune the IMP. When the contractor produced its basis of estimates for the wing's review, the wing was in a much better position to analyze the material, manage the contractor, and proceed forward with all the necessary reviews until the end of the program because the IMP was well-understood by the entire program office. Most important, the wing's personnel were better educated and more capable as acquisition professionals, both in the short term for the benefit of that program and in the long term for the benefit of their careers and any other programs to which they'll move.

Building Our House
DoD's problems are not in its processes but in its abilities to use them. The department has rules guiding acquisitions life cycles, there are guides to teach acquisition professionals how to perform their functions and reviews within the life cycle, and there are Defense Acquisition University courses to teach professionals how to read the guides. But we do not have understanding. What we often have is a box-check mentality and an infatuation with a procedure for completing rather than ever truly *accomplishing* a task. We have programs in place without actual or logical IMPs and with unrealistic schedules. Is it any wonder, then, that so many of our programs go over budget and over schedule and under-perform?

The problems are not from lack of caring. By our nature, we are proactive and we look to solve problems or avoid them before they develop. But to build a house, we need more than good builders; we need good architects. We need to be able to read and understand the plans to reach a finished product. We need not only attention to details but also the understanding to know why details are important. Without good architecture, a house may look like a house, with walls and a roof and a floor to walk on. But that house will never be inhabitable, never accomplish its purpose, never stand up to code—not without significant rebuilding, schedule delays, and cost bumps. None of us would want our houses built this way, and nor should we support our acquisition programs without good planning. The first step in solving the problems in our acquisitions community is good planning—not just in the process of making the plans (we have guides to tell us how) but in actually performing the substantive activities, in practical knowledge and attention to detail. Program management is an art, and a well-run acquisition is our craft. Through content-based execution—by creating and following our plans—we can strengthen our acquisitions community.

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