

DON SNYDER

# Funding Technology-Related Business Initiatives in the Department of the Air Force

Information technology (IT) and business systems for human resource management (HRM) transformation are challenging to fund in the Planning, Programming, Budgeting, and Execution (PPBE) process, yet these systems are foundational to all other activities in the Department of the Air Force (DAF) and therefore critical for the future health of the force.

This report is one in an expected series of three aimed at helping the DAF understand the elements necessary for success in transforming IT and business systems for HRM. The U.S. Air Force has begun a set of initiatives, called the Talent Management Digital Transformation, for modernizing its IT systems that support its portfolio of HRM activities.<sup>1</sup> This report outlines approaches for navigating the PPBE process that are more likely to secure ongoing funding for IT-enabled HRM transformation. Anticipated future reports will examine best practices for implementation and different ways in which the Air Force could use data to improve its talent management functions.

In this report, I give a brief overview of the PPBE process, explore the various challenges of funding technology-related business initiatives in general, and offer some recommendations for better program advocacy.

## Approach

I used three methods to examine improved strategies in the PPBE process for funding technology-enabled HRM initiatives:

1. interviews with subject-matter experts in programming technology-enabled HRM and related initiatives in the DAF and other services
2. reviews of previous initiatives for lessons

## Key Findings and Recommendations

Securing funding for digitally transforming human resource management in the Department of the Air Force can be challenging. Programs for these types of initiatives are foundational and face challenges when competing for funding during the Planning, Programming, Budgeting, and Execution (PPBE) process with operational programs that directly affect the warfighting mission. In addition, budget requests go through several levels of approval, and not all arguments are persuasive at all levels.

The key findings for funding foundational programs are as follows:

- New initiatives are most likely to be successful if offsets are identified to pay for most or all of the new program, but long-term success requires these offsets to be realized.
- The program is more likely to be successful if the program element monitor (PEM) has narratives justifying the program that are tailored to the levels of deliberation (for example, how the program contributes to a mission area and also how it integrates with other efforts to enable higher objectives).
- The better informed and the better prepared the PEM is to address all questions regarding potential changes to resourcing over the Future Years Defense Program (FYDP), the more likely the program is to be funded.
- The more that the PEM works with the user community to gain support and program objective memorandum (POM) advocacy, the more likely the program is to succeed.
- A program is more likely to succeed during execution if it is structured in such a way that incremental successes can be demonstrated.
- A program is more likely to succeed during execution if it earns the continuing support and engagement of senior leaders.
- A program is more likely to succeed if all the hidden costs of process realignment or software development to accommodate bespoke processes are identified and budgeted up front rather than emerging as later program cost growth.

The key recommendations are as follows:

- Ensure that appropriate analysis is done to definitively establish that a technology-enabled human resource management (HRM) program would be a cost-effective piece of the budget, which is to say that the value of its benefits and future cost-avoidance exceeds its costs—including all hidden costs, such as process changes that may be needed, and temporary overlap of old and new systems. *Definitively* means meeting the same standards of rigorous methodology and evidence that are used in analyses of other programs, such as weapon systems.
- Develop a communications plan in which this evidence of cost-effectiveness can be presented effectively at all levels of the budget process.
- Structure the programs to incrementally secure any efficiencies and sequentially retire any legacy systems.
- Ensure that the personnel representing the initiative are sufficiently knowledgeable to defend the program.

3. examination of PPBE processes with a focus on attributes that place technology-enabled HRM initiatives at risk when competing with other initiatives.

The discussion in this report draws on all of these methods, although it does not directly cite the interviewees (to protect confidentiality).

## Challenges

The determination of whether a technology-enabled HRM program—or any IT or business system—is a good idea for the DAF depends on whether it will deliver capabilities worthy of its costs relative to other funding priorities. All three of the defense decision

support systems play vital roles. The three decision support systems are

1. the Joint Capabilities Integration and Development System (JCIDS), which sets requirements
2. the Defense Acquisition System, which acquires hardware, software, and services
3. the PPBE system, which advocates for funding.

For transformative IT and business-system initiatives to be successful, experience indicates a need for a sound and well-articulated business case, effective program management and implementation, and adequate funding.<sup>2</sup> The responsibility for building a sound business case lies in the JCIDS process. The responsibility for program management and implementation lies in the acquisition process. Here, I focus on adequate funding, which is the responsibility of the PPBE process. Although the focus of this report is on the role of the PPBE process, the integrated nature of the activities for all three systems will require touching on issues that cross all three. A program without a sound business case and without a sound plan for implementation is not deserving of funding. Therefore, some findings and recommendations for advocating for adequate funding reveal activities that need to be performed by the two other decision support systems.

## Issues with Funding Structures

Some of the challenges of funding IT and business systems in general, and technology-enabled HRM initiatives specifically, arise from inherent attributes of the PPBE process.<sup>3</sup> A short review of the PPBE process in the DAF is helpful to place these challenges in context.

Every dollar in the budget falls into a program element and an appropriation code. Program elements—of which there are roughly 800 in the DAF—are distinct, coherent activities. Appropriations codes specify the type of money used, such as military pay or procurement, and align with how Congress appropriates obligation authority. In general, program elements have funding from multiple appropriations codes. Each program has a program element monitor (PEM) who is the subject-matter expert for the program element and advocates for it during all stages of the PPBE process.

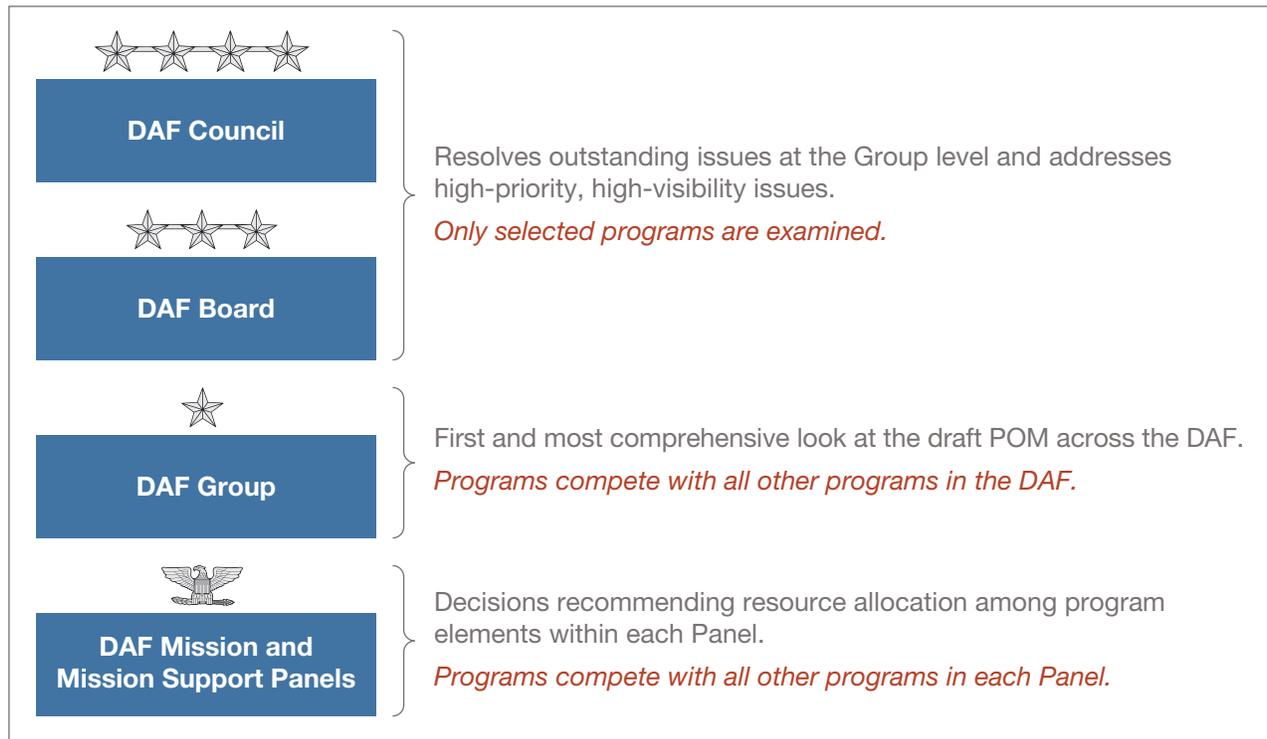
### Abbreviations

BA-08	Budget Activity-08
DAF	Department of the Air Force
DIMHRS	Defense Integrated Military Human Resources System
DoD	U.S. Department of Defense
ECSS	Expeditionary Combat Support System
FYDP	Future Years Defense Program
HRM	human resource management
IT	information technology
JCIDS	Joint Capabilities Integration and Development System
OSD	Office of the Secretary of Defense
PEM	program element monitor
POM	program objective memorandum
PPBE	Planning, Programming, Budgeting, and Execution

Program elements are organized into Panels according to mission. An overall depiction of the structure of the PPBE process within the DAF, called the Corporate Structure, is shown in Figure 1.<sup>4</sup> There are about six Mission Panels and about four Mission Support Panels.<sup>5</sup> At an early stage in the building of the draft budget, or *program objective memorandum* (POM), PEMs advocate on behalf of their programs to their respective Panel chairs in a process called *PEM Parades*. At this stage, a program element's resourcing competes only against other programs in the Panel, and hence against programs in a similar mission area. Trades, therefore, are among program elements of similar mission.

The next stage in the deliberation is at the Group level. The Group takes the first integrated look at the POM across the entire DAF. At this level, program elements compete against the full range of programs, regardless of mission area. Shortfalls in funding, called *disconnects*, can be solved by finding resources from a bill payer in a different mission area, called an *offset*. The Group resolves most of the issues of disconnects and finding offsets. Higher levels at the Board and Council stages resolve any remaining matters and generally focus only on high-profile programs.

FIGURE 1  
Department of the Air Force Corporate Structure



An important observation is that arguments that succeed for many programs at the Panel stage might not be persuasive at the Group stage.<sup>6</sup> And if an argument fails at the Group level, it will not be reconsidered at the Board or Council stage unless the program is of high importance to the highest-level leaders in the DAF. An argument can be won at the Panel stage by successfully advocating for the importance of the program and its resourcing level *in terms of its contribution to the specific mission area*. A program can be successfully advocated at the Group stage by *appealing to higher objectives*. These objectives can be priorities from the Office of the Secretary of Defense (OSD)—for example, those in the National Defense Strategy. Alternatively, they can be objectives from a combatant commander—for example, one specified in an Integrated Priority List.<sup>7</sup> Compelling arguments at the Group (and higher) stages tend to be based on national-level warfighting priorities, not the mission-specific needs that can be compelling at the Panel stage. The importance of justifying a program as a national-level need is even greater when

assessed during OSD-level Program Budget Review and during congressional markup.

There are structural attributes of this process that create general problems for putting together a coherent budget, and some are specific to IT and business systems. One issue is that most deliberations at the Panel level transpire *before* Panels are given a top-line budget (or *bogey*) to meet across the Future Years Defense Program (FYDP). This bogey is necessarily a portion of the total topline for the DAF. The reason that it comes late to the Panels is that the topline for the DAF comes late in the process from the U.S. Department of Defense (DoD) and the Office of Management and Budget. (This step of the process is called *passback*.) The Panel, therefore, must entertain a range of options to be prepared for a range of bogeys. Furthermore, inputs to the Panels are often not required to be balanced, so the Panels receive initiatives without corresponding offsets. When offsets are offered, they indicate clearly the priorities of the input sources and aid the Panel in establishing whether a lower priority from one input source might be more important than a higher priority from another. Some programs are also

effectively off the table for offsets but are not explicitly declared so by higher authorities. Panels, therefore, must use their limited time and resources considering these options, even though they are highly unlikely to play in final deliberations. These factors combine to increase the workload of the Panels and decrease the time that the Panel has to build effective arguments for the most-critical programs.

As I will discuss, advocates for IT and business systems encounter additional obstacles negotiating the challenges of the Corporate Structure and dealing with the practical constraints of the PPBE process. In the next section, I discuss how programs can succeed or fail to secure initial resourcing, then discuss how programs that successfully gained initial resourcing can lose that resourcing during execution.

## Principal Findings

In this section, I identify specific characteristics of how IT and business systems fare in the PPBE process, with the findings highlighted in bold type. The next section provides some suggestions for partial remedies.

### Offsets, Narratives, and a Well-Prepared Program Element Monitor Can Help Secure Initial Program Support

The federal budget is perennially constrained. Most of the resource allocation is carried over from the previous fiscal year. Most new initiatives, therefore, need to be funded using offsets from some other program. These offsets typically come from programs in the same Panel. If there are no offsets available within the Panel, then the program generally needs high-level advocacy to take offsets from an unrelated program. This leads to several general conditions, which are outlined here.

**New initiatives are most likely to be successful if offsets are identified to pay for most or all of the new program, but long-term success requires these offsets to be realized.**

For many IT and business systems, for example, the offset will probably be found by offering future savings or cost avoidance, either because of anticipated efficiencies brought by the new program or by retir-

ing a legacy system that the new program will replace. Otherwise, the overall budget must expand, or the offsets must come from some other program. It is vital to success that these offsets be realistic and that they be sufficiently quantified to convince skeptical audiences. If the analysis is poor and the offsets do not materialize at the programmed time, the program will be at risk even if the arguments do prevail at this stage. I elaborate further on this point in the next section.

Finding offsets is a particular challenge for IT and business systems. Exactly what efficiencies might be realized can be hard to estimate accurately. Even if a legacy system can be retired, the timing of this retirement will depend on the execution of the new initiative, and the costs of the new initiative might not be as expected. These uncertainties make identifying offsets difficult and dangerous—dangerous because if the savings are not realized, an additional future bill will need to be paid. The JCIDS and acquisition processes play vital supporting roles in identifying these offsets to support advocacy in the PPBE process.

When deliberations rise to the Group level, IT and business systems are potential offsets to pay for other programs. The risk of being the source of an offset is higher for foundational initiatives, such as IT and business systems, than it is for operational initiatives, such as new weapon systems. For this reason, IT and business systems need justifications that can withstand competing programs at the Group and higher levels of deliberation. Therefore, these programs need distinctly different narratives at the different levels of the PPBE process.

**The program is more likely to be successful if the PEM has two narratives to justify the program:**

1. one narrative for the Panel level that focuses on how the program resolves issues at the mission level and why it should compete favorably with other programs in the mission
2. a second narrative tailored for levels of review above the Panel level that focuses on national-level priorities and warfighting contributions.

Even with sound arguments for offsets and why a program should be resourced, the effort can fail if the PEM is not fully prepared to address all questions that might be posed during program review. Since PEMs rotate frequently, a large fraction are new to

their programs. The nature of questions that might be posed changes as the funding request proceeds from the Panel level up to the OSD-level Program Budget Review and congressional questions during markup. The PEM must anticipate this range of questions and be prepared to give compelling answers. Questions might include the following: What actually is being bought? How much will hardware cost? Software? Contracted services? If the hardware buy is spread over two years, would half of the capability be secured after the first year even if the second year is not funded? What would the consequences be of any shifts in resourcing in all years of the FYDP?<sup>8</sup> The PEM will need support from the JCIDS and acquisition processes to effectively represent the program. The PEM will also need to interact with JCIDS and the acquisition process representatives to explain to them what is needed to advocate for the program in the PPBE process.

**The better informed and prepared the PEM is to address all questions regarding potential changes to resourcing over the FYDP, the more likely the program is to be funded.**

IT and business systems in general, and technology-enabled HRM programs in particular, exist for and benefit a wide range of users across the DAF. Working with this user community to understand its needs and any changes that might be necessary to processes, manning, and training helps the PEM gain both credibility with reviewers and support from the user community. User community support of an initiative increases the likelihood that the initiative will compete well in the Corporate Structure. The program management office also plays a central role in this coordination.

**The more the PEM works with the user community to gain its support and POM advocacy, the more likely the program is to succeed.**

## Continuing Program Support Hinges on Demonstrating Incremental Successes, Getting Senior Leader Support, and Identifying and Budgeting for Hidden Costs

To secure continued funding for a program, it must execute adequately over time. To review all the ways

in which a program can fail during execution is beyond the scope of this report. Many failures have been attributed to poor requirements statements during the JCIDS process or to management failures in the acquisition process. I focus here on attributes that are under some control of the PPBE process. Two examples of large business programs that failed will help make the points more concrete. It can be argued that both of these examples had a long run of successful funding but failed because of poor performance by JCIDS, acquisition, or some combination of both.

Our first example is the Expeditionary Combat Support System (ECSS). ECSS became the cornerstone of the larger Expeditionary Logistics for the 21st Century (a.k.a. eLog21) initiative that was launched in 2003. ECSS was to be a single software system replacing hundreds of unconnected legacy logistics systems.<sup>9</sup> Using commercial, off-the-shelf software (Oracle R12 eBusiness Suite), ECSS was expected to have minimal risk and was portrayed as following the best practices of previous, successful enterprise resource planning systems.<sup>10</sup> ECSS promised to be one system that held the authoritative data for virtually all U.S. Air Force logistics processes. However, the commercial, off-the-shelf software needed to be highly modified because the U.S. Air Force's processes were different from commercial processes, and the U.S. Air Force was not willing or able to change those processes.<sup>11</sup> ECSS struggled for years with this massive undertaking. In an effort to show some return on investment, the program was restructured three times in attempts to deliver some incremental capabilities. But after roughly eight years and over \$1 billion spent, the service still had virtually nothing to show for the effort.<sup>12</sup> The U.S. Air Force finally canceled ECSS in November 2012.

The lesson relevant for this report is that ECSS, even after restructuring, was set up to deliver massive capabilities at once rather than small incremental successes. Despite one pilot release, no functional capability could be fully executed by ECSS and no legacy systems could be retired in the whole duration of the program. Although the counterfactual history cannot be proven, had the program been able to deliver incremental capabilities over time and the corresponding legacy systems retired, ECSS likely would have had a higher chance of continuing. I note that this struc-

turing might have been more costly in the long term because it could have led to less efficient writing of software. With no discernable capability delivered, no future promise was enough to save it.

Programs are more likely to enjoy continued resourcing during execution and avoid becoming a bill payer for another initiative if they are structured so that they regularly deliver working capabilities to justify continued funding and provide any offsets that they have promised, such as efficiencies and the retirement of legacy systems. Structuring a program for success requires careful coordination and communication between the program management office and the PEM.

**A program is more likely to succeed during execution if it is structured so that incremental successes can be demonstrated.**

Our second example, the Defense Integrated Military Human Resources System (DIMHRS), was a technology-enabled HRM program. The DIMHRS program was started in 1998 to address inaccuracies in the personnel pay systems and lack of integration in the joint environment. The program was to use commercial, off-the-self software (PeopleSoft from Oracle) and be common across all services, including active duty, reserve, and national guard.<sup>13</sup> DIMHRS was intended to provide:

- (1) accurate and timely personnel data,
- (2) standard data for comparison across the services and other components, (3) tracking information on reservists for both pay and service credit, (4) tracking information on

military personnel in and out of theater, and (5) integrated personnel and pay functions.<sup>14</sup>

Ultimately, the program failed to deliver on these needs and was canceled in 2010 after more than a decade of effort with few tangible results to show for more than \$1 billion spent.<sup>15</sup>

A postmortem analysis concluded that DIMHRS failed for multiple reasons. Salient among them were a lack of consistent oversight and prioritization by senior leaders, lack of a coherent high-level implementation plan, and requirements creep.<sup>16</sup> When DIMHRS was initially funded, it had enthusiastic support among senior leaders, but their interest and advocacy waned. When management of the program was left to lower-level managers, the complex, enterprise-wide issues that arise with such a large endeavor (such as requirements creep) were not adequately resolved.<sup>17</sup> By the time of its demise, DIMHRS had thoroughly lost support at the highest levels. As Secretary of Defense Robert Gates testified, “Many of the programs that I have made decisions to cut have been controversial within DoD. I will tell you this one was not.” Chairman of the Joint Chiefs ADM Michael Mullen testified that DIMHRS was a “disaster” and that “I applaud the termination of the program.”<sup>18</sup>

The initial efforts of both ECSS and DIMHRS for resourcing were successful. Both programs were successful enough in the PPBE process to spend over \$1 billion. But in the end, both failed. Initial senior-leader support was insufficient for long-term success. Poor structuring of ECSS was a key contributor to the failure of that program. For the purposes of PPBE-related matters, one reason that DIMHRS failed was

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languishing interest by senior leaders, who did not adequately plan and manage the program.<sup>19</sup> Despite adequate funding for years, the program failed because of poor execution.

**A program needs continuous, successful execution to earn and maintain the continuing support and engagement of senior-level leaders.**

According to interviews, and judging by the examples of ECSS and DIMHRS, business systems often bring hidden costs. Identifying these costs early and accounting for them in the budget avoids one source of program cost growth during execution and possible program failure. Exactly how these costs can emerge depends somewhat on the selected acquisition pathway. Law and policy allow two acquisition pathways: defense business system acquisition and software acquisition. Both present challenges for continued program success.

The intended pathway for a technology-enabled HRM program is as a defense business system acquisition.<sup>20</sup> On this pathway, a program purchases commercial, off-the-shelf software and adjusts processes to match those the software was designed to support.<sup>21</sup> The goal is to minimize modification of the software and, therefore, software procurement costs. By policy, “DoD acquisition of business systems will be aligned to commercial or government best practices and will minimize the need for customization of commercial products to the maximum extent practicable.”<sup>22</sup>

This pathway has several potential hidden costs. The first is the cost of any changes to processes (and associated training) to match those of the commercial sector that the commercial, off-the-shelf software was designed to support. Costs to change processes or retrain personnel to match commercial practices might be borne by organizations in the DAF. Under

these circumstances, costs will not fall into a single line in the budget and can be difficult to estimate. When processes need to change to match the commercial software, the changes could erode wide support for the initiative, making it appear to be more of a burden than a solution to problems. Even when DAF processes initially appear to largely match those of the commercial sector, some mismatches of DAF processes and commercial processes will be inevitable. Some processes in the DoD are by law or circumstance different from those in the commercial sector. Under these circumstances, a second source of potential hidden costs are those that will be incurred to customize the software to accommodate these mismatches in the DAF. Finally, the software will need to interface with other data systems, which could induce a third source of hidden costs: interface modifications.<sup>23</sup> How much accommodation will be through process change, and how much through software change? These costs are often not captured up front.<sup>24</sup> When they appear, they are likely to be considered requirements creep. Both ECSS and DIMHRS failed to change processes and drove high costs of software modifications when the promise was that using commercial software would keep software development costs lower. Whatever their source, the more that these costs can be accurately captured and budgeted at the outset, the less likely they will appear as cost growth during program execution and jeopardize continued funding. The JCIDS, acquisition and PPBE processes must work in concert to identify and capture these costs up front.

The other pathway for a technology-enabled HRM program is as software acquisition. The trend for this pathway is moving away from defining static requirements, building software in a single effort, testing, then fielding a finished product in these

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discrete steps. The newer paradigm, referred to under the rubric of *agile*, is to continuously develop, deliver, and modify code in rapid increments.<sup>25</sup> Even some business systems similar to the DAF Talent Management Digital Transformation initiatives<sup>26</sup> have been selected as pilot programs for various agile software acquisition programs, including the Navy Personnel and Pay program.<sup>27</sup> Agile software development and acquisition are meant to be more responsive to user needs and to security challenges as they emerge.

But agile software acquisition also has budgeting challenges. Breaking from the paradigm of discrete, sequential activities does not match well with PPBE process demands. Requirements are documented in unfamiliar ways, progress is measured in unfamiliar ways, and costs are difficult to quantify and justify.<sup>28</sup> Programs using this pathway are therefore intrinsically hard to initiate and defend in the PPBE system. We recommend reading the section “How to Justify Your Budget When Doing DevSecOps” in a recent report by the Defense Innovation Board.<sup>29</sup>

To partially ameliorate these challenges, OSD created a Software and Digital Technology Budget Activity-08 (BA-08).<sup>30</sup> BA-08 provides more flexibility for moving funds across appropriations to address small, unanticipated shortfalls that are difficult to address through normal POM allocations. BA-08 is a pilot initiative and not meant to be a permanent solution, but something like it might persist if it is deemed successful.

Whether acquired through the defense business system pathway or the software acquisition pathway, software needs continuous sustainment to ensure continued functionality and security.<sup>31</sup> This sustainment of computer code needs to be budgeted.

The need to capture all these costs, regardless of acquisition pathway, leads to the last principal finding: **A program is more likely to succeed if all the hidden costs of process realignment or software development to accommodate bespoke processes have been identified and budgeted up front rather than emerging as later program cost growth.**

Judging by what the interviews revealed, the general view across the services is that IT and business-system programs—particularly those for technology-enabled HRM—have struggled with addressing the

seven issues listed in bold in this section. Specifically, these programs have struggled with the following:

- identifying arguments that compete well with nonfoundational programs at the Group and higher levels of review
- quantifying any cost savings in order to offer an offset for new initiatives
- when offsets are offered, realizing those offsets during program execution (In one case, offsets offered initially in the program were not realized, and the service later found itself needing to “buy back” those promised offsets.)
- accommodating agile acquisition with PPBE processes.

Some experts that I interviewed described having observed PEMs who did not command a sufficiently detailed understanding of the programs to effectively answer questions posed during PPBE review. Additionally, the DAF has, to some degree, found money during execution to compensate for the inability to secure resources in the POM. That ad hoc solution is a temporary one, however; it can lead to the inability to show that funding levels in the POM were insufficient.

## Recommendations and Closing Comments

As described earlier in this report, the structure of PPBE deliberations impedes foundational programs in favor of operational programs. As foundational programs, technology-enabled HRM programs suffer in this competition. Aside from sweeping changes to the PPBE process, these challenges will not be easily resolved. Nevertheless, some measures can improve the chances of success of technology-enabled HRM programs.

### Recommendations

I offer four principal recommendations.

**Recommendation 1: Ensure that appropriate analysis is done to definitively establish that a technology-enabled HRM program would be a cost-effective piece of the budget, which is to say that the value of its benefits and future cost-avoidance exceeds its costs—including all hidden costs, such as**

**process changes that may be needed, and temporary overlap of old and new systems. By *definitively*, I mean meeting the same standards of rigorous methodology and evidence that are used in analyses of other programs, such as weapon systems.**

According to the interviews, personnel at the Panel level understand the persuasive value of analytically based narratives that I describe in the findings. But the analytical support available to those representing technology-enabled HRM programs in the PPBE process is meager compared with the support available to those representing operational programs, such as new, cutting-edge weapon systems. The enterprise generally supports operational programs with extensive modeling and simulation, wargames, exercises, and other methods to demonstrate the value of such programs to national objectives. Such an extensive array of analytical methods and organizations to provide analytical support is lacking for most foundational programs. Although I do not question the general merits of operational initiatives, the lack of comparable demonstrations for foundational initiatives presents the enterprise with an imbalanced view of relative merits and leaves it at risk of making suboptimal decisions for the DAF as a whole. The lack of such support for foundational initiatives does not, according to the research, result from the lack of desire on the part of Panel-level actors to have such analysis, but on the lack of sufficient analytical support from the enterprise for PPBE actors to provide such analytically based narratives. It is not within the scope of responsibilities of the PEM or other PPBE actors to provide this analysis. It should have been part of the JCIDS activities to justify the program, and senior leaders could help by expanding the analytic agenda to better cover IT and business initiatives.

As part of this analysis, the program should critically examine the initiatives for hidden costs. Some of these costs are inevitable, even if acquisition pathways assume they can be avoided. These costs could be in the program itself, such as the need to modify commercial, off-the-shelf software and sustain it over time. Or they might arise elsewhere, such as from the need to adopt new processes or retrain users. If the former are not identified and budgeted for, they appear as cost growth. If the latter are not identified and in the budget, the program risks losing the support of the

very community it is most directly intended to benefit. Capturing these costs will require an integrated effort across the three defense support systems.

**Recommendation 2: Develop a communications plan in which this evidence of cost-effectiveness can be presented effectively at all levels of the budget process.**

Narratives should fully document a problem or set of problems that current legacy systems inflict on readiness, morale, and responsible use of human resources. The narrative at the Panel level rightfully should focus on the mission associated with the Panel. Any initiative should, as much as possible, be part of a coordinated effort in its mission area. Therefore, justifications are warranted in terms of the Panel's ambit so that the effort is demonstrably coordinated and integrated with other programs in that mission area. If well crafted and well articulated, such mission-level arguments can be compelling at the Panel level.

But arguments in terms of Panel priorities might not be persuasive at higher levels of review. At those levels, warfighting priorities (such as new weapon systems) often need to find offsets to fund new initiatives. The national-level need and warfighting contribution of such a program as a new weapon system—and the potential consequences of not funding it—are often fairly clear. The justifications used to back operational initiatives frequently provide detailed analysis, games, or exercises that have convinced senior leaders. To be competitive, business-system initiatives need analytical rigor on par with that of operational programs. Otherwise, business-system initiatives or programs risk being the offset for an operational initiative. When business-system initiatives lack analytical rigor, narratives for them often look more like “nice to have” options rather than “need to have” programs. The failure of such high-profile initiatives as ECSS and DIMHRS does not help.

To avoid being the offset, the advocates for technology-enabled HRM (and similar) programs should be prepared with arguments that are compelling in terms of national-level objectives for the warfighter. One common (unsuccessful) strategy is to review guidance, such as the National Defense Strategy (NDS),<sup>32</sup> and the priorities of the Secretary of the Air Force, the Chief of Staff of the Air Force, or the Chief of Space Operations; locate text that is

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related in some way to the program; and declare that the program is supporting high-level guidance. The weakness of this strategy is that it does not sufficiently distinguish a given program from other PPBE initiatives. The reality is that the statements in such high-level guidance are often so broad that virtually every program can find supporting language. This approach can easily devolve into coming across as platitudes or looking like a program that is proposed for parochial reasons and is grasping for higher-level justification. This perception can be especially problematic when a business system program is compared with an operational program that is supported by analysis and the results of wargames and exercises.

No program should be proposed until rigorous analysis establishes that it is cost-effective, and this analysis should be able to stand up to such scrutiny. What might such arguments look like for Talent Management Digital Transformation initiatives? The analysis should be thorough and accurate, and the uncertainties documented. It is beyond the scope of this report to perform such analysis, but some of the key issues and questions that analysis should address are as follows:

- What are the problems that arise from the status quo that this initiative will ameliorate?
- What are the negative effects in terms of, for example, readiness, morale, or waste, should this status quo continue? The effects listed should be as broad as can be confidently documented, not confined to the HRM community.
- What other programs might be negatively affected if the proposed program is not funded? It is easy to overlook the interconnectedness of programs. The lack of funding for one can cause execution problems for another. Documenting these interrelationships can not only provide a strong argument

for the program but also potentially gain the support of other programs.<sup>33</sup>

The impacts of funding, or not funding, a program should be traced to as many other programs and higher-level objectives as possible. That “audit trail” should be as grounded as much as possible in analysis. The PPBE structure and deliberations disfavor foundational programs, such as IT and business systems, and favor operational initiatives, such as new hypersonic weapons. The more that the rationale for Talent Management Digital Transformation initiatives can be cast in such terms as *readiness*, the more likely they will be to succeed in the PPBE deliberations, and the more likely it becomes that they will gain and sustain the support of the user community.

These narratives should not be created just for advocacy in the PPBE by PPBE actors. They should have been part of the justification of the program during the JCIDS process and be further developed by the acquisition process. The PEM, however, needs to work with these other decision-support-system actors to communicate what will, and what will not, work well during PPBE deliberations.

**Recommendation 3: Structure the programs to incrementally secure any efficiencies and sequentially retire any legacy systems.**

To the extent practicable, the program should be structured such that benefits accrue on a timescale that encourages continuing support. If benefits, such as efficiencies or retirement of legacy systems, are deferred until a massive effort is completed—perhaps beyond the FYDP, as in the cases of ECSS and DIMHRS—experience indicates that senior-leader support and funding will erode. This consideration might guide whether to bundle efforts into a large program or to disaggregate them into smaller programs. There might be cases in which structuring the program in a way that enhances its chances of both initial

and continuing resourcing in the PPBE process makes it less efficient as a program. Those tactical decisions will need to be made. There might be instances in which structuring the program well for PPBE deliberations leads to a slightly inefficient approach to the writing and fielding of the software and therefore slightly higher lifetime costs. On the other hand, minimizing lifetime costs could lead to a program that does not survive the PPBE process. Program structuring needs to be a careful coordination between the program management office and the PEM.

**Recommendation 4: Ensure that the personnel representing the initiative are sufficiently knowledgeable to defend the program.**

Even a program that is well justified and has sound analysis behind it can lose in the PPBE process if the personnel assigned to represent it cannot adequately address the questions posed during PPBE deliberations, as I heard during the interviews. The questions that are posed will depend on the level of deliberation in the PPBE, Program and Budget Review, and congressional markup. A root cause of the cost growth and ultimate demise of ECSS identified by the Institute of Defense Analysis was “because the people who began this program had insufficient expertise in what they were buying.”<sup>34</sup> Anyone representing the program, especially the PEM, should be thoroughly familiar with what the program does and why. The PEM, and to some extent the Panel Chair, should be able to answer any question with supporting analysis regarding the consequence of any increase or decrease in funding, or shift of funds in the FYDP. To master these knowledge domains, clear lines of communications should be maintained among the PEM, program office, and user community. The advocates also should be well versed on past programs, such as ECSS and DIMHRS, and maintain up-to-date knowledge regarding modern software acquisition pathways. Rotation of PEMs will need to be managed to ensure that PEMs new to a program are not taking over at a critical juncture.

Following these recommendations should enhance the chances of favorable reviews in the PPBE process.

## Closing Comments

The most common recommendation that I heard during interviews for improving the funding of technology-enabled HRM programs was gaining senior-leader advocacy, some high-level official who directed the program as a “must do” priority. Such advocacy is beneficial, but I do not offer it as a recommendation for two reasons. First, senior-leader advocacy should be earned, not granted. The four recommendations that I offer provide a foundation to earn that support. If those four recommendations are embraced, senior level advocacy should follow. Note that the first recommendation—providing adequate analytical support—must come from senior leaders. Second, ECSS and DIMHRS both had high-level support and success in the PPBE process—at least, enough success to secure about \$1 billion over about a decade. But personality-driven support did not last because many of the recommendations were not embraced. Although the *concepts* behind ECSS and DIMHRS might have been sound, the *execution* was not, and senior leaders eventually abandoned them. Senior-leader support should be viewed as the outcome of sound analysis and advocacy, not a shortcut.

Another common comment was that technology-enabled HRM programs are part of a larger change management problem. Although I focus on PPBE issues in this report, I agree with this assessment. The ultimate success of any program depends on its execution, and a key component of the execution of a technology-enabled HRM program is successful change management.<sup>35</sup> Generally, IT and business systems are not solutions to problems. Problems are alleviated by sound processes. IT and business systems are the means by which sound processes are executed. If the processes are flawed, no IT or business system will fix them. Ultimately, success of these initiatives is determined by a range of factors. Successful funding in the PPBE process is one such factor, and it must be integrated with skillful JCIDS and acquisition efforts.<sup>36</sup>

## Notes

- <sup>1</sup> See U.S. Air Force, 2017.
- <sup>2</sup> Gunasekaran, Ngai, and McGaughey, 2006; Finney and Corbett, 2007; Riposo et al., 2013.
- <sup>3</sup> I conform to Department of Defense usage and refer to the process as PPBE, although I note that the DAF now refers to the process as the Strategy, Planning, Programming, Budgeting, and Execution (SPPBE) Process (Air Force Policy Directive 90-6, 2019; Department of Defense Directive 7045.14, 2017).
- <sup>4</sup> Other services have analogous structures with different names for the structural elements. The DAF now has parallel structures for the U.S. Air Force and U.S. Space Force. I simplify these structures into the DAF without loss of generality.
- <sup>5</sup> The exact number and constitution of Panels shifts slightly from year to year, and the detailed assignment of program elements to Panels and the exact number of Panels are not important for this discussion.
- <sup>6</sup> If the size and scope of an IT or business system program has gained support from high-level leaders, the program might be protected at the Panel stage and not need much advocacy.
- <sup>7</sup> An *Integrated Priority List* is a set of high-priority requests submitted by a combatant commander to fill identified shortfalls for the commander's assigned missions.
- <sup>8</sup> Analysts at the Institute for Defense Analysis concluded that one of the root causes of the failure of the Expeditionary Combat Support System (to be described later in this report) was that "the people who began this program had insufficient expertise in what they were buying" (Frazier et al., 2011, p. iv).
- <sup>9</sup> U.S. Air Force, 2011.
- <sup>10</sup> U.S. Air Force, 2009; Ketrick et al., 2011.
- <sup>11</sup> See Committee on Homeland Security and Governmental Affairs, U.S. Senate, 2014.
- <sup>12</sup> Stross, 2012.
- <sup>13</sup> Farrell, 2008; Paltrow and Carr, 2013.
- <sup>14</sup> Farrell, 2008, p. 4.
- <sup>15</sup> Philpott, 2010; Ketrick et al., 2011.
- <sup>16</sup> Paltrow and Carr, 2013; Connor et al., 2016, pp. 26–27. *Requirements creep* is "the addition of new technical or operational specifications after a requirements document is approved by the appropriate validation authority for the requirements document" (10 U.S. Code § 2547).
- <sup>17</sup> Connor et al., 2016, pp. 26–27.
- <sup>18</sup> Committee on Armed Services, U.S. Senate, 2011, pp. 55–56 (testimonies were on February 2, 2010).
- <sup>19</sup> See Walker, 2006.
- <sup>20</sup> Department of Defense Instruction 5000.02, 2020; Department of Defense Instruction 5000.75, 2020.
- <sup>21</sup> These initiatives are often called *vanilla* enterprise resource planning systems in the commercial sector.
- <sup>22</sup> Department of Defense Instruction 5000.75, 2020.
- <sup>23</sup> For a more detailed discussion, see Riposo et al., 2013.
- <sup>24</sup> U.S. Government Accountability Office, 2020, Appendix V.
- <sup>25</sup> Office of the Under Secretary of Defense for Acquisition and Sustainment, 2019. For a definition of *agile* in law, see Public Law 115-91, 2017, Section 874.
- <sup>26</sup> U.S. Air Force, 2017.
- <sup>27</sup> Public Law 115-232, 2018, Section 869.
- <sup>28</sup> See Defense Innovation Board, 2019, pp. S119–S128.
- <sup>29</sup> Defense Innovation Board, 2019, pp. S119–S128.
- <sup>30</sup> Office of the Under Secretary of Defense for Acquisition and Sustainment, 2020.
- <sup>31</sup> Defense Science Board, 2018, p. 27; Defense Innovation Board, 2019.
- <sup>32</sup> U.S. Department of Defense, 2018.
- <sup>33</sup> For a well-described and well-documented example, see Kent et al., 2008, pp. 115–121.
- <sup>34</sup> Frazier et al., 2011, p. iv.
- <sup>35</sup> For an excellent guide to change management in government, see Fernandez and Rainey, 2006.
- <sup>36</sup> See Finney and Corbett, 2007; Riposo et al., 2013.

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## About This Report

The funding and successful implementation of business systems has been challenging in the Department of Defense. As the Department of the Air Force embarks on new initiatives to update human resource management, it needs sound strategies for securing and retaining the necessary funding. This report presents findings and recommendations for such as strategy. The research reported here was commissioned by the Director, Force Development, Deputy Chief of Staff for Manpower, Personnel and Services, Headquarters U.S. Air Force, and conducted within the Workforce, Development, and Health Program of RAND Project AIR FORCE as part of a fiscal year 2021 project, “Enabling Future Technology-Enabled Human Resources Management for the United States Air Force.”

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