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A New Look at Enablers and Barriers to Performance Based Life Cycle Product Support (PBL) Implementation

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Efficient and effective product support development and implementation are not simple. Increasingly, more focus is being placed on how to deliver cost-wise and effective product support. In an environment of Better Buying Power—greater efficiency and productivity in defense spending—a need to better understand and implement product support that is performance outcome-based is not only prescribed, but prudent. PBL can provide desired performance based product support. A 2005 study unearthed perceived PBL enablers and barriers. This article is a byproduct of 2011 research contrasting the 2005 study's PBL barriers and enablers. Through survey of the acquisition workforce, data were collected on 15 PBL implementation factors. This article discusses current working perceptions that either encourage or impede PBL implementation.

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The acronym “PBL” has changed. Its definition now corresponds to Performance Based Life Cycle Product Support vice Performance Based Logistics—but has the scope and function of PBL really changed? Indeed, the objective of the PBL name change was to broaden the context of how, why, when, and who would implement and manage PBL. Rightfully so, policy makers thought it prudent to redefine the initiative to make it clear that PBL is not just a tool for the logistician, but now includes other program areas of responsibility such as system engineers, contract specialists, etc.

The work of various roles required with the implementation of PBL is broader than what was initially envisioned, and PBL has become a more significant enabler to greater product support capability throughout the Department of Defense (DoD). PBL should no longer be viewed as solely outcome-focused on an end product, nor from just the perspective of supporting the logistics support elements. PBL needs to be considered throughout the entire life cycle and as an enabler to forge a more effective product support strategy throughout the product’s entire life cycle—from “must have it” (initial requirement) to “rust has it” (final disposal).

But changing PBL and how it is implemented and managed obviously takes more than a name change from the stroke of a pen. Has PBL really changed over the years since it was embraced in earnest in the late 1990s? Specifically, has the PBL environment changed—have barriers and/or enablers been transformed for PBL so it can be implemented more successfully throughout DoD? At the day’s end, do we really understand PBL? Have perceptions of PBL being too expensive, requiring greater funding, or being too complicated to implement in terms of developing proper contractual incentives/awards or partnering agreements, changed? Have Services’ viewpoints of PBL changed? Have some of the barriers and enablers to PBL’s effective and efficient implementation changed over the last 5–10 years?

The research analyzed the current perceptions of PBL through the eyes of approximately 300 plus military, civilian government, and contractor personnel working primarily in program management and logistics. The respondents were asked to rate 15 factors as to whether they believed a factor was a barrier or an enabler to PBL implementation. They also rated how significant they believed each factor impacted PBL implementation in their program on a scale from 1 (minimal) to 4 (very significant). They were asked other related questions to determine if they

had accomplished a Business Case Analysis on their program and what the overall effect was on their program's cost, schedule, and performance from implementing PBL.

Over 600 defense acquisition professionals had an opportunity to participate in the online posted survey. The invited respondent pool consisted of selected graduates of Defense Acquisition University (DAU) acquisition courses (e.g., LOG 235/236 and LOG 350) and other identified personnel that were known to have knowledge and experience in implementing PBL within DoD. Of the identified personnel that were invited to participate in the survey, approximately 50 percent participated in the survey. These writings will explore and discuss information gathered from those 300 plus PBL implementers on whether the effects of PBL barriers and enablers have changed. But before we discuss more on PBL perceptions, we should first understand where we have been to know where we need to go. A synthesis of recent writings is provided to underscore the discussion of perceived changes in PBL implementation enablers and barriers.



PBL Yesterday and Today

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Much has been written (Canaday, 2010; DeVries, 2005; Fowler, 2009; Fowler, 2010; Geary, Koster, Randall, & Haynie, 2010; Kobren, 2009; Miller, 2008; Omings, 2010), spoken, and taught regarding PBL—not only about its advantages, but also about what prevents it from being fully embraced and effectively implemented by all the Services.

Since PBL is becoming a growing practice within industry and DoD, the literature discussed herein will leverage both bodies of knowledge within industry and government. Before the discussion begins, we should level the playing field with a common understanding and concise definition of PBL. As Kobren (2009) asserts, PBL is about performance. It is about readiness. It is also about enabling mission accomplishment and ensuring the warfighter has weapon systems that are available, reliable, and supportable when and where required. PBL is part of a long tradition of contracting for performance. Since its inception, PBL has continued to evolve. The shift toward Integrated Logistics Support attempted to wrap together the distinct logistics elements into a coordinated approach, but there was still the disjointed acquisition versus sustainment support issues and the lack of a linkage between supportability measures and warfighter needs (DeVries, 2005). Fowler (2009), then Assistant Deputy Under Secretary of Defense for Materiel Readiness, believes the time is coming to rebrand the sustainment approach. The rebranding effort should include an emphasis on re-integrating complete life-cycle sustainment into programs.

Clearly, product support, while primarily a logistics and sustainment function, is not actually synonymous with the fundamental aspect of logistics. To that point, product support encompasses materiel management, distribution, technical data management, maintenance, training, cataloging, configuration management, engineering support, repair parts management, failure reporting and analysis, and reliability growth (DoD, 2009). To further this point, Canady (2010) talks about how PBL remains the preferred method for weapon systems sustainment. However, defense officials are scrutinizing PBL strategies such as those on the C-17, pressing for lower costs, better proof of savings, and more government control of long-term sustainment options.

Geary et al. (2010) inform us that effective product support requires contributions from both the public and private sectors. A significant challenge over the course of the next decade, particularly in today's acquisition environment of declining financial resources combined with project deficits and undiminished operational demands, is creating a more effective, unified, and fiscally prudent industrial integration strategy for product support. They also highlight some of the real DoD innovators and enablers in deploying PBL effectively and why they were successful. Some of the highlighted key enablers to PBL's success were: integrated partnerships, incentive strategies, a culture of innovative teams, shared visions on objectives/metrics/incentives, and shared common grounds on win-win scenarios between industry and government.

In government, PBL has garnered mixed reviews and outcomes. A few organizations have implemented support strategies under the guise of a performance outcome-based strategy only to discover the product support was a hybrid version of a transactional arrangement. Department of Defense Directive 5000.01 (2007) requires that program managers develop and implement performance outcome-based logistics strategies that optimize total system availability while minimizing cost and the logistics footprint. But, more than we would like to think, organizations proceed at their own peril by not conducting an initial business case analysis to determine their potential Return On Investment associated with their product support decision. Fortunately, there are true successful ventures that evidence those attributes and objectives sought with PBL implementation (Beggs, Seymour, & Ertel, 2005).

Miller (2008) identifies an ingredient required for a successful PBL undertaking. Stated plainly: Get on with the work of sourcing the best possible product support results for the warfighter given statutes and regulations governing your options. Find the most cost-effective means of supporting warfighters. He further states, the research is clear that, properly done, PBL can be an important part of the solution. He also highlights several barriers and enablers that affect PBL implementation—similar to those explored in this article. He identifies funding, regulations, BCAs, and several other misperceptions driven by a misunderstanding or lack of experience working with PBL.

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Former Deputy Under Secretary of Defense for Materiel Readiness Randy Fowler wrote in his 2010 work, *Future of Product Support*, that among critics there remains a strong consensus that an outcome-based, performance-oriented product support strategy is a worthy objective. As much as any other organizational construct to date, Fowler touches on the situation of defense leadership. On the one hand, transforming product support will require not only strong leadership in DoD, but also an open-minded, reform-driven DoD-congressional partnership and a collaborative DoD-industry relationship to realize PBL's objectives. The national security and economic environments dictate tough-minded acquisition reform and logistics transformation. On the other hand, the challenges of affordability constraints; the need to upgrade systems, processes, and infrastructure; and a continuing, persistent operations tempo prescribe a clear need for DoD implementation of an integrated plan to address product support across the defense enterprise—like PBL.

Fowler (2010) also suggests that PBL will only succeed when driven from the topmost levels in the program or organization. One can surmise only top-level managers have the breadth of perspective and authority needed to see the entire process from start to finish. An effective pro-



ponent of PBL must be part visionary, part communicator, and part leg breaker. Program managers are charged with ensuring the development and implementation of performance outcome-based strategies that strive for a more cost-effective weapon systems support approach and a balanced use of public-private partnerships. Program managers and logisticians must be open to contrasting product support strategies to experience those benefits PBL can afford a weapon system.

Oming (2010) offers, in certain circles, that PBL has been viewed as a business fad and is derided in much the same fashion as Total Quality Management and Lean Six Sigma when those concepts were first espoused—misconceptions on their true value. He highlights that it is true that these methods are not a panacea, but time has shown that when applied under the right circumstances, they can provide powerful results.

One final point about Fowler's discussion on the future of product support should be noted: Fowler, like Kobren and Geary et al., understands the role of a product support strategy such as PBL where it is crucial to our national interest to ensure that product support achieves a level of performance equal to its importance. Customer or warfighter requirements, not internal values, should guide the product support manager's performance or decisions. They must replace old ways of thinking with new ideals and expectations associated with letting the old paradigms go. These include replacing perfectionist ways of thinking with experimental thinking, and getting-it-just-right credos with making-it-better credos.

A recurring theme among authors is the importance of positive preconditions for PBL success: senior management and sponsorship, realistic requirements and expectations, empowered and collaborative product support integrators, strategic context for efficiency growth, shared vision, sound supply chain management practices, and appropriate people participating full-time with a sufficient budget. Some also identify negative preconditions related to PBL: wrong sponsor (leader for the job), cost-cutting focus, narrow technical focus, and do-it-to-me attitudes. Some authors assert that, to turn around negative conditions, we must educate the workforce on PBL and do something small first.

PBL Perceptions Discovered

2 What do we truly understand about the current workforce's perceptions of PBL? What are some of the known or perceived PBL implementation and management conundrums facing program management practitioners?

The objective of the study was to gather information from senior DoD leadership on factors that could be enhanced to help reduce identified barriers or factors that would enable more effective PBL implementation. The study examined the perceived effects of 15 factors relating to PBL implementation—whether they were a barrier or enabler and the relative importance of these factors for carrying out the product support strategy. The genesis of factors used in this and the previous study was based on literature searches, numerous PBL briefings from the Services, various conference minutes, and informed identification of what is perceived to be an appropriate set of factors for study—the most prevalent barriers and enablers that were impacting PBL implementation efforts.

Figure 1 shows the factors and definitions that were rated on the survey by each of the 300 plus respondents. Respondents were provided the option to rate a neutrally or unbiased (no predisposition to being an enabler or barrier) worded factor as either a barrier or an enabler.

The method used to determine a factor's specific rating score and whether a factor was a barrier (negative rating score) or an enabler (positive rating score) was to multiply the ranking (either positive or negative 1, 2, 3, or 4 based on the respondent's selection on the survey) by the total number (votes) of respondents that selected that ranking.

Information was obtained suggestive of current thinking regarding these 15 factors as to their effects on PBL implementation—the main objective of the survey. Ten factors were determined by respondents to be enablers (positive rating scores) to implementation while 5 were determined to be barriers (negative rating scores). In particular, Warfighters' Perspective had the highest rated score as an enabler with a score of 323. Five factors (Performance Metrics, Total Life Cycle Systems Management [TLCSM], Strategic Alliances/Partnerships, Supply Chain Management [SCM], and Performance Based [PB] Contracting) were next in the positive rankings (enablers) with similar scores ranging from 217 (Metrics and TLCSM) to 193 for PB Contracting. Four other

FIGURE 1. FACTORS, DEFINITIONS, AND SURVEY RESPONDENTS' PERCEPTIONS (BARRIERS VS. ENABLERS)

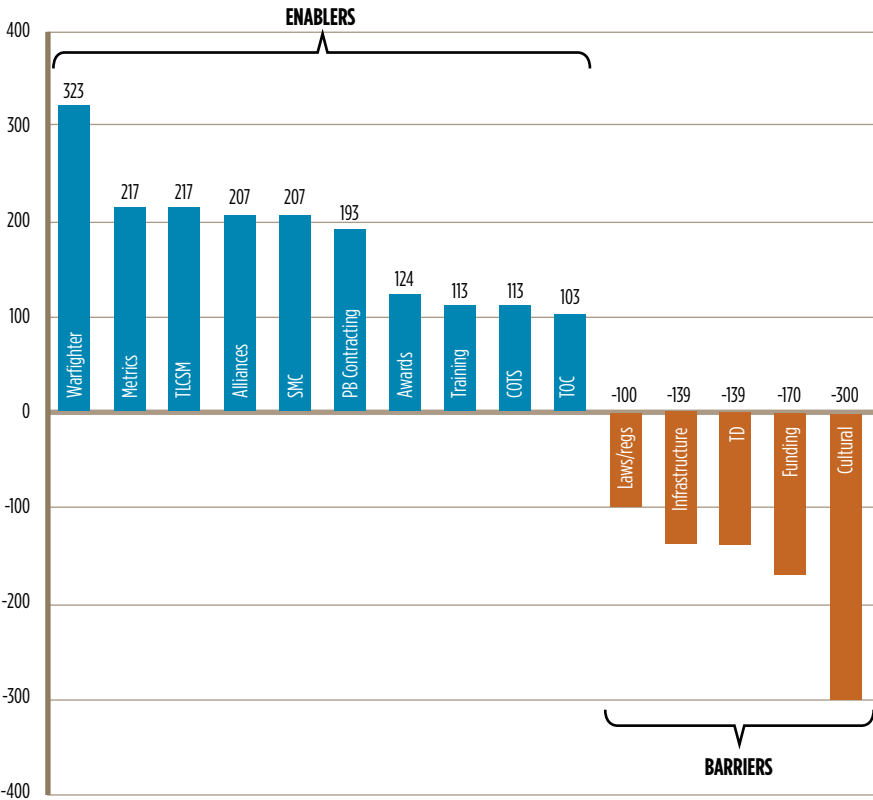
1.	BARRIER: Funding. Working capital fund, colors of \$, expiring \$
2.	BARRIER: Statutory-Regulatory Requirements. Title 10, Core, DoDI 5000.02, Service policies
3.	BARRIER: Cultural Paradigms. Organic vs. Contractor Logistics Support (CLS), parts management vs. performance management
4.	BARRIER: Existing Infrastructure or Organization. Management, oversight/review, structures/processes
5.	BARRIER: Technical Data (TD) Rights. Ownership of technical data package, access to technical data
6.	ENABLER: PBL Awareness/Training. Formal DAU training, in-house/on-the-job training, personnel skills
7.	ENABLER: Incentives/Awards. Award/incentive fees, administration of innovative contracts/agreements
8.	ENABLER: Supply Chain Management (SCM). End-to-end customer support, enterprise integration
9.	ENABLER: Strategic Alliances/Partnerships. Depot partnering, joint ventures
10.	ENABLER: Performance Based (PB) Contracting. Incentive/award fees, innovative contracts
11.	ENABLER: Performance Metrics. Information systems, variations, trends
12.	ENABLER: Total Life Cycle Support Management (TLCSM). PM's TLC product support responsibility
13.	ENABLER: Adoption of Commercial Off the Shelf (COTS). Commercial practices/procedures, products, subsystems
14.	ENABLER: Total Ownership Cost (TOC). Cost accounting, reporting, tracking
15.	ENABLER: Warfighters' Perspectives. Readiness, affordability, combat requirements

enablers were close in their positive rating scores (124 to 103): Incentives/Awards, PBL Awareness/Training, Adoption of COTS, and Total Ownership Cost (TOC).

Cultural Paradigms was the highest rated barrier (negative ranking score of -300). This was significantly above the second place barrier of Funding with -170. The next three negative rated factors (barriers) were grouped together from -139 to -100. Collectively, raw scores for the four grouped barrier factors—Funding, Technical Data [TD] Rights, Existing Infrastructure or Organization, and Statutory-Regulatory Requirements—were so similar that little can be interpreted about their relative different effects on PBL without further or a more granular analysis.

The graphic (Figure 2) displays the rating scores and relative differences or similarity of the barriers and enablers.

FIGURE 2. ENABLERS/BARRIERS RELATIVE COMPARISONS



The survey data analyses determined that from the initial 15 factors, 10 were enablers and 5 were barriers to PBL implementation. This distribution of factors was considered significant since in the previous study in 2005 by DeVries 7 factors were considered to be enablers while 7 others were considered to be barriers. An additional factor of Warfighters' Perspective was included in this study that was not rated in 2005. Specifically, PBL Training and Incentives/Awards had previously (2005) been identified as a barrier. The 2011 study determined they were enablers. Even though these two factors (Training and Incentives) were rated in the lower 30 percent of the enablers in 2011, it is suggestive that respondents did not perceive these two ranked factors to be barriers as they were categorized in the 2005 survey. This highlighted the reason for allowing the respondents to determine by their ratings whether a factor was a barrier or an enabler.

The results highlighted that of the 15 factors rated on the questionnaire, only 5 were identified as barriers. Ten were identified as enablers—3 more than in the 2005 study. More factors are now (2011) considered to be enablers to PBL implementation than previously identified in 2005. Perceptions in 2011 may be that PBL is not as difficult to implement and more factors are considered to be aids or enablers to its successful implementation.

As highlighted in figure 1, respondents considered the Warfighter's Perspectives to be the most important positive factor (enabler) facilitating PBL implementation. This matches the commonly accepted theory that the warfighter is normally assumed to be one of the most critical elements or factors to a program's overall success. The success of PBL implementation is no different—the Warfighters' Perspectives factor is highlighted in this research data as being critical to a program's success.

Respondents considered Cultural Paradigms a significant challenge (barrier) to PBL implementation. Cultural paradigms are normally assumed to be among the most serious impediments or hindering factors to a program's ability to accept change or accomplish a challenging issue within the program. The success of PBL implementation is no different—Cultural Paradigms must be overcome if a program or PBL is to succeed in the complex DoD environment. In relationship to PBL implementation, Cultural Paradigms being rated the highest is not surprising given that culture is the most challenging factor to overcome in any significant change, especially when these new concepts or changes

are viewed as threats. Many government personnel consider PBL as a threat because of a common misperception that it is a synonym for contractor logistics support (CLS) or “contracting out support.” The aforementioned information is vital for any program to consider when attempting implementation of different business practices like performance based incentives.

As seen through the eyes or viewpoint of the respondents, clearly the Warfighters’ Perspectives factor had a positive effect on PBL implementation. Respondents report that if they were able to determine and maintain a warfighter’s point of view, they had a greater ability to effectively implement PBL. Clearly, these respondents are sending an important message to potential implementers of PBL—if you want to effectively implement PBL you need to understand and maintain the Warfighters’ Perspectives. This point of view is a normal, commonly accepted theory, but one that is not always supported with empirical data.

The study also revealed that the same can be said for Cultural Paradigms; it had a perceived significant effect on PBL—but as a barrier. Like the Warfighters’ Perspectives factor, the Cultural Paradigms factor has a significant effect on PBL implementation. The Cultural Paradigms factor is perceived as a significant barrier and must be reduced or eliminated if PBL is going to be more successful. Specific paradigms were not detailed within the survey; however, some commonly known paradigms consider PBL as another way of buying CLS, as too expensive to incorporate and manage, and not as flexible in terms of providing needed product support. PBL can be a valued-added game changer such as public-private partnerships, where potentially the best of entities (industry and government) collaborate to meet warfighter requirements. To move beyond cultural impediments requires hard work to change old ways of thinking. As discussed earlier in this article, customer or warfighter requirements, not internal values, should guide the product support manager’s performance or decisions. They must replace old ways of thinking with new theories and expectations associated with letting the old paradigms go. If DoD is to effectively implement PBL, then the acquisition and sustainment workforce education and training needs to continue the reduction of cultural maladies that impede the ability to implement a viable PBL solution.

Results and Discussion

The **Warfighters' Perspectives** are perceived by senior program management practitioners to be the most vital enabling factor to ensuring PBL is effectively and efficiently implemented—a result suggestive of the 2011 study. In all future endeavors, any plan to deploy PBL as a viable product support strategy should include the warfighters and their critical perspectives if PBL is to be successfully implemented.

PBL Awareness/Training and Incentives/Awards should be considered effective enablers to PBL implementation and need to be fully embraced by the Services and the Office of the Secretary of Defense. The 2011 survey indicated that current respondents consider these factors (Figure 1) to be vital to the success of PBL. They were rated as barriers in 2005; conversely, they have been shown in the 2011 study to be effective enablers, and need to be leveraged as such. Continued attention should also be placed on ensuring that incentive-based contracts are properly managed by DoD and the Services' contracting agencies. PBL training should also be continued through development of additional courses and Continuous Learning Modules by DAU and other DoD training agencies. Senior leaders should also attend similar courses and related conferences/symposiums—especially in light of the Cultural Paradigms factor discussed next, which was considered to be the most significant PBL barrier.

Cultural Paradigms should be addressed very carefully by all PBL implementers. This factor was identified by respondents as the major barrier to successful PBL deployment. DoD leadership must address this fact and ensure that PBL training is provided so all involved understand more clearly what is at stake (more affordable product support, increased readiness, or enhanced efficiencies). Additionally, they should understand what the cultural impediments are to PBL's acceptance as an effective means to ensure greater product support and mission effectiveness. Continued promulgation of success stories that highlight the true capabilities of PBL should be shared throughout the Services—along with how and who have been most successful in implementing PBL. Specific attention should be placed on removing cultural impediments. In particular, future training should include awareness of related cultural impediments and techniques for reducing these impediments. The target audience for this type of training would be senior program managers, systems engineers, contract specialists, and logisticians.

Additional emphasis should be placed on enhancing all the identified 10 enablers. Conversely, efforts should be placed on reducing the effects of the 5 identified barriers. Besides the Warfighters' Perspectives, the policy responses to five other factors (Strategic Alliances/Partnerships, Supply Chain Management, Performance Metrics, TLCSM, and PB Contracting) are likely to yield large benefits. Besides focusing on Cultural Paradigms, the four grouped items identified as barriers (Funding, TD Rights, Existing Infrastructure or Organization, and Statutory-Regulatory Requirements) should be treated as opportunities for mitigation efforts to reduce their undesired effects on successful PBL implementation.

Conclusions

The 2011 survey identified 10 critical PBL enablers that should be enhanced; it also identified 5 barriers that should be minimized in PBL implementation. The results of this study have applications to successful implementation of PBL throughout DoD and the commercial-industrial workplace.

To restate, the research provided the following results:

- The single most significant enabling factor for PBL was maintaining the Warfighters' Perspectives in the 2011 study.
- The top barrier to PBL was Cultural Paradigms in the 2011 survey.
- Warfighters' Perspectives (2011) replaced Performance Metrics from the 2005 study as the most significant enabler.
- Cultural Paradigms (2011) replaced Funding from the 2005 study as the most significant barrier.
- Two barriers from the 2005 study were determined to be enablers in the 2011 study (PBL Awareness/Training and Incentives/Awards).

Future research similar to this effort should ensure or include the participation of other disciplines such as systems engineers, testers, contract specialists, and business cost estimators and financial managers, to view perceptions about PBL through a “larger aperture” or perspective. Additionally, analyses should be conducted with the existing data to determine if survey respondents expressed different perceptions between functional career areas, e.g., do all supply specialists have a different perception of the effect training has on PBL implementation vs. program managers? It should also be highlighted that the survey did not specifically question respondents on whether their perceptions of PBL implementation were reflecting their opinions on each factor’s effect on PBL implementation under current practices and policies, or if their opinions reflected each factor’s effect regardless of current practices. This is an important consideration when one is considering the causes of implementing PBL. Is implementation affected more by specific program or project-unique PBL policies or practices, or by the general DoD/Office of the Secretary of Defense policies and procedures effects on PBL? Clearly, more research is required on the current dynamic topic of PBL.

Author Biographies

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References

- Beggs, J., Seymour, T., & Ertel, B. (2005). *Performance-based logistics perspective*. Retrieved from <http://www.boozallen.com/media/file/performance-based-logistics-perspective.pdf>
- Canaday, H. (2010). *How much will sustainment change?* Military Logistics Forum [Website]. Retrieved from <http://www.military-logistics-forum.com/military-logistics-forum/272-mlf-2010-volume-4-issue-8-september/3351-how-much-will-sustainment-change.html>
- Department of Defense. (2007). *The defense acquisition system* (DoD Directive 5000.01). Retrieved from <http://www.dtic.mil/whs/directives/corres/pdf/500001p.pdf>
- Department of Defense. (2009). *Department of Defense reliability, availability, maintainability, cost rationale report manual*. Retrieved from [https://acc.dau.mil/adl/en-US/378147/file/51172/RAM-C percent20Manual percent20Jun percent2009.pdf](https://acc.dau.mil/adl/en-US/378147/file/51172/RAM-C%20percent20Manual%20percent20Jun%20percent2009.pdf)
- DeVries, H. (2005). Performance-based logistics—barriers and enablers to effective implementation. *Defense Acquisition Review Journal*, 11(3), 243–253.
- Fowler, R. (2009). Misunderstood superheroes. *Defense AT&L Magazine*, 38(1), 8–10. Retrieved from <http://www.dau.mil/pubscats/PubsCats/atl/jan-feb09.pdf>
- Fowler, R. (2010). The future of product support. *Defense AT&L Magazine*, 39(2), 16–20. Retrieved from http://www.dau.mil/pubscats/ATL%20Docs/Mar-Apr10/datl_mar-apr10.pdf
- Geary, S., Koster, S., Randall, W. S., & Haynie, J. J. (2010). Performance Based Life Cycle Product Support (PBL) strategies: Enablers for more effective government participation. *Defense Acquisition Review Journal*, 17(4), 450–483. Retrieved from http://www.dau.mil/pubscats/PubsCats/AR%20Journal/arj56/ARJ56_Final.pdf
- Kobren, B. (2009). What performance based logistics is and what it is not—and what it can and cannot do. *Defense Acquisition Review Journal*, 38(5), 254–267. Retrieved from <http://www.dau.mil/pubscats/PubsCats/Kobren.pdf>
- Miller, A. (2008). Performance-based logistics works. *Aviation Week & Space Technology*, 169(17), 78. Retrieved from http://www.ndbi.utk.edu/Uploads/files/Miller_Aviation_Week_11-08.pdf
- Omings, T. (2010, January–March). Unmanned aircraft systems (UAS) project office (PO) finds powerful cost efficiency advantages through proper performance-based logistics (PBL). *Army AL&T*, 14–19.