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IMPROVING THE DoD's TOOTH-TO-TAIL RATIO

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Executive Summary

It is projected that the Department of Defense (DoD) will see a funding reduction of \$487 billion over the next 10 years (Office of Management and Budget [OMB], 2013). In order to stay within budget, the DoD plans to implement targeted reductions in force structure, reprioritize key missions and the requirements that support them, promote efficiency improvements in acquisition, and continue to reform other business practices.

However, these efforts, at least in their current form, will prove insufficient. The Congressional Budget Office (CBO) asserts that the DoD's costs will soon outstrip its budget as expenditures for manpower, maintenance, and health care continue to increase, thereby eliminating the funds necessary for the planned recapitalization, modernization, and transformation of the military (CBO, 2013). The DoD must make hard decisions in order to prevent such an outlook from becoming a reality.

In the past, the DoD has reduced the number of military personnel (and to a lesser extent, equipment orders and program funding) in order to constrain costs. At present, however, the active military force structure is already near an all-time low, and existing equipment inventories are becoming older, smaller, and less effective against emerging technologies.

It is within this challenging environment that the DoD must strive to improve its “tooth-to-tail” ratio. This term, familiar to defense analysts, refers to the relative level of support personnel (military, civilian, and contractor) required to maintain combat forces. The *tooth* refers to the personnel that train for and perform operational missions, whereas the *tail* refers to the personnel that support the combat forces. As of 2011, the active-duty military end-strength was 1,459,409 (BLS, 2012). Of these personnel, only 17% are identified as performing combat specialties. This compares to an average of 26% assigned to combat roles in other countries, according to a recent survey of 29 nations (Gebicke & Magid, 2010). Note that these figures do not take into account civilian and contractor personnel, the majority of whom provide support functions.

Given the severity of the nation's budgetary constraints, merely tweaking various processes or reducing Department overhead or personnel by some arbitrary percentage may not suffice. Schwartz and Mosler (2013) wrote that across-the-board cuts simply do not work; rather “they

spare the poorest performing elements from deeper cuts” (p. 29). Unfortunately, rather than confront the problem head on, some service-led strategies for reducing costs have relied on quick fixes rather than fundamental change.

Given the current threat environment—for example, an increasingly unstable Middle East, the spread of global terrorism, and China’s economic and military growth—the United States must strive to maintain its military edge. Fortunately, there are some indications that the DoD has begun to embrace this challenge. For instance, the DoD has proposed eliminating two of its regional commands, a move that would cut thousands of jobs, eliminate redundancy, and improve diplomacy abroad by elevating the roles of civilian agencies (Friedman & Sapolsky, 2013). The DoD has also proposed base closures, which Congress has failed to approve.

These are good first steps, but there is ample room for the realignment of force strength. Indeed, the numbers speak for themselves. The Defense Business Board (DBB) recently reported that there were 1.4 million total active-duty troops in the U.S. military, yet only 340,000 were deployed at any given time—roughly one quarter of the force in 2010. Moreover, one quarter of active military personnel served in commercial or non-inherently governmental jobs during this time. It is not unreasonable to conclude that the military is performing too many non-military functions.

The number of non-combatant military support forces, which increased significantly over the course of the 20th century, has an analog in the private sector: the non-production labor force, which also increased, from 18.6% in 1950 to 31.9% by 1987. But over the last couple of decades, in response to global competitive pressures, firms were forced to reduce overhead and introduce new efficiencies in order to excel in a changing environment.

Comprehensive cost accounting has proven essential in providing the visibility necessary to make decisions that lead to private-sector improvement initiatives. Organizations rely on comprehensive cost accounting systems in order to fully understand their costs. One system in particular, activity-based costing (ABC) has been widely adopted. Since the 1980s, ABC has been a major part of business re-engineering efforts and process improvement efforts. It is also used in strategic decisions concerning pricing, production mix, business processes, and overhead reduction.

The private sector has also tackled excessive overhead through the launch of initiatives that lead to fundamental reorganization and total process improvement. The private sector experience makes clear that dramatic overhead reduction and efficiency improvements entail more than across-the-board cuts. Rather, overhead reduction occurs through integrated process reevaluation and rationalization. Coyne, Coyne, and Coyne (2010), for example, noted that there is no single idea that can radically change the cost structure of an organization or department. Indeed, they asserted that organizations can achieve overhead reduction goals only through the combination of 10 or more discrete actions.

In the private sector, firms also undertake business process re-engineering (BPR) in order to create entirely new processes that are more efficient. “BPR involves reinventing processes by abolishing the old ones and finding imaginative ways of accomplishing work while designing completely and radically new processes” (Goksoy, Ozsoy, & Vayvay, 2012). Standard total quality management philosophies aim to achieve incremental improvements, whereas BPR aims to make radical improvements. In addition, private-sector firms rely on a variety of different strategies (e.g., Six Sigma, Lean, Total Quality Management) to implement continuous performance improvement (without increasing costs), in order to compete effectively. For example, many successful firms use so-called Lean processes to increase speed in manufacturing or service delivery.

Finally, within the private sector, integrated supply chains are revised and reimagined in order to foster a competitive advantage, to be more responsive to market changes, and to recover from disruptions more quickly. Often, major corporations attempt to restructure their global supply chain operations at times of competitive and financial challenge. Today’s most successful firms rely on world-class supply chains characterized by high-reliability and narrow distributions

The commercial world has achieved these impressive results, in large part, by leveraging advances in information technology and creating integrated digital supply chains, enabling asset visibility from the manufacturer to the end user, created from the ground up and using centrally managed networks.

The DoD has yet to fully embrace the efficiency-based reforms introduced within the private sector. Too often, the DoD treats the symptoms rather than the underlying problems. The DoD’s

failure to embrace efficiency-based reforms is reflected in five areas that, from a private-sector point-of-view, require immediate attention. These areas include the following:

- **Underperforming Logistics Support**

The Department of Defense (DoD) is one of the largest and most complex organizations in the world. Likewise, the DoD's supply chain, which accounted for \$210 billion in fiscal year (FY) 2010, is massive (DBB, 2011). The current system, however, is largely an ad-hoc mix of government and industry, with little cost visibility or performance accountability, and does not perform to world-class standards for responsiveness, reliability, costs, personnel, and asset visibility (Bell, 2007).

- **Duplication and Redundancy**

Within the federal government, there are multiple agencies performing the same job at the same time. The DoD is no exception. From weapon systems programs to military health care services, wasteful duplication and redundancy consume funding that could be spent to improve military efficiency and effectiveness.

- **Inefficient Personnel Mix**

The Government Accountability Office (GAO) noted that over 40% of the DoD's total active-duty forces have never been deployed, while 11.4% have been deployed over three times. As of May 2010, 1.1 million out of 1.4 million active-duty troops were not deployed. One way to bring costs down is to reevaluate the DoD's use of personnel and reduce the number of active-duty troops being used for functions that are not inherently governmental, replacing them with private-sector employees from firms that are hired on a competitive basis.

- **Brass Creep**

“Brass creep,” or the proliferation of high-ranking positions relative to the overall number of troops, is of growing concern, especially given the predicted growth in personnel costs. Former Secretary of Defense Robert Gates defined the brass creep

problem in 2010 as “having generals do what colonels are perfectly capable of doing. Generals require huge staffs and command structures: three-star generals serving four-stars, two-stars serving three, each tended by squadrons of colonels and majors” (Schwellenbach, 2013). From 1990 to 2010, the number of generals and admirals decreased 10%, while active-duty military personnel decreased over 30% (Schwellenbach, 2013).

- **Inadequate Cost Accounting**

An additional challenge, which makes it difficult for the DoD to make sound management decisions when analyzing and evaluating alternative strategies, is its inadequate cost accounting systems. As discussed previously, the private sector maintains robust cost accounting systems to track all relevant expenses, since profit realization depends on these management accounting systems to accurately capture all of the costs of providing a good or service. All costs are fully allocated (using a process such as activity-based costing) among a firm’s products so that the firm knows how much it spends on what, allowing the firm to price its output (be it a product or service) appropriately. On the other hand, most DoD organizations cannot identify all of their costs and fail to account for them in their cost analyses. Rather, their costs are grouped into general accounts (e.g., personnel) instead of by activities.

Leaders from academia, media outlets, think tanks, research institutes, and government agencies have noted that the Pentagon must undergo comprehensive structural reform in order to make its finances sustainable.

The needed restructuring will likely cause internal upheaval and disruption. It will require political courage and commitment from senior leadership, within and outside of the DoD in order to combat opposition and ensure that meaningful reform takes place. Powerful interest groups within or closely aligned with the DoD are likely to oppose calls for reform. Overcoming internal opposition is vital to the realization of true cost savings and improvements.

The following recommendations derive from the realization that current spending has reached unsustainable levels that, left unchecked, will begin to adversely impact our nation’s military

end-strength, and they are informed, partially, by private-sector strategies that have enabled firms to significantly reduce their costs in light of similar pressures. We list these recommendations below.

1. Strengthen Accounting and Accountability

- Establish effective control over the growth of the bureaucracy

Defense agencies and field agencies alone account for some 20% of the Defense Department budget (DBB, 2011). Many of these auxiliary bodies do not use meaningful performance management systems, operate noncore functions, and have only passive supervision. The DoD must restrain the growth in headcount, simplify the command structure, and reduce bureaucratic layering.

- Adopt a managerial cost accounting approach

Managerial cost accounting is the tool that business managers use to understand the costs embedded in their business processes. Currently, DoD organizations cannot identify all of their costs and fail to account for them in their cost analyses, making it exceedingly difficult to make cost-cutting determinations, and improve efficiency. DoD agencies and the military services need to adopt a comprehensive costing approach in order to enable effective decision-making centered on efficiency.

- Incentivize efficiency

All DoD services and agencies should implement continuous process improvement (including Lean processes and Six Sigma) in order to reduce costs while improving operating effectiveness of their organizations across the full range of operational, administrative, science and technology, and support functions. Unless incentives are provided to encourage continuous improvement, personnel may continue to rely on outdated practices.

2. Make Efficient Use of Personnel

- Acquire and promote to meet force structure objectives

Currently, recruiting and promotion practices are not aligned with force structure objectives. Rather, the military services adjust their number of personnel in response to budgetary changes. This practice is particularly disturbing with regard to active-duty combat forces. The DoD must determine its future needs and then acquire and promote accordingly.

- Increase reliance on DoD civilians to fill roles that are not military-essential

In order to help to shrink the swollen rank structure within certain military occupations, and, at the same time, refocus attention on military-essential functions, non-military functions that are inherently governmental should be filled by DoD civilians. It is clear that civilians are more effective in carrying out commercial and other non-core functions because they do not have to perform additional military-specific responsibilities. The DoD should follow the recommendations proposed under the Bowles-Simpson Fiscal Commission, which would eliminate some 88,000 military personnel who are performing commercial activities and replaces them with 62,000 civilians, at significant per-employee savings (Schwellenbach, 2013).

- Increase reliance on contractors to provide non-inherently governmental functions

Some DoD functions are inherently governmental, and these functions must be performed by government personnel (military or civilian). However, if competitively bid, non-inherently governmental functions can be performed more affordably by contractors, then there is no reason to retain active-duty military or government civilians for these functions. At the same time, it is important that the DoD be able to manage and oversee contractors. Accordingly, the DoD must recruit highly qualified systems engineers, managers, and acquisition personnel to provide the required oversight.

3. Streamline Operations

- Eliminate duplication and redundancy

As the fiscal pressures facing the nation continue, so too does the need for the Department of Defense to improve the efficiency and effectiveness of its programs and

activities. Opportunities to take such action exist in areas where DoD programs or activities are fragmented, overlapping, or duplicative. The DoD must rein in overhead costs by eliminating duplication and redundancy. Again, the military must refocus its efforts on improving the efficiency of its core functions. Non-military functions within the DoD that are duplicated by other federal programs should be eliminated immediately.

- Reduce infrastructure

As duplicated and redundant functions are eliminated, and as the Iraq and Afghanistan drawdowns continue, the DoD must seek to proportionally reduce its physical infrastructure, both at home and abroad. Unfortunately, Congress has resisted, and continues to resist, infrastructure reduction initiatives, such as base realignment and closure (BRAC) in their effort to remain popular with their constituents, for whom closures could have significant impacts on local economies, particularly if the planning for their conversion is inadequate.

- Re-engineer business processes

Commercial sector firms re-engineer business processes in an effort to obtain so-called quantum improvements, as opposed to incremental ones. Today, re-engineering efforts leverage information technology in order to maximize the value-adding content of a process and minimize everything else (El Sawy, 2001).

Within the DoD, internal resistance to change is the key reason for failed attempts to redesign processes. Senior management needs to stay engaged in the project in order to signal its importance. Operational managers must go beyond simply accepting the new concepts to becoming their champions. The staff must see how the new initiative will improve their business performance, and the agency must produce small wins on department-level, ad hoc projects. This approach is an effective way of confronting cultural obstacles, generating staff buy-in, and achieving meaningful change.

4. Improve Logistics

- Develop a world-class supply chain

An integrated (end-to-end) system within the DoD—a critical component of world-class commercial logistics systems—does not exist. The DoD needs to move away from its traditional hierarchical command and control structure towards a more adaptive system that will provide the precise, agile support required for the distributed, network-centric operations that the DoD envisions.

- Leverage technology

The DoD should seek to develop sophisticated logistics networks, much as the commercial sector has already done. The DoD must strive to create a network-centric, knowledge-driven environment where information technology provides superior and relatively seamless connectivity of data, information, and awareness. In order to implement improved logistics, several key technologies need to be further developed. In particular, the DoD should expand research and development in the areas of improved sensing and improved modeling and algorithms. The DoD also must continue to reduce manpower requirements for operations and maintenance solutions by investing in robotics and automation, in addition to fuel management and efficiency solutions and renewable energy sources.

Efficiently using resources and reducing overhead within the DoD is essential, given that expenditures on domestic discretionary programs face long-term reductions as a result of the high national debt burden, prevailing economic conditions, and the protracted debate over the federal budget deficit. The DoD must rebalance expenses against available funds as it enters into a period of budgetary contraction. This task is particularly challenging, given that a sizable portion of defense spending is designated for both mandatory personnel expenditures and incentives, such as health care. Now more than ever, the DoD must take steps to improve its tooth-to-tail ratio.

I. Introduction

Recent events have served as catalysts for budget reform and reduction efforts throughout the federal government. These events include the financial crisis of 2007 and 2008, the subsequent global recession, the European sovereign debt crisis, congressional debt ceiling debates, and Standard & Poor's downgrade of U.S. government bonds. In an effort to begin to address the yearly deficits and mounting national debt, Congress arrived at an imperfect solution, the Budget Control Act (2011), which introduced sequestration (i.e., mandatory, across-the-board budget caps.)

It is projected that the Department of Defense (DoD), for its part, will see a funding reduction of \$487 billion over the next 10 years (OMB, 2013). In order to stay within budget, the DoD plans to implement targeted reductions in force structure, reprioritize key missions and the requirements that support them, promote efficiency improvements in acquisition, and continue to reform in other business practices. However, these efforts, at least in their current form, will likely prove insufficient. The Congressional Budget Office (CBO) found that the DoD's 2013 Future Years Defense Program (FYDP), a five year spending plan provided to Congress, fails to bring down spending to a sustainable level. In fact, the CBO asserted that the DoD's costs will soon outstrip its budget as expenditures for manpower, maintenance, and health care continue to increase, thereby eliminating the funds necessary for the planned recapitalization, modernization, and transformation of the military (CBO, 2013). The DoD must make hard decisions in order to prevent such an outlook from becoming a reality.

In the past, the DoD has reduced the number of military personnel (and to a lesser extent, equipment orders and program funding) in order to constrain costs. The fact that total defense spending (in real terms) was higher in 2010 (see Figure 1) than at any point since the end of World War II suggests to critics that the military could further decrease the number of troops and reduce the scope of acquisitions. At present, however, the active military force structure is already near an all-time low (see Figure 1), and existing equipment inventories are becoming older, smaller, and less effective against emerging technologies.

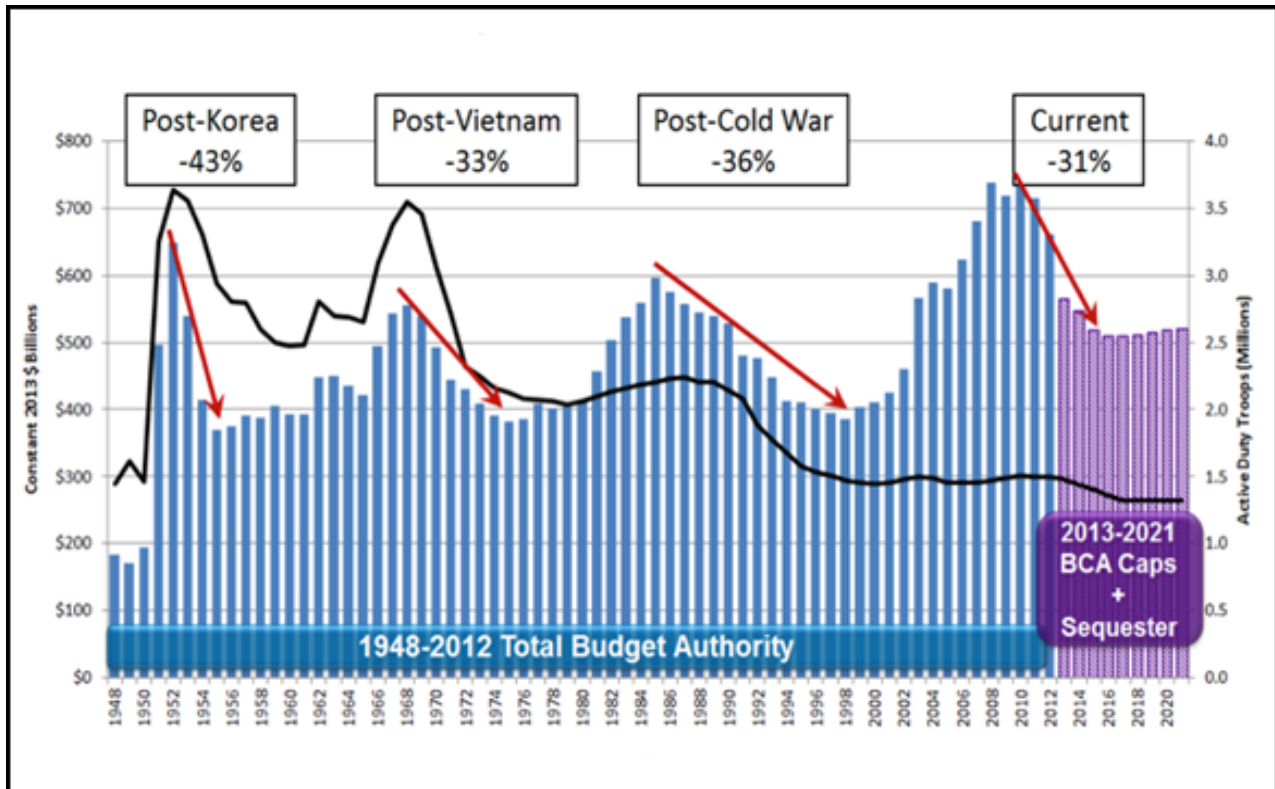


Figure 1. DoD Budget and Active-Duty Troops, 1948–2020 (Center for Strategic and International Studies, 2012)

At the same time, the costs of its acquired goods and services have risen significantly over the last decade. For example, the total acquisition cost of the military’s most expensive program, the F-35 Joint Strike Fighter, has increased by more than 90%, from \$233 billion (for 2,866 aircraft) in 2001 to \$396 billion (for 2,457 aircraft) in 2012. Meanwhile, the average total cost for operations and maintenance per troop nearly doubled to \$115,000 in 2012, compared with \$58,000 in 2001 (Korb, Rothman, & Hoffman, 2012). This dramatic increase reflects rising, across-the-board, costs in such areas as health care and retirement, in addition to the significant increases in active-duty compensation passed into law during a decade of war in Iraq and Afghanistan.

Indeed, a substantial portion of the military’s budget is earmarked for spending on personnel-related costs. These costs represent a considerable strain on the Department’s resources. A Congressional Budget Office report entitled *Approaches for Scaling Back the Defense Department Budget Projections* showed that “more than 90 percent of the estimated growth in

costs arises in four particular areas: military cash compensation, military health care benefits, the acquisitions of major weapon systems, and civilian compensation” (CBO, 2013, p. 21). *The New York Times* reported that the Pentagon spends \$181 billion each year, nearly one-third of its base budget, on military personnel costs: \$107 billion for salaries and allowances, \$50 billion for health care, and \$24 billion in retirement pay (Bumiller & Shanker, 2012). Currently, soldiers and officers earn more than 90% of Americans with equivalent education (DoD, 2012a). However, politically charged reforms, like those to health care, retirement, and compensation are unlikely to occur in the near term. And in any case, these entitlements will most likely remain intact for grandfathered current personnel and retirees.

It is within this challenging environment that the DoD must strive to improve its tooth-to-tail ratio. This term, familiar to defense analysts, refers to the relative level of personnel support (military, civilian, and contractor) required to maintain combat forces. The *tooth* refers to the personnel that train for and perform operational missions, whereas the *tail* refers to the personnel that support the combat forces (e.g., service headquarter staffs, maintainers, health care providers, logisticians). As of 2011, the active-duty military end-strength was 1,459,409 (Air Force Magazine, 2012). Of these personnel, only 17% are identified as combat specialties. This compares to an average of 26% assigned to combat roles in other countries, according to a recent survey of 29 nations (Gebicke & Magid, 2010). Note that these figures do not take into account civilian and contractor personnel, the majority of whom also provide support functions.

In fact, despite significant increases in military spending following the September 11, 2001 terrorist attacks, the ratio of combat personnel to total military personnel is smaller today than it was in 1997 (see Figure 2), a year in which the total military force structure was smaller (1.42 million total personnel in 1997 vs. 1.46 million in 2011), and the number of combat personnel was greater (298,000 vs. 226,000). Thus, historic improvements in the tooth-to-tail ratio do not merely reflect increases in combat personnel relative to a fixed “tail.” In principle, then, it appears that the current ratio can be reduced by improving enterprise-wide efficiency.

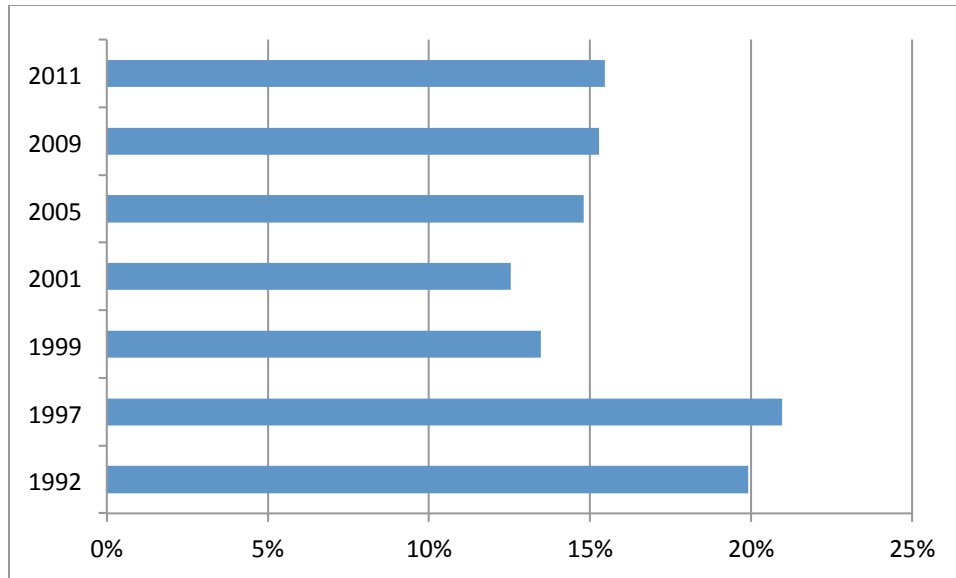


Figure 2. Percentage of Combat Personnel (of Total Military Personnel)

Note. The information in the figure came from the Bureau of Labor Statistics (2011)

Given the severity of the nation’s budgetary constraints, merely tweaking various processes or reducing department overhead or personnel by some arbitrary percentage may not suffice. Schwartz and Mosler (2013) wrote that across-the-board cuts simply do not work; rather “they spare the poorest performing elements from deeper cuts” (p. 29). Unfortunately, rather than confront the problem head on, some service-led strategies for reducing costs rely on quick fixes rather than fundamental change. For instance, in June of 2013, the Army announced plans to cut some 80,000 troops, reducing the headcount from 570,000 soldiers to 490,000 soldiers (Carter & Bensahel, 2013). There was no mention of a plan to reform its often outdated business practices, or address the politically difficult task of reducing its infrastructure—strategies that have been discussed for years, yet never implemented. Nor was it evident that there was a serious examination of developing and leveraging unmanned systems, and other technologies, to replace the loss of end strength.

More recently, the Army announced plans to replace some civilian contractors with soldiers in order to save money. Soldiers that are currently idle due to the lack of combat training funds, and the drawdown in Afghanistan, will be tasked with post security and dining hall duty (Curthoys, 2013). Ironically, contractors who competitively perform security and dining services cost significantly less than soldiers. This move may have a negative impact on troop morale and

points to the lack of long-term planning. In May of 2013, the GAO (2013a) found that the DoD failed to adequately address statutory requirements for its workforce plan, and inventory of contracted services, as required by the National Defense Authorization Act for Fiscal Year 2013.

Given the current threat environment—for example, an unstable Middle East, the spread of global terrorism, and China’s growth (both economic and military) and its increasingly belligerent behavior in the South China Sea—the United States must strive to maintain its military superiority. The military has no choice but to improve the efficiency of its operations.

Fortunately, there are some indications that the DoD has begun to embrace this challenge. For instance, Secretary of Defense Hagel ordered a 20% cut in top brass and senior civilians (Whitlock, 2013) in July of 2013. More recently, the DoD has proposed eliminating two of its regional commands, a move that would cut thousands of jobs, eliminate redundancy, and improve diplomacy abroad by elevating the roles of civilian agencies, like the U.S. Agency for International Development (Friedman & Sapolsky, 2013). In addition, the DoD has proposed base closures as the force structure was drawn down, but Congress refused to act.

The DoD has also begun to invest more in the areas of automation and robotics. A January 2014 *National Defense* article entitled “Budgets permitting, Marines could be fighting alongside robots by 2020s” highlights several technologies that are under development including unmanned ground systems that “duck and fight like humans,” and autonomous ground vehicles and helicopters (Parsons, 2014, pp. 34–35). These new technologies will reduce the personnel required to successfully complete missions, which will help to bring down costs. But as the title of the above-noted article suggests, the investment in cost-reducing technologies and initiatives is, ironically, constrained by current budget realities. Hence, it is clear that the DoD must reduce wasteful inefficiencies in order to free up the necessary funds.

There is ample room for the realignment of force strength. Indeed, the numbers speak for themselves. The Defense Business Board (DBB) recently reported that there were 1.4 million total active-duty troops in the U.S. military, yet only 340,000 were deployed at any given time—roughly one quarter of the force in 2010 (Punaro, 2013) Moreover, one quarter of active military

personnel served in commercial or non-inherently governmental jobs during this time. It is not unreasonable to conclude that the military is performing too many non-military functions.

Report Roadmap

Given the current economic challenges—challenges that are unlikely to subside, at least in the short term—the DoD must make tough choices in order to meet its national security needs. Improving efficiency in order to reduce costs may require that the DoD and the services reconsider longstanding processes and procedures that are deeply entrenched within the organizational culture. Individually, such reforms may fail to significantly reduce top-line spending, but collectively, such changes will begin to pay off. From placing military activities that have little to do with the military’s primary mission (i.e., conducting combat operations) under civilian authority, to consolidating activities that are duplicated across the military services, there is vast potential for reform.

In the next section, we describe tooth-to-tail trends and current resource misalignment within the DoD. In Section III, we examine private sector strategies aimed at reducing overhead and increasing efficiency and discuss the extent to which similar strategies might be used successfully within the DoD. Next, in Section IV, we discuss the potential for reform, and provide numerous examples of inefficiency within the DoD. In Section V, we provide policy recommendations and concluding remarks.

II. Background

The DoD has faced major budgetary constraints over the last few years. Automatic spending cuts, along with other planned budget reductions, have placed considerable external pressure on the DoD. In 2012, senior leaders within the department warned Congress about the impact of sequestration, which would lead to spending reductions on top of the \$487 billion in cuts already planned in the OMB's fiscal year (FY) 2013 budget. Defense leadership noted that the impact "would be devastating for the Department" (Panetta, 2011).

In January 2013, President Obama and congressional leaders delayed sequestration until March of 2013 by agreeing to a budget deal that averted tax increases and delayed the automatic spending cuts. Lawmakers then decided to reduce the size and scope of the sequestration. Funds supporting military personnel were exempted. The spending reductions were shifted to civilian employees, contractors, operations, weapons programs, and maintenance costs. In March of 2013, shortfalls in the Operation and Maintenance (O&M) account led the DoD to furlough its civilians. However, these recent challenges, and their short-term fixes, must not be allowed to mask the true problem: fundamental resource misalignment.

Resource Misalignment

As a result of continued resource misalignment and structural inefficiencies that are compounded over time, the DoD's future budgetary outlook, though well-intentioned, is unrealistic. The DoD's 2013 Future Years Defense Program (FYDP) discusses the continuation of a reform agenda known as the More Disciplined Use of Resources (MDUR) campaign. Strategies to realize savings included achieving new efficiencies, eliminating additional duplication and overhead, tightening personnel costs, enhancing contract competition, and reevaluating modernization programs. Under the campaign, the DoD would continue to streamline installation support and management overhead in order to match capacity to the envisioned force structure. The budget request reflected a \$9.6 billion reduction compared to the FY 2013 program and a projected reduction of about \$60 billion over the period of FY 2013 through FY 2017 (Office of Under Secretary of Defense (Comptroller)/Chief Financial Officer, 2013; see Figure 3).

	<u>FY 2013 Reduction</u>	<u>FY2013–2017 5-Year Reduction</u>
Department of Army	\$4,208	\$21,717
Department of Navy	\$1,164	\$9,499
Department of Air Force	\$1,966	\$10,305
Defense-Wide	\$2,245	\$18,652
Total DoD	\$9,583	\$60,173

Figure 3. Reductions in \$Millions

The budget detailed the specific cost savings plans for each branch of the armed services. Much of these cost savings come from consolidation and streamlining headquarters functions in addition to the subsequent reduction in staffing. In addition, the DoD made plans to merge or consolidate several auxiliary support services outside of the armed forces. The budget justification breaks down the MDUR campaign into several initiative bins. Streamline Management Overhead and Operations makes up the second largest bin, behind Facilities, Housing, and Construction. Spending reductions on facilities and housing were to be delivered largely from eliminating new construction and delaying planned investments as overseas operations declined. Much of the savings from the Streamline Management Overhead and Operations initiative (est. FY 2013 \$1.6 billion and FYDP \$8.8 billion) come from reducing, downsizing, and consolidating support structures and overhead.

However, the CBO's (2012) *Long-Term Implications of the 2013 Future Years Defense Program* casts doubt on the DoD's ability to deliver the anticipated savings. CBO projections show costs outgrowing the DoD's budget allocation. The report yields the following conclusions (with all costs measured in 2013 dollars):

- To execute its base-budget plans for 2013 through 2017, the DoD would need additional appropriations totaling \$53 billion (or 2.0%) in real, inflation-adjusted, terms. For the entire projection period of 2013 through 2030, the DoD's base-budget plans would require appropriations totaling \$1.2 trillion (or 12%) more than if funding for the base budget was held at the 2012 amount (\$543 billion).

- The primary cause of growth in the Defense Department’s costs from 2013 to 2030 would be operations and support (O&S), which accounted for 64% of the base budget in 2012. In particular, there would be significant increases in the costs of military health care, compensation of the department’s military and civilian employees, maintenance activities, and various operational expenses.
- The cost of replacing and modernizing weapon systems would increase sharply during the next several years, from \$168 billion in 2013 to \$212 billion in 2018—an increase of 26%. Acquisition costs would remain fairly steady at that level until 2025 before declining.

Tooth-to-Tail Trends

The tooth-to-tail ratio describes the portion of funds allocated for combat forces as compared to the portion of funds allocated for support and non-combat elements. The *tooth* is traditionally defined as “units whose primary mission is the conduct of combat and combat support operations” (McGrath, 2007, p. 4). The *tail* is defined as those personnel that directly support a combat organization (McGrath, 2007). The tail includes administrative, logistic, and life support units. These units perform a range of functions such as providing command and control for combat, combat service support (CSS), infrastructure support and establishing semi-permanent camps and bases, health care, and morale, welfare, and recreation (MWR) facilities. Again, note that this traditional definition excludes civilian and contractor personnel. Figure 4 shows the current distribution of active-duty enlisted personnel by military occupational group.

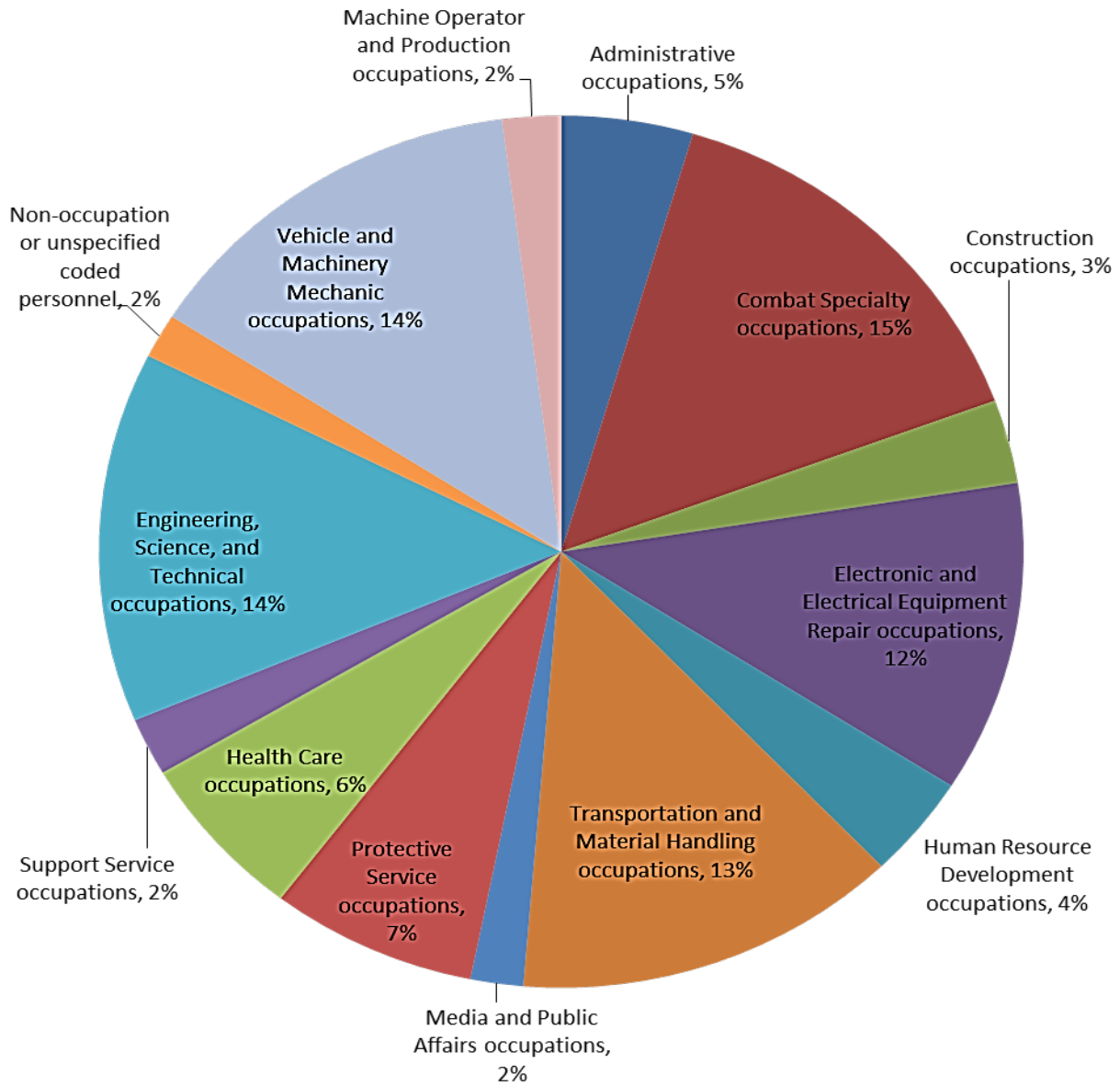


Figure 4. Active-Duty Enlisted Personnel by Military Occupational Group in 2011

Note. The information in this figure came from the BLS, 2011.

There has been a decreasing long term trend in the number of combat forces and an increase in the level of non-combat support forces. Combat elements have declined from over 50% in 1918 to 33% in Korea, 35% in Vietnam, and 27% during the Cold War (McGrath, 2007). The adoption of the all-volunteer Army led to a further decrease in combat elements. During the first Gulf

War, the proportion of noncombat elements increased from under 50% to over 70%, and it increased radically during the U.S. invasion of Iraq. Part rebuilding effort, the conflict entailed the mass employment of civilian contractors in a multitude of supporting roles (McGrath, 2007). McGrath (2007) detailed the extent of the decline in combat forces:

The percentage of combat forces fell from 53 percent to 39 percent as a result of the effects of mass motorization and mechanization. By 2005, noncombat elements had risen proportionally to three fourths of the force size. Using average figures, combat forces have been about a quarter of the force, while logistics elements were roughly a third of the force or half of the noncombat elements. On average, headquarters elements composed a quarter of the force. Units or contractors providing life support functions formed less than 10 percent of the total force and slightly more than a tenth of all noncombat elements. While combat elements averaged 32.5 percent and ranged between 40 and 25 percent since 1941, recent trends in combat forces are weighted toward the lower end of the range, rather than the higher end or even the average. (p. 74)

There are many reasons behind the increase in noncombat elements. For example, progressively more-complex and mobile weapons require a larger number of logistics support troops (and civilians and contractors) and the development of a mechanized and motorized army has reinforced the growing trend in logistics support. Additionally, there has been a proliferation of headquarters in modern warfare, which are used to coordinate command and control combat elements, as well as manage noncombat elements.

Finally, there has been growth in other support functions which include base command and support units, signal infrastructure units, engineer units with primary missions of infrastructure construction and support, finance offices, judge advocate general offices, labor service support units, base public information units, and contracting units (McGrath, 2007).

In a 2010 report, McKinsey reported that the United States consistently ranked among the worst in terms of large overhead and spending inefficiencies relative to the defense organizations of industrialized peers. At a tooth-to-tail ratio of 16:84, the United States ranks well behind the industrialized nations' average of 26:74 (Gebicke & Magid, 2010; see Figure 5). This ratio is unsustainable in today's fiscal climate. The DoD must reduce the size of its tail in order to align its expenses with available resources. The CBO reports that reducing O&S costs is critical to

stalling future cost growth. And the DBB found that “substantial budget cuts (5 to 15 percent) can be achieved without affecting future mission readiness provided that there is an intense focus on reducing ‘overhead and infrastructure’ spending” (DBB, 2011).

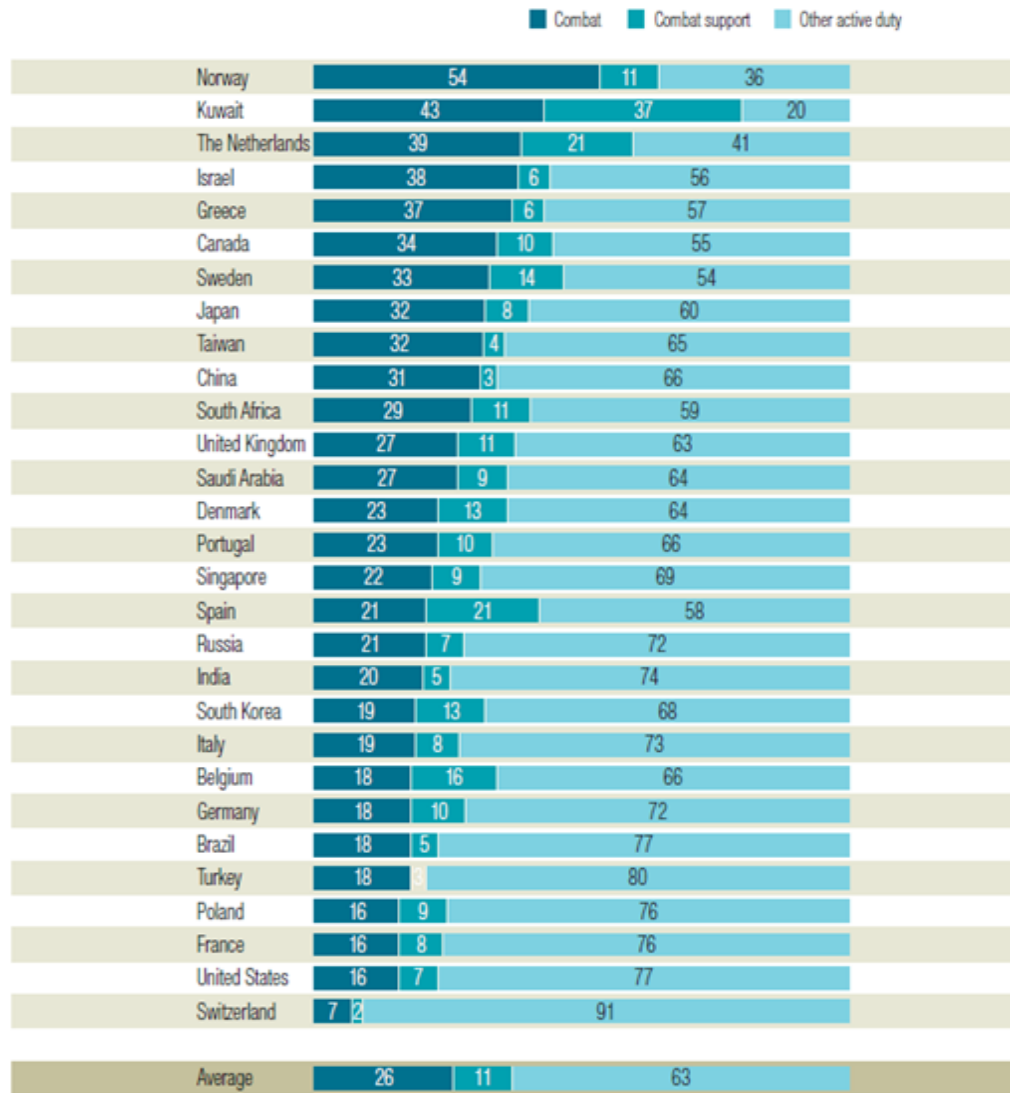


Figure 5. Industrialized Nations’ Tooth-to-Tail Ratio (Gebicke & Magid, 2010)

Note. Combat roles include armor, infantry, reconnaissance, and combat aviation. Combat support roles include artillery, engineers, and signals.

III. Private Sector Strategies

The numbers of non-combatant military support forces, which increased significantly over the course of the 20th century, has an analog in the private sector: the non-production labor force, which also increased, from 18.6% in 1950 to 31.9% by 1987 (Cameron, 1993). But over the last couple of decades, in response to global competitive pressures, firms were forced to reduce overhead and introduce new efficiencies in order to excel in a changing environment.

Comprehensive Cost Accounting

Comprehensive cost accounting has proven essential in providing the visibility necessary to make decisions that lead to private-sector improvement initiatives. Organizations rely on comprehensive cost accounting systems in order to fully understand their costs. One system in particular, activity-based costing (ABC) has been widely adopted. Since the 1980s, ABC has been a major part of business re-engineering efforts and process improvement efforts. It is also used in strategic decisions concerning pricing, production mix, business processes, and overhead reduction. Firms cannot make good management decisions without an accurate cost accounting system.

ABC takes into account the costs of all of the resources that are used and all of the tasks that are performed to deliver the service to the customer. Managers can use this information to enhance profitability and cut costs. ABC uses a four-step process: (1) identify the activities that consume resources, (2) identify the specific cost drivers associated with each activity, (3) compute a cost rate per driver unit or transaction, and (4) assign costs to products or services by multiplying the cost driver rate by the number of cost driver units consumed by the product or service provision (Laverson, 2000). ABC is considered a more nuanced and, thus, accurate way of allocating costs in that it accounts for the specific inputs that go into making a product or providing a service.

To successfully implement an effective cost accounting system, such as ABC, staff buy-in is essential. Operational managers and staff must go beyond simply accepting the new concepts to becoming champions. The staff must see how the new initiative will improve their business performance. The staff must be able to clearly communicate benefits of the new cost

information. Research findings show that employees' satisfaction with ABC implementation is positively correlated with clarity of objectives and quality of ABC information (Fei & Isa, 2010). Simply presenting a new system developed by external experts in staff meetings will not create staff buy-in. It is important to give the staff practical experience developing the new system and produce small wins on department-level ad hoc projects. Of critical importance, senior management must stay engaged in the project in order to signal its importance. Studies have found that top management support is a significant factor in determining the success of ABC implementation (Fei & Isa, 2010).

However, simply generating better costing information does not automatically reduce resource consumption, increase resource utilization, or improve performance. Rather, using the cost information in order to improve decision making requires a larger improvement initiative led by management and supported by employees as part of a holistic approach.

Comprehensive costing is not without its challenges. First and foremost, it is generally time consuming and costly. Secondly, it is not always possible to accurately allocate certain indirect or overhead costs. For instance, it is often assumed that if a service or function is eliminated or transitioned to an external service provider, then the associated overhead will be eliminated. But this is not always the case for a variety of reasons. For example, the service function may have relied on resources, administrative or otherwise, that cannot be proportionally reduced. Some costs are fixed in the short term; hence, several activities may need to be competitively contracted out in order to trigger a real reduction in overhead.

Overhead Reduction

The term overhead refers to the ongoing expenses of operating a business. These costs include everything from facility costs and utilities, to janitorial service employee wages. In order to significantly reduce overhead and improve efficiency, the private sector relies on initiatives that entail fundamental reorganization and total process improvement. The private sector experience makes clear that dramatic overhead reduction and efficiency improvements entail more than across-the-board cuts. Blaxill and Hout (1991) summarized overhead reduction as follows.

Overhead is not only about cost; more fundamentally, it's about process. Process change is not easy. It requires a long term commitment from the entire organization. Too often senior managers assume that by mechanically eliminating chunks of business or consolidating operations, they will improve the company's position. In fact, only by designing controllable and highly integrated processes ... can companies lower overhead costs permanently. *All* processes must be addressed: product design, manufacturing, logistics, distribution, and all supplier and customer relationships. (p. 7)

Overhead reduction occurs through integrated process reevaluation and rationalization. Coyne et al. (2010) noted that there is no single idea that can radically change the cost structure of an organization or department. Rather, they asserted that organizations can achieve overhead reduction goals only through the combination of 10 or more discrete actions.

Coyne et al. (2010) cautioned that the degree of reduction incites proportional organizational disruption. Thus, they reasoned that a 10% reduction in overhead is achievable through an incremental plan, while a 20% reduction requires reorganization of activities to eliminate those of low value. A 30% (or greater) reduction requires the pursuit of cross-department activities and program elimination. Below, these reduction techniques are described in more detail.

- A 10% reduction in overhead employs incremental ideas that do not significantly disrupt an organization's or department's interactions with others. Common strategies include consolidating incidentals (combining activities across departments that have similar aims, for example), lowering headcount by restructuring job duties and eliminating underperformers. Additionally, the authors pointed out that most administrative departments use as much as 20% of their budgets to supervise and coordinate their own activities. Thus, reduction in overhead can be achieved by a reduction in spending on internal department management.

A number of private-sector firms have significantly reduced overhead by taking advantage of the above strategies. For instance, in 2010 Lockheed Martin launched a new program intended to reduce overhead by decreasing the number of leaders, at the director and vice president levels. According to the company, "the [overhead reduction] program is intended to reduce layers of management and afford opportunities for talented

individuals to take on broader assignments to continue to grow their careers” (“Lockheed,” 2010, p. 1). In fact, Lockheed Martin believes the move will yield positive results that go beyond the bottom line by providing more immediate, direct communications within the corporation and with its customers.

- A 20% reduction in overhead requires the reorganization and elimination of activities. This kind of reduction will have a corresponding impact on other departments. The authors cautioned that

it is rarely possible to achieve cost reductions of 20 percent unless you remove a significant portion of the work content from the department. It is never a good idea to attempt to do the same work with 20 percent fewer people. (Coyne et al., 2010)

Eliminate work where costs exceed the benefits. This process starts by identifying all opportunities to reduce the department’s workload and redistribute responsibilities among the remaining employees. Coyne et al. (2010) described the redesign process in a series of steps.

- First, talk to the counterparts and get a solid understanding of how work from a given department impacts another and then check that the work is truly needed.
- Second, eliminate liaisons and coordinators. These positions are based on an assumption that parties cannot communicate with one another. Often, this assumption is wrong.
- Third, eliminate reports that do not serve a useful purpose. Additional savings can be found through process changes. Many times processes outlive their usefulness and cease to be an efficient use of resources. Reduce business requirements. Eliminate manual processes in favor of an electronic or automated alternative. Eliminate steps or processes that do not matter.
- Finally, look for opportunities to save money by shifting deadlines forward.

Merrill Lynch provided an example in which one of its clients, a private label coffee manufacturer, invested in equipment to automate the packaging process. According to

Merrill Lynch, “the company was able to reallocate labor to increasing production volume rather than packaging product.” The company was able to grow by 18% in 2012 without adding labor costs (Bank of America/Merrill Lynch, 2011).

- A 30% (or greater) reduction in overhead calls for cross-department collaboration and program elimination. These changes have the greatest potential of organizationally disruption. Firms should consider coordinating parallel roles across departments. Many departments perform similar functions or even purchase the same items independently, on a small scale. Coordination can yield valuable savings. Bundling services and centralizing identical activities within one office in addition to outsourcing administrative and other duties that are not unique to the company can dramatically reduce overhead.

Program elimination is the most challenging aspect of cutting overhead costs. It eliminates duplication and provides more efficient use of resources. Firms should consider eliminating low-value meetings and forums. This measure increases the productive time for employees by reducing their extraneous time commitments. Restructure or cut cross-department activities. Review the resource utilization of activities. Look for opportunities to reduce the resource commitment of onerous and time consuming activities. And finally, eliminate programs that have the least added value and are resource intensive.

As Coyne et al. (2010) suggested, facilities rationalization can have a dramatic impact on overhead. Over the past decade, IBM consolidated its call center operations in order to reduce IT-related energy costs by 25% (Prow, Hines, & Prieto, 2011). In addition, its aggressive adoption of voice, video, and document sharing and collaboration tools reduced travel-related expenses by 10–20% (Prow, Hines, & Prieto, 2011).

It is essential to realize that overhead reduction is an iterative process. It employs several cost reduction techniques, maintains an open dialogue with participants, measures the outcomes, and determines whether the cost saving benefits exceed the costs of internal disruption. It is an ongoing process that requires several iterations before it is successfully completed.

Business Process Re-Engineering

The DoD's MDUR campaign, described in Section II, can be characterized as retrenchment—i.e., a reduction in the size that maintains the enterprise's operational ability. In the business world, retrenchment is meant to maintain and potentially strengthen a firm's position in the industry, whereas downscaling and down-scoping are partial exit strategies, which vacate competitive space and leave gaps that incumbents could pursue (Dewitt, 1988). Outside of the troop withdrawal in Afghanistan and Iraq (which could be characterized as a market withdrawal), the MDUR campaign employs tactics such as centralization and specialization of production, consolidation of offices, alteration of supplier relationships, and realignment of managerial responsibilities; these tactics are aimed at improving efficiency and eliminating redundancies. However, they do not eliminate service lines altogether or radically re-engineer processes. In short, the MDUR campaign did not go far enough.

In the private sector, on the other hand, firms often undertake business process re-engineering (BPR) in order to create entirely new processes that are more efficient. "BPR involves reinventing processes by abolishing the old ones and finding imaginative ways of accomplishing work while designing completely and radically new processes" (Goksoy et al., 2012, p. 90). Standard total quality management philosophies aim to achieve incremental improvements, whereas BPR aims to make radical improvements.

BPR entails a fundamental redesign of business processes and "organizational change characterized by strategic transformation of interrelated organizational subsystems producing varied levels of impact" (Goksoy et al., 2012, p. 92; see Figure 6). BPR employs tactics such as process visualization: development of an ideal state, process mapping and modeling: process flowcharts, role activity diagramming, change management, benchmarking, process and customer focus, problem solving and diagnosis (Pareto diagramming, cognitive mapping, process prototyping and simulation), program management, and process measurement.

Implementing BPR

- **Identification of necessary change:** Management must ask fundamental questions about current business operation and recognize the need for change.
- **Ensure commitment and support from top management:** Management needs to be engaged throughout the process.
- **Communicate the necessity to change with employees:** Employees must understand the genius of the change, how the changes connect to the overall strategy, and how these changes will benefit them in order to eliminate internal resistance.
- **Develop process objectives:** The organization should determine its desired objectives with the BPR initiative.
- **Form a re-engineering team:** Management must select a competent team that is familiar with the BPR concepts and has the necessary experience.
- **Determine the scope and scale of the project and develop a project schedule:** The organization should define the scope and context of the project. The scope needs to be consistent with the desired objectives. The organization should also set a project schedule that includes duration and describes the work to be accomplished in each step of the project.
- **Designate the processes to be re-engineered:** The new processes should be identified and prioritized in terms of urgency and contribution to BPR objectives.
- **Take advantage of IT:** Information technology should be assembled to assist BPR efforts transition smoothly from existing to new processes.
- **Include collaborators such as suppliers and freight forwards in the re-engineering initiative:** The organization should collaborate with suppliers and other complementary organizations to ensure the maintenance of long term business relationships.
- **Pilot the new processes:** The organization should perform a pilot before launching the full implementation of the new processes. The pilot will help identify potential flaws prior to the fully implementing the new processes.
- **Train employees who have relevance with the redesign processes:** The organization should conduct training programs to ensure that employees acquire the necessary skills to operate the new processes.
- **Implement the new processes:** The organization should also make a transition plan that allows for a smooth transition from the current processes to the new processes.
- **Monitor and improve the new processes constantly:** Changing environment require continuous monitoring and refinement of redesign efforts.

Figure 6. Implementing BPR

Note: The information in this chart came from Goksoy, Ozsoy, & Vayvay, 2012.

Radical change impacts the entire organization and requires cross functional support and support from institutional leaders. Such large scale projects are high risk endeavors. In fact, studies show that more than two-thirds of BPR attempts fail (Goksoy et al., 2012). However, struggling firms must undertake re-engineering efforts in order to compete effectively in difficult economic times.

Since its development in the early 1990s, many companies have implemented BPR and have reported dramatic benefits. Ford Motor Co., CIGNA, and Wal-Mart are all widely recognized as having successfully used BPR to significantly reduce their costs (Al-Mashari & Zairi, 1999).

Continuous Performance Improvement

Today, private-sector firms rely on a variety of different strategies (e.g., Six Sigma, Lean, Total Quality Management) to implement continuous performance improvement, in order to compete effectively. For example, many successful firms use so-called Lean processes to increase speed in manufacturing or service delivery. According to its 2004 annual report, Boeing was able to save \$210 million dollars in one year alone through the use of Lean initiatives (Marx, 2005). Others use Six Sigma managerial concepts in order to improve strategic alignment via an improved focus on the customer and the use of rigorous analytical tools. Giuda (2012) described the success of Lean Six Sigma within the private sector:

Lean Six Sigma is a process that was first used by Motorola and then popularized by General Electric CEO Jack Welch in the mid 1990's that determines waste and inefficiencies within supply chains and organization processes. By using Lean Six Sigma, companies have saved hundreds of billions over the past two decades. GE's success in using it proved that it paid off. Other companies that have also used Lean Six Sigma to improve efficiency and save money are 3M, ACME, Sears, Dell, DuPont Whirlpool, Xerox, and many more. (p. 1)

The leading early proponent of Six Sigma, GE, was able to boost its 1997 operating budget by \$300 million through the use of Six Sigma; in 1998, the financial benefits of Six Sigma more than doubled, exceeding \$600 million (Harry & Schroeder, 2000).

Lean and Six Sigma concepts are widely used in tandem across industries to eliminate waste in areas such as transportation, inventory, and production; minimize variability; improve performance; and, ultimately, reduce costs. This is not to suggest that implementation of these concepts is easy. Implementing Lean Sigma Six requires a cultural change. In large organizations, implementing cultural change requires multiple initiatives, the undivided attention of management, and time. Companies that implement Lean Six Sigma typically launch several

iterations and reevaluate their programs continuously. Successful Lean Six Sigma initiatives require a sustained and concentrated effort that may endure for several years.

Supply Chain Restructuring

A firm's supply chain is the network upon which it relies to source raw materials, manufacture products (or create services), store and distribute goods, and ultimately deliver the product or service to the customer. Supply chain management spans all movement and storage from point of origin to point of consumption.

The processes that take place within a supply chain can be divided into two categories, depending on whether they are executed in response to a customer order or in anticipation of customer orders. Pull processes are initiated by a customer order, and push processes are initiated and performed in anticipation of customer orders.

In the private sector, integrated supply chains are revised and reimagined in order to foster a competitive advantage, to be more responsive to market changes, and to recover from disruptions more quickly. Often, major corporations attempt to restructure their global supply chain operations at times of competitive and financial challenge.

Today's most successful firms rely on world-class supply chains characterized by high-reliability and narrow distributions. For example, UPS Worldport sorts, routes and tracks 300,000 packages per hour; FedEx Global Hub lands an aircraft every 90 seconds and then moves packages through 300 miles of conveyor belts; Walmart and Dell utilize sense-and-respond supply chains which allow them to react to customer demand within hours; Dell makes a desktop computer every 5 seconds in response to custom-tailored internet orders; and Benetton dramatically transformed its total production process to rapidly respond to changing customer demands (Harrington, 2005; The Economist, 2006).

The commercial world has achieved these impressive results, in large part, by leveraging advances in information technology and creating integrated digital supply chains, enabling asset visibility from the manufacturer to the end user, created from the ground up and using centrally

managed networks. Wal-Mart, for example, built global communication and relationship networks with their suppliers that ensured reliable material flows, while reducing—and in many instances virtually eliminating—inventories. In this case, suppliers were incentivized to get on board with Wal-Mart’s supply chain strategy because it would ultimately lead to less supplier time and resources dedicated to managing the supply chain and, thus, greater profits. Wal-Mart became the world’s largest retailer in 2006, with \$312.4 billion in sales, and operating in 15 countries, serving more than 138 million customers each week (Johnson, 2006). Wal-Mart prides itself as being a leader in worldwide supply chain management, with a visible network of worldwide suppliers, warehouses, and retail stores that behave as “a single firm with near real-time information” (Russell, 2007). Wal-Mart’s integrated data systems enable bi-directional communications that are mutually beneficial and allow the chain to prepare and stock shelves without a huge surplus of inventory.

Commercial-sector manufacturers are always looking for ways to improve their processes and increase productivity. Increasingly, technical automation, including the introduction of robotic systems, is being used in warehouses and distribution centers to increase logistics productivity. With the application of robotic automation, firms have benefitted in many ways. These benefits have increased reliability and flexibility, leading to consistent and predictable performance. Robotics also enables manufacturers to combat labor shortages while at the same time improving working conditions and safety for employees. Companies have invested in these technologies not only to reduce costs but to improve their performance and increase their competitive advantage.

For example, the retailer Staples recently experimented with automation in two of its warehouses because traditional warehouse practices failed to provide the flexibility, speed, and cost profile that Staples needed to continue its exploration into high-efficiency supply chain configurations. The new Staples’ fulfillment system solution relies on mobile inventory delivered to operators at inventory stations around the perimeter of the facility. The new system has reduced employee injuries and has increased the speed of order fulfillments, while simultaneously reducing costs and increasing operational flexibility. “We lowered our supply chain costs significantly,” the company reports (Manrodt, Ogle, & Harrington, 2011, p. 12). According to one manager, “We’ve seen double digit increases in productivity for four straight years. The material handling

and warehouse management systems allow us to prevent and, to some degree, predict where errors will occur so we can fix them before shipping the order to the customer” (Manrodt, Ogle, & Harrington, 2011, p. 12). He went on to say that “the key here is that we can prevent errors from occurring” (Manrodt, Ogle, & Harrington, 2011, p. 12).

Other companies have also begun to rely increasingly on automation. Goodyear recently automated its tire and storage facility in Fayetteville, NC. Now, robots handle every aspect of warehouse distribution, “from the time the product arrived from manufacturing, all the way through a sequential loading onto the trailer for customer delivery” (Torrens, 2011, p. 2). And in March 2012, Amazon purchased Kiva Systems, which sells fully robotic warehouses, and expects to automate 69 warehouses, with 1,000 robots operating in the near future (Kucera, 2012).

IV. The Potential for Reform

The DoD has yet to fully embrace the efficiency-based reforms introduced within the private sector. Too often, the DoD treats the symptoms rather than the underlying problems. For instance, department-wide savings are often realized by canceling or eliminating scheduled weapons and procurement programs. For example, the Navy and Marine Corps recently canceled the expeditionary fighting vehicle program, allowing Secretary of Defense Robert Gates to claim significant savings. But as the American Enterprise Institute wrote, “When key acquisition programs are terminated, the requirements they were designed to meet do not disappear” (Eaglen, 2013). Rather, the costs of modernizing are shifted to some point in the future.

Often, cost-saving initiatives simply do not go far enough. To its credit, the DoD eliminated nearly 400 of its internally generated annual reports in 2011, by reducing agency reporting requirements. While the production of these documents undoubtedly consumed vast amounts of time and personnel, they were of questionable relevance, and in many cases, were seldom read; the DoD’s decision to attack the symptom—the reporting burden—rather than address the organizational structure within the agencies’ bureaucracies that created the burden in the first place must be called into question.

The DoD’s failure to embrace efficiency-based reforms is reflected in five areas that, from a private-sector point-of-view, require immediate attention. These areas include (1) the DoD’s logistics network, which has yet to attain the world-class status achieved by large private-sector enterprises; (2) functional redundancy and duplication throughout the DoD; (3) the DoD’s mix of personnel (active-duty, civilian, and contractor) that does not efficiently meet the DoD’s mission requirements and long-term strategy; (4) “brass creep” and the problematic rank structure within certain military professions; and (5) the lack of comprehensive cost accounting, thus impeding good decision making.

Improving efficiency in these areas is not merely a matter of political will; indeed, challenging the status quo requires not only political courage and leadership commitment but also creative solutions, cooperation and collaboration among the services and with industry, and, of most importance, a clear vision for the future. Below we discuss these areas of reform.

Underperforming Supply Chain and Product Support

The DoD is one of the largest and most complex organizations in the world. Likewise, the DoD's supply chain, which accounted for \$210 billion in FY 2010, is massive (DBB, 2011). The current system, however, is largely an ad hoc mix of government and industry, with little cost visibility or performance accountability, and does not perform to world-class standards for responsiveness, reliability, costs, personnel, and visibility (Bell, 2007).

Given the size and scale of the DoD supply chain, modernization efforts that are currently in place have been struggling to effectively create change. While the DoD has indeed been making progress, it is doing so slowly and without a consistent focus. For example, during the Gulf War in 1991, it took five months to deploy troops and equipment to the Persian Gulf, and the logistics support was developed while forces were not engaged in hostilities (GAO, 1991). With DoD's inefficient supply chain at that time, the average order to receipt time was 49 days.

Comparatively, the performance of the DoD's supply chain has improved significantly during the past decade, and customer wait time, a key performance indicator of the logistics system, has decreased considerably (down from 24 days to 15 days between 2004 and 2007, a 37.5% improvement), a major accomplishment but still far from what might be considered world-class (Bell, 2007). Figure 7 shows the steady improvement of customer wait-times within the DoD and compares those metrics to the standards that have been established in the commercial marketplace.

On the other hand, as previously noted, commercial best practices have set high standards in supply chain operations, with customer wait-times of one to two days domestically and two to four days internationally, high-reliability, and narrow distributions. Improving the DoD's supply chain will continue to prove challenging so long as the Department continues to rely on numerous, non-integrated, non-interoperable information systems, thus making it difficult to have the real-time asset visibility and tracking that are available to world-class firms.

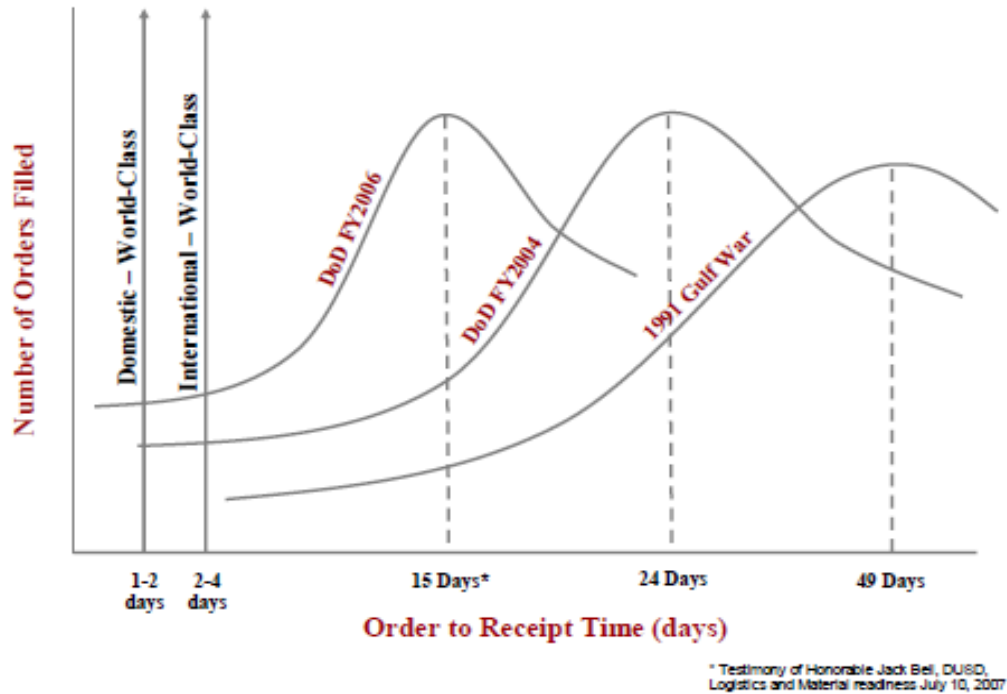


Figure 7. DoD Supply Chain: Successful But Not World-Class (Bell, 2007)

Another source of inefficiency in the DoD’s product support is the strategy used to provide that support. Although various DoD directives stipulate that performance-based logistics (PBL) is the DoD’s preferred approach to supporting weapon system logistics, it has yet to be adopted across the enterprise. The objective is to develop accountability, instead of using control. The performance-based logistics approach focuses on performance outcomes (e.g., a 95% readiness rate for a weapon system) as opposed to the transactional approach and has demonstrated performance increases, while simultaneously cutting costs.

A number of large weapon programs (e.g., the F/A-18) have used the PBL approach to achieve significant costs savings. As a result of Boeing’s PBL contract for support of the F/A-18, availability improved by 23%, and repair turnaround time was reduced by 74%; these were accomplished with a total cost benefit of \$688 million (Fowler, 2009). Another PBL contract for the maintenance of the F/A-18’s auxiliary power units (and those of other Navy aircraft) was awarded to Honeywell in 2012. This program has achieved \$50 million in savings, with a sustained 97% on-time delivery of products (Honeywell, 2012).

Unfortunately, as of 2009, only 20% of weapon systems used the PBL approach (DoD, 2009). Resistance to the PBL approach takes many forms; some high-level officials within the DoD have questioned its cost effectiveness, while some acquisition professionals have come to see PBL as “contracting for logistics.” Others are reluctant to change from standard ways of operating, and both DoD personnel and contractors lack experience in writing, negotiating and managing PBL contracts.

Thus, to a large extent, the DoD continues to rely on traditional sustainment strategies. These are focused on conducting business transactions to procure parts and services, in an effort to ensure maximum weapon system availability. The military services had to estimate and compute the requirements, then procure, store, and when required, ship the necessary parts. This meant that DoD customers (military services and agencies) focused on ensuring that they had enough spare parts and inventory to meet any need or requirement (often referred to as a “just in case” system). This approach tended to increase demand (the “whiplash effect”) and larger than ideal inventories. A recent inspector general’s report revealed that for some equipment, more than 10 years of spare parts had been ordered and were being stored on shelves at supply depots (Schwartz & Mosler, 2013).

Given current logistics networks, the DoD must also bear the costs and risks for forecasting, ordering and maintaining inventory, warehousing, managing obsolescence, securing transportation, conducting reliability analysis, and managing configuration management and field engineering. This approach created incentives for the original equipment manufacturers (OEMs) and vendors to sell more spare parts and maintenance, while encouraging performance and reliability improvements be incorporated into the next generation of equipment, often resulting in weapon systems with low availability. Finally, because of the increased logistics management burden assumed by the customer, DoD resources had to be realigned from core competencies to supporting the supply chain.

While the current system generally meets requirements, the lower reliability, availability, and inefficient processes result in higher costs. More specifically, weapon system support challenges include the following:

- The current logistics structure does not support rapid force projection, nor does it support warfighter efficiently.
- Weapon systems require a large in-theater presence for support.
- The support comes through a complex, inefficient supply chain, with limited in-transit and in-theater asset visibility.
- Turnover of maintenance personnel is problematic.
- Original equipment and support contractors are not incentivized to improve system availability.

Operational and structural challenges directly contribute to the overall weapon system support challenges that the DoD faces today. The operational environment is defined by a high operations tempo, high maintenance levels, large maintenance/supply footprint, and turnover of maintenance personnel. The structural environment has high equipment design complexity, significant disconnect between the performance of a system and its required maintenance, a lack of communication between acquisition and logistics functions, long waits for priority parts, organic legacy depots, and numerous stand-alone legacy logistics business systems. These challenges constrain the DoD's ability to effectively and efficiently support weapon systems.

Duplication and Redundancy

In the words of *Washington Post* writer David Fahrenthold, “Duplication is one of Washington’s most expensive traditions” (2013). Within the federal government there are multiple agencies performing the same job at the same time. The DoD is no exception. To provide one simple, though no less illustrative, example, the U.S. military had two types of camouflage in 2002. It now has 10. The Marines started the trend by sponsoring research to test different patterns. The other services followed suit, spending hundreds of thousands of dollars testing and purchasing camouflage. The Navy and Marines now have new uniforms to wear in the desert, though both are different. The Air Force has a new airman battle uniform, which for the time being may not be worn in battle (airmen serving in Afghanistan are to wear the Army’s camouflage). And the Navy created a new camouflage to wear when on base, on ships, or in other environments where camouflage is not necessary.

Because there is often little empirical evidence to differentiate the programs that work well from those that do not, different government agencies, or departments, take on new functions in an effort to improve upon existing programs. Moreover, organizations tend to hoard information so that they are perceived as more valuable (Lamb, 2013). As a result, organizations create new programs and hire more personnel to develop capabilities and collect and process information that is already available elsewhere. This results in duplication and redundancy, a practice that is always wasteful but intolerably so when budgets are declining.

In March 2012, the GAO issued its second annual report on duplicative activities within the federal government entitled *Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue* (GAO, 2012a), which covered a variety of federal departments. The report identified areas of duplication and redundancy. In order to achieve cost savings and enhance revenue, the GAO recommended that the DoD focus on several areas including, most notably, military health care and defense headquarters, areas marked by duplication and redundancy.

The DoD, however, tends to eschew changes to the status quo, leading to missed opportunities to streamline functions and eliminate the duplication of effort. The perceived uniqueness of the individual services' missions is often used to justify duplicative programs that have little added value. Military health care is supported by individualized overhead and command structures within the Air Force, Navy, and Army. Given that the vast majority of military doctors provide routine health services domestically to servicemen and women, their spouses, and children, such division seems unnecessary. Given the rising costs of health care, common sense dictates that the DoD should revive a longstanding idea: the creation of a Defense Medical Corps.

Unfortunately, the idea of replacing the individual service commands with a joint medical command garners opposition, despite decades of joint in-theater operations and successful mergers of military medical centers. The critics' arguments rest largely on parochial concerns and unfounded rationales. In 2006, Lt. General Roudebush, the then-Air Force surgeon general, asserted that the Air Force "has its medical support intertwined and woven into the mission and the line of the Air Force and is something we feel very strongly contributes to our ability to

support the joint war fight” (Capital Gazette, 2006, p. 1). Similarly, Vice Admiral Donald C. Arthur, the then-Navy surgeon general, noted that although he had “a different concept” for the future of military medicine, “it came down to what could realistically get done without a lot of disruption to the system” (Capital Gazette, 2006, p. 1). But disruption, it might be argued, is exactly what is needed.

This insistence on service-unique requirements is also present in weapon system development. For instance, each of the four services is “intent on acquiring different UAS [unmanned aerial systems] that meet their perceived unique requirements” according to the Congressional Research Service (CRS; Pincus, 2013, p. 1). The result, the CRS asserted, “has been excessive costs required for different systems with duplicative or overlapping capabilities” (Pincus, 2013, p. 1). Given the growing role that UAS are predicted to play in the future, this problem is likely to continue.

Examples of duplicative programs abound. The GAO (2013b) recently released a report citing the potentially overlapping capabilities of the planned \$7 billion Next Generation Jammer (NGJ), the Navy’s airborne electronic surveillance jamming system (p. 19). Although the GAO noted that there is no current overlap among the NGJ and three similar programs under development by the Air Force, Army, and Marines, it found that the DoD failed to define the specific mission-related requirements that the different systems would fulfill, leaving open the possibility of duplication in the future. It is perhaps unsurprising that the Army stated that it “plans to rely on its own airborne electronic attack systems to perform the necessary jamming in support of its ground systems” (GAO, 2013b, p. 16). In order to decrease redundant spending, the DoD is using a modular open systems approach in developing the NGJ, which will allow for system components to be modified and replaced in the future. The open systems approach also allows independent suppliers to build components that can plug-in to the existing system, thereby ensuring complementarity with other systems. Although such an approach is often deemed essential given the rapid development of new technologies with emergent properties, it can also enable insufficient long-term planning, both technical and tactical.

Even when programs are designed with the express purpose of facilitating greater “jointness” and interoperability among the military service branches, programmatic redundancies occur.

Take, for example, the case of the Joint Tactical Radio System, or JTRS, the now defunct program that was conceived “to put the entire joint force on the same wavelength” (Thompson, 2007, p. 1).

Development of the JTRS radios themselves was divided into five clusters, each of which was headed by one of the military services. For instance, the Air Force was tasked with developing JTRS for Air Force and Navy fixed-wing aircraft and helicopters, while the Army oversaw development of handheld, man-portable, and other small JTRS variants. The perceived simplicity behind the open architecture concept guided DoD officials in establishing this initial, decentralized management structure and acquisition strategy.

By dividing procurement responsibilities among the services, all of the costs (research, development, fielding, etc.) associated with each radio variant would be shouldered by the user of the end product. Though this strategy seemed the most equitable, it engendered a service-centric approach, rather than a DoD-wide enterprise approach, and JTRS came to be viewed as a radio replacement program as opposed to a new, holistic enterprise-wide information infrastructure. Consequently, there was no enterprise-wide systems engineering master plan; rather, each radio was designed to meet service-specific needs and desires with little regard for how the radio might fit within the overall network or integrate into different platforms. The strategy led to the duplication of effort. For example, both Cluster 1 (led by the Army) and Cluster 4 (led by the Air Force) were tasked with the development of JTRS for their own helicopter platforms.

This sort of inefficiency is acute even among some of the DoD’s more mundane functions. For instance, it is unclear why the Navy relies on an admiral to command the Naval Exchange Service, while Army and Air Force have the Army & Air Force Exchange Service, and the DoD relies on civilians to manage the Defense Commissary Agency across the different services. Indeed, some question why military commissaries and exchanges still exist in the first place, at least domestically, given the proliferation of private-sector retailers, over the last few decades. The DoD realizes that commissary benefits are outdated and unnecessary. In fact, the DBB proposed a plan to shutter commissaries on domestic military bases in order to curb excessive

personnel costs, which, as noted, are a major contributor to defense spending. Eliminating commissaries would save tax payers \$1.4 billion annually (Chandrasekaran, 2013). In order to preserve the commissary benefit, the DBB recommended providing active-duty military families and retirees with discount cards that could be used at leading retailers.

Unfortunately, DBB efforts were stalled by various interest groups, trade associations, and veterans groups. These groups lobbied both their Congress members and DoD senior leadership. Senior advisors in the Defense Department were quoted as saying that leading the fight would be simply too difficult. The proposal was abandoned. This episode illustrates the level of internal opposition within the Defense Department to cost reduction strategies. Major restructuring, overhead reduction, and cost savings will require internal upheaval and disruption. It will require political courage and commitment from senior leadership within and outside of the DoD to combat opposition and ensure that meaningful reform takes place.

Duplication and redundancy are particularly prevalent within the various defense organization headquarters, which explains the recent efforts by Secretary Gates and Secretary Panetta to shrink their number of personnel. However, making the necessary reductions appears to be easier said than done. The GAO recently found that “an underlying challenge facing the Department of Defense is that it does not have complete and reliable headquarter information available for use in making efficiency assessments and decisions” (GAO, 2012b, p. 5). Department of Defense Instruction 5100.73 guides the identification and reporting of headquarters information; however, its instructions are out of date. They do not include all components of the headquarters organization or track contractors that perform headquarters functions. In order to make responsible cuts that lead to increased efficiency, the DoD must first improve the quality of the information upon which it relies.

Often, DoD efforts to reduce the level of redundancy and eliminate duplication of effort are less successful than originally envisioned. DoD officials wrongly conclude that duplication of staff and resources leads to excessive bureaucratic friction and an inability to collaborate, prompting them to reduce personnel by a certain percentage. Lamb (2013) took an opposing view, asserting that it is “the inability to collaborate [that] stimulates duplicative staff elements” (p. 29). Simply put, officials add experts to their staff rather than rely on other offices. Thus, when officials

reduce their staffs in an effort to reduce costs, they get less of what they do not need (i.e., condensed briefings and narrow advice) but, in the words of Lamb (2013), “not an iota more” of what is truly needed—“well-integrated, multi-functional problem assessments and solutions” (p. 29).

At the same time, officials tend to overestimate the savings that accompany the elimination of duplicative functions or lack the data to determine the cost implications. For example, in 2010, President Obama approved Secretary Gates’ plan to eliminate the Joint Forces Command (JFCOM) as part of his effort to save \$100 billion over five years, arguing that the services had achieved an unprecedented level of jointness. Nevertheless, because some of JFCOM’s functions were moved to other DoD agencies or carried out by the military services, the net savings are difficult to estimate. When pressed by Virginia lawmakers (JFCOM was based in Norfolk and employed some 6,000 personnel) to explain the rationale for the Command’s closure, Deputy Defense Secretary William Lynn conceded that a “business case” for closing JFCOM had not yet been developed (Bartel, 2010).

Inefficient Personnel Mix

The DBB (2010) noted that over 40% of the DoD’s total active-duty forces have never been deployed, while 11.4% have been deployed over three times. As of May 2010, 1.1 million out of 1.4 million active-duty troops were not deployed. The DBB noted that “more active duty [troops] would be available for deployment if non-military functions were converted to civilians or were eliminated” (DBB, 2010). One way to bring costs down is to reevaluate the DoD’s use of personnel by reducing the number of active-duty troops being used for inherently nongovernmental functions. FY 2009 FAIR inventory found that 339,142 active-duty military were performing commercial activities at an average cost of \$160K/year” (DBB, 2010)). Costs, then, were listed at over \$54 billion per year. The DBB also noted that eliminating 10% of commercial activities positions could save \$5.4 billion annually (DBB, 2010) and that the current mix of contractors, civilians, and active-duty military constitutes a “poor use of our most expensive personnel—active duty military” (p. 4).

At the same time, the increased reliance on contractors has facilitated the widespread perception that industry has too much influence on government decision-making. According to some government officials, there are simply too many contractors. President Obama campaigned to “reform federal contracting and reduce the number of contractors” (Obama, 2007, p. 1). In 2009, he issued a memorandum directing federal agencies to reform the contracting process, stating that contracting is “plagued by massive cost overruns, outright fraud, and the absence of oversight and accountability” (Obama, 2009, p. 1). Although some of this criticism may be warranted, it serves to further the negative perception of defense contractors, the vast majority of which operate in strict accordance with the law and provide products and services to the DoD at competitive prices. The fact is that without government contractors, the U.S. military would be unable to carry out effectively and efficiently many functions that are vital to national security.

The rapid growth in the number of contractors over the last two decades, in and of itself, does not justify the assertion that there are too many contractors. By failing to define the problem in more specific terms, as well as failing to adequately assess performance and costs, recent policy efforts have often proven misguided.

For example, the Obama administration sought to bolster the government workforce by converting contractor positions into government jobs, a process known as insourcing, and estimated that this would save up to \$44 billion annually. This prediction was echoed across the DoD, which, in assembling its 2011 budget, calculated a 30–40% savings for each insourced position (Soloway, 2009). This estimate was likely based on a comparison of the cost of the contractors (overhead included) versus only the salary of the government employees, overstating the savings (Gansler, Lucyshyn, & Rigilano, 2012). Based on this calculation, the DoD made significant changes to its workforce composition. For instance, the Air Force assumed responsibility for C-17 program logistics integration, a service that, at the time, was being provided by various contractors. It also decided to end its long-standing contract with Lockheed Martin for F-22 support services (Gouré, 2010).

Contractors’ prices are established in the competitive market, and they provide the attributes of agility and scalability to the total force. Because contractors do not need to make long-term

commitments to their employees, they are better able to surge during times of conflict, natural disaster, or other contingencies. In fact, contractors can often be mobilized more quickly than the Guard or Reserve (which contain two-thirds of the logistics personnel in the Army, for example), without the commitment or expense of sustaining a large, long-term staff. During the first Gulf War, for example, reserve units that were activated to support active component combat forces, did not arrive in-theater until approximately 200 days after the operation began.

And unlike government personnel, contractors are not bound by deployment or salary constraints. Consequently, a contractor can require its employees to deploy for longer periods—and pay them accordingly. As a result, contractors often have had a more stable workforce during long-term operations, providing an element of experience and continuity to the support infrastructure. Finally, when the requirement changes, the contractor workforce can be downsized much more quickly, with no long-term costs. For example, the most recent U.S. CENTCOM Contractor Census Report has the number of contractors in Iraq down to 9,000 (which includes those supporting the DoD, as well as the Department of State), from a wartime high of approximately 170,000 (DoD, 2012b).

An ongoing challenge is comparing the cost of contracting out required support, to the cost of maintaining the required capability organically. The cost of the contractor includes all direct and indirect costs, along with all training and equipment costs, any deferred compensation, and a fee; and they are hired only for the required timeframe. On the other hand, the salaries of military personnel clearly do not include these costs. Even if one includes the costs for medical care, retirement, hostile fire pay, life insurance, and family separation allowances, there are still the costs for administrative support in theater, post-service veterans benefits, in-service education, mid-tour or home leave, training leave, and the equipment to support them, as well as the overhead cost associated with their management.

Perhaps most important, these DoD costs do not include the rotation base; Ideally, the Army needs to maintain two units stateside for each deployed unit. This time at home lets units recuperate from their deployment, reconstitute personnel and equipment, and train for their next deployment. That means for each soldier in-theater the Army needs approximately two more soldiers stateside. Moreover, this force must be maintained in peacetime, to be ready to respond

to military operations. Contractor support, on the other hand, as previously noted, can be reduced dramatically or eliminated, when the support is no longer needed.

A year after President Obama launched this insourcing initiative, Defense Secretary Robert Gates concluded that insourcing was not producing the anticipated cost savings (Brodsky, 2010a). Apparently, the cost of replacing contractors failed to offset the cost of the government hires and their training. He concluded that directly reducing the value of contractor awards—as opposed to increasing the government workforce—would be a more effective approach. Other leaders also began to reconsider the insourcing initiative. A provision in the 2011 Defense Authorization Bill, sponsored by Representative James Langevin (D-RI) prevented the DoD from establishing “any arbitrary goals or targets to implement the insourcing initiative” (Brodsky, 2010b, p. 1). In a February 2011 directive, Secretary of the Army John McHugh wrote that “in an era of significantly constrained resources, the Army must approach the insourcing of functions currently performed by contract in a well-reasoned, analytically based and systemic manner” (McHugh, 2011, p. 1). Despite these new directives, contractors continue to face undue hostility, and the government struggles to acquire non-inherently governmental functions efficiently and affordably.

Brass Creep

“Brass creep,” or the proliferation of high-ranking positions relative to the overall number of troops, is of growing concern, especially given the predicted growth in personnel costs. Former Secretary of Defense Robert Gates defined the brass creep problem in 2010 as “having generals do what colonels are perfectly capable of doing. Generals require huge staffs and command structures: three-star generals serving four-stars, two-stars serving three, each tended by squadrons of colonels and majors” (Schwellenbach, 2011).

From 1990 to 2010, the number of generals and admirals decreased 10%, while active-duty military personnel decreased over 30% (Washington Post, 2010; see Figure 8). The overall number of officers has also increased relative to the number of enlisted personnel. In 1992, 15% of the active-duty military were officers; today the figure is 17%. In 2010, Secretary Gates also took steps to reduce admirals and generals by 5% (Whitlock, 2011). However, as of January

2013, the military had increased the number even more; today there are 976 admirals and generals (Koenig, 2013). To put this number in perspective, the Navy has more admirals than ships, whereas during World War II, there was only one admiral for every 30 ships (Mather, 2013).

Brass creep presents a problem because of the significant costs associated with each additional admiral and general. Salaries increase with years of service and rank. And although the salaries for active-duty military officers are capped (e.g., for 2014, General Officer basic pay is limited by Level II of the Executive Schedule which is \$15,125.10 per month, and basic pay for O-6 and below is limited by Level V of the Executive Schedule which is \$12,266.70 per month). The retired pay, however, is calculated based on the uncapped rate. For example, the uncapped base pay for a four star general-officer, with over 36 years of service, is \$18,821 per month, or almost \$226,000 per year (Defense Finance and Accounting Service [DFAS], 2014).

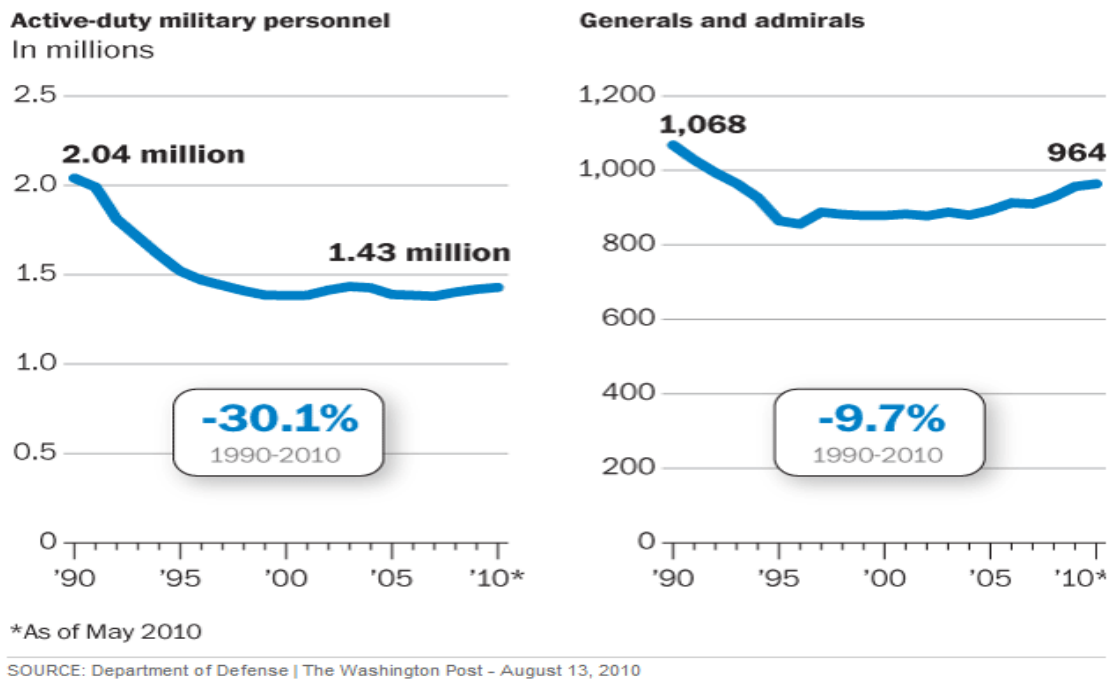


Figure 8. Active-Duty Military Personnel vs. Generals and Admirals, 1990–2010 (Washington Post, 2010)

Moreover, salary is but one component of an officer’s benefits package. All service members are eligible for a housing allowance, but admirals and generals are entitled to significantly more

expensive housing compared with lower ranking officers or enlisted personnel. In a June 2013 report, the Pentagon evaluated homes leased for use by generals and admirals, examining 32 lavish estates across the globe. In Coral Gables, FL, over \$100,000 in annual rent is paid through taxpayer dollars for a four-star general's accommodations. In Naples, Italy, an admiral's villa costs \$180,000 in annual rent. Additional housing costs often include security, grounds staff, house staff, and transportation to and from the U.S. base. For a general's historic estate in Chievres, Belgium, these costs alone exceed \$100,000 annually (Koenig, 2013).

The rank structure within certain military professions is another area of inefficiency. Again, an examination of military health care proves instructive. While opinions may differ regarding the necessity of operating Air Force, Army, and Navy hospitals in the United States to care for military personnel and their families when private medicine is of equal, if not superior, quality, it is difficult to understand why the military needs majors, colonels, and generals to serve as family practice doctors, optometrists, and dieticians. This is not a question of military salaries or compensation; indeed, when benefits are included, the earnings of military health care professionals are roughly equal to their counterparts' in the private sector—which, needless to say, is entirely appropriate. Rather, the time and energy that officers must devote to activities outside of their occupational duties (e.g., professional military education, assignment policies) is significant, leading to inefficiencies.

For instance, the Air Force employs more than twice as many officers in health care roles as it does in combat roles. It is unlikely that a disproportion of this magnitude is based on a needs assessment detailing the number of required personnel in positions of military authority. Rather, it is clear that rank is used primarily to promote and compensate medical personnel as they gain experience and tenure. Many occupations within the DoD use the rank structure in a similar fashion. In fact, today there is a higher percentage of officers in non-combat occupations than combat occupations, a trend that began within the last decade (see Figure 9).

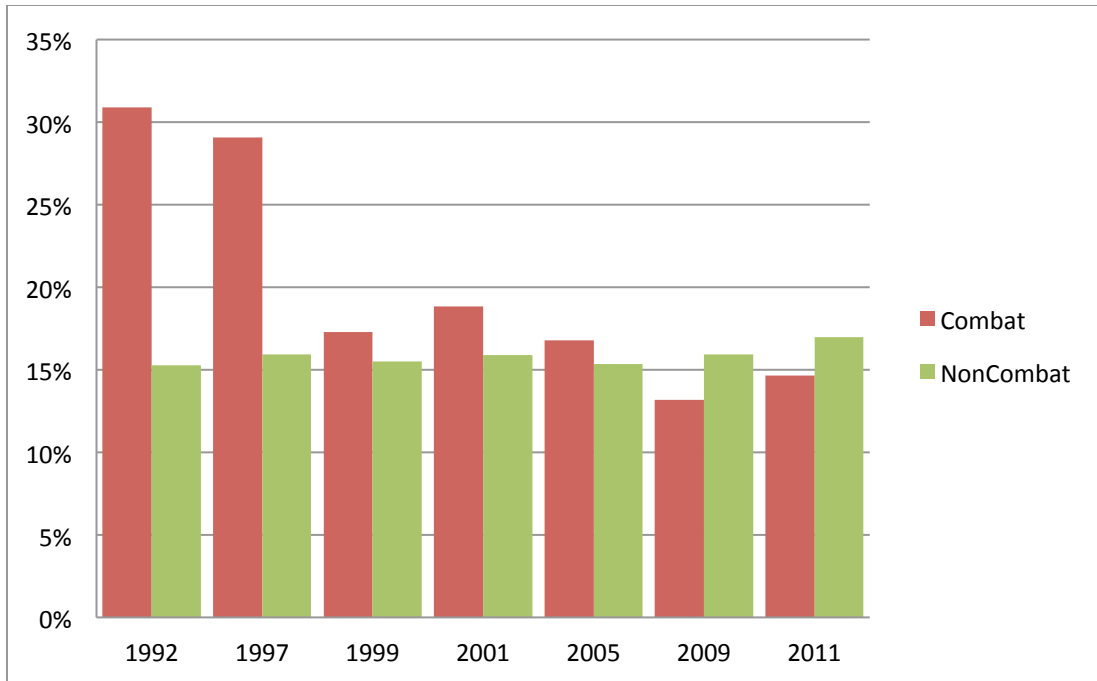


Figure 9. Percentage of Officers Within Combat and Non-Combat Occupations
Note. The information in this graph came from BLS (2011).

Inadequate Cost Accounting

An additional challenge, which makes it difficult for the DoD to make sound management decisions when analyzing and evaluating alternative strategies, is its inadequate cost accounting systems. As discussed previously, the private sector maintains robust cost accounting systems to track all relevant expenses, since profit realization depends on these management accounting systems to accurately capture all of the costs of providing a good or service. All costs are fully allocated among a firm's products so that the firm knows how much it spends on what, allowing the firm to price its output (be it a product or service) appropriately. Some costs may also be allocated among firms, organizations, or programs within organizations in order to more fully identify the costs associated with product manufacture or service provision. For instance, multiple organizations may share office space, janitorial services, electricity, and so forth. Organizations in this position estimate their usage cost for the item in question using various techniques and come to an agreement as to their respective responsibility for paying it. With this detailed cost information, managers can make better management decisions, particularly when

analyzing alternative strategies (e.g., choosing between in-house or contractor provision of a product or service).

On the other hand, most DoD organizations cannot identify all of their costs and fail to account for them in their cost analyses. Within the DoD, some costs are shared across agencies, programs, and functions, and even across military service branches. In some cases, some support functions are provided and funded by other organizations and are viewed as being “free” to the supported organization. Because these costs may not be reflected in an organization’s operating budget, its cost of doing business may seem lower than it actually is, and its management decisions are distorted. Shared costs can include financial management, human resources management, legal services, grants management, agency management, information systems and their security, budget formulation and execution, research and development, personnel security, and insurance. Unless these cost accounting processes are improved, management decisions will continue to be made based on incomplete or inaccurate cost data.

This is not to say that efforts have not been made. In 1990, Congress passed the Chief Financial Officers (CFO) Act requiring the DoD to produce “private sector-style financial statements” that government auditors could access and evaluate on a regular basis (Hanks, 2009, p. 181). The DoD would, in effect, develop an accrual-based accounting system. In the private-sector, this system is used to match revenues to expenses when a transaction occurs (as opposed to when payment is made), allowing owners, investors, and managers to determine whether their business is operating profitably at a given moment in time. In order to create the necessary buyer–seller relationships within the DoD, all support activities would be placed under working capital financing such that the primary mission activity would “pay” for the goods and services that they received with congressionally appropriated funds (Hanks, 2009, p. 185).

Twenty-three years later, the DoD has yet to comply with the act. But this is beside the point. Hanks (2009) pointed out that although consolidated financial reports might be useful in the private sector (where profits are concerned), in the public sector, decision-makers need to understand and manage internal costs. Consequently, this type of historical financial statement is of little value in this regard. Moreover, while profitable businesses might attract more investment, Congress is unlikely to increase the budgets of organizations based on their glowing

year-end financial statements; in fact, Congress might dole out more funding to organizations that are struggling. In any case, the bottom line is that managers need cost information during program execution so that they can make management decisions. In retrospect, it appears that some of the effort expended to implement the CFO Act should have also been directed at improving the DoD's management accounting process.

Meanwhile, the DBB, in discussing the increase in personnel outlays noted that “the fundamental problem is that defense agencies and field agencies are not being managed as cost-effective businesses or recognized as a major element of overhead” (DBB, 2010, p. 29). Currently, defense agencies and field agencies account for 20% of the Defense Department budget. Many of these auxiliary bodies do not use meaningful performance management systems, operate noncore functions, and have only passive supervision.

V. Recommendations and Conclusion

Leaders from academia, media outlets, think tanks, research institutes, and government agencies have noted that the Pentagon must undergo comprehensive and structural reform in order to make its finances more sustainable. In March of 2013, Mackenzie Eaglen of the American Enterprise Institute summarized the approach that the DoD must embrace:

More than anything, what Washington requires today is political courage. Pentagon leaders, advocacy groups, and elected politicians must have the resolve to tell various constituent groups that the status quo is unacceptable and unsustainable. Leaders must make the case that tough, structural reform is the smartest path forward. The Secretary of Defense and each of the services' uniformed and civilian leaders will have to sustain interest in overseeing these changes along with providing creative incentives for the bureaucracy to follow through. (p. 1)

The needed restructuring will likely cause internal upheaval and disruption. It will require political courage and commitment from senior leadership, within and outside of the DoD, in order to combat opposition and ensure that meaningful reform takes place. Powerful interest groups within, or closely aligned with, the DoD are likely to oppose calls for reform. Overcoming internal opposition is vital to the realization of true cost savings and improvements.

Recommendations

The following recommendations derive from the realization that current spending has reached unsustainable levels that, left unchecked, will begin to adversely impact our nation's military end-strength and they are informed, partially, by private sector strategies that have enabled firms to significantly reduce their costs in light of similar pressures. We list these recommendations below.

1. Strengthen Accounting and Accountability

- Establish effective control over the growth of the bureaucracy

The continued growth of the DoD bureaucracy, especially within the combatant commands, defense agencies, and field agencies, is unsustainable. The DoD must obtain

complete and reliable headquarter costs information. Current records do not include all components of the headquarters organization or track contractors that perform headquarters functions (GAO, 2012b), making it exceedingly difficult to control costs.

Defense agencies and field agencies alone account for some 20% of the Defense Department budget (DBB, 2012). Many of these auxiliary bodies do not use meaningful performance management systems, operate noncore functions, and have only passive supervision. The DoD must restrain the growth in headcount, simplify the command structure, and reduce bureaucratic layering.

- Adopt a managerial cost accounting approach

Managerial cost accounting is the tool that business managers use to understand the costs embedded in their business processes. Currently, DoD organizations cannot identify all of their costs and/or fail to account for them in their cost analyses, making it exceedingly difficult to make cost-cutting determinations, and improve efficiency. DoD agencies and the military services need to adopt a comprehensive costing approach in order to enable effective decision-making centered on efficiency.

- Incentivize efficiency

All DoD services and agencies should implement continuous process improvement (including Lean processes and Six Sigma) in order to improve operating effectiveness of their organizations across the full range of operational, administrative, science and technology, and support functions.

The implementation of a robust managerial accounting system will enable DoD officials to improve efficiency and cost effectiveness. However, unless incentives are provided to encourage continuous improvement, personnel may continue to rely on outdated practices. In the private sector, compensation, promotions, and organizations' future budgets are all based, at least in part, on business leaders' ability to improve year-over-year efficiency.

2. Make Efficient Use of Personnel

- Acquire and promote military members to meet force structure objectives

Currently, recruiting and promotion practices are not aligned with force structure objectives. Rather, the military services adjust their number of personnel in response to budgetary changes. This practice is particularly disturbing with regard to active-duty combat forces. Although budgetary uncertainty will likely continue into the foreseeable future, the DoD must determine its future needs, and then acquire and promote accordingly. Within some occupations, the rank structure is used solely as a promotion tool to recognize performance and years of service. As such, the number of high ranking military members is a consequence of this practice, rather than a predetermined calculation that reflects force structure objectives.

- Increase reliance on DoD civilians to fill roles that are not military-essential

In order to help to shrink the swollen rank structure within certain military occupations, and, at the same time, refocus attention on military-essential functions, non-military functions that are inherently governmental should be filled by DoD civilians. Over the last decade, more than 50,000 military positions have been converted into civilian positions. Unfortunately, cultural resistance within the military has impeded the rate of conversions, as of late. However, it is clear that civilians are more effective in carrying out commercial and other non-core functions because they do not have to perform additional military-specific responsibilities. The DoD should follow the recommendations proposed under the Bowles-Simpson Fiscal Commission, which would eliminate some 88,000 military personnel who are performing commercial activities and replaces them with 62,000 civilians, at significant per-employee savings (Schwellenbach, 2013).

- Increase reliance on contractors to provide non-inherently governmental functions

Some DoD functions are inherently governmental, and these functions must be performed by government personnel (military or civilian). However, if competitively bid, non-

inherently governmental functions can be performed more affordably by contractors, then there is no reason to retain active-duty military or government civilians for these functions.

At the same time, it is important that the DoD be able to manage and oversee contractors. Accordingly, the DoD must recruit highly qualified systems engineers, managers, and acquisition personnel to provide the required oversight.

3. Streamline Operations

- Eliminate duplication and redundancy

The DoD must rein in overhead costs by eliminating duplication and redundancy. Again, the military must refocus its efforts on improving the efficiency of its core functions. Non-military functions within the DoD that are duplicated by other federal programs should be eliminated immediately. For instance, the Defense Domestic Dependent Elementary and Secondary Schools duplicate the functions provided by the Department of Education as well as local school districts. The Department of Defense Tuition Assistance Program, which provides college funding for military members on active duty, duplicates the functions provided by the Department of Veterans Affairs. Non-military research and development should also be eliminated, with important projects transitioned to the appropriate federal department.

As previously discussed, there is considerable duplication and redundancy within the DoD itself, in areas such as medical care and headquarters activities. A strategic review must be undertaken, to review programs and functions, and eliminate duplication.

- Reduce infrastructure

As duplicated and redundant functions are eliminated, and as the Iraq and Afghanistan drawdowns continue, the DoD must seek to proportionally reduce its physical

infrastructure, both at home and abroad. Unfortunately, Congress has resisted, and continues to resist, infrastructure reduction initiatives, such as base realignment and closure (BRAC), in their effort to remain popular with their constituents, for whom closures could have significant negative impacts on local economies, particularly if the planning for their conversion is inadequate. Clearly, there will be winners and losers when it comes to infrastructure reduction, but the political and parochial concerns of members of Congress must not be allowed to overshadow the necessity of maintaining national defense and security objectives, which will continue to rely on tough, and at times, unpopular decision-making.

- Re-engineer business processes

Commercial sector firms re-engineer business processes in an effort to obtain so-called quantum improvements, as opposed to incremental ones. Today, re-engineering efforts leverage information technology in order to maximize the value-adding content of a process and minimize everything else (El Sawy, 2001).

Within the DoD, internal resistance to change is the key reason for failed attempts to redesign processes. Senior management needs to stay engaged in the project in order to signal its importance. Operational managers must go beyond simply accepting the new concepts to becoming champions. The staff must see how the new initiative will improve their business performance, and the agency must produce small wins on department-level ad hoc projects. This approach is an effective way of confronting cultural obstacles, generating staff buy-in, and achieving meaningful change.

4. Improve Supply Chains and Product Support

- Develop a world-class supply chain

An integrated (end-to-end) system within the DoD—a critical component of world-class commercial logistics systems—does not exist. The DoD needs to move away from its traditional hierarchical command and control structure towards a more adaptive system

that will provide the precise, agile support required for the distributed, network-centric operations that the DoD envisions.

- Leverage technology

The DoD should seek to develop sophisticated logistics networks, much as the commercial sector has already done. The DoD must strive to create a network-centric, knowledge driven environment where information technology provides superior and relatively seamless connectivity of data, information, and awareness. In order to implement improved logistics, several key technologies need to be further developed. In particular, the DoD should expand research and development in the areas of improved sensing and improved modeling and algorithms. Clearly, this is an area in which the DoD can take full advantage of world-class commercial systems and technology.

The DoD must also continue to reduce manpower requirements for operations and maintenance solutions by investing in robotics and automation in addition to fuel management and efficiency solutions and renewable energy sources. Resources should also be invested in developing and improving in-theater logistics to include the energy-efficient generators, onsite water production, and insulated shelters.

Conclusion

Efficiently using resources and reducing overhead within the DoD is essential, given that expenditures on domestic discretionary programs face long-term reductions as a result of the high national debt burden, prevailing economic conditions, and the protracted debate over the federal budget deficit. The DoD must rebalance expenses against available funds as it enters into a period of budgetary contraction. This task is particularly challenging, given that a sizable portion of defense spending is designated for both mandatory personnel expenditures and incentives, such as health care. Now more than ever, the DoD must take steps to improve its tooth-to-tail ratio.

References

- Al-Mashari, M. & Zairi, M. (1999). BPR implementation process: an analysis of key success and failure factors. *Business Process Management Journal*, 5(1), 87-112.
- Bank of America/Merrill Lynch. (2011). Overhead control for manufacturers: New strategies for plugging the gaps. Retrieved from http://corp.bankofamerica.com/documents/10157/67594/Overhead%20Control%20for%20Manufacturers_New%20Strategies%20for%20Plugging%20the%20Gaps.pdf
- Bartel, B. (2010, September 30). Pentagon admits savings unknown if JFCOM closed. *The Virginian-Pilot*. Retrieved from <http://hamptonroads.com/2010/09/pentagon-admits-savings-unknown-if-jfcom-closed-0>
- Brodsky. (2010a, May). House committee rejects insourcing quotas. *Government Executive*. Retrieved from <http://www.govexec.com/dailyfed/0510/052010rb3.htm>
- Brodsky, R. (2010b, March). Administration puts stamp on inherently governmental. *Government Executive*. Retrieved from <http://www.govexec.com/welcome/?zone=welcome&rf=http%3A%2F%2Fwww.govexec.com%2Fdailyfed%2F0310%2F033110rb1.htm>
- Budget Control Act of 2011, Pub.L. 112–25, § 365, 125 Stat. 240 (2011).
- Bureau of Labor Statistics. (2011). Military Careers. Retrieved from <http://www.bls.gov/ooh/military/military-careers.htm>
- Capital Gazette. (2006). Army-Navy plan for unified medical command rejected. Retrieved from http://www.capitalgazette.com/news/army-navy-plan-for-unified-medical-command-rejected/article_48cf7d06-3ea1-5723-a5e8-517463c1c55f.html
- Carter, P. & Bensahel, N. (2013, June 26). Reboot: Why the Army's plan to cut 80,000 troops doesn't go nearly far enough. *Foreign Policy*. Retrieved from <http://www.foreignpolicy.com/articles/2013/06/26/reboot>
- Bell, J. (2007). From warehouse to warfighter: an update on supply chain management at DoD. Senate Homeland Security and Governmental Affairs: Oversight of Government.
- Blaxill, M., & Hout, T. (1991, July–August). The fallacy of the overhead quick fix. *Harvard Business Review*, 69(4), 93–101.
- Bumiller, E., & Shanker, T. (2012, January). Panetta to offer strategy for cutting military budget. *The New York Times*. Retrieved from http://www.nytimes.com/2012/01/03/us/pentagon-to-present-vision-of-reduced-military.html?pagewanted=all&_r=0

- CBO. (2012). *Long-term implications of the 2013 Future Years Defense Program*. Washington, DC: Author.
- CBO. (2013, March). *Approaches for scaling back the Defense Department's budget plans*. Washington, DC: Author.
- Center for Strategic and International Studies. (2012). Implications of the FY 2014 Defense budget. Retrieved from http://csis.org/files/attachments/130417_implications_FY14_defense_budget_presentation.pdf
- Chandrasekaran, R. (2013, June 1). Plan to shut military supermarkets shows difficulty of cutting defense spending. *Washington Post*. Retrieved from http://www.washingtonpost.com/world/national-security/commissary-plan-backlash-show-difficulty-of-cutting-military-personnel-spending/2013/06/01/15fb6c12-c922-11e2-9245-773c0123c027_story.html
- Coyne, K., Coyne, S., & Coyne, E. (2010, May). When you got to cut costs: A practical guide to reducing overhead by 10%, 20%, or (wince) 30%. *Harvard Business Review*, 74–82.
- Curthoys, K. (2013). Army memo: soldiers to replace contractors for dining, security services. *Army Times*. Retrieved from <http://www.armytimes.com/article/20131016/NEWS05/310160034/Army-memo-Soldiers-replace-contractors-dining-security-services>
- DBB. (2010, July). *Reducing overhead and improving business operations: Initial observations*. Washington, DC: Author.
- DBB. (2011, July). *Corporate downsizing applications for the DoD (FY11-08)*. Washington, DC: Author.
- DoD. (2009, November). *DoD weapon system acquisition reform: Product support assessment*. Retrieved from http://www.ndia.org/advocacy/legislativeandfederalissuesupdate/documents/dod_weaponssystem_acquisition_reform_psa_19nov09.pdf
- DoD. (2012a). *Contractor support of U.S. operations in the USCENTCOM area of responsibility to include Iraq and Afghanistan, 4th quarter FY 2012, Iraq-Afghan Contractor Census*. Retrieved from <http://www.your-poc.com/4th-quarter-fy-2012-iraq-afghan-contractor-census/#sthash.8OIBHcSr.dpuf>
- DoD. (2012b). *Report of the Eleventh Quadrennial Review of Military Compensation*. Washington, DC: Author.
- DFAS. (2014). Military pay tables. Retrieved from <http://www.dfas.mil/militarymembers/payentitlements/militarypaytables.html>

- Dewitt, R. (1988, December). Firm, industry, and strategy influences on choice of downsizing approach. *Strategic Management Journal*, 19, 59–79.
- Eaglen, M. (2013, March). Shrinking bureaucracy, overhead, and infrastructure. Why this defense drawdown must be different for the Pentagon. Retrieved from the American Enterprise Institute website: <http://www.aei.org/article/foreign-and-defense-policy/defense/shrinking-bureaucracy-overhead-and-infrastructure-why-this-defense-drawdown-must-be-different-for-the-pentagon/>
- El Sawy, O. A. (2001). *Redesigning enterprise processes for e-business*. Boston, MA: McGraw-Hill/Irwin.
- Fahrenthold, D. (2013, May). With 10 patterns, U.S. military branches out on camouflage front. *The Washington Post*. Retrieved from http://www.washingtonpost.com/politics/us-military-has-10-kinds-of-camouflage-uniforms-government-duplication-at-its-finest/2013/05/08/58f2fe4e-b67c-11e2-bd07-b6e0e6152528_story.html
- Fei, Z., & Isa, C. (2010, August). Factors influencing activity based costing success: A research framework. *International Journal of Trade, Economics and Finance*, 1(2), 144–150.
- Fowler, R. (2009). Performance Based Logistics. Defense AT&L. January-February 2009, 9-13.
- Friedman, B. & Sapolsky, H. (2013, September 30). Shut down the US combatant commands. *Defense News*.
- Gansler, Lucyshyn, & Rigilano. (2012). Toward a valid comparison of contractor and government costs. Monterey, CA: Naval Postgraduate School.
- GAO. (1991). *Operation Desert Storm - the services' efforts to provide logistics support for selected weapons systems*, Report to the Chairman, Committee on Armed Services, House of Representatives (NSAID-91-321). Washington, DC: Author.
- GAO. (2012a). *Opportunities to reduce potential duplication in government programs, save tax dollars, and enhance revenue* (GAO-11- 318SP). Washington, DC: Author.
- GAO. (2012b). *Defense headquarters: Further efforts to examine resource needs and improve data could provide additional opportunities for cost savings* (GAO-12-345). Washington, DC: Author.
- GAO. (2013a). *Next Generation Jammer: DoD should continue to assess potential duplication and overlap as program moves forward* (GAO-13-642). Washington, DC: Author.
- GAO. (2013b). *Defense acquisitions: Continued management attention needed to enhance use and review of DOD's inventory of contracted services* (GAO-13-491). Washington, DC: Author.
- Gebicke, S., & Magid, S. (2010). Lessons from around the world: Benchmarking performance in defense [Special issue: Defense]. *McKinsey on Government*, Spring(5).

- Giuda, K. (2012, September). Lean government Six Sigma? Why do politicians ignore it? *Forbes*. Retrieved from <http://www.forbes.com/sites/realspin/2012/09/09/lean-government-six-sigma-why-do-politicians-ignore-it/>
- Goksoy, A., Ozsoy, B., & Vayvay, O. (2012, January). Business process re-engineering: Strategic tools for managing organizational change an application in a multinational company. *International Journal of Business and Management*, 7(2), 89–104.
- Gouré, D. (2010, October). Insourcing vs. efficiency: Conflicting initiatives could disrupt DoD's work. *DefenseNews*. Retrieved from <http://www.defensenews.com/>
- Hanks, C. (2009). Financial accountability at the DoD: Reviewing the bidding. *Defense Journal*, 16(2), 51, 181-196.
- Harrington, M. (2005, September 30). Dell's goal: A PC every 5 seconds. *The Business Journal*.
- Honeywell (2012). Honeywell awarded \$181 million Navy contract for performance based logistics and maintenance program on Global Aircraft Fleet. Retrieved from [https://honeywell.com/News/Pages/Honeywell-Awarded-\\$181-Million-Navy-Contract-For-Performance-Based-Logistics-Maintenance-Program-On-Global-Aircraft-Fleet.aspx](https://honeywell.com/News/Pages/Honeywell-Awarded-$181-Million-Navy-Contract-For-Performance-Based-Logistics-Maintenance-Program-On-Global-Aircraft-Fleet.aspx)
- Johnson, F. (2006). Supply chain management at Wal-Mart. Richard Ivey School of Business, University of Western Ontario.
- Koenig, Bryan. (2013, July). Pentagon moves to reduce housing expenses for generals. *CNN*. Retrieved from <http://security.blogs.cnn.com/2013/07/22/pentagon-moves-to-reduce-housing-expenses-for-generals/>
- Korb, L., Rothman, A., & Hoffman, M. (2012). Reforming military compensation: Addressing runaway personnel costs is a national imperative. *Center for American Progress*. Retrieved from http://www.americanprogress.org/issues/2012/05/pdf/military_compensation.pdf
- Kucera, D. (2012, March). Amazon acquires Kiva Systems in second-biggest takeover. *Bloomberg*. Retrieved from <http://www.bloomberg.com/news/2012-03-19/amazon-acquires-kiva-systems-in-second-biggest-takeover.html>
- Lamb, C. (2013, October). Seeking production from Pentagon staff reduction. *Defense News*. Retrieved from <http://www.defensenews.com/article/20131010/DEFREG02/310100012/Seeking-Production-From-Pentagon-Staff-Reduction>
- Manrodt, K., Ogle, M., & Harrington, L. (2011). The case for infrastructure investment: Lessons from Medco and Staples. Retrieved from

- http://www.scmr.com/article/The_Case_for_Infrastructure_Investment_Lessons_from_Medco_and_Staples/
- Mather, M. (2013, May). Enlisted sailors forced out while Navy has more admirals than ships. Retrieved from <http://wtkr.com/2013/05/02/enlisted-forced-out-while-navy-has-more-admirals-than-ships/>
- McGrath, J. (2007). *The other end of the spear: The tooth to tail (T3R) in modern military* (The Long War Series Occasional Paper 23). Fort Leavenworth, KS: Combat Studies Institute Press.
- OMB. (2013). *The President's budget for fiscal year 2013*. Retrieved from <http://www.whitehouse.gov/omb/budget>
- Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer. (2013). *More disciplined use of resources: Fiscal year 2013 budget estimates*. Retrieved from http://dcmo.defense.gov/publications/documents/FY2013_Budget_Request_Overview_Book.pdf
- Panetta, L. (2011, November). Statement by Senators McCain and Graham on Secretary Panetta's letter detailing "devastating" impact of sequester. Retrieved from <http://www.mccain.senate.gov/public/index.cfm?FuseAction=PressOffice>
- Parsons, D. (2014, January). Budgets permitting, Marines could be fighting alongside robots by 2020s. *National Defense*. Retrieved from http://www.nationaldefensemagazine.org/archive/2014/January/Pages/BudgetsPermitting_MarinesCouldBeFightingAlongsideRobotsby2020s.aspx
- Pincus, W. (2013, April). Fine print: A game of overlap. *The Washington Post*. Retrieved from http://www.washingtonpost.com/world/national-security/fine-print-a-game-of-overlap/2013/04/22/694991ec-a9d7-11e2-a8e2-5b98cb59187f_story.html
- Punaro, A. (2013). Presentation delivered to the Committee for a Responsible Federal Budget. Washington, D.C.
- Russell, S. (2007). Supply chain management: More than integrated logistics. Retrieved from http://www.aflma.hq.af.mil/lgi/002_Russel_Article.pdf.
- Schwellenbach, N. (2013, August). Why targeting defense department civilians is a problem. Retrieved from the Center for Effective Government website: <http://www.foreffectivegov.org/node/12651>
- Thompson, L. (2007, December 5). *U.S. Spending on military technology through 2010*. Presentation to the Reuters Aerospace and Defense Summit, Washington, DC. The Lexington Institute.

- Torrens, B. (2011). Lean logistics: Goodyear's automated warehouse puts customers on top. *RMT Robotics*. Retrieved from http://www.rmtrobotics.com/media/pdf/Rmtrobotics_Casestudy_Goodyear.pdf
- Harry, M. & Schroeder, R. (2000). *The Six Sigma Fieldbook*. Random House.
- Laverson. (2000). A study of overhead Rate behavior at a U.S. Air Force Base in the context of A-76 competitions. Arlington, VA: RAND.
- “Lockheed Martin announces plan to reduce leadership ranks.” (2010, July 6). *Bloomberg*. Retrieved from <http://www.bloomberg.com/apps/news?pid=conewsstory&tkr=LMT:US&sid=aQLamdbKGeV0>
- Marx, M. (2005). Boeing. ISixSigma. Retrieved from <http://www.isixsigma.com/industries/aerospace-and-defense/boeing/>
- McHugh, J. (2011, February). Memorandum for Army agencies: Reservation of in-sourcing approval authority. Washington, DC: Secretary of the Army.
- Obama, B. (2007). The change we need in Washington. Retrieved from http://obama.3cdn.net/0080cc5786142284_2a0mvyxpz.pdf
- Obama, B. (2009, March 1). Remarks by the President on procurement. Retrieved from <http://www.whitehouse.gov/the-press-office/remarks-president-procurement-3409>
- Prow, C., Hines, D., & Prieto, D. (2011). Strategies to cut costs and improve performance. *IBM Center for the Business of Government*. Retrieved from <http://www.businessofgovernment.org/article/strategies-cut-costs-and-improve-performance>
- Schwartz, N. & Mosler, B. (2013, October 7). Bad business for US Defense Department. *Defense News*.
- Soloway, S. (2009). Insourcing benefits are all smoke and mirrors. *Washington Technology*. Retrieved from <http://washingtontechnology.com/articles/2009/11/02/insights-soloway.aspx>
- The Economist. (2006, June 15). The Physical Internet. Retrieved from <http://www.economist.com/node/7032165>
- Washington Post*. (2010, August 13). Active-Duty Military Personnel vs. Generals and Admirals, 1990–2010.
- Whitlock, C. (2011, December 28). Pentagon trimming ranks of admirals, generals. *Washington Post*. Retrieved from http://www.washingtonpost.com/world/national-security/pentagon-trimming-ranks-of-generals-admirals/2011/12/20/gIQAhAU7MP_story.html

Whitlock, C. (2013, July 16). Hagel orders 20 percent cut in Pentagon top brass, senior civilians. *Washington Post*. Retrieved from http://www.washingtonpost.com/world/national-security/hagel-orders-20-percent-cut-in-pentagon-top-brass-senior-civilians/2013/07/16/7a004788-ee56-11e2-8163-2c7021381a75_story.html

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