

Defense Business Transformation

by

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Table of Contents

Preface	v
The Senior Advisory Group.....	vi
Executive Summary	vii
Part One: DoD Business Transformation.....	1
A. Background.....	5
1. Impacts of the Information Technology Revolution	5
2. Impact of IT on Business Processes	7
3. DoD Transformation	10
B. Transformation in the Public Sector	11
1. The Need for Business Transformation.....	11
2. Objectives of Public Agency Transformation	13
3. Challenges and General Observations.....	14
C. DoD’s Initial Attempt at Defense Business Transformation	17
1. Background	17
2. The Transformation Begins.....	19
3. Assessment of initial transformation effort	24
D. Current Transformation Effort	26
1. Approach	26
2. Business Transformation Agency: Objective, Goals and Structure	30
3. Management of the Transformation Process.....	35
4. Evolving Governance Structure of the Business Transformation Effort.....	39
5. Other Management Initiatives at DoD	43
6. Business Transformation Strategic Objectives—Looking Toward the Future.....	44
E. Performance and Achievements of the Current Transformation Effort.....	46
F. Findings and Recommendations	50
Part Two: Cases Studies.....	63
A. Public Sector Transformation Experiences.....	65
1. A Short History of the Slow Transformation of the IRS.....	65
B. Business Transformation Agency Case Studies.....	73
1. Defense Integrated Military Human Resource System	73
2. Defense Agencies Initiative (DAI).....	82
3. Interim Voting Assistance Program	85
4. Security Clearance Reform	88
C. Business Transformation in the Services.....	90
1. Navy ERP	90
2. Army Logistics Modernization Program.....	100
3. Defense Logistics Agency—BSM	108
References.....	116
Acknowledgments.....	131
About the Authors.....	132

Table of Figures

Figure 1: U.S. Federal Government Expenditures (Office of Management and Budget 2008).....	11
Figure 2: Scope and Impacts of the BMMP Effort	21
Figure 3: BMMP Leadership Challenges.....	23
Figure 4: Increase in DoD Business Systems, 2003-05 (GAO 2005b).....	25
Figure 5: Initial DoD Business Systems Transformation Governance Structure.....	27
Figure 6: DoD Core Business Missions.....	29
Figure 7: Tiered Accountability.....	30
Figure 8: Business Transformation Agency Organizational Structure	32
Figure 9: Procure to Pay End-to-End Process.....	34
Figure 10: IRB Investment Tiers	35
Figure 11: Single Governance and Decisions Support Framework	36
Figure 12: BTA Approach to Business Transformation	38
Figure 13: Responsibilities of the CMO	40
Figure 14: Integrated Business IT Budget Picture (\$M) (DoD 2009).....	48
Figure 15: DIMHRS Summary	75
Figure 16: DIMHRS Development Timeline.....	78
Figure 17: Selected Cost Estimates (June 2001; February 2003; December 2007).....	79
Figure 18: Defense Agencies Initiative End-to-End Capabilities	82
Figure 19: DAI Wave 1 Implementation Schedule.....	83
Figure 20: IVAS Timeline (Ambrose 2007).....	87
Figure 21: Streamlined Security Clearance Framework	88
Figure 22: Security Clearance Process Performance Improvement (Current Averages—Initial Investigations).....	89
Figure 23: Summary of Navy ERP Pilot Programs	93
Figure 24: Navy ERP Pilot Convergence Strategy	94
Figure 25: Navy ERP Template 1 Releases	94
Figure 26: Benefits of LMP vs. Legacy Systems.....	102
Figure 27: LMP Timeline & Milestones.....	106
Figure 28: DLA BSM Guiding Principles and Reengineering Tenets.....	109
Figure 29: DLA BSM - Legacy System Capability Comparison	109
Figure 30: DLA BSM Capability Improvements.....	110
Figure 31: DLA BSM Timeline.....	112
Figure 32: BSM Change Management Strategy	114

Preface

Over the past 20 years, information technology has been rapidly advancing, producing new capabilities that enable organizations to greatly enhance visibility into their business operations. While many private organizations have successfully taken advantage of these new technologies to develop enterprise-wide information systems that reduce costs and improve performance, the federal governments still lags far behind. DoD, one of the largest organization in the world with an annual budget over \$500 billion, still relies on several thousand, non-integrated, and non-interoperable information legacy systems, that are error prone and redundant and do not provide the enterprise visibility necessary to make sound management decisions. Moreover, between FY 07 and FY 09, DoD has requested from Congress over \$47 billion in appropriations to operate, maintain, and modernize these business systems.

There is an urgent need for DoD and the components to modernize their business systems and processes in order to reduce costs, improve efficiency and performance, and, most importantly, improve warfighter support. Currently the U.S. is facing a number of fiscal challenges that will directly affect DoD funding. Government debt is at an all-time high, and still growing due to the 2008 financial crisis and the ongoing conflicts in Iraq and Afghanistan, and the growth in mandatory spending programs, such as Social Security, Medicare, and Medicaid, are exacerbating this problem. Given these fiscal pressures, DoD funding has likely reached its high-water mark, and as budgets are reduced, there will be a tough choice between weapons and business systems.

This report attempts to develop an understanding of how developments in information technology have impacted business operations, tracks the Department's business systems transformation efforts, evaluates its performance and achievements, and recommends policy actions to improve the transformation effort. Overall this report intends to help speed up business transformation efforts at DoD, and improve their prospects for success. In addition to the University research, this report relied upon the guidance of a Senior Advisory Group, comprised of experts with extensive experience in business transformation from private industry, the federal government, and the military services. The Senior Advisory Group helped to guide the research, assist in the development of the findings and recommendations, and review our report.

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**Mr. Deseve served on the Senior Advisory Group until he was appointed to his current position, as the Senior advisor to the Office of Management and Budget for Recovery Act Implementation, and Special Advisor to the President and Assistant to the Vice-President, at which time he chose to resign*

Executive Summary

Introduction

The Department of Defense (DoD) is the largest organization in the world, with operations that span a broad range of agencies, activities, and commands. With an annual budget over \$500 billion, DoD employs millions of people that operate worldwide and maintains an inventory system that is an order of magnitude larger than any other in the world. However, the business systems used to manage these resources are outdated and inefficient. DoD relies on several thousand, non-integrated, and non-interoperable legacy systems, that are error prone, redundant, and do not provide the enterprise visibility necessary to make sound management decisions.

In order to meet current and future challenges, DoD needs business systems that enable it to be flexible, adaptive, and accountable. Transformation of business systems and process will not only reduce costs and improve performance, it is critical for improving warfighter support. Recognizing this, former Defense Secretary Donald Rumsfeld began a business transformation initiative in July 2001.

This report is divided into two parts. Part I evaluates DoD's business systems transformation effort, identifies lessons learned, and make recommendations to improve the prospects for success of the current business transformation effort. Part II includes several cases studies of business systems transformation in the federal public sector, at the Business Transformation Agency (BTA), and in the Military Services. Each case describes a specific transformation initiative and identifies lessons learned from the experience.

Public Sector Transformation

Public and private organizations face different types of challenges, but both must deal with growing pressures that create the need to adopt new technologies and organizational models to achieve their missions. Continual innovation in information technology (IT) over the past 20 years has made computing and networking cheaper and faster, providing organizations with capabilities to significantly improve visibility, productivity, and efficiency. More recently, IT is being used for far more advanced applications in virtually all types of organizations, as companies and government agencies are applying networked IT to help with complex tasks such as enterprise resource planning and supply chain integration.

While the IT revolution produced the tools and technology that allow organizations to expand their capabilities and worker productivity, there are several adverse trends that both public and private organizations face in creating an environment that drives transformation.

The first major trend is the increasing government debt and the growth in federal entitlement spending. As the mandatory obligations of the federal government continue to grow, a greater percentage of government revenues must be dedicated to cover their costs. As a result, there will be fewer funds to allocate to discretionary spending priorities, including national defense. The second trend is the growing role that knowledge plays in the operation of most organizations, impacting organizational performance and decision-making, as new technologies allow unprecedented visibility into an organization's operations. As businesses and government agencies transform their business operations, they must be mindful of new vulnerabilities caused

by the growing dependence on IT and address issues of information assurance, security, and privacy. Protecting proprietary and sensitive information is one of the highest concerns for businesses and government agencies as cyber attacks can produce tangible losses.

These trends, among other factors, are creating the environment that is driving transformation in both public and private organizations. Because of these influences, business management transformation is not just a matter of business process improvement or reengineering, but requires a holistic approach to adapting to a dynamic environment, often prompting organizations to do new things in new ways (Rouse 2006).

Initial attempt at Business Systems Transformation at DoD

DoD's initial business transformation effort can be traced back to demands from Congress for better management and accountability of appropriated funds for all federal agencies and organizations. Throughout the 1990s, Congress passed a series of legislative initiatives designed to address the issues of financial management and the integration of modern IT in government agencies. Additionally, DoD and the Services were facing a range of financial management and related business process challenges and were criticized for their massive budgets and their inability to produce unqualified financial audits. There was growing concern that more and more funds were being wasted each year.

When President George W. Bush took office in 2001, he made it clear that improved financial performance would be one of his administration's top priorities. Both the President and the GAO were pressuring DoD and other government agencies to produce clean financial audits, with the underlying assumption that financial accounting—the type used in the private sector—can add value to government activities. Because of fundamentally flawed business systems and persistent weaknesses in internal controls and processes, not one of the military services was able to pass the test of an independent financial audit (GAO 2005a).

In July of 2001, Secretary of Defense Donald Rumsfeld issued a memorandum to the Department of Defense establishing the Financial Management Modernization Program (FMMP) under the sponsorship of the USD-Comptroller. The main priority of the program was to produce reliable, accurate and timely financial information, with the goal to achieve an unqualified audit opinion on the Department's FY 2007 financial statements (Candrea 2004). While it is important to have financial statements that show a clear picture of where taxpayer funds have been invested, having this as the primary goal of DoD reform detracted from the need for a comprehensive overhaul of DoD business processes—impacting all aspects of DoD operations, in both effectiveness and efficiency.

For its first step in the transformation process, DoD set an ambitious goal to develop a comprehensive enterprise architecture by May 2003. However, as DoD realized the true scope of the transformation effort, it adopted an incremental approach to developing the architecture and recast the FMMP; its mission expanded and it became the Business Management Modernization Program. DoD changed the program to reflect the more comprehensive nature of the transformation underway at DoD, linking financial management reform to the broader concept of business process reform.

Through 2005, the BMMP increased DoD-wide systems visibility by identifying the existing inventory and developing an understanding of over 4,000 business systems. Although the program claimed some limited successes, the cost for the program through the 4-year period was

approximately \$440 million. This limited success at such a high cost was due to several challenges the BMMP faced during its first few years in operation.

First, there was the lack of appreciation for the breadth and depth of the DoD Business Mission, and the unwieldy scope of the required transformation. The DoD Comptroller's staff did not have the experience to organize and lead an effort of this magnitude. Frequent changes in leadership--six directors in four year--exacerbated this problem. Second, not enough was done to ensure that new investments were designed to be in compliance with the Business Enterprise Architecture. A lack of oversight and leadership contributed to an uncoordinated effort to integrate new business systems. Third, the initial overall direction of the business transformation strategy maintained a focus on obtaining a "clean audit," rather than an effort to transform the overall business management processes of the department. This led to disengagement by other functional communities and stakeholders. Finally, the program focused almost exclusively on building an enterprise architecture, rather than delivering business capabilities.

Although reform of DoD business practices has been a priority for more than a decade, various initiatives had, at best, limited success. Any large-scale transformation, such as the one being attempted by DoD, would be complex and problematic. However, the slow progress of BMMP demonstrated the need for a new approach if the transformation was to be successful. A new approach was developed in 2004 with the passage of the Ronald Reagan Defense Authorization Act for FY 2005.

Current Transformation Effort

Congress and other DoD observers were becoming increasingly frustrated with DoD's lack of progress in its business modernization effort. Several specific provisions were included within the National Defense Authorization Act for FY 2005 that compelled the DoD to sharpen its focus on the development and modernization of its business systems. One key provision, designed to rein in the uncoordinated and escalating cost of business systems, requires certification approval of any business system modernization in excess of \$1 million over the system's development and modernization lifecycle. The authority to certify business systems investments was delegated from the USD-Comptroller to two newly established entities: the Defense Business Systems Management Committee (DBSMC) and the Investment Review Boards (IRB)

The Secretary of Defense chartered the DBSMC (Under the Leadership of the Deputy Secretary of Defense) to set the overall business transformation priorities and "recommend policies and procedures required to integrate DoD business transformation and to review and approve the defense business enterprise architecture, the enterprise transition plan, and cross-Department, end-to-end interoperability of business systems and processes" (Wolfowitz 2005). The DBSMC was also tasked with developing the enterprise-wide Business Enterprise Architecture (BEA) and publishing the annual Enterprise Transition Plan.

In addition to the DBSMC, DoD established a series of Investment Review Boards to assist in the review of all business system modernization investments over \$1M. The previous system to review new investments was inadequate, as many new investments were made without review and approval of the USD-Comptroller. These new IRBs assess investments relative to their impact on the end-to-end transformation within their designated areas of responsibility. They then make investment recommendations to the appropriate investment Certification Authority, which are eventually approved or disapproved by the DBSMC. The new structure of review, that

the IRBs provide, spreads the responsibility of reviewing new investments, and creates accountability in the domains of the core business missions.

The Deputy Secretary of Defense, and the DBSMC, also recognized the need to institutionalize the transformation process. To achieve this, DoD established the Business Transformation Agency (BTA) as part of the new governance structure for the overall business transformation strategy. The BTA would provide a single point of accountability for coordinating, consolidating, and integrating business transformation efforts at the enterprise level. The overarching mission of the BTA is to achieve improved warfighter support, while enabling financial accountability across the DoD. Once established, the BTA identified six Business Enterprise Priorities (BEPs) that represent the areas of business operations that increased focus will bring most dramatic, immediate and positive impacts (DoD 2005). These identified priorities were: personnel visibility, acquisition visibility, common supplier engagement, materiel visibility, real property accountability, and financial visibility.

Congress continued to drive business systems transformation at DoD through a series of National Defense Authorization Acts, which addressed issues of governance and leadership. Under pressure from GAO and Congress, DoD established an additional role for the Deputy Secretary of Defense: to serve as the Department's Chief Management Officer (CMO). Congress recognized and accepted the additional responsibilities of the Deputy Secretary of Defense, but went further in the NDAA 2008 by requiring DoD to establish the position of Deputy CMO who is to serve as the vice-chair of the DBSMC and is responsible for developing a strategic management plan for the Department. The NDAA 2008 also required the Services to designate their respective Under Secretaries as Service-level CMOs. In the NDAA 2009, Congress sought to further institutionalize business systems transformation governance reforms by requiring the Services to establish Service-level offices of business transformation. As of June 2009, the DCMO has not yet been nominated, and the Services are in the early stages of complying with the NDAA 2009.

Other management initiatives are also making an impact on the overall business transformation effort. Continuous Process Improvement/Lean Six Sigma (CPI/LSS) is an ongoing OSD initiative seeking to develop a culture of continuous improvement in the areas of reliability, process cycle times, costs, quality, and productivity. In 2007, DoD recognized the success of these strategies and established the DoD CPI/LSS Program Office within the Office of the Deputy Under Secretary of Business Transformation (within AT&L). Then Deputy Secretary of Defense, Gordon England, sought to institutionalize the LSS strategy by instructing all Components to use CPI/LSS to improve productivity, mission performance, safety, flexibility and energy efficiency (DoD 2008e). Through Executive Order, President Bush initiated another important management initiative across all federal departments by requiring them to designate Performance Improvement Officers (PIO). In November 2007, DoD appointed Elizabeth McGrath to the position of Performance Improvement Officer with the primary responsibilities to advise the Secretary of Defense on performance goals and measures, and convene the appropriate agency personnel throughout the year to assess and improve program performance and efficiency.

As DoD was preparing for the incoming Obama Administration, on December 10, 2008, the BTA released the first of eight transition documents titled "DoD Business Transformation: Challenge, Opportunity and Guiding Principles." This document outlines the importance of the Business Mission Area, explains some of the reasons why progress has so far been elusive, and

envisions a model of successful business transformation. This document also explains the prevailing status of the business transformation effort and ensures that progress is sustained as new, high-level officials are appointed to office. Going forward in the business transformation effort, the BTA determined that DoD's new leadership will need to maintain a visible and aggressive commitment to progress.

Performance and Achievements of the Current Transformation Effort

Since the BTA was established in October 2005, the trajectory of DoD's Business Transformation has been significantly altered. From slow, almost random progress of the pre-2005 initiative, the new efforts have demonstrated some improvement in several key areas. First, progress has been made in completing and revising the Business Enterprise Architecture (BEA). DoD has kept its commitment to periodically update the BEA, most recently in May 2009 with version 6.0. Second, DoD has complied with the requirements to the NDAA 2005 to update the Enterprise Transition Plan, the Business Enterprise Architecture, and annually report to Congress on the progress of defense business operations. Third, a system has been put in place to efficiently review the IT investments. DoD established the Investment Review Boards Process to provide a governance and oversight framework for effective investment decision-making. Fourth, DoD has established a new management structure to provide more stable leadership for business systems transformation. Through a sequence of NDAAs, Congress required DoD to establish the positions of Chief Management Officer (CMO) and Deputy Chief Management Officer (DCMO). It also required the Services to designate a Chief Management Officer and to establish Service-level offices of business transformation. Finally, management of those programs placed under the BTA umbrella has demonstrated much-improved project efficiency. This is demonstrated in Part Two of this report through four cases studies including: the Defense Integrated Military Human Resources System, The Defense Agencies Initiative, the Interim Voting Assistance System, and Security Clearance Reform at DoD.

While the BTA holds a degree of influence over many projects at the enterprise and OSD level, such as the Defense Integrated Military Human Resource System (DIMHRS) and the Defense Agencies Initiative (DAI), much of the business transformation effort occurs at the component level. Approximately half of all business transformation systems and initiatives are for the components, and they receive 66% of all funding for business transformation. Given the importance of business systems transformation at the component level, this report includes case studies on three large initiatives: Navy Enterprise Resource Planning, Army Logistics Modernization, and the Defense Logistics Agency Business Systems Modernization.

Findings and Recommendations

Although many challenges remain, the business transformation effort at DoD has experienced some improvement since the major 2005 course correction. The previous business transformation initiatives achieved limited results, and were plagued with a general underestimation of the scope of the challenge, along with a variety of problems. Congress played a significant role in setting the new direction of business transformation at DoD. The 2005 NDAA created a new business systems transformation governance structure and established an improved business systems investment review process, while the BTA set business transformation priorities and provided day-to-day management of the transformation effort at the DoD enterprise level. As DoD leadership realized the scope of the business transformation effort,

they placed an emphasis on involving top-level leadership by establishing the DBSMC and creating the BTA.

Congress has continued to mandate governance and leadership reform at DoD to improve leadership and oversight of the transformation effort through a series of National Defense Authorization Acts. DoD leadership has also pursued other management initiatives that are driving performance improvements. Through establishing the position of Performance Improvement Officer and the institutionalization of CPI/LSS (Continuous Process Improvement/Lean Six Sigma), DoD has attempted to provide a framework for delivering incremental improvements in performance and efficiency.

Despite the recent progress in the business transformation effort, many challenges remain. Business transformation at an organization as large and diverse as the DoD is difficult, and requires a great deal of patience and persistence. The current organizational structure of DoD evolved over decades, and will not change in a very short period of time. In order to continue advancing in the business systems transformation effort, DoD needs to address the many challenges presented by the business transformation process. The following provides a summary of this report's findings and recommendations.

Systems Development

- **Finding 1.1:** DoD components continue to develop functionally based ERP systems for supply chain, finance, and human resources, which do not produce end-to-end, integrated capabilities. However, this does not mean that there needs to solely be one overarching ERP at the enterprise level. Subordinate organizations may have a need to have a tailored ERP “instance” for their local operations. The number of instances of an ERP does not matter so long as they are interoperable, and aggregate easily.
- **Recommendation 1.1:** DoD should reevaluate its definition of “enterprise” so that it can match the correct authority to manage the change, and then focus on end-to-end capabilities. ERP implementations should focus on maximizing the utility of a single ERP system, and not creating “functional ERP systems” that are inherently stove-piped and costly to stitch together. Multiple ERP “instances” should be based on standards, be interoperable, and can be aggregated.
- **Finding 1.2:** Some DoD business modernization programs have tried to do too much in a single initiative. Large scale business systems implementations using a “big bang” approach create significant challenges. Other programs implemented using an incremental approach have experienced more success.
- **Recommendation 1.2:** When developing these large, complex systems, programs should avoid an all inclusive “big bang” approach. Although large scale implementations appear to be “silver bullets” to longstanding problems at DoD, in practice, they create more problems than they actually solve.
- **Finding 1.3:** While DoD has learned that the customization of Commercial-off-the-Shelf ERP software is a significant barrier to success, owners of legacy systems now advocate the use of specialized data interfaces to avoid changes in current business processes.

These data interfaces restrict the realization of the main cost savings that ERP systems can provide, which is, that they allow an organization to retire legacy systems.

- **Recommendation 1.3:** In order to reduce costs and accelerate the implementation of new business modernization initiatives, DoD managers should pursue the “minimally sufficient solution” and not allow unnecessary expanded or specialized capabilities. One strategy senior managers can use, is to discontinue the practice of requesting information in legacy report format. Moreover, those with the responsibility to drive transformation must have the authority to eliminate funding for legacy systems, and thus reduce the “requirement” for specialized interfaces.
- **Finding 1.4:** Although interfaces with legacy systems pose several problems, transferring legacy data to a new system is also very challenging. Data reconciliation takes a huge commitment of manpower by agency leadership.
- **Recommendation 1.4:** DoD should develop a clear policy on how to deal with legacy data that focuses on the “minimally sufficient solution” and discourages the use of data interfaces and specialization.

Management

- **Finding 2.1:** The many DoD employees involved with business transformation often lack the necessary experience and skills to lead the planning and managing of its implementation. Congress allowed DoD to hire as many as 2,500 Highly-Qualified Experts (HQEs) to fill critical positions, with compensation packages more competitive with the private sector. However, this process takes significantly longer compared to the private sector and the compensation still lags behind what the private sector can offer. Additionally, the security requirement at the BTA eliminates the pool of resident aliens, where much of the requisite expertise and talent resides.
- **Recommendation 2.1.** The Congress, the Secretary of Defense, and the Service Secretaries and Chiefs must continue to ensure that the Defense Business Transformation effort and the Business Transformation Agency (BTA) have adequate and stable resources—funding and human resources. Congress should allow DoD to retain and expand the authority to hire HQEs. The BTA should evaluate its security clearance requirement for employment, and, if appropriate, removed for these positions, to allow permanent resident aliens (like those that are allowed to serve in the military services) to fill them. DoD must also work toward developing the required capabilities organically, by developing clear incentives and career paths for individuals who specialize in business systems and IT.
- **Finding 2.2:** Under Congressional special hiring authority, DoD is allowed to hire Highly-Qualified Experts (HQEs) at a salary equivalent to that of the Vice President. However, internal policies restrict HQE’s salary to SES pay scale. This hinders the ability of the BTA to attract the needed talent to drive and manage transformation.

- **Recommendation 2.2:** Congress, the new Administration, and especially the SecDef and Deputy SecDef, must continue to ensure that DoD is able to recruit, hire, train, and retain the required personnel. DoD needs maximum flexibility in pay, benefits, and other variables so that they can attract, hire, and retain the talented individuals, with the appropriate skills, to oversee the technically complex enterprise system developments. DoD should start by altering internal policies to allow agencies to hire HQEs at the salary level set by the Congressional special hiring authority.
- **Finding 2.3:** There is a need for better communication regarding the purpose of ERP systems. While the problems of legacy systems are known, yet tolerated, benefits of business transformation such as cost savings, and improved efficiency, are not always obvious or adequately communicated. Unless there is a clear understanding of the benefits of business transformation, stakeholders of legacy systems will question the need to adjust to an entirely new system.
- **Recommendation 2.3:** The BTA, Agencies and the Services need to define output performance measures for transformed business systems so that stakeholders understand not only the costs, but also the benefits of transformation. Clear examples of cost savings and improved efficiency are needed to achieve greater buy-in from stakeholders and agencies within DoD.
- **Finding 2.4:** The transformation of DoD’s business processes and systems will require many of DoD’s employees to acquire new skills. ERPs and other business transformation initiatives will significantly change the nature of many jobs within DoD. In order to meet this human capital challenge, DoD will need to be able to provide more training to its current workforce and be able to recruit qualified workers from the private sector.
- **Recommendation 2.4:** DoD ERP experts, not contractors, should lead (or co-lead) ERP implementations. With DoD employees taking leadership roles for both functional and technical positions, the systems development and the transformation effort will be driven, as it should be, by DoD personnel, and not consultants.
- **Finding 2.5:** The main resistance to ERP implementation comes from those with functional authority at the working level. In terms of the business transformation budget, DoD has already declared ERPs as the centerpiece to business transformation. However, DoD continues to fund incremental improvements to the same systems that it hopes to replace with ERP systems. This resistance and hedging from functional authorities works to both slow progress in the ERP implementation, and keep legacy systems alive—delaying or derailing the transformation effort.
- **Recommendation 2.5:** Leadership at all levels of DoD needs to abandon this hedging strategy, of continuing to unnecessarily support legacy systems. DoD needs to align business transformation efforts and provide necessary resources across programs to ensure the delivery of end-to-end business processes.

Senior Leadership

- **Finding 3.1:** Leadership emphasis has proved critical to energize DoD's Business Transformation. Completing the scope of change envisioned for DoD's business and financial management systems will require continued and committed leadership; especially from the Secretary and Deputy Secretary of Defense.
- **Recommendation 3.1:** The Secretary and Deputy Secretary of Defense must continue to make Defense Business Transformation one of their top priorities. While one of the main objectives of defense business transformation is reducing costs and improving efficiency, the overarching goal is improved warfighter support. Highlighting the link between defense business transformation and enhancing warfighter support is critical to gaining support from key stakeholders and overcoming the organizational, cultural, and technical challenges of business transformation.
- **Finding 3.2:** Initial DoD business transformation efforts were plagued by a lack of stability in leadership at the program level. The frequent turnover of directors experienced previously, by the Business Modernization Management Program, as well as with the key individuals in specific programs, such as Defense Integrated Military Human Resources System (DIMHRS), contributed significantly to their mediocre performance. Since the National Defense Authorization Act for Fiscal Year 2005, there has been more continuity of leadership in the transformation process. However, if this is not sustained, momentum for business transformation will be lost and progress reversed.
- **Recommendation 3.2:** The Secretary and Deputy Secretary of Defense need to ensure that, to the extent possible, senior military leaders with IT experience are in charge of large business transformation initiatives, and held accountable for results. Similarly, the Secretaries of the Services must place high ranking officials in leadership roles of Service-level business transformation initiatives, and hold them accountable for results.
- **Finding 3.3.** The current goals of DoD's Business Transformation effort are general and qualitative. Organizations that have successfully transformed their business systems have had clearly stated, well defined, measurable goals. Cisco Systems Inc. (a leading IT company), for example, when transforming their business systems set a goal to achieve a one day close, and cut finance costs in half. DoD, Services, and agencies must be able to monitor the effectiveness of their changes by continuously tracking the effectiveness of their changes against the established strategic goals.
- **Recommendation 3.3.** The Deputy Secretary of Defense, acting in his role as the Chief Management Officer, must develop clear and quantifiable goals and metrics to guide the Department, monitor its progress, and measure the effectiveness of the changes that are made.
- **Finding 3.4:** Within DoD's components, especially in the military services, uniformed leadership is critical, but not always evident. DoD agencies are usually headed by three-

star flag officers. The BTA, a DoD agency, is currently headed by a qualified senior civilian, but no plans exist for future military leadership.

- **Recommendation 3.4:** The SecDef and Service Secretaries must ensure that the business transformation programs have the necessary, qualified senior military and civilian leadership. When the time comes to replace the current Director of the BTA, a senior, IT experienced, military flag officer (three-star) should be named to that post. This will help reinforce the link to, and importance of, business transformation and warfighter support.
- **Finding 3.5:** There are several new key leadership positions such as Chief Management Officer, Deputy Chief Management Officer, and the Service-level Chief Management Officers that will be critical to leading DoD's business transformation. However, there is still a lack of clarity regarding the specific roles, responsibilities, and authorities these positions will have. Additionally, their roles and responsibilities, relative to other senior DoD officials, need to be clarified (see below).
- **Recommendation 3.5:** Critical senior positions such as Chief Management Officer, Deputy Chief Management Officer and Service-level Chief Management Officers should be filled by people who have experience running large businesses, and also have an extensive IT background.

Governance

- **Finding 4.1:** DoD's business modernization program governance requires a committed steering body of cross-functional senior executives. The new governance structure created in 2005 got the involvement and attention of the Department's senior leadership, through several different venues, such as the Investment review Boards (IRBs) and the Defense Business Systems Management Committee (DBSMC).
- **Recommendation 4.1.** SecDef and DepSecDef must ensure the changes catalyzed by the National Defense Authorization Act for Fiscal Year 2005 continue.
- **Finding 4.2:** Investment Review Boards (IRBs) in practice do not fully accomplish their intended purpose. While the IRBs maintain a more technical focus, and the DBSMC is a high level committee that meets only on a monthly basis to deal with big-picture issues, smaller, but important, business transformation issues do not always get adequate attention.
- **Recommendation 4.2:** Establish another subordinate board to the DBSMC that is more dedicated to solving the integration problems posed by the business transformation. The new board should be chaired by the Deputy Chief Management Officer and its members should include senior enough people to have authority, but are also close enough to the work to understand what transformation means from an operational standpoint. Cross-functional business transformation oversight should be a significant portion of their workload.

- **Finding 4.3:** Three federal laws continue to complicate the Defense Business transformation (i.e. Goldwater-Nichols, Clinger-Cohen, and the NDAA FY 2008). They cause overlapping responsibilities between the Under Secretary of Defense (AT&L), the Assistant Secretary of Defense for (Networks and Information Integration), and the Deputy Chief Management Officer.
- **Recommendation 4.3:** Congress and the new Administration must work to resolve remaining organizational barriers. The Secretary of Defense should place the Assistant Secretary of Defense for (Networks and Information Integration) in the Under Secretary of Defense (AT&L) organization and suggest to Congress to modify the Clinger-Cohen Act so he/she can remain the Chief Information Officer. Also, the new role of the Deputy Chief Management Officer should be strictly as a strategic advisor to the Chief Management Officer, and should not have any programmatic responsibility (which would still flow from the Defense Business Systems Acquisition Executive (DBSAE) to the Under Secretary of Defense (AT&L), as the Senior Acquisition Executive (SAE)).
- **Finding 4.4:** Even with the establishment of the Business Transformation Agency, there is still some fragmentation within the DoD's transformation effort. There are still elements of the OSD staff developing business systems independently, and, other elements of OSD that were not fully integrated into the BTA.
- **Finding 4.5:** The BTA directly manages only some of the enterprise systems, but its involvement with the many other large business information systems managed by the Services and components is necessary, and can be of great value. Currently the BTA facilitates transformation, brings ideas, knowledge and assistance to other decision makers, but is not empowered to drive the transformation process.
- **Finding 4.6:** Evolving from DoD's legacy, stove-piped structure into an integrated, enterprise-wide system naturally meets with individual and organizational resistance. One of the most important problems with the current business systems environment at DoD is that there are too many legacy systems that are not interoperable. However, the integration of enterprise-wide, integrated and interoperable systems has proven to be very challenging in part because of the significant changes to organizational culture that transformation causes. Despite the challenge of changing an organization's culture, current and future budgetary pressures create an urgent need for change. DoD funding has likely reached its high-water mark for funding; and as budgets are reduced, there will be a tough choice between weapons and business systems.
- **Recommendation 4.4:** The new Administration must work to strengthen the role of the BTA to lead the management of DoD's Business Transformation. The Secretary of Defense and Deputy Secretary of Defense should assign all OSD level enterprise programs under the BTA umbrella. The SecDef should also assign the BTA the pivotal role in providing the control (including with the Services) that ensures compliance with the BEA. This is critical to enable the necessary integration and interoperability between federated business systems.

Part One: DoD Business Transformation

Introduction

The first decade of the 21st century began to demonstrate the significantly different and challenging national security environment that the U.S. now faces. Seeking to develop creative, innovative strategies and solutions to meet the challenges presented by the new, dynamic national security environment, the Department of Defense (DoD) embarked on a path to transform the military services, in order to meet, and overcome, new and uncertain challenges. One of the important drivers behind the challenges of the national security environment is the rapid development of new technologies, especially information technology.

Over the past several decades, information technology (IT) has advanced at a very rapid pace, and is now integrated into virtually every aspect of our lives. One of the most significant impacts of IT has been in the workplace. Many businesses have harnessed the new capabilities of IT to develop new business models and transform their business processes, attempting to improve performance and efficiency. While many firms are motivated to transform their business operations because of increased competitions from globalizations, the federal government is also under intense pressure to improve the performance of its business systems.

Although, there are many cases of successful private sector business systems transformation that can be cited, the transformation of DoD's business systems has proven to be very challenging. This is understandable given the scope of DoD's operations. DoD is the nation's largest employer with over 1.4 million active duty military and over 700,000 civilian personnel. Additionally, DoD supports over 2.3 million veterans and over 839,000 National Guard and Reserve Forces (U.S. Air Force 2009). DoD, the largest organizations in the world, has over \$3.6 trillion in Assets and Liabilities, an annual budget of over \$500 billion, and 5.2 million inventory items that are managed by 5,600 IT systems (Cappacio 2009; DoD 2008a). Transformation of an organization of this size is a monumental task.

As a result, the Department of Defense, still relies on thousands of stove-piped, non-integrated, non-interoperable business systems, that create a great deal of inefficiency. These inefficient "legacy" systems were created over several decades, as the numerous organizations within DoD independently developed specialized systems, using unique processes, objectives, and functions, designed to best support their mission areas. As information systems evolved, many of these systems became outdated. Moreover, the lack of data standards, obsolete computer languages, and non-interoperability of these systems frequently caused errors, redundancy, and a growing cost for systems maintenance. For over a decade, DoD has attempted to integrate new information technologies to improve business management with limited success.

Pressure from Congress, and GAO, along with the new challenges presented by the current national security environment created the urgent need to improve business management at DoD. Additionally, as the U.S. government's financial obligations expand, particularly for Social Security and Medicare (discussed later), there will be a continued downward pressure on funding DoD budgets. The DoD's business transformation to date, however, has proved to be a challenging and complex task. Billions of dollars have been invested in transformation initiatives with mixed results.

This report attempts to develop an understanding of how developments in information technology have impacted business operations, tracks the Department's transformation efforts, evaluates its performance and achievements, and recommends policy actions to improve the

transformation effort. This report is divided into two parts. Part I evaluates DoD's business systems transformation effort, while Part II includes several cases studies of business systems transformation.

Part I. Section B explores the impacts of the information technology revolution on public and private organizations. Section C argues for the need for public sector business systems transformation, explains the objectives of public sector transformation, and provides an overview of challenges public organizations face in the transformation effort. Section D assesses DoD's 2001-2004 initial attempt at business systems transformation. Section E examines the 2005 DoD business systems transformation course correction and the current transformation effort. Section F describes the performance and achievements of the current transformation effort at the DoD enterprise level and the transformation initiatives of the Services and components. Section G concludes Part I of the report with findings and recommendations to enhance prospects for success in the business systems transformation effort at DoD.

Part II. Part II includes eight cases of business systems transformation. Each case describes a specific transformation initiative and seeks to draw lessons from each experience. Section A describes the transformation of business systems at the IRS and draws lessons on the challenges of business systems transformation in the federal government. Section B includes four cases of business transformation led by the Business Transformation Agency: Defense Integrated Military Human Resources System (DIMHRS), Defense Agencies Initiative (DAI), the Interim Voting Assistance Program (IVAS), and Security Clearance reform at DoD. Section C of Part II concludes the report with three case studies at the component level: Navy Enterprise Resource Planning (ERP), Army Logistics Modernization Program (LMP), and Defense Logistics Agency Business Systems Modernization Program (BSM).

A. Background

1. Impacts of the Information Technology Revolution

The IT revolution began in the late 1950s and 1960s, when large mainframe computers were first used to store, process, and analyze large amounts of data. The IT revolution accelerated throughout the 1980s and 1990s, as personal computers became ubiquitous and the Internet was introduced, allowing for new business models such as electronic commerce. Moreover, the capabilities of IT made it possible for organizations to significantly improve productivity and efficiency, which has in turn spurred economic growth.

More recently, IT is being used for far more advanced applications in virtually all types of organizations. Companies have applied networked IT to help with complex tasks such as enterprise resource planning and supply chain integration. As a consequence, managers have unprecedented visibility into an organization's business operations, enabling more informed business decisions. It is now possible to view the business operations in an organization using systems that automatically provide critical information, in "real-time," rather than waiting for monthly or quarterly reports.

In addition to driving improved business operations, developments in IT have catalyzed and fueled the growth in globalization. With the capacity and speed of information networks, many different tasks can be parceled out, and performed virtually anywhere, as long as there is Internet access. As a result, businesses experience the effects of increased global competitive pressures, which have forced many of them to transform their operations to meet the needs of these new realities.

Even as many enterprises, such as General Electric and IBM, have successfully undergone fundamental transformation of their businesses, government agencies have had much less success. The Department of Defense, the largest government agency in terms of funding, exemplifies an organization that has not been able to successfully adapt its operations to the developments of IT. Although some progress has been made on many fronts in its effort to reengineer its business processes and management, the DoD still lags far behind the capabilities of the "world class" private sector. One of the great ironies is that the DoD and other government agencies funded research that is largely credited for the development of technologies that spawned the IT revolution. Now, new IT innovation and developments are driven by, and for, the commercial sector; and government agencies will need to adapt these in order to take advantage the benefits of the new technology.

Emerging commercial IT products and technologies have many potential applications for government operations, which can significantly improve effectiveness, while reducing costs. However, developing new business systems can require a substantial up-front investment, some of which can take years to recuperate, and generally faces much organizational, cultural, and individual resistance. Despite the challenges, the reengineering of business processes to leverage the available technologies is critical to improving the performance of government agencies and the military, as has been aptly demonstrated by "world class" private sector firms.

IT Can Improve Productivity

The growing role of IT in day-to-day operations continues to be a significant and positive driver of worker productivity. As new technologies, that reduce the costs of producing, communicating, and analyzing data, become more available, they will continue to transform the operations of private and government organizations in the future.

Information technologies can provide many benefits to an organization. However, information technology alone will not improve its overall performance. In addition to the automation of repetitive clerical and administrative tasks, IT enables companies to fundamentally reengineer business processes and develop new business models. Utilizing technology to automate existing business processes can only provide marginal benefits to an organization seeking to improve the efficiency of its operations. However, the skillful implementation of both information technologies and reengineered business processes, that take advantage of IT, can produce greater productivity increases. One of the most influential management experts coined the relevant phrase “don’t automate, obliterate”, suggesting the elimination of inefficient business processes (Hammer, 1990). Rather than automating inefficient processes, an organization should seek to reengineer business processes to eliminate inefficiencies. For private industry, companies that successfully integrate information technologies into their business models will achieve greater efficiency and have a competitive advantage over their industry peers. As more and more companies undergo business transformation, the companies that do not find ways to integrate IT into their business models will find themselves at a competitive disadvantage.

Challenges Posed by IT and the New Business Environment

While information technology can potentially solve many of an organization’s problems, it also produces new challenges. One of the major challenges, before the IT revolution, was that managers had to make decisions based on limited information. As the IT revolution continues, the problem will not be the lack of information, but how to synthesize the wealth of information available to make sound business decisions. If properly analyzed, better information (both quantity and quality) should lead to better decisions, which will enhance the efficiency and competitiveness of an organization. These new developments have compelled business managers to take advantage of information technologies to integrate IT into their operations, streamlining administrative processes, supply chains, financial processes and improving management.

Another major challenge, as the DoD increases its dependence on information technology and increases its interconnectedness, is the growing vulnerability to cyber attacks. These can be used to disrupt military operations, for example, by disrupting logistics systems and supply chains. The DoD, along with the rest of the federal government, is increasingly aware of this growing threat, and the shortcomings of the current cyber security initiatives (Gorman 2009). The Secretary of Defense “has said publicly, our defense networks are constantly under attack. They are probed thousands of times a day. They are scanned millions of times a day. And the frequency and sophistication of attacks are increasing exponentially.” And, as a result the Secretary has made cybersecurity a central focus of DoD’s ongoing Quadrennial Review (Lynn 2009).

Driving Technological Development

Another significant impact of the IT revolution is the increasingly important role of the private sector in technological development. The IT revolution is based on technologies that were in part developed or funded by the government. A commonly cited example of a technology initially developed by the public sector that has had a profound impact on private enterprises is the Internet, one of the key drivers of the IT revolution. While the Internet was first developed in 1969 as part of a DoD Advanced Research Project Agency (now DARPA) project, the private sector is now the primary driver of information technology innovation. In recent decades, many of the technologies that the commercial sector has been able to exploit were developed by (or funded by) DoD. The challenge for private enterprises was to modify or create commercial applications for technologies developed for military purposes. As the information revolution continues into the future, DoD will need to find ways to apply commercially developed technologies to their own operations. This is demonstrated by the expanded use of Commercial-Off-the-Shelf (COTS) products and technologies in all areas of the DoD and the Services.

2. Impact of IT on Business Processes

The IT revolution impacted the private sector in several major ways. Broadly, new technologies have enabled businesses to be more efficient, specialized, and competitive.

Electronic Commerce

Electronic commerce is playing an increasingly important role in economic activity. Virtually all enterprises have developed websites to bolster sales and custom orders. Not only is electronic commerce affecting the way that businesses and consumers are interacting, but also how businesses deal with each other. Electronic commerce, which was made possible by the reduction in the cost of communication, brings a number of efficiencies to the market. Most notably, it enables business and consumers to cut out intermediaries, thereby reducing costs for both the business, and the consumer.

The IT revolution is also breaking down the barriers to market entry. Utilizing electronic commerce and other information technologies, the startup investment required to compete in many industries has drastically fallen.

Financial Management

Nearly all systems within an organization have a direct or indirect relationship with the Financial Management System in the organization. Finance is a core function in most organizations with costs, profitability (in the private sector), and efficiency of the enterprise being evaluated and reported. Virtually all strategic and operational management decisions in both the public and private sector are based on financial data. There is a functional area where information systems have had a significant impact, allowing some companies to be able to close their books in a day, providing the most current information to managers and stakeholders.

For example, Cisco Systems, a leading IT company (established in 1984) with over 67,000 employees and annual revenue of 39.5B in FY 2008, that provides many products and services critical to internet infrastructure, set ambitious goals for improvement of its financial management systems. Their goals were to “achieve a one day close, cut finance costs in half, and

to transform the way the financial management system would support decision makers” (Gansler, Luby 2004). Through sustained commitment by management, the standardization and reengineering of business processes, creating an organizational culture that embraces information technology and web-based application, and continually reassessment of process, Cisco was able to achieve its goals in reforming its financial managements system in just a few years.

Enterprise resource planning

Enterprise resource planning systems (ERP) is an enterprise-wide information system designed to manage the resources, information, and activities needed to complete business processes. ERPs are commercially available software systems that support and integrate many key functions within an organization such as financial management, human resources management, product planning, inventory maintenance, supply chain management, etc.

Greater levels of integration between different functional areas allow an organization to share a common database, and seamlessly communicate relevant information. Many private sector companies have successfully integrated ERP systems in order to achieve greater efficiency, lower costs, and increased visibility of operations, personnel, supply chains, and product inventories. The main benefit of ERPs is the information they make available to managers that allow them to make more informed business decisions.

Integration of an ERP into business operations introduces some risks. Although the goal of implementing an ERP into the business model is generally to reduce costs, a substantial investment is generally required at the outset. Managers must be able to recognize what investments will provide the greatest return, and add the most value to the organization. Whether they provide a certain amount of cost savings, or provide better information for strategic decisions, the goal must be clear. Another major challenge organizations face when implementing an ERP solution is the change it brings to the organization, which is often resisted by employees and other stakeholders.

Supply Chain Management

Supply chain management (SCM) encompasses the planning and management of all activities of a network of interconnected businesses that are involved in the delivery of products and services to customers. Over the past several decades, information technology has revolutionized the way in which these networks of interconnected businesses operate with each other. SCM and ERP systems both contribute to the overall distribution and coordination of resources. Just as an ERP enhances information flow between different areas of an organization, it can also improve SCM by enhancing the flow of information between different members of the supply chain. Improving SCM generally leads to reduced costs, higher efficiency, and better service.

One of the major drivers of innovation in SCM in business is the ever-increasing pressures of globalization to reduce costs and increase sales. As a result, some companies have developed very advanced systems to manage complex supply chains. For example, at the UPS Worldport, the company’s worldwide air hub, over 300,000 packages are sorted every hour by a system that automatically photographs, measures, and weighs each package. Their process relies on a computer system that reads “super-barcodes” on each package that automatically determines their destination and directs them along 17,000 conveyor belts toward their intended bag or air freight container (Staff 2006c).

The integration of IT into business operations continues to advance as computing becomes cheaper and more powerful; and these developments in IT are continuing to transform the management of virtually every aspect of the supply chain. Improvements in enterprise resource planning software and new technologies such as Radio Frequency Identification (RFID) increase information visibility, which allows for better buyer/seller collaboration. This in turn enables improved demand planning and forecasting. Supply chains are now more responsive to customer demand, which can reduce the costs of transport, purchasing, and warehousing. Increased competition from globalization, and further developments in IT, continue to encourage businesses to optimize their supply chains, allowing them to operate leaner and more efficient.

Real-Time Enterprises

As the Information Revolution continues, businesses and other organizations are becoming more adept at using available information for strategic management decisions. One of the major capabilities that organizations now have as a result of technologies such as the internet and high-speed data networks is the ability to view the organization's operations in real time. This is widely considered by business analysts as the next stage of the information revolution. Developments in information technologies, up until that last decade, have primarily focused on automating existing business processes. As information technologies become more widespread, businesses and other organizations will be able to run their operations in a manner that is fundamentally different from previous ways of business.

This has led to what some business analysts are calling real-time enterprises (RTE). Real-time enterprises are being made possible through a combination of new technology and refined business processes that promote value based management. No longer do managers need to wait for periodic reports that can be costly to produce to make strategic management decisions. Information systems automate many of the business processes and produce information for managers faster and more accurately. Reengineering business processes to allow real time visibility provides a number of advantages; most important are the cost savings and more informed management decisions that these systems provide.

Becoming a real-time enterprise is much more than automating existing business practices. It requires an operational transformation that adds value through improving business processes, to improve efficiency and eliminate waste. Since becoming a real-time enterprise requires new business models to achieve the possible benefits, deep structural changes within a company may be inevitable.

General Electric (GE) is a company that continues to reinvent itself though through business process reengineering, and was one of the first large organization to achieve real time capabilities in their operations. Driven by competitive pressures, GE developed a system of "digital cockpits" designed to provide up-to-the-minute business performance information across the entire organization (Lindorff 2002). In a matter of seconds managers can check information on sales, order rates and inventory levels across the globe. This enabled the manager to react to problems much faster than waiting for periodic reports. With information provided on a real time basis, the manager can now better interact with GE's own operations as well as with its suppliers and customers. Through digitization GE has been able to cut costs in almost all areas of business and was expected to save \$10 B annually (Lindorff 2002).

3. DoD Transformation

Clearly, the information technology revolution profoundly impacted the private sector. The public sector is struggling to gain the same benefits. While many large private sector enterprises have successfully implemented new enterprise resource planning systems, integrated RFID into the supply chains, and developed real-time organizational visibility, similar transformations in DoD Agencies and the Military Services have been very challenging. So far, DoD has experienced mixed results in integrating information technology into business systems. Some small business transformation initiatives such as Defense Logistics Agency's EMALL and the transformation of DoD's Defense Finance and Accounting Service have successfully demonstrated how business transformation can create tangible cost savings and performance improvements. However, DoD's ERP implementations have proven to be more challenging, which is especially troubling since DoD currently spends about half of its business transformation budget on ERP systems and has gained only limited improvements in operational capability. Contrasting the business transformation efforts of DoD with the private sector, it is clear that DoD is far behind the private sector in acquiring the capabilities enabled by the IT revolution. This report tracks the experience of DoD in its attempt to transform its business operations using information technology and seeks to identify and recommend policies that will contribute toward more successful outcomes.

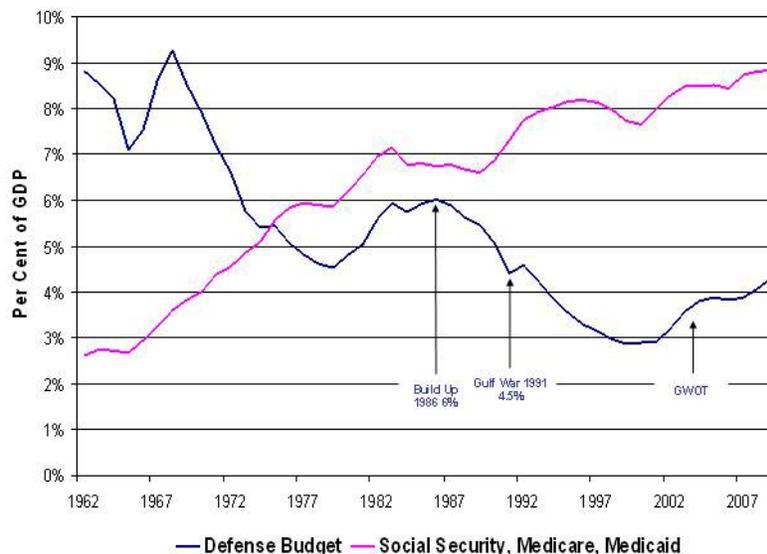
B. Transformation in the Public Sector

1. The Need for Business Transformation

Public and private organizations face different types of challenges, and they both must deal with growing pressures that create the need to adopt new technologies and organizational models in order to achieve their missions. While the IT revolution produced the tools and technology that allow organizations to expand their capabilities and worker productivity, there are several trends that both public and private organizations face, that create the environment that drives transformation.

The first major trend that that we believe will drive transformation is the increasing government debt. In recent years, the federal government has taken on huge amounts of debt in part because of the ongoing conflicts in Iraq and Afghanistan and the 2008 financial crisis. This increase is only exacerbated by the growth in mandatory spending programs, such as Social Security, Medicare, and Medicaid, as well as growing levels of interest on national debt. This growth will severely constrain the ability of the United States to invest additional funds in discretionary programs, most notably defense. Figure 1 contrasts the growth in federal entitlement spending with Defense budgets as a percent of the Gross Domestic Product (GDP).

Figure 1: U.S. Federal Government Expenditures (Office of Management and Budget 2008)



According to a December 2007 Congressional Budget Office report, federal spending on Medicare and Medicaid measured as a share of GDP will rise from 4% in 2007, to 12% in 2050 and 19% in 2082. The same report projects federal spending on Social Security will increase from 4% of GDP in 2007 to 6% in 2032 (Orszag 2009). The majority of the growth in the cost of Medicare and Medicaid is due to higher costs per beneficiary, while the growth in the cost of Social Security will largely be the result of the demographic changes (most notable the retirement of the baby boom generation).

The financial crisis of late 2008 and the subsequent stimulus package have also caused the government to borrow record amounts. As of June 2009, the federal debt totaled approximately 11.3 trillion and the Congressional Budget Office expects it to grow approximately \$9 trillion over the next 10 years (Kohlmayer 2009). To illustrate the gravity of this situation, in 2018 the cost of paying interest on the outstanding debt will be greater than all non-defense discretionary spending (approximately 3.6% of GDP) (Graham 2009). As the mandatory obligations of the federal government continue to grow, a greater percentage of government revenues must be dedicated to cover their costs. As a result, there will be fewer funds to allocate to discretionary spending priorities, including national defense.

The second trend is the growing role that knowledge plays in the operation of most organizations. Knowledge assets depend greatly on the nature of the business. They can be the knowledge of markets, products, technologies, supply chain processes, and patents that a business owns. Knowledge assets can be an important source of competitive advantage for a business. This is especially true as globalization accelerates, speeding up technology diffusion, and increasing competition. As businesses continue to seek competitive advantages, they invest more and more in knowledge creation, and knowledge of their business environments. Innovation and the creation of new products, services, and ideas are what create value in businesses. These knowledge assets enable business to generate profits, add value, and achieve business objectives. In this age of globalization, information and specialized expertise are the most valued assets that organizations possess.

In terms of organizational performance and decision making, knowledge also plays an increasingly important role. New technologies allow unprecedented visibility into an organization's operations. While in the past an important challenge facing managers was the ability to make operational decisions based on limited information, managers are now faced with the challenge of analyzing and interpreting the wealth of information that IT has made available. Better information, in terms of quantity and quality, should lead to better decisions and better outcomes. In the case of DoD, more informed business decisions should lead to improved warfighter support.

The growing importance of knowledge is also creating human capital challenges for most organizations. In order to take full advantage of the tools and technologies produced by the IT revolution, organizations need to hire and develop employees with specific talents and skill sets that may be different from those they currently employ. Not only do organizations need to develop new skills, but they must also reorganize their business models to promote the creation of new knowledge, disseminate it widely throughout the organization, and quickly embody it into new technologies and products (Nonaka 1991).

The increased dependence on information technologies to address the challenges presented by these major trends also creates new vulnerabilities. As businesses and government agencies transform their business operations, they must be mindful of this growing dependence on IT and address issues of information assurance and security. This is especially relevant with the integration of information technologies that take advantage of the internet and digital networks, which represent virtually all new information technologies. Since information technology depends both on a physical infrastructure (that enables the flow of information globally), and the software (that provides the new capabilities), the threats from these new vulnerabilities are diverse. The physical infrastructure that IT systems rely on includes servers, nodes, cables and satellites; as well as the information systems themselves. Both are vulnerable to disruption.

Threats from an array of cyber attack techniques are damaging to both private and public organizations that increasingly rely on IT to manage their operations. Protecting proprietary and sensitive information is one of the highest concerns for both businesses and government agencies. Cyber attacks can produce tangible losses: mostly from lost productivity, revenue, direct costs and loss of customer trust (Warwick, 2009). In 2004, the Congressional Research Service estimated that the economic impact of cyber attacks on businesses had reached \$226 billion (Coleman 2008).

Because of these trends, transforming an enterprise is not just a matter of business process improvement or reengineering, but requires a holistic approach to adapting to a dynamic environment, often prompting organizations to do new things in new ways (Rouse 2006). Enterprise transformation seeks to align people, processes, and technology closer to an organization's mission and vision, in order to improve its performance. To be effective, this type of change must be implemented enterprise-wide, as it affects virtually all facets of an organization including its leadership, strategy, processes, systems, financial condition, and organizational structure. This change can be very challenging, since different stakeholders are affected in different ways. Enterprise leadership must place a high priority on these transformative initiatives in order for them to be successful, and equip their organizations to better face the many dynamic challenges presented by the current environment.

2. Objectives of Public Agency Transformation

Information technology plays a critical role in transforming the operations of an organization, and will continue to play a critical role as an enabler and driver of transformation as its capabilities continue to expand beyond back-office support to an essential tool for achieving an organization's mission. As the role of IT expands, the roles of many stakeholders in an organization also change. For example, health-care service providers are increasingly relying on IT systems to manage electronic patient records, as well as automate daily clinical, financial, and administrative functions in order to maximize physician productivity. Although these IT systems can reduce costs and improve the quality of healthcare delivery, they require employees to do different kinds of work. Thus, enterprise transformation is not only about improving how work is performed currently, but also about performing new and different tasks. "Transformational change is strategic and disruptive—aiming for significant, quantum improvements in effectiveness and significant cost savings. Incremental change is more evolutionary, focused on tactical moves where more modest management improvements and efficiency gains are the goal" (Breul 2005).

While the overall goal of public agency transformation is to improve the services that they deliver at a lower cost, the specific objectives for each agency may be different. Government agencies provide a broad array of services, and different agencies face different organizational needs and challenges. The former Comptroller General, David Walker, has identified, what he believes are top-level transformation objectives for federal agencies. According to Walker, government organizations should transform so that they can (Walker 2007):

- Become less hierarchical, process-oriented, stove-piped, and inwardly focused
- Become more partnership-based, results oriented, integrated, and externally focused
- Achieve a better balance between results, customer, and employee focus
- Work better with other governmental organizations, nongovernmental organizations, and the private sector, both domestically and internationally, to achieve results

- Focus on maximizing value, managing risk, and enhancing responsiveness within current and expected resource levels

Transformation of government agencies also requires the long-term, dedicated commitment of critical resources in the form of time and money. Although the goal of public agency transformation is to reduce costs and increase efficiency, transformation, however, also generally requires a substantial up-front investment.

Because the benefits of transformation are long-term and difficult to measure, and the risks and costs are short-term and obvious, high-level commitment is often inconsistent. The transformation of the Internal Revenue Service serves as a good example. Since the 1970s, the IRS has attempted several transformation initiatives with limited success. One of the largest attempts at reform, the Tax Systems Modernization project (1986-1996), failed in-part because the IRS did not have a long-term strategic vision. When taking into account that there were six Commissioners of Internal Revenue (two acting) during this period, the result is not surprising. A successful IRS transformation initiative began in 1997 that involved a major change in the agency's mission, organizational structure, managerial responsibility, and the basic jobs function of many employees. With consistent leadership, and a holistic approach to meet the organizational challenges, IRS has made significant progress. A detailed case study of the IRS business systems transformation can be found in Part Two of this report.

As organizational transformation impacts virtually every facet of an organization, it is important to develop an understanding of how to manage these changes. The transformation process can be long and complicated; and many factors can influence the trajectory of the transformation process including an ever-changing external environment, changes in organizational mission, and changes in technology. Most transformation initiatives will encounter obstacles, both internal (i.e. resistance to change), and external (such as changes in funding and legislation). The ability of an organization's leadership to be able to deal with these challenges will significantly impact the level of success or failure of the transformation initiative. For this reason, leadership commitment is one of the most important drivers of successful transformation. To be truly successful, transformation must become a part of the organizational ethos, embedded in the daily operation of the enterprise; it should become a process without a foreseeable end.

3. Challenges and General Observations

There is a clear need for both public and private organizations to transform their operations to adapt to the ever-evolving environment in which they exist. Organizational transformation in both the public and private sector can be very challenging. Although both private and public organizations face some similar challenges in their transformation initiatives, several factors make public agency transformation more daunting.

First, government agencies are led by political appointees, and, there is often a high degree of leadership turnover. Large-scale transformation initiatives in government agencies require the commitment of top level leadership in order to be successful. This can present a serious challenge with the relatively short average duration of a political appointment. As of 2009, the average tenure of Senate-confirmed appointees is only 3.3 years, and only 2.8 years for appointees who serve at executive departments (Breul 2009). The average tenure of politically appointed senior officials also tends to vary between government agencies. For example, the

turnover rate at DoD is much higher. From 1949 through 1999, the average tenure of Secretary of Defense and Deputy Secretary of Defense were 30 months and 23 months respectively; and among other senior DoD official, the most common tenure was between 11 and 20 months (Marcum 2001).

Another major problem with political appointees is the considerable lag time between a candidate's nomination and Senate confirmation. The Senate confirmation process of political appointees takes an average of 8.5 months, more than triple the time needed 30 years ago (Marcum 2001). Because of the increased scrutiny that Congress places on candidates, Presidential administrations conduct more extensive vetting processes. Due to the longer time required for Senate confirmations, and the higher turnover, the vacancy rates of political appointee positions have increased. For example, at DoD, political appointee positions are vacant approximately 20 percent of the time (Marcum 2001). This problem is highlighted by the current administrations difficulty in nominating qualified top-level political appointees that require Senate confirmation. As of June 2009, only 144 appointees (for the approximately 490 positions available) had been confirmed by the Senate (Staff 2009c).

Second, public agencies often have budgets that change from year to year as funding for programs must be authorized by Congress on an annual basis. Public sector transformation initiatives generally require several years to complete, requiring substantial and consistent funding throughout their duration to realize any benefits. Ensuring adequate resources needs to be a part of any transformation strategy. Inadequate funding can lead to ineffective implementation efforts, higher levels of interpersonal stress, and even neglect of core organizational activities and functions (Fernandez 2006). The IRS, for example, launched several business transformation initiatives dating back to the 1960s, which failed in part due to budget changes.

Third, many government agencies have entrenched cultures, and sub-cultures, that make them inherently resistant to change. The culture of an organization has been defined as the specific collection of values and norms that are shared by people and groups in an organization, that control the way they interact with each other, as well as external stakeholders. Organizational cultures can be difficult to characterize because they are comprised of many intangible factors based on the organizations history, tradition, or the ethos of an influential leader. All organizations have cultures, and large and fragmented organizations may also have many sub-cultures, which affect the way in which members of the same organization deal with each other. However the culture is described, it plays an important role in the day-to-day operations of an organization. Because of this, organizational culture needs to be considered in any transformation initiative, since culture can significantly change the roles of many stakeholders and upset the existing "way of doing business." This is one important reason why many stakeholders resist transformational initiatives. Frequent leadership turnover makes the task of changing an organization's culture even more difficult, if not impossible; political appointees that only stay only a year or two will not be able to substantially affect an organization's culture.

Fourth, federal agencies lack human capital agility. Transformation initiatives will generally require employees with a different skill set. Private sector firms make these changes on relatively short time scales, while the federal government has a long bureaucratic process to change staffing level or functions, and to hire or terminate an employee. While these processes are

intended to discourage politically motivated personnel decisions, it makes it harder for federal agencies address current or expected human capital needs.

Another human capital challenge for the federal government is its difficulty in providing compensation packages that can compete with the private sector, particularly for highly skilled IT personnel. In many cases, the maximum salary the federal government can offer is far less than what they can command in the private sector. (Congress has, however, provided some limited flexibility, by authorizing DoD to hire small numbers of highly qualified experts, at higher than the published civilian employee pay scales.)

C. DoD's Initial Attempt at Defense Business Transformation

The DoD manages twice the budget of the world's largest corporation, employs more people than the population of a third of the world's countries, provides medical care for as many patients as the largest health management organization, and carries five hundred times the number of inventory items as the world's largest commercial retail operation.

(Department of Defense 2006)

1. Background

As noted above, the Defense Department is one of the largest organizations in world. Its worldwide operations span a broad range of organizations, agencies, activities, and commands. Many of these organizations operate semi-autonomously, and independent of each other. Attempting to maximize the efficiency and effectiveness of warfighter support within their specific function, these organizations independently developed specialized systems designed to best support their mission area. And, as a result, the objectives, structure, and functions within the resultant information systems vary widely across Services and defense agencies. Moreover, some of the software used is still written in outdated computer languages, lacks data standards and is costly to maintain. Accordingly, these non-integrated, non-interoperable legacy systems frequently result in a duplication of effort, errors and inconsistencies, and, of course, a great deal of inefficiency.

In the 1990s, a new approach at administrative reform took hold, with a goal to “reinvent government.” Shortly after his election, President Clinton empowered Vice President Al Gore on March 3, 1993 to lead the National Performance Review (NPR), the best-known of these reinvention initiatives. In 1993, Vice-President Al Gore released his report “Creating Government that Works Better and Costs Less” calling for a need to simplify procurement, eliminate regulatory burden, and rely more on the commercial marketplace. Early efforts to implement change with the DoD became evident when the newly confirmed Secretary of Defense released a memo titled “A Mandate for Change” calling for a complete cultural change on how the DoD operates (Rogers, Birmingham 2004).

The priority of DoD business transformation carried into the second term of the Clinton Administration. In the foreword to the 1997 Quadrennial Report, Secretary of Defense William Cohen placed strong emphasis on the importance of DoD business transformation.

We also need to take advantage of business process improvements being pioneered in the private sector. Over the past decade, the American commercial sector has reorganized, restructured, and adopted revolutionary new business and management practices in order to ensure its competitive edge in the rapidly changing global marketplace. It has worked. Now the Department must adopt and adapt the lessons of the private sector if our armed forces are to maintain their competitive edge in the rapidly changing global security arena.

The 1997 QDR outlined a number of initiatives designed to take advantage of new technological developments and private sector business practices, and established a task force to “look for ways we can consolidate functions, eliminate duplication of effort, and improve

efficiency” (Cohen 1997). The task force created 54 Defense Reform Initiative Directives, and the DoD established the Defense Management Council to ensure that the directives were implemented (Office of the Secretary of Defense 2001; Buchheit 2004). Many of these recommendations, however, were related to paperwork reduction, rather than a comprehensive overhaul of DoD business systems. Although during the Clinton presidency some advances in business transformation (to take advantage of more efficient private sector business practices) were made, progress toward enterprise integration was slow (Buchheit 2004).

These efforts were complemented by Congress, which passed a series of initiatives to address the issues of financial management and the integration of modern IT in government agencies. The goal was to improve the management and accountability of appropriated funds for all federal agencies and organizations. These include the:

Chief Financial Officers Act of 1990 (CFOA)

- This act was the most comprehensive and far-reaching financial management improvement legislation passed by Congress in 40 years. With the principal goal to strengthen accountability and sound management, the act established a leadership structure, provided for long-range planning and requires audited financial statements. The act was designed to enhance the government’s ability to use timely, reliable, and comprehensive financial information to become better stewards of taxpayer money (Chief Financial Officers Council 2008). An underlying assumption built into the CFO act was that financial accounting—of the type used in the private sector—can add value to government activities. However, whether this is true is unclear (Hanks 2005)

Government Management Reform Act of 1994 (GMRA)

- This act built on the goals of the CFO act of 1990 in that it was designed to help ensure that government managers have the financial information and flexibility they need to make sound policy decisions and manage resources. A major component of this act was that it allowed the consolidation and streamlining of the many reports agencies are required to submit to Congress. This act also required government agencies to provide annual audited financial reports of all their activities, spending and revenues (Clinton 1994).

Federal Financial Management Improvement Act of 1996 (FFMIA)

- Congress enacted the FFMIA with the goal to improve federal accounting practices and increase the government’s ability to provide more reliable financial information. The FFMIA went well beyond the requirements of the CFOA and GMRA, and require the auditors of the 24 agencies included in the CFOA to implement and maintain financial management systems that comply with federal guidelines, applicable accounting standards, and the U.S. Government Standard General Ledger (GAO 1997).

Clinger-Cohen Act of 1996 (CCA)

- This Act, also known as the Information Technology Act, was intended to reform acquisition laws and information technology management of the Federal Government. CCA was passed in response to the large amount of federal funds that individual agencies were devoting to improve their IT systems with poor results. The act was designed to

address this problem by creating the position of Chief Information Officer with the responsibility of “developing, maintaining, and facilitating the implementation of a sound and integrated information technology architecture” (Lankhorst 2005). Most importantly, the CCA ensured that government agencies stopped investing in systems that worked poorly and did not improve performance.

The enactment of these laws established the positions of Chief Financial Officer and Chief Information Officer at the agency level. This enhanced the management of DoD’s IT and financial functions, as well as created new levels of accountability.

2. The Transformation Begins

When President Bush took office in 2001, he made it clear that improved government performance was a top priority. In the President’s Management Agenda (PMA), “Improved Financial Performance” was one of the five critical government-wide management initiatives identified. The PMA focus on a clean financial audit was the “basic prescription for any well managed organization”, and that it is necessary to support operating, budgetary, and policy decisions, reinforcing the requirement of the CFO Act of 1990 (Office of Management and Budget 2002). In addition, GAO was criticizing the DoD, and other government agencies, for not being in compliance with the CFO act and produce clean financial audits. Because of fundamentally flawed business systems and persistent weaknesses in internal controls and processes, not one of the military services was able to pass the test of an independent financial audit (GAO 2005a).

Based on a request from the Secretary of Defense, the Institute for Defense Analysis (IDA) conducted a study to recommend a strategy of improvement for the financial management systems within the DoD. Their report, *Transforming DoD Financial Management Systems: A Strategy for Change*, was issued in April 2001, and made the following assessment:

Current DoD financial, accounting and feeder/operational management systems do not provide information that could be characterized as relevant, reliable and timely. Nor is the “support of management decision-making,” generally an objective of financially-based information, currently developed or planned for future development. Front-end investment and much work need to be done to accomplish a necessary transformation. Many positive projects are currently underway in DoD; however, they are narrowly focused, do not have sufficient senior leadership and urgency behind them, and are not part of an integrated DoD-wide strategy.

Business Transformation Since 2001

It is not, in the end, about business practices, nor is the goal to improve figures on the bottom line. It's really about the security of the United States of America. And let there be no mistake, it is a matter of life and death. Our job is defending America, and if we cannot change the way we do business, then we cannot do our job well; and we must.

U.S. Secretary Of Defense
Donald H. Rumsfeld
September 10, 2001

In July 2001, Secretary of Defense Donald Rumsfeld issued a memorandum to the Department of Defense establishing the Financial Management Modernization Program (FMMP). He wrote, "One of my highest priorities is to have reliable, accurate and timely financial management information upon which to make the most effective business decisions. Because we do not always have that information, we must change the Department's business operations and systems (Dorobek 2001)." The FMMP was established under the sponsorship of the Under Secretary of Defense (Comptroller). Although the program addressed all business activities with emphasis on finance and accounting, its early focus was clearly on obtaining an auditable financial statement (Walker 2004).

Obtaining the first unqualified audit of DoD financial statements would take devoted and sustained leadership and a lot of money; and sustaining a clean audit would be even harder. Secretary Rumsfeld set initial goal to achieve an unqualified audit opinion on DoD FY 2007 financial statements (Candrea 2004). While it is important to have financial statements that show a clear picture of where taxpayer funds have been invested, having this as the primary goal of DoD reform detracted from the need for a comprehensive overhaul of the way DoD does business. Clean financial statements will help explain where money has already been spent, but will not help build a strategy to improve business practices and ensure that taxpayer funds are spent more efficiently in the future. Achieving an unqualified opinion on its finances will not necessarily mean that the Department's house is in order (Candrea 2004).

As a complicating factor, the DoD organizational structure naturally evolved to form "silos," such as the individual military services and DoD agencies that often functioned without interacting with each other (Walker 2004). There were also "functional silos," such as human resources and finance. DoD and military organizational structures evolved to form "silos" in part due to Title X of US-Code, which dictates a relatively independent role for the Services for manning, equipping, and training their military forces, and as a result created their own business systems to manage their specific needs (Buchheit 2004). In this environment, business systems were developed with significant differences in content and format (DoD reported having 2,274 different business systems in fiscal year 2004), and were generally non-integrated, non-interoperable, redundant, and cost ineffective. Moreover, it was difficult to compare business needs, systems, and technology capabilities with these parochial solutions.

In May 2003, the FMMP was renamed the *Business Management Modernization Program* (BMMP) and placed under the joint sponsorship of the Under Secretary of Defense (Comptroller) and the Assistant Secretary of Defense (Networks and Information Integration). This was done to reflect the more comprehensive nature of the transformation underway at DoD,

linking financial management reform to the broader concept of business process reform. In September 2003, the Secretary of Defense reconfirmed this commitment by designating DoD business transformation as one of his top ten priorities (Kutz 2003). The scope and potential impact of DoD's Business Management Modernization Program were significant (see figure 2).

Figure 2: Scope and Impacts of the BMMP Effort

Scope and Impacts of the BMMP Effort

- **5.5M employees, service members and beneficiaries**
 - Paychecks and W-2's
 - Personnel records and actions
 - Medical and Dental records, appointments, admissions and discharges
 - Training records, plans, and scheduling classes
 - Travel requests, tickets, vouchers
- **\$400B+ /Year**
 - 267 Appropriations
 - 124 Million accounting transactions
 - 11.2 Million invoices
- **\$700B+ in Assets**
- **Buildings at 6,700 locations in 146 Countries**
 - \$620B in Real Property Assets
 - 2.3M square feet of buildings
 - 3.2M acres
- **1,312 Major weapons systems**
 - 4.6 Million parts and supplies managed
- **150+ Federal Source Laws and Regulations (Ex. Title 5, 10, 32, 37)**
 - 4,200+ Specific requirements from source laws
- **2,274 Systems ... and Counting**
 - Different standards and interpretations of rules and requirements

Source: Adapted from Briefing at Defense Acquisition University
Dr. Paul Tibbits, Director, BMMP
May 12, 2004

In late 2004, the acting Under Secretary of Defense (AT&L) directed that responsibility for the BMMP effort be shared by the Deputy Under Secretary of Defense for Financial Management (Mr. Thomas Modley) and the Deputy Under Secretary of Defense for Business Transformation (Mr. Paul Brinkley in AT&L). This move initiated breaking down the organizational stovepipes, and the resultant logjam, between the two Office of the Secretary of Defense (OSD) organizations (AT&L and Comptroller) and allowed for greater alignment across OSD for this effort.

The program's original strategy was to decompose the business processes into seven domains and assign a domain owner. The work then progressed, developing the enterprise architecture vertically within the domains, which the program identified as a critical first step. Much of the effort of the program over the next several years was devoted to this goal.

An enterprise architecture is an attempt to develop a clear and comprehensive description of an organization (e.g., federal department or agency) or a functional or mission area that cuts across more than one organization (e.g., logistics, human resources, financial management). The various frameworks used to develop an enterprise architecture consistently: (1) describe the architectures for both the enterprise's "As Is" and "To Be" environments in logical (e.g., business, performance, application, information) as well as technical (e.g., hardware, software, data) terms, and (2) define a capital investment sequencing plan to transition from the "As Is" to the "To Be" environment (GAO 2003). Once this is completed, it is necessary to explore options and make decisions regarding which legacy systems to retain, modify, or retire, and which new

systems either introduce on a temporary basis or to pursue as strategic solutions (GAO 2005a). These snapshots further consist of views, which can be one or more of conceptual or logical representations of the enterprise (Dorobek 2001). Developing an enterprise architecture became a major objective of the transformation effort.

DoD first began development of a department-wide business enterprise architecture in July 2001, and originally set an ambitious target of completing it by May 1, 2003 (GAO 2003). DoD later realized that it would not be able to achieve this target and began to take an incremental approach, and designated the work in progress BEA version 1.0. However, key components of the “As Is”, “To Be”, and the transition plan of the initial BEA framework, lacked sufficient scope and detail to effectively guide and constrain department-wide business systems modernization (GAO 2003). As a result, continuing efforts to modernize current systems were at risk of being non-integrated, non-interoperable, redundant, and cost ineffective.

It was critical that DoD’s new investments in IT business systems be compatible with the developed architecture, and work toward the overall transformation goal. The National Defense Authorization Act of 2003 contained a provision to enforce this objective. It specified that all of DoD’s new IT investments over \$1M be reviewed and approved by the Undersecretary of Defense (Comptroller) (GAO 2005a). This requirement was reiterated in the 2004 DoD Appropriations Act–Sec. 8084 (DoD Appropriations Act 2004). The DoD Comptroller needed to determine whether or not the improvements are consistent with the criteria specified in the NDAA 2003 act.

Initially, there was a general agreement that the systems owners were responsible for initiating the \$1M review process. It later became evident that this approach did not work. In FY 2004, of the approximately 200 business systems modernization initiatives with obligations of funds that exceeded \$1M, 30 systems, with obligations of \$242.5M, were not reviewed by the DoD Comptroller. Since the passage of the 2003 NDAA in December 2002, the military services and defense components obligated about \$651M for business systems modernizations without the required review by the DoD Comptroller. These figures illustrate that not enough action was taking place to ensure that new business systems are interoperable. At this point DoD was still at risk of spending billions of taxpayer dollars on duplicative, stove-piped, non-integrated systems that do not optimize mission performance and accountability which are not in line with DoD business transformation goals (GAO 2005a).

Through 2005, the BMMP increased DoD-wide systems visibility by identifying the existing inventory and developing an understanding of over 4,000 business systems. The program had also claimed the following specific achievements:

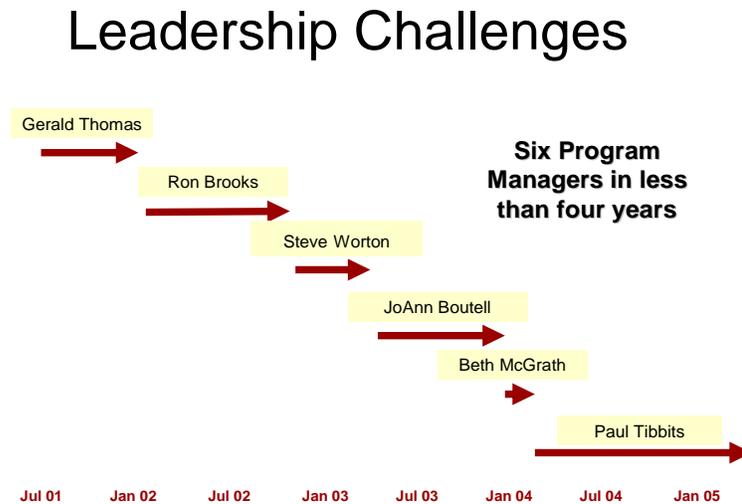
- Created data standards within DoD by building and publishing a Standard Financial Information Structure (SFIS) with uniform coding of financial data for use in all DoD information systems.
- Analyzed requirements from legislation, regulation, and policy, and identified those pertinent to financial compliance.
- Developed the Business Enterprise Architecture. This architecture will provide a blueprint for DoD’s future business processes, data, and technology; and should form the foundation for the transformation effort.

- Created an awareness of and improved control over IT spending by developing a systems assessment process for examining both new and legacy systems to see if they comply with the developed business enterprise architecture and are worthy of subsequent investment.
- Encouraged cross-organizational cooperation by building working relationships between and among functional domains and military services to ensure cross-process requirements are incorporated into systems development.

Despite these achievements, BMMP had faced significant challenges. These results came at a significant cost—approximately \$440,000,000—leading many to wonder if more progress could have been made. The initial single-minded focus on developing an enterprise architecture was certainly too comprehensive and too technical. The goal of attaining a clean audit—an early program priority, and still an objective—existed in parallel with the need to reengineer business processes and deliver better support to the warfighters. As a result, there was not enough buy-in from all stakeholders, and a lack of consensus on program priorities. This in turn significantly limited progress in the business transformation effort.

Another major challenge for the BMMP was a lack of continuity in program leadership. The program had six different managers in 4 years (see figure 3); this made the task of maintaining a consistent program vision and strategy difficult, if not impossible.

Figure 3: BMMP Leadership Challenges



As early as 2003, GAO identified creating the position of Chief Management Officer as a potential solution to the lack of sustained leadership (Sprengr 2007b). GAO believed that this would formally designate responsibility and accountability in a senior official, to lead the business transformation effort (Walker 2006).

3. Assessment of initial transformation effort

All too many consultants, when asked, “What is 2 and 2?” respond, “What do you have in mind?”

Norman Ralph Augustine

After almost 4 years of business transformation efforts with the DoD, it was clear that there were numerous issues impeding progress. The following four issues with the business transformation effort help explain the lack of progress.

First, there was the lack of appreciation for the breadth and depth of the DoD Business Mission, and the unwieldy scope of the required transformation. GAO characterized this transformation effort at DoD as a “challenging and ambitious task.” This transformation was (and is), in fact, as complex and costly as a major acquisition, and should have been treated accordingly. The DoD Comptroller’s staff did not have the experience or the talent to organize and lead an effort of this magnitude. The frequent changes in leadership further exacerbated this issue.

Second, not enough was done to ensure that new investments were designed to be in compliance with the Business Enterprise Architecture. There were clear guidelines outlined in the NDAA 2003, and DoD was not able to meet compliance. Over \$651 M was invested in new IT systems without the required oversight by the office of the DSD-Comptroller. This is related to the previous issue because had these investments in business transformation been viewed as major acquisition, more resources would have been dedicated to their oversight. More oversight would have helped ensure the interoperability of the new systems, and that they are in line with business transformation goals.

Third, the initial overall direction of the business transformation strategy maintained a focus on obtaining a “clean audit,” rather than an effort to transform the overall business management processes of the department. Even after 3 years of marginal success in business transformation, DoD maintained the primary goal of obtaining a clean audit in 2007 (Onley 2004a). This led to disengagement by other functional communities and stakeholders.

Fourth, the program focused almost exclusively on building an enterprise architecture, rather than delivering business capabilities. This is related to the first issue as they initially thought they would have an architecture done within a year, which was not the case as the BEA is still a work in progress. This task proved far more difficult than anticipated, and absorbed virtually all of the program’s resources. As work progressed, the number of DoD business systems identified during the period 2003-05 increased, as shown in figure 4. After 3 years of work, the GAO assessed that there was little significant change in the content of the architecture, or in controlling how the department was spending on existing and new systems (GAO 2004a). Moreover, DoD was continuing to spend billions of dollars (\$19B in FY 04) to operate, maintain, and modernize these systems (Onley 2004a).

Although reform of DoD business practices has been a priority for more than a decade, various initiatives had at best limited success. Any large-scale transformation, such as the one being attempted by DoD, would be complex and problematic. However, the slow progress of BMMP demonstrated the need for a new approach if the transformation was to be successful. A new approach was developed in 2004 with the passage of the Ronald Reagan Defense Authorization Act for FY 2005.

Figure 4: Increase in DoD Business Systems, 2003-05 (GAO 2005b)

Domain	April 2003	February 2005	Difference
Acquisition	143	179	36
Financial Management	752	600	(152)
Human Resources	665	713	48
Installations and Environment	128	473	345
Logistics	565	2005	1440
Enterprise Information Environment	21	40	19
No Domain*	0	140	140
Total	2274	4150	1876

Note: Based on an analysis of Business Management Modernization Program (BMMP) reported inventory of business systems as of April 2003 and February 2005

* A specific domain was not assigned to these systems

D. Current Transformation Effort

... overhauling DoD's financial management operations represents a major challenge that goes far beyond financial accounting to the very fiber of the Department's range of business operations and management culture.

David Walker, Comptroller General of the United States,
Testimony before the Committee on Government Reform,
U.S. House of Representatives, April 8, 2003.

1. Approach

National Defense Authorization Act for FY 2005: Catalyst for a new direction

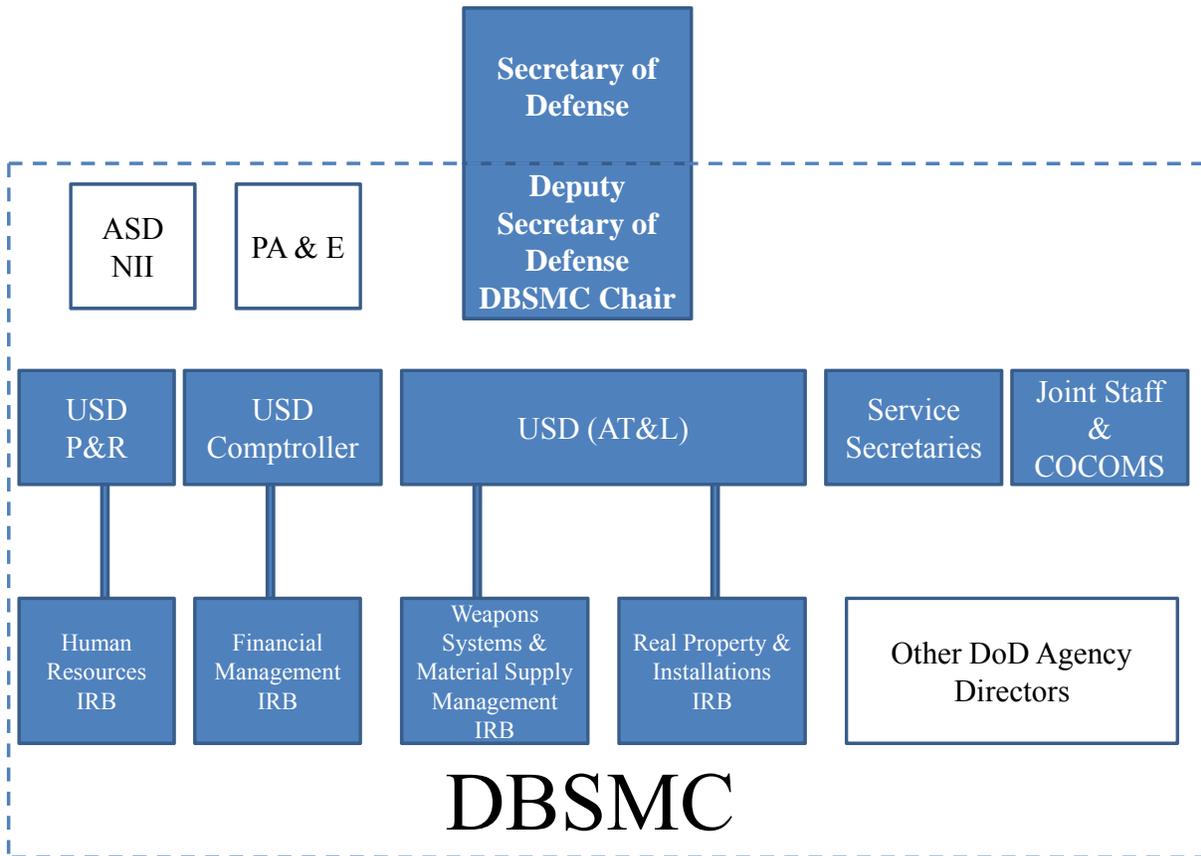
Congress and other DoD observers were becoming increasingly frustrated with DoD's lack of progress in its business modernization effort. Several specific provisions were included within the National Defense Authorization Act for FY 2005 that compelled the DoD to sharpen its focus on the development and modernization of its business systems.

As discussed in section IV, the process to ensure that new IT investments comply with the BEA was inadequate, as hundreds of millions of dollars of investments for new business systems were not reviewed by the DoD comptroller. The FY 2005 NDAA included a key provision, designed to rein in the uncoordinated and escalating cost of business systems, which requires certification approval of any business system modernization in excess of \$1 million over the system's development and modernization lifecycle. The authority to certify business systems investments was shifted from the USD-Comptroller to two newly established entities, the *Defense Business Systems Management Committee* (DBSMC) and the *Investment Review Boards* (IRB).

Defense Business Systems Management Committee

The FY 2005 NDAA mandated that the Secretary of Defense establish the DBSMC to become the principal agent responsible for DoD Business Transformation, overseeing transformation in the Business Mission Areas (BMA) and helping to ensure the warfighter's needs and priorities are met. Congress also required DoD to complete its Business Enterprise Architecture (BEA) and develop a transition plan for implementation by September 30, 2005. This external pressure significantly altered the trajectory of the Defense Business Modernization effort. Based on this guidance, on February 7, 2005, the Deputy Secretary of Defense formally established the DBSMC within the DoD (see figure 5). It also identified its mission to provide renewed executive leadership, in both direction and execution, to the DoD's business transformation efforts.

Figure 5: Initial DoD Business Systems Transformation Governance Structure



DoD chartered the DBSMC in order to comply with the requirements in the NDAA FY 2005 (DoD 2006a). As a consequence, the DBSMC now had the responsibility to set the overall business transformation priorities and “recommend policies and procedures required to integrate DoD business transformation and to review and approve the defense business enterprise architecture, the enterprise transition plan, and cross-Department, end-to-end interoperability of business systems and processes” (Wolfowitz 2005). Chaired by the Deputy Secretary of Defense, the DBSMC is the senior-most governing body overseeing Business Mission Area transformation. In order to accomplish its objectives, the DBSMC provides the final review and approval of the business enterprise architecture and the business systems investment decisions, and monitors the progress of the transformation. Recognizing the importance of the role of acquisition in this effort, the Under Secretary (AT&L) was designated the Vice Chair of the DBSMC, and the functions of the BMMP office were moved into the new organization.

Investment Review Boards

In addition to the DBSMC, a series of Investment Review Boards were established to assist in the review of all business system modernization investments over \$1M. It is important to note that IRBs only review new investments, not funds that go to maintain old or legacy business systems. These IRBs assess investments relative to their impact on the end-to-end transformation

within their designated areas of responsibility. They then make investment recommendations to the appropriate investment Certification Authority, and these are eventually approved or disapproved by the DBSMC. The previous system to review new investments was deemed inadequate, since many IT investments were made without the review and approval of the Under Secretary of Defense (Comptroller). The new structure of review that the IRBs provide spread the responsibility of reviewing new investments, and creates accountability in the domains of the core business missions. There are four IRBs, each of which is designated the responsibility to review new business system investments in the five core business missions (One IRB is responsible for reviewing investments in both Weapons Systems Lifecycle Management and Materiel Supply & Service Management).

DoD Strategic Objectives

In 2005, DoD adjusted its approach to business transformation to focus on the accomplishment of four strategic objectives. The following objectives are focused on enhancing DoD's ability to complete its mission, and to do so in a more efficiently.

- **Support the Joint Warfighting Capability of the DoD**
DoD places a high priority on improving business operations to provide better support to all of its stakeholders. In order to improve warfighter support, DoD must be able to support their full range of joint requirements. This is driving the need for commonality and integration of business and financial operations. The business infrastructure of the future must be able to provide mission-driven, adaptive, and agile business services and information. This calls for instant access to cross-Service personnel and installation data, consolidated healthcare information, and real-time resource and financial management information.
- **Enable Rapid Access to Information for Strategic Decisions**
Improved business operations will help produce the information that DoD leaders need to make sound and timely decisions. Relevant information needed by DoD leader to make such decisions include improved knowledge of supply chain operations as well as centrally available, secure and integrated data about military and civilian personnel and their location, assignments, compensation, and duty status. In order to be able to provide this type of information DoD has established six strategic Business Enterprise Priorities, each making critical information more visible and accessible.
- **Reduce the Cost of Defense Business Operations**
The DoD business transformation effort seeks to eliminate waste and improve the efficiency of DoD operations. DoD is a very large and complex organization that has several programs that on the GAO high-risk series that are vulnerable to waste, fraud abuse. There are many opportunities throughout the Department and the Components to identify areas where business process can be made more efficient and less costly. DoD has recognized the need to streamline business operations in order to effectively deliver warfighting capabilities and deal with growing pressures on Department resources. The myriad of costly and outdated stove-piped systems, procedures, and programs are being replaced with more efficient processes that reduced costs while delivering better warfighter support. The strategy that DoD has adopted includes better management of business system investments and taking advantage of best commercial practices through minimizing customization.

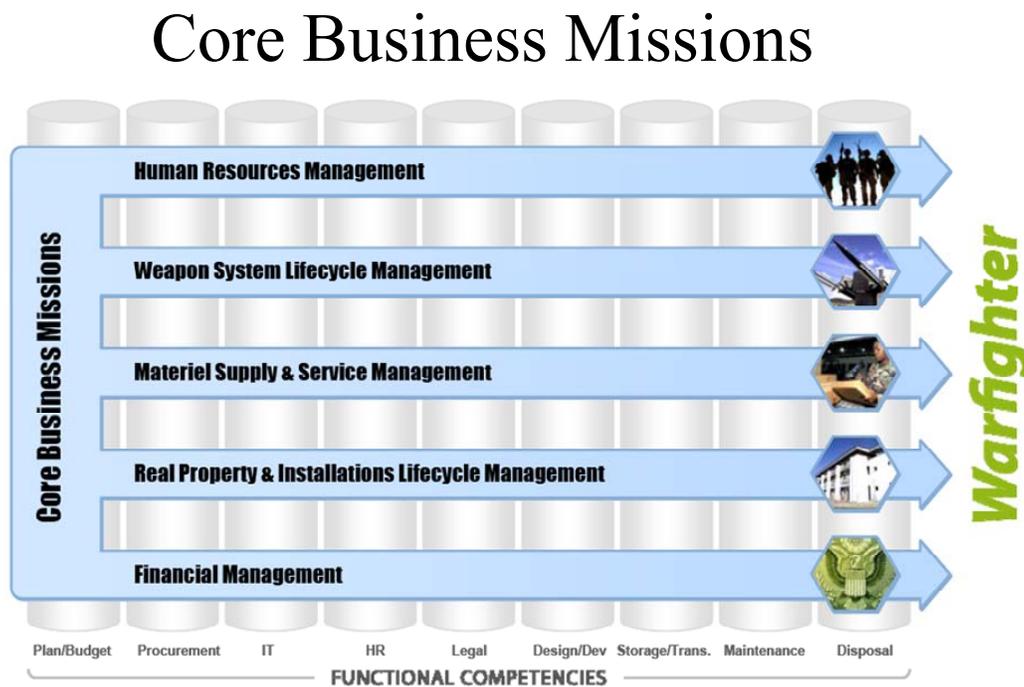
- **Improve Financial Stewardship for the American People**

As a taxpayer supported entity, DoD recognized its responsibility to the American people to carefully manage its resources. Effective financial management relies on information that is accurate, reliable and timely. Currently DoD is not fully capable of providing that quality of information, which is one of the reasons why it has not been able to achieve an unqualified audit opinion. Reliable financial statements can help manage operational performance, and demonstrate accountability to the American people and compliance to federal accountability laws and regulations. Seeking to achieve an unqualified audit opinion, DoD has developed a comprehensive Financial Improvement and Audit Readiness (FIAR) Plan. This plan serves as DoD’s roadmap for improving overall financial management through improving internal controls and finding solutions to material weaknesses. Efforts to improve financial stewardship will focus on either improving the accuracy, timeliness, and availability of financial information or helping the Department achieve an unqualified financial audit.

Realignment of the Core Business Missions (CBM)

The new approach also recognized the need for horizontal integration across the functional competencies to ensure that business systems and operations work in coordination with one another. Business systems capabilities would now be prioritized based upon their alignment across five Core Business Missions (CBMs). This new framework correctly aligned business transformation with a focus on end-to-end business processes designed to support the warfighter. Figure 6 demonstrates the horizontal, end-to-end focus of business systems transformation (DoD 2008b).

Figure 6: DoD Core Business Missions



As DoD continues to improve its business capabilities, the Investment Review Boards (IRBs) and the corresponding USDs provide guidance and oversight over investments in the Core Business Missions. While split into five core areas, these five business missions must also be integrated in order to achieve an enterprise-wide business process.

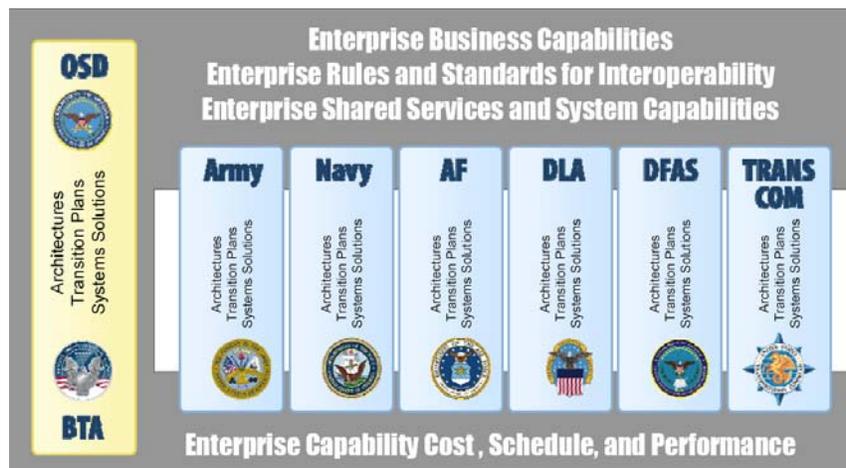
Business Transformation Agency

The Deputy Secretary of Defense and the DBSMC also recognized the need to institutionalize the transformation process. To achieve this, DoD established the Business Transformation Agency (BTA) as part of the new governance structure for the overall business transformation strategy. The BTA would provide a single point of accountability for coordinating, consolidating, and integrating business transformation efforts at the enterprise level. The overarching mission of the BTA is to achieve improved warfighter support while enabling financial accountability across the DoD. The BTA will be discussed in greater detail below.

Tiered Accountability

The DBSMC also recognized the need to focus their energy on enterprise-wide imperatives. They introduced the concept they identified as “tiered accountability”: relying on accountability at multiple tiers of the DoD organization. This concept is based on an approach to business transformation that is based on dividing the planning and management of systems and initiatives between Enterprise and Component-levels. At the Enterprise level, DoD provides program management discipline that delivers a layer of corporate services across the Department, while Component-level business transformation then becomes the responsibility of the Component Headquarters (see figure 7) (DoD 2008b).

Figure 7: Tiered Accountability



2. Business Transformation Agency: Objective, Goals and Structure

DoD formally established the Business Transformation Agency (BTA) on October 7, 2005, though its organizational structure was not approved until February 3, 2006. With the mission to

guide transformation of business operations in order to achieve improved warfighter support while enabling financial accountability across the Department of Defense, the BTA provides day-to-day management of the business transformation effort at the DoD Enterprise level and supports the DBSMC and other transformation governance bodies. The BTA was created by shifting existing resources into a single unified, focused organization aiming to ensure consistency, consolidation and coordination of DoD enterprise-level business systems; reduce redundancies in business systems and overhead costs; encourage further collaboration across DoD; and achieve centralized visibility to investment in DoD-wide business modernization efforts (BTA 2009c).

Based on the guidance from the DBSMC, the BTA focused primarily on those requirements that have broad impact across the DoD enterprise. They also worked with OSD functional leaders to gather prioritized business requirements that can be depicted in the BEA and ultimately get implemented in business systems across the Department. Additionally, the BTA facilitated the standardized investment review process on behalf of the IRBs.

Further, the BTA was assigned the responsibility for the acquisition, development and deployment of 27 information systems (BTA is currently responsible for 33 information systems), each of which is focused on delivering an enterprise-wide capability. Previously these programs were managed by the various components of OSD, and there was no single point of accountability. To provide oversight for these programs, the BTA established an office of Defense Business Systems Acquisition Executive (DBSAE). The DBSAE is responsible for driving the successful implementation of assigned initiatives and programs that deliver DoD enterprise systems and capabilities. In addition, the DBSAE is charged with “supporting the warfighter, supporting program managers and program executive offices; advocating for BTA and designated programs; and serving as the milestone decision authority for specific programs, as directed by DBSMC” (Pair 2007b). Finally, the DBSAE serves as the DoD Component Acquisition Executive for enterprise-level programs and initiatives (Pair 2007a). The remainder of the BTA is organized as depicted in figure 8.

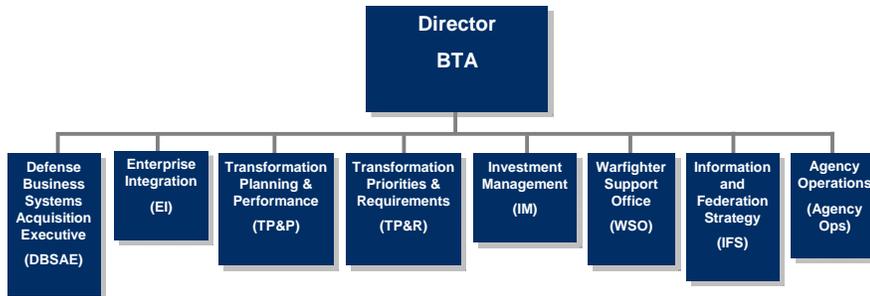
Business Enterprise Priorities

Once established, the BTA identified six Business Enterprise Priorities (BEPs) that represent the areas of business operations that increased focus will bring most dramatic, immediate and positive impacts (DoD 2005). These identified priorities were:

- Personnel Visibility (PV), defined as having reliable information that provides visibility of all military service members, civilian employees, military retirees, contractors (in theater), and other U.S. personnel. The goal of PV is to provide accurate, timely and readily available personnel information (including data on military, civilians, contractors, and coalition resources supporting the operation) to ensure accurate and timely compensation and benefits.
- Acquisition Visibility (AV), defined as achieving timely access to accurate, authoritative, and reliable information supporting acquisition oversight, accountability and decision making throughout the Department for effective and efficient delivery of warfighter capabilities. The goal of AV is to bring transparency to critical information supporting full lifecycle management of the Department’s processes that deliver weapon systems and automated information systems.

Figure 8: Business Transformation Agency Organizational Structure

BTA Organizational Structure



- Common Supplier Engagement (CSE), defined as the alignment and integration of the policies, processes, data, technology, and people to provide a consistent experience for suppliers and DoD stakeholders to ensure reliable and accurate delivery of acceptable goods and services to support the warfighter. The goal of CSE is to simplify and standardize the methods that DoD uses to interact with commercial and governmental suppliers in the acquisition of goods and services.
- Materiel Visibility (MV), defined as the ability to locate and account for materiel assets and their condition throughout their lifecycles and provide transactions and management visibility across logistics systems in support of the joint warfighting mission. The goal of MV is to provide users with timely and accurate information on the identity, location, movement, status, and condition of unit equipment, materiel and supplies, greatly improving overall supply chain performance.
- Real Property Accountability, defined as providing the warfighter and Core Business Mission (CBM) access to near real-time secure, accurate, and reliable information on real property assets and environment, safety and occupational health data. The Real Property and Installations Lifecycle Management (RPILM) Core Business Mission (CBM) provides the installation assets and services necessary to support our military forces in a cost effective, safe, sustainable and environmentally sound manner.
- Financial Visibility, defined as providing immediate access to accurate and reliable financial information (planning, programming, budgeting, accounting, and cost

information) to improve financial accountability and efficient and effective decision making throughout DoD in support of the mission of the warfighter. The goal of FV is to effect changes in financial management aimed at reducing investment and operating costs by facilitating ever-improving accountability, efficiency and decision making.

The annual series of ETPs define the specific goals, objectives, and strategy to improve business operations capabilities for each business enterprise priority.

Enterprise Transition Plan & Business Enterprise Architecture

The Enterprise Transition Plan (ETP) was one of the key requirements of the NDAA 2005, and it put real pressure on the DoD and BMMP to advance the development of the Business Enterprise Architecture (BEA). The NDAA required DoD to develop a BEA meeting a number of specific requirements by September 30, 2005 (GAO 2006). Complying with the demands set by the NDAA 2005, DoD released BEA 3.0, which was designed to meet the specified requirements, and address major flaws that were identified in earlier versions. DoD also released the first ETP in September 2005, which described a systematic approach for the transformation of business operation within the DoD.

At this point, DoD shifted its efforts from trying to create a single, centralized architecture spanning the full range of functions and activities of the Department to a federated approach that relies more on open standards and a service oriented architecture to facilitate information sharing. With this approach, the transformation effort would seek to provide tangible outcomes for a limited set of priorities (Hardy 2008).

Now that the DoD established specific BEPs, and the adopted a federated approach to business transformation, the BTA began to further develop the Business Enterprise Architecture (BEA). With the simultaneous release of the BEA 3.0 and the initial ETP in September 2005, the BTA made the commitment to update and release new versions every six months until an adequate operational ability is achieved and then they would be updated on an annual basis. This commitment to periodic updates would not only demonstrate progress, but also provide an improved operational capability every six months. Developed to be an integrated roadmap aligned with the BEA to achieve DoD's business transformation objectives, the ETP contained time-phased milestones, performance metrics, and a statement of resource needs for new and existing systems that are part of the BEA (for the Component architectures as well). By the March 15, 2006 report to Congress, DoD achieved 67 of 89 (75%) of the enterprise-wide milestones established in the 2005 ETP (DoD 2006a). The ETP also included a schedule to phase out legacy systems.

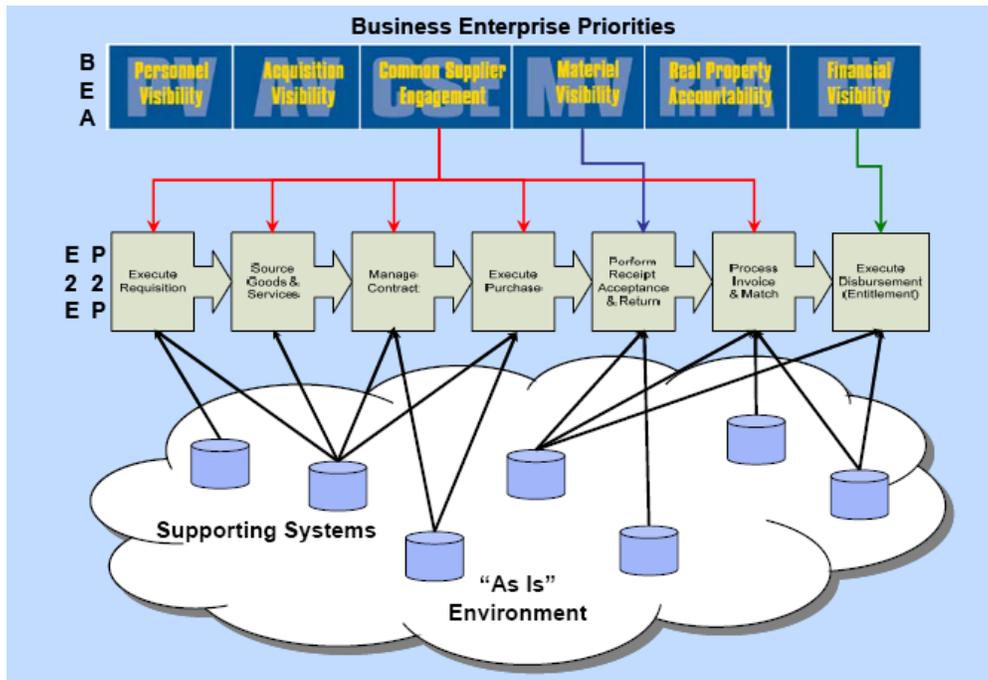
DoD has fulfilled its commitment to release updates every six months until the March, 2007 release of BEA 4.1. At this point, the DoD decided that the BEA had reached an adequate operational capability, and updates would only be released on an annual basis. In March 2009, BTA released the most recent version of the business enterprise architecture (BEA 6.0) along with its March 2009 Congressional Report on Defense Business Operations. As the BEA continues to mature, the BTA and other business transformation governing bodies will continue to identify functional gaps in the BEA and set business transformation priorities accordingly.

End-to-End Business Processes

Developing end-to-end business processes is a central part of enterprise resource planning. DoD has identified 15 end-to-end business processes that it is planning to incorporate into the Business Enterprise Architecture. Six of these processes have already been incorporated into the BEA including: procure to pay, acquire to retire, budget to report, hire to retire, order to cash, and plan to stock. Procure to pay is one of the more important end-to-end processes the Department is developing and it encompasses all business functions necessary to obtain goods and services. In the case of procure to pay, as depicted in figure 9, begins with requisition and ends with disbursements and addresses three of DoD’s business enterprise priorities (DoD 2008b). The current business process for procure to pay is very complicated, spans several functional organizations, and often breaks down as execution goes from one functional stovepipe to the next. Attempts to streamline this process have only had limited success in part because of the lack of Enterprise standards and entrenched business rules and system integration requirements perpetuated by functionally aligned business owners. The BTA is leading the Departments effort to undertake a comprehensive review of this business process to identify potential policy, system, data and governance changes needed to improve performance.

As the agency responsible for leading business transformation at the DoD, the BTA is closely involved in with series of governance models to implement, manage, and measure end-to-end business improvements: the IRB/DBSMC review process, the Business Capability Lifecycle, and the Five-step Transformation Approach.

Figure 9: Procure to Pay End-to-End Process



3. Management of the Transformation Process

Investment Review Process

The relatively low threshold for the requirement to certify investment over \$1 M set by the NDAA 2005 created a significant workload, and could have easily overwhelmed the IRBs. In line with the concept of tiered accountability, the DBSMC and BTA developed a four tier review process to certify new investments reflecting the scope, complexity, cost and risk of a new investment (DoD 2006b). Tiers I-III investments are over \$1M, while tier IV investments under the \$1M threshold (see figure 10) (BTA 2009a). While there is essentially no difference in core documentation required for IRB certification between investments in Tiers 1-3, the degree of scrutiny applied by the IRB's will vary in proportion to the size of the investment. With tier IV investments, the Component project manager is responsibility to ensure that new business system investments comply with BEA standards. Investment Tiers for Defense Systems have been designated as follows:

Figure 10: IRB Investment Tiers

Tier 1	Includes all Major Automated Information System (MAIS) defense business system programs
Tier 2	Includes all non-Major Automated Information System (MAIS) defense business system program investments \$10 million or above
Tier 3	Includes all non-Major Automated Information System (MAIS) defense business system program investments \$1 million and less than \$10 million
Tier 4	Includes all non-Major Automated Information System (MAIS) defense business system program investments less than or equal to \$1 million
Interest Program	Includes any defense business system programs, regardless of Tier or point in lifecycle, that has been designated an IRB "Interest Program"

Responsibility to ensure that a business system investment is in compliance with the BEA (among other criteria) begins with the Component Project Manager (PM). The PM is the first line of accountability for new investments, and they must understand that their systems are subject to review and certification by Component PCAs (Pre-Certification Authority), an IRB, and the DBSMC.

Each Component is responsible for designating a PCA who is assigned accountability for the Component's business system investments. The Component PCAs have a number of responsibilities, most notable the responsibility to establish the Component's own investment review process to support Component transformation initiative. The CPCAs are also responsible for identifying, reviewing, and certifying investments over \$1 million that require IRB approval. Before the investment proposal is sent to the BTA and the appropriate IRBs, the CPCA must either certify the project is in compliance with the BEA (and other criteria) or reject the new investment.

The investment proposal will go through a review process within the appropriate IRB, which will recommend to the IRB chair certification, or non-certification based on investment criteria. If the IRB certifies an investment project, it is then sent to the DBSMC for final approval. This tiered process with multiple levels of accountability enables the IRBs to focus their attention on the most significant issues (Fisher 2006).

In some cases a proposed business system investment may cut across more than one of the core business missions, and therefore would be subject to more than one of the IRBs. One way that the four IRBs have addressed this issue is by having joint meetings every quarter. Since DoD established this new certification process, the IRBs and the DBSMC have approved funding for 314 individual systems, representing approximately \$7.9B in modernization investment funding (DoD 2008d).

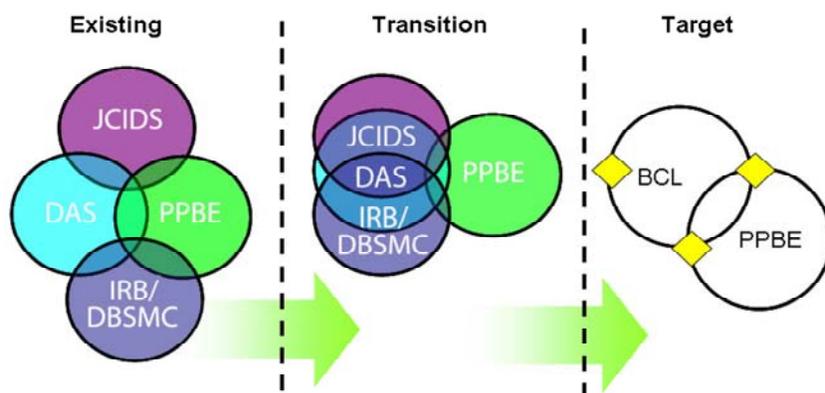
Business Capability Lifecycle (BCL)

As part of the strategy to deliver enterprise wide, end-to-end capabilities, DoD adopted a new investment review process in tandem with the IRB/DBSMC governance structure. DoD recognized that major acquisitions programs had serious acquisition and implementation issues: some programs lacked well defined requirements; non materiel solutions were often overlooked, existing governance procedures were bureaucratic, and decision makers often did not have information they need to make informed decisions. These problems hindered the business transformation process, and delayed capability improvements to the warfighter.

In order to address this problem, in February 2007, the USD (AT&L) directed the DoD to develop a new approach for acquiring business capabilities based on results and accountability. As a result, DoD decided to adopt the Business Capabilities Lifecycle (BCL), a new integrated framework for acquiring business capabilities. This new framework was established by merging three major DoD processes to provide a single governance and decisions support framework: the CJCSI 3170.01G, Joint Capabilities Integration and Development System (JCIDS), DoDI 5000.02 Operation of the Defense Acquisition System (DAS) and the Investment Review Board (IRB)/Defense Business System Management Committee (DBSMC) governance bodies (established by sections 2222 and 186, respectively, of title 10, U.S.C) for defense business capabilities and systems (see figure 11) (DoD 2008b; Staff 2009a).

Figure 11: Single Governance and Decisions Support Framework

BCL: Streamlined Governance



- *Joint Capabilities Integration Development System (JCIDS)
- Defense Acquisition System (DAS)
- Planning, Programming, Budget and Execution (PPBE)
- Investment Review Board (IRB)
- Defense Business Systems Management Committee (DBSMC)

This essentially consolidates existing requirements, acquisitions and enterprise architecture compliance into a single governance framework, BCL (DoD 2008b). Under BCL, the DBSMC and the IRB's now serve as the single governance body for business capability and investments from the initial concept creation through ultimate deployment, serving the dual roles of investment review and acquisition oversight (DoD 2008b).

The Business Capability Lifecycle consists of three distinct phases:

Business Capability Definition Phase: Identify the problem, its root causes and the desired outcome, as well as determine the solution scope, objectives and metrics, which will be delivered to the appropriate IRB in the form of a Problem Statement.

Investment Management Phase: Conduct an analysis of alternatives, recommend a solution and develop a detailed plan to justify and acquire the chosen solution. This phase also focuses on meeting statutory and regular requirements to include development of the acquisition, testing and contracting strategies, to be contained within a single Business Case.

Execution Phase: Develop, build, test and deploy the capability. Lessons learned, Business Case revalidation and tracking the metrics developed in the initial phase ensure the problem and the selected solution are still valid (DoD 2008b).

The Business Capabilities Lifecycles is guided by five major tenets that contribute to the goal of improving business capabilities and ensuring sound MAIS investments at DoD and in the Services. The five tenets are:

- Enable delivery of operational capability within 18 months.
- Focus the program manager on program execution.
- Enable timely, fact-based decision making.
- Allow acquisition decision making at the lowest level possible.
- Allow for flexibility in program implementation strategies.

BCL seeks to streamline and integrate documentation, governance and acquisition requirements that facilitate more informed business and investment decisions that result in faster delivery of business capabilities from MAIS investment (Staff 2009a).

Enterprise Risk Assessment Methodology (ERAM)

To further mitigate the risks of MAIS implementations, the DSD directed the Department to implement the Enterprise Risk Assessment Methodology (ERAM), a proactive and independent risk assessment process that is used to reduce systemic risk and support informed decision making, for its largest business MAIS and other Major Defense Acquisition Programs (MDAP). The ERAM approach focuses on delivering business capabilities rapidly, at a reduced cost, by using cross-functional teams to interview key program employees to discover unnecessary program risks and issue risk mitigation recommendations (Buxbaum 2007a).

ERAM evaluations are a critical part of the BCL. The findings and mitigation plans from ERAM evaluations are provided to the Milestone Decision Authority and the appropriate functional IRB. As of June 2009, the BTA has conducted ten ERAM evaluations on ten programs across the military services and DoD agencies, with a common finding that many programs risks are external and beyond the control of the Program Manager (Staff 2009b). This finding supports the claim that senior leadership needs to be highly involved in the business

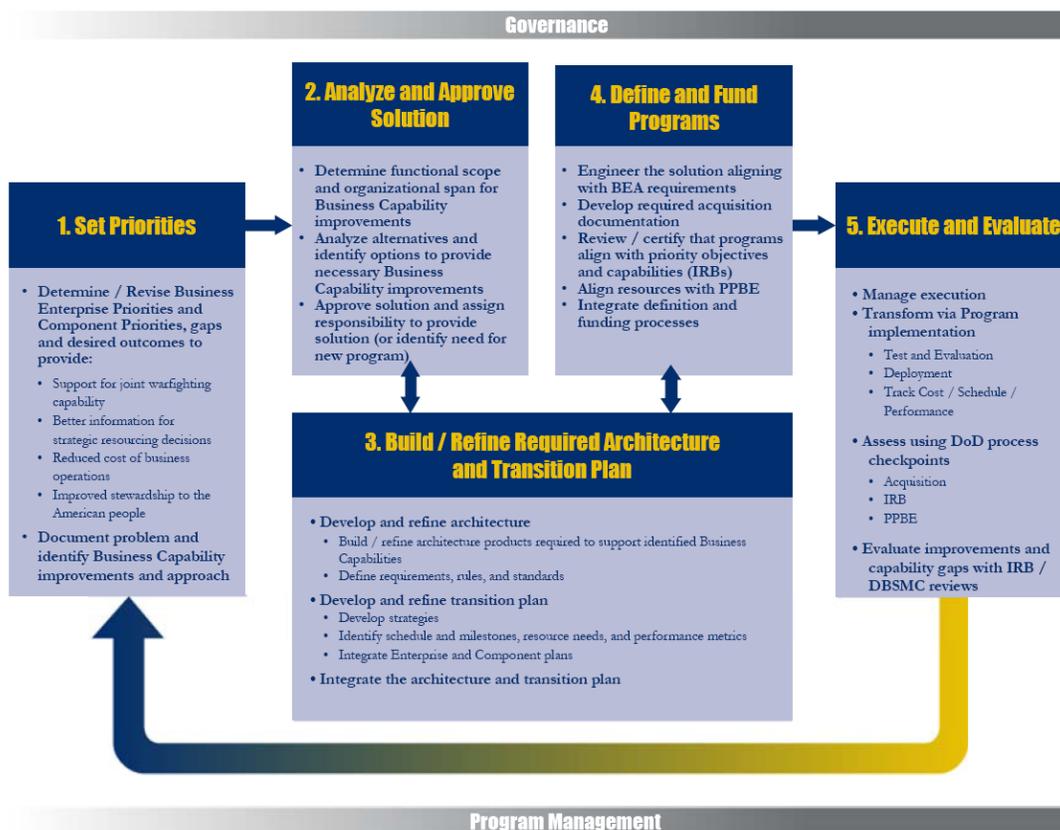
transformation process, as they are in a better position to address external challenges. BCL and ERAM continue to play a critical role in the business systems modernization effort.

Five-step Transformation Process

In July 2007, BTA released version 1.1 of the Business Transformation Guidance (BTG), which is meant to provide general guidance for functional and technical business transformation planners, architects, and managers at all levels of DoD. The BTG achieves this by clarifying roles of participants; establishing common processes to govern, manage, plan and execute business transformation at all levels; describing the required architecture and planning information; and outlining the Defense Business Transformation Approach (DoD 2007b).

The Five-step Transformation Approach, as described in the July 6, 2007 release of the Business Transformation Guidance, describes a systematic management process for delivering improvements in business systems that applies to virtually all transformation activities at the enterprise, component and program level. DoD employees involved in the transformation effort use this approach to articulate desired outcomes, set business capability priorities, identify capability gaps, determine the business capability improvements required, and implement solutions. The Business Transformation Approach is described in more detail in figure 12 (DoD 2007b).

Figure 12: BTA Approach to Business Transformation



4. Evolving Governance Structure of the Business Transformation Effort

Establishing the CMO and DCMO Positions

As noted in the previous section the lack of continuity of leadership was a key challenge facing the BMMP in its efforts to improve the performance to transform the business systems of DoD. Through its four-year existence, the BMMP had six different managers, which made the task of maintaining a consistent program vision and strategy difficult. The lack in continuity of leadership was just one of the several failures of business systems modernization efforts throughout the 2001-2004 period that led to the major changes in transformation strategy prescribed in the NDAA FY 2005.

In 2007, GAO praised DoD for making important progress in several areas of business transformation efforts, specifically the creation of the DBSMC, IRBs, and the BTA (with its BEA and ETP). However, it remained critical of the new strategy because, as GAO argued, it was too focused on business system investments rather than forming overall business transformation strategy (GAO 2007b). In addition, GAO claimed that although some important improvements have been made since the NDAA 2005, DoD still lacks a full-time leadership position dedicated solely to the planning, integration, and execution of business transformation efforts, specifically a Chief Management Officer (CMO) for DoD (GAO 2007b). The new structures created in 2005 such as the BTA and the DBSMC partially addressed this problem. However, members of the DBSMC are political appointees with terms that expire when the presidential administration changes. GAO has proposed for years a new position that would institutionalize a management framework that encompasses all aspects of business transformation, including establishing overall responsibility for defining what is included in business transformation (GAO 2007b). A key criterion of this new position recommended by GAO is that it should be a fixed term appointment, so that as political winds change, DoD business transformation efforts continue uninterrupted. GAO believed that the DoD CMO position should have significant authority, experience, and tenure to provide sustained leadership and integrate DoD's overall business transformation effort (GAO 2007c).

National Defense Authorization Act of FY 2006

As DoD resisted this recommendation, Congresses included a provision in the 2006 National Defense Authorization Act that directed DoD to commission "one or two" studies on the feasibility and advisability of establishing a Deputy Secretary of Defense for Management (NDAA 2006). Two studies were conducted by the Institute for Defense Analyses and the Defense Business Board that both came to the conclusion that a CMO, in some form, was needed to focus on integration and enterprise-wide business transformation (GAO 2007b).

Over time, pressure from GAO, Congress and other DoD observers to establish a CMO position at the DSD level grew to a point where DoD had to address the issue. After the Institute for Defense Analyses and the Defense Business Board released their studies, DoD responded with a letter to congress in May 2007 arguing that the role of CMO should be assigned to the DSD, and would be formalized in an internal DoD directive. It remained in opposition to codifying the position in legislation on the grounds that it would restrict the flexibility of future Presidents and Defense Secretaries to build an integrated management team, and would create "another layer of bureaucracy to an already convoluted decision making process" (GAO 2007b).

DoD eventually relented under the looming possibility that Congress would pass legislation requiring DoD to establish the CMO position, and on September 18, 2007 named Deputy Secretary of Defense Gordon England the first DoD CMO (Brinkley 2007; Sprenger 2007b). Although this action did create the new position of CMO, it essentially codified and augmented the prevailing responsibilities of the DSD, much in the way suggested in DoD’s May 2007 letter to congress. Figure 13 lists some of the primary responsibilities of the DoD CMO (NDAA 2006). This did not satisfy GAO, as it argued that the DSD had too many other responsibilities to focus the giant task of DoD business transformation; it continued to advocate for a new fixed-term position with the management of business transformation efforts as their primary function.

Figure 13: Responsibilities of the CMO

Responsibilities of the CMO
Ensure Department-wide capability to carry out the strategic plan of the DoD in support of national security objectives
Ensure the core business missions of the Department are optimally aligned to support the Department’s warfighting mission
Establish performance goals and measures for improving and evaluating overall economy, efficiency and effectiveness and monitor and measure the progress of the Department
Develop and maintain a Department-wide strategic plan for business reform.

National Defense Authorization Act of FY 2008

Congress did, however, eventually require DoD to establish the position of Deputy CMO in Section 904 of the NDAA 2008. The DoD Final Implementation Report for the NDAA 2008 indicates that the Director of the BTA will now report to the newly created Deputy Chief Management Officer (DCMO). The DCMO will report to the Deputy Secretary of Defense in his role as the Chief Management Officer (and no longer to the USD AT&L). Although DoD established the office of the DCMO in October 2008, as of June 2009, the office is still headed by Assistant DCMO Elizabeth McGrath. The effect this position will have is dependent on many other factors and it remains unclear whether this will help or hinder the business transformation process.

In addition to requiring the DoD to establish the DCMO position, the NDAA 2008 also required the Secretary of each military department to “assign the duties and authorities relating to the management of business operations” to the Under Secretary of each military department (NDAA 2008). Essentially, the Under Secretaries of the Military departments were given the responsibility of Service-level CMOs and are required to report to the CMO and DCMO of DoD regarding the business operations of their respective military departments.

Strategic Management Plan

The NDAA 2008 also required the Secretary of Defense, acting through the DoD CMO, to develop a strategic management plan (SMP) that contains detailed descriptions of:

- Performance goals and measures for improving and evaluating the overall efficiency and effectiveness of the business operations of DoD and achieving an integrated management system for business support areas within the Department of Defense;

- Key initiatives to be undertaken by the Department of Defense to achieve the established performance goals.
- Procedures to monitor the progress of the Department of Defense in meeting the established performance goals and measures.
- Procedures to review and approve plans and budgets for changes in business operations.
- Procedures to oversee the development, review, and approval of all budget requests for defense business systems. (GAO 2009a; NDAA 2008)

DoD released its first SMP on July 25, 2008, and characterized it as a first step towards providing the Congress with a comprehensive plan as required by the NDAA 2008. This initial SMP describes how recent institutional and governance reforms have improved the efficiency of defense business operations, and suggests that this progress can serve as a template to guide future improvements (DoD 2008c). The 2008 SMP is intended to be used as a guide to align business operations with the performance priorities of the Secretary, the Military Departments, Defense Agencies, and Combatant Commanders. Additionally, it outlined its three clear purposes:

- Focus the Secretary’s senior leadership team on key priorities.
- Ensure the Department’s governance processes allow senior leaders to make informed decisions regarding the steps that must be taken to achieve those priorities.
- Provide the transparency needed to measure whether priorities are met—and if not—to provide the information needed to quickly improve performance.

In January 2009, GAO released a report outlining several criticisms of the 2008 SMP claiming that it lacks key information and elements. Specifically, GAO claims that the 2008 SMP:

- Does not identify and strategic goals, objectives, and performance measures
- Does not provide detailed information about business operations
- Does not identify accountability for achieving desired results, such as the roles of the CMO, the DCMO, the CMOs for the Military Departments, and other senior leaders in monitoring the implementation and execution of the SMP.
- Does not demonstrate results, provide a comprehensive view of performance for business operations, or link resource needs to performance (GAO 2009a).

While DoD does not identify specific strategic goals and objectives, the SMP consistently refers to the goals set in the Quadrennial Defense Review. In addition, the 2008 SMP itself identifies the lack of some criteria, including two of the five Congressional requirements that are to be addressed in the 2009 update of the SMP (DoD 2008c).

National Defense Authorization Act of FY 2009

The NDAA 2009 built upon the changes and requirements outlined in the NDAA 2008. This legislation included two important changes that affect the role of the DCMO and the Service-level transformation effort. While the NDAA 2008 established the position of DCMO, the NDAA 2009 institutionalized some of the responsibilities of the DCMO. Specifically, the legislation states that the DCMO “shall serve as the vice chairman of the Defense Business System Management Committee, and shall act as chairman in the absence of the Deputy

Secretary of Defense.” This officially replaces the USD AT&L as the vice chair of the DBSMC with the DCMO.

Service Level Office of Business Transformation

While the NDAA 2008 required the Secretary of each military department to designate the department Under Secretaries as CMOs, the NDAA 2009 goes a step further by requiring the Secretary of each military department to establish a business transformation office and develop comprehensive business transformation plans. The NDAA 2009 also requires the newly designated CMO of each military department report to Congress on business transformation plans after the first six months, and then annually for the following 3 years (Mosquera 2008). These Service-level business transformation plans need to include measurable performance goals and objectives, a well-defined enterprise-wide business systems architecture and transition plan encompassing end-to-end business process, and plans for implementation (NDAA 2009).

The Service-level business transformation offices should be designed to function in a similar capacity as the BTA, but within each military department. The head of this new office will be appointed by the military department CMO in coordination with the BTA director. While the Service-level CMOs will work with policy guidance from the Director of the BTA, the head of the service level Office of Business Transformation will report directly to the military department CMO.

The Office of Business Transformation for each military department will directly support the business transformation initiatives set forth by the department CMO. In addition, the Service-level business transformation offices will be responsible for:

- Transforming the budget, finance, accounting, and human resource operations of the military department in a manner that is consistent with the comprehensive business transformation plan.
- Eliminating or replacing financial management systems of the military department that are inconsistent with its business systems architecture and transition plan.
- Ensuring that the business transformation plan and the business systems architecture and transition plan are implemented in a manner that is aggressive, realistic, and accurately measured.

The military department CMO also must ensure that the business transformation initiatives at the service-level are consistent with the Business Enterprise Architecture and Enterprise Transition Plan developed by the BTA, the Standard Financial Information Structure, the Federal Financial Management Improvement Act, and any other applicable law or regulation. The NDAA 2009 also stipulates that the Services must make an initial report to Congress on their plans actions, as well as annual updates in 2010, 2011, and 2012.

DoD Senior Governance

In May 2008, the Secretary of Defense designated three bodies to assist him in making key strategic management decisions in a transparent and collaborative manner related to aligning the Department’s business operations with strategic goals:

- The *Defense Senior Leadership Conference (DSLCL)* is co-hosted in with the CJCS to address issues and to provide advice and assistance to the Secretary on the strategic direction of the Department.
- The *Senior Leader Review Group (SLRG)* meets at the discretion of the Secretary to address DoD issues and priorities of the highest level and provide advice and assistance to the Secretary of Defense on the strategic direction of the Department.
The *Deputy's Advisory Working Group (DAWG)* the DAWG would meet at the discretion of the Deputy Secretary of Defense "to provide advice and assistance to the Deputy Secretary of Defense on matters pertaining to DoD enterprise management, business transformation, and operations; and strategic level coordination and integration of planning, programming, budgeting, execution, and assessment activities of the Department."

5. Other Management Initiatives at DoD

Continuous Process Improvement (CPI) & Lean Six Sigma (LSS)

While much of the business transformation effort focuses on the implementation of large information systems, other smaller scale initiatives are critical to achieving DoD's overall business transformation goals. Continuous Process Improvement (CPI) is an ongoing OSD initiative seeking to develop a culture of continuous improvement in the areas of reliability, process cycle times, costs, quality, and productivity. In a May 2006 memo, then DSD Gordon England recognized CPI as an effective tool for improving the operating effectiveness of the DoD in all areas of operation and called for an expanded use of CPI. Attached to the memo was the Continuous Process Improvement Guidebook that serves as a framework for implementing CPI. Central to this framework is the application of process improvement tools and methods, most notably Lean Six Sigma (LSS), a business management strategy that seeks to reduce variability in process execution and eliminate waste.

In 2007, DoD recognized the success of these strategies and established the DoD CPI/LSS Program Office within the Office of the Deputy Under Secretary of Business Transformation within AT&L. Subsequently, in a May 15, 2008 DoD directive, then DSD Gordon England sought institutionalize the LSS strategy by instructing all Components to use Lean Six Sigma to improve productivity, mission performance, safety, flexibility and energy efficiency (DoD 2008e). This directive demonstrates how DoD is planning to make Continuous Process Improvement/Lean Six Sigma (CPI/LSS) a permanent part of DoD culture (Olsen 2002). CPI/LSS concepts and tools are intended to be applied to virtually all DoD organizations, including combat, industrial, service, office environments, field and operational organizations.

Although LSS methods have been used sporadically for process improvement since the 1990s, it wasn't the foundation of process improvement until the April 2007 memo that established the DoD LSS Program Office. Since, considerable progress in process improvement has been achieved. DoD as a whole has completed over 14,000 projects. At the OSD level 109 completed projects with measurable outcomes, have resulted in a reduction of 23,216 process days, and a cost avoidance of \$600,000. The Components are also embracing the use of CPI/LSS to improve performance. For example, the Army expects savings of \$4.25 billion from the process improvement projects of their CPI/LSS experts.

Despite some successful cases of LSS implementation, there is some concern that this strategy is misguided. There is some disagreement to the extent these business management methods developed for private manufacturing companies could be used in the public sector. It is also argued by some management experts that LSS is not useful for improving business processes that are at least partially outside the control of the organization. This is important for DoD, the Components, and all federal agencies because there are many legal requirements and congressional mandates that are out of the control of government agency managers.

Performance Improvement Officer

On November 13, 2007, President Bush signed Executive Order 13450, Improving Government Program Performance, which directed all federal departments to appoint a Performance Improvement Officer (PIO) with the goal of spending taxpayer resources effectively and more effectively each year (DoD 2008b). In January 2008, Elizabeth McGrath, the Principal Deputy Under Secretary of Defense for Business Transformation, was appointed Performance Improvement Officer. She serves this role in addition to being the DoD Assistant Deputy Chief Management Officer and is responsible for generating the Departments Strategic Management Plan. Some of the primary responsibilities of the PIO as outlined in EO 13450 include supervising the performance management activities of the agency, advising the head of the agency regarding program administration, assisting the development and use of within agency performance measures, and convening the appropriate agency personnel throughout the year to assess and improve program performance and efficiency (Bush 2007).

The Executive Order also established the Performance Improvement Council, which is chaired by the Deputy Director for Management of the Office of Management and Budget, with all agency performance improvement officers as its members. This Council seeks to achieve the goal of the EO of spending taxpayer resources more efficiently and effectively by facilitating the flow of information concerning methods of performance improvement.

6. Business Transformation Strategic Objectives—Looking Toward the Future

As DoD was preparing for the Obama Administration, on December 10, 2008, the BTA released the first of eight transition documents titled “DoD Business Transformation: Challenge, Opportunity and Guiding Principles.” This document outlines the importance of the Business Mission Area, explains some of the reasons why progress has so far been elusive, and envisions a model of successful business transformation. This document also seeks to explain the current status of the business transformation effort and ensure that progress is sustained as new high-level officials are appointed to office.

Deputy Secretary of Defense Gordon England announced in December 2008 that he would not continue to his service through the Obama Administration. This was an important development because he had been a strong advocate of business transformation and modernization for years. For the first time, the new President now had to nominate a DSD who, by law, will also serve as the DoD CMO. On January 8, 2009, President Obama nominated William Lynn to serve as the Deputy Secretary of Defense, and he was confirmed by the Senate on February 11, 2009.

BTA's Six S's of Success—Six Guiding Principles

Going forward in the business transformation effort, the BTA determined that DoD's new leadership will need to maintain a visible and aggressive commitment to progress. The BTA released its "Six S's of Success" to serve as the guiding principles for new DoD leadership. They are intended to provide both a path to transformation and the means to evaluate the measurable impact of the effort.



- **Strategic Alignment** of DoD's approach to optimizing its business mission area must be achieved throughout the organization, aided by the new DCMO, to ensure a common approach and set of priorities that will be consistently governed and evaluated in pursuit of the Department's business transformation objectives.
- **Standardize** essential operational data, processes, and business rules in order to significantly improve the Department's ability to process and share information throughout the enterprise in support of warfighter mission execution and management decision making.
- **Simplify** the Department's overly complex business rules that unnecessarily complicate operations, lead to expensive and risk-filled solutions, and inhibit breakthrough business performance improvement.
- **Streamline** the Department's core end-to-end business processes to eliminate non-value added activities and achieve significant improvements in the efficiency and effectiveness of business operations.
- **Stovepipe** operations must be **eliminated** from solution design and deployment, so that the Department's historically narrow-focused approach to business gives way to an approach that seeks to optimize end-to-end processes, which represent the foundation for the way the Department actually delivers on its mission.
- **Systems and Services** must be deployed in a timely and cost effective manner with a conscious focus on sound requirements management and comprehensive risk mitigation to achieve improved efficiency and effectiveness throughout the entire DoD enterprise (BTA 2009b).

With strategic alignment across all involved stakeholders as the foundation, the BTA intends for these six guiding principles to be the basis of future transformation efforts.

E. Performance and Achievements of the Current Transformation Effort

From slow, almost random progress of the pre-2005 initiative, the new revitalized efforts have demonstrated progress in several key areas. These were, to a large degree, catalyzed by the passage of the NDAA of 2005 and the subsequent stand-up of the Business Transformation Agency, in October 2005. The trajectory of DoD's Business Transformation had been significantly altered.

First, some real progress has been made in completing and revising the business enterprise architecture. DoD has kept its commitment to periodically update the BEA. GAO criticized early versions of the BEA because of some major functional gaps (GAO, 2005e). DoD released the latest version of the BEA (6.0) in March 2009. This version of the BEA continues to address functional gaps, missing elements, inconsistencies, and usability issues. For example, BEA version 6.0 begins to address information assurance issues by identifying related laws, regulations, and policies and incorporating them in to the BEA (GAO, 2009b). This version of the BEA also begins to incorporate security requirements, controls, and standards as well as the technical standards that allow business systems to work in an expeditionary environment (GAO, 2009b). Although BEA 6.0 still has some limitations, it represents the thin layer of corporate architectural policies, capabilities, rules and standards that focus on addressing enterprise-level priorities.

An example of the standards set by the BEA is the Standard Financial Information Structure (SFIS). Over time, the Services and many DoD components developed different financial reporting systems that make enterprise wide transactions difficult to track. This lack of financial data standards impedes the ability of the DoD to measure performance at an enterprise level. SFIS is a standard set of data elements and business rules that enables budgeting, performance based management and standardized financial reporting across DoD components. SFIS improves financial visibility across the department by reducing the number of customized general ledger accounting systems, which improves data comparability. DoD has achieved considerable progress in deploying SFIS department wide; from 26% of total assets in Q1 FY 2007 to 87% of assets in Q1 FY 2009.

Second, DoD has complied with the requirements to the NDAA 2005 to update the Enterprise Transition Plan, the Business Enterprise Architecture, and annually report to Congress on the progress of defense business operations. The ETP provides a roadmap for transforming the Department's business operations by defining the priorities that DoD will use to manage major information systems and transform human resources, materiel supply, property management, weapons system development and financial management programs. Additionally, the ETP identifies capability gaps in the BEA and establishes time phased milestones designed to target these areas of weakness. In addition these milestones demonstrate measurable progress and provide periodic improvements in the operational capability of enterprise systems and initiatives.

The ETP also provides the context for understanding the Department's transformation progress and plans of the fiscal year. With a new Presidential administration, the 2008 ETP also served as a primer for incoming DoD leaders on the current approach to business transformation, recent process, and near-term challenges.

Third, a system has been put in place to review DoD's IT investments. DoD established the Investment Review Boards Process to provide a governance and oversight framework for effective investment decision-making. Each IRB assesses individual investments relative to their impact on end-to-end business process improvements, ensuring their compliance with the BEA. The tiered structure of accountability to certify new business system investments has improved the quality and efficiency of new investment oversight.

Fourth, DoD has established a new management structure to provide more stable leadership for business systems transformation. Through a sequence of NDAs, Congress required DoD to establish the positions of Chief Management Officer (CMO) and Deputy Chief Management Officer (DCMO). It also required the Services to designate a Chief Management Officer, and to establish Service-level offices of business transformation. However, the specific roles and authority of these positions remain somewhat unresolved, and a DCMO has yet to be nominated. The impact of these changes has yet to be assessed.

Finally, those programs placed under the BTA umbrella have demonstrated some improvement. One of the inherited large programs (DIMHRS), however, still faces major challenges, which is demonstrated by the 2009 overhaul of the deployment strategy. The BTAs involvement in the DIMHRS projects is documented and evaluated in Part Two of this report.

The BTA has also initiated several business transformation programs that have addressed long standing issues at DoD. One of its initiatives, the Defense Agencies Initiative (DAI), is intended to be a standardized financial management solution set for the 28 Agencies and field activities within DoD. The BTA is transforming its own operations, as a pilot program for DAI, and to set an example that transformation is possible. A more detailed account of the Defense Agencies Initiative is also provided in Part Two of this report.

The BTA has also been able to initiate and implement other smaller scale business transformation initiative in short time periods. For example, the BTA was able to develop and deliver a secure online absentee voter assistance program in 22 days that allowed DoD military and civilian personnel abroad to rapidly request and receive absentee ballots. The BTA also leads the OSD Lean Six Sigma office. Through this office, the BTA worked with the Office of the Director of National Intelligence, the Office of Management and Budget, and the Office of Personnel Management to transform the security clearance process at DoD.

While the BTA has direct control over the assigned programs at the OSD enterprise level, much of the business transformation effort occurs at the component level. The importance of the components role in the DoD business systems transformation is highlighted in the March 2009 Report to Congress. According to the report, 57 of the 102 target systems and initiatives for improving business effectiveness and efficiency identified by the Department in FY 2008 are being developed by the components (DoD 2009). Moreover, the majority of the funding for business transformation initiatives is at the component level. Throughout FY 07—FY09, approximately 66% of all funding for business transformation was directed towards systems and initiatives at the component level (see figure 14 below). Within the budget of for business transformation at the components, it is evident that the majority of these funds are spent on programs in the three military departments. Some of the larger business transformation programs over the last several years include the Navy's Enterprise Resource Planning initiative, the Army's Logistics Modernization Program, and the Defense Logistics Agency's Business Systems Modernization program. These three cases, which demonstrate instances of business

systems transformation at the component level, are described in further detail in part II where we identify challenges they have encountered, and draw lessons learned from each experience.

There are also three systems and initiatives that are being developed by the Military Health System (which reports to the Under Secretary of Defense (Personnel and Readiness)), and not under the direct control of the BTA: the Federal Health Information Exchange (FHIE), Bidirectional Health Information Exchange interface (BHIE), and the Armed Forces Health Longitudinal Technology Application (AHLTA). This is significant because these three programs represent a significant portion (12.6 percent) of total DoD business transformation funding from FY 2007—FY 2009 (DoD 2009). This demonstrates that there is still some fragmentation within DoD’s business transformation efforts, even at the OSD level.

Figure 14: Integrated Business IT Budget Picture (\$M) (DoD 2009)

	FY06 & Earlier	FY07	FY08	FY09	Total
Enterprise	2,539.3	437.1	420.6	402.5	3,799.7
Components	6,920.6	1,453.5	1,688.4	1,762.3	11,824.9
Medical	1561.4	276.3	170.8	242.5	2,251.0
Total	11,021.3	2,166.9	2,279.8	2,407.3	17,875.6

Clearly, the components have a very important role in the overall business transformation effort. While many of the changes in the governance of business systems transformation are at the OSD level, the Services and components are affected in several important ways.

First, the military services and components have complied with the NDAA 2005, and have prepared their portions of the ETPs and Annual Reports to Congress. This requires the Services and components to evaluate how their business transformation initiatives align with the six Business Enterprise Priorities and contribute to achieving end-to-end capabilities. Additionally, the components must develop specific goals, objectives, and timelines for their transformation initiatives in the ETP, and report on their progress in annual Report on Defense Business Operations to Congress. Through these more stringent reporting requirements, the components are more accountable to achieve tangible improvements in business capabilities that are in line with enterprise priorities.

Second, the military services have a significant role in developing the overall Business Enterprise Architecture. In 2005, DoD adopted a federated approach to developing the BEA. The BEA developed by the BTA at the enterprise level laid the foundation for the Services to build and align their subsidiary architectures. DoD’s federation strategy, which stated the Department’s federated architecture goals and described federation concepts, provided a foundation on which to build and align DoD’s parent BEA with the enterprise architectures of the components. Despite this, GAO remains critical of both the DoD parent BEA and the

component's subsidiary architectures. While the parent BEA does not define the details needed to execute the federation strategy, the component architectures remain in very early stages of developments (GAO 2008e).

Third, the reformed investment review process directly affects the military services and components. The components are encouraged to evaluate their own special or unique needs and tailor system investments accordingly. The new investment review process is designed to ensure that the new investments seek to achieve end-to-end capabilities, are in line with the Department's business enterprise priorities, and are in compliance with the Business Enterprise Architecture. As previously discussed, all investments over \$1 million must go through the investment review process and receive certification from the DBSMC. This investment review process is based on the tenet of tiered accountability and designed so that the components can pursue investments that meet their specific needs while avoiding the proliferation of stove-piped systems. Beginning at the program manager level, the investment review process establishes individual accountability to business systems investments. The goal is to have improved investment decisions and oversight.

Finally, the NDAA's of 2008 and 2009 significantly changed the governance structure of business transformation at the component level. While the 2008 NDAA required the Service Secretary of each military department to designate their Under Secretary as the Service's Chief Management Officers, the 2009 NDAA required the Under Secretary of each military department to also establish a Service-level Office of Business Transformation. Some of the specific requirements include: the development of a comprehensive business transformation plan, a well-defined enterprise-wide (the component) business systems architecture, and an accompanying transition plan. The primary goals of these requirements are to ensure adequate leadership and direction of business transformation initiatives. Given that most funding for business transformation occurs at the component level, it is important that there is a clear and specific plan for business transformation. Much like the 2005 NDAA required major changes to governance structure of the business transformation effort at the OSD level, the requirements of the 2008 and 2009 NDAA require significant changes in the business transformation effort at the component level. At this time, the Services are in the early stages of meeting these congressional requirements (GAO 2009a).

F. Findings and Recommendations

Although many challenges remain, the business transformation effort at DoD has experienced several improvements since the major 2005 course correction. The previous business transformation initiatives achieved limited results, and were plagued with a general underestimation of the scope of the challenge, along with a variety of problems. At that time DoD also shifted from the narrow goal of trying to obtain a “clean audit” opinion, to the broader goal of transforming the overall business management process of the department.

Congress played a significant role in setting the new direction of business transformation at DoD. The 2005 NDAA created a new business systems transformation governance structure and established an improved business systems investment review process, while the BTA set business transformation priorities and provided day-to-day management of the transformation effort at the DoD enterprise level. With this new approach to business transformation, the leadership recognized the breadth and depth of the DoD business mission and created the necessary layers of accountability in an attempt to ensure that business systems investments delivered results.

As DoD leadership realized the scope of the business transformation effort, they placed a strong emphasis on involving top-level leadership by establishing the DBSMC and creating the BTA. Since 2005, DoD was enabled by the consistent, high-level, leadership provided by the Deputy Secretary of Defense, Gordon England, and Director of the BTA David Fisher. Congress has continued to mandate governance and leadership reform at DoD to improve leadership and oversight of the transformation effort through a series of National Defense Authorization Acts. The NDAAs of FY 2006-2009 required DoD to establish the position of CMO and DCMO; and the Services to designate their Under Secretaries Service Level CMOs, and establish Service-level offices of business transformation. While these requirements have not yet been fully implemented, they contribute to establishing the governance structure needed to drive transformation and add a layer of accountability to deliver business capabilities.

Other management initiatives are also driving performance improvements. Along with better management of the larger business transformation activities, DoD has placed additional focus on improving performance at all levels of the organizations. Through establishing the position of Performance Improvement Officer and the institutionalization of CPI/LSS (Continuous Process Improvement/Lean Six Sigma), DoD established a framework for delivering incremental improvements in performance and efficiency. CPI/LSS have already delivered tangible results in reducing costs and process times at both the OSD and Service-level. DoD is continuing to integrate CPI/LSS into the organizational culture through training its workforce to develop expertise in LSS.

Despite the recent progress in the business transformation effort, many challenges remain, and DoD’s business systems modernization remains on GAO’s list of programs at risk (GAO 2009b).

Business transformation at an organization as large and diverse as the DoD is difficult, and requires a great deal of patience and persistence. The current organizational structure of DoD, and its culture, evolved over decades, and will not change in a short period of time. In order to continue advancing in the business systems transformation effort, DoD needs to address the many challenges presented by the business transformation process. Based on the results of our

study, the following section details specific findings and recommendations to improve the prospects for success in the business transformation effort. They are separated in four broad categories: systems development, management, senior leadership and governance.

Systems_Development

Finding 1.1: DoD continues to develop functionally based ERP systems.

Enterprise Resource Planning (ERP) has historically focused on the integration of internal business functions, by streamlining the data flow between different functions. They added value through this integration, the subsequent sharing of data and processes, and the provision of real-time information to managers. Currently, however, DoD components are still developing functional ERP systems, such as ERPs for supply chain, finance, and human resources. Then, in order to achieve end-to-end capabilities, systems integrators must find ways to stitch together the functional ERPs. This approach does not take full advantage of the integrative potential ERPs.

Moreover, this does not mean that there needs to solely be one overarching ERP at the enterprise level. Subordinate organizations may have a need to have a tailored ERP “instance” for their local operations. The total number of instances of an ERP does not matter, so long as they are based on standards, are interoperable, and can be easily aggregated at the enterprise level.

Recommendation 1.1: DoD should reevaluate its definition of “enterprise” so that it can match the correct authority to manage the change, and then focus on end-to-end capabilities.

ERP implementation should focus on maximizing the utility of a single ERP system, and not creating “functional ERP systems” that are inherently stove-piped and costly to stitch together.

Moreover, it is not necessary to develop one comprehensive system for large and diverse organizations. The number of ERP instances, or number of business systems, does not really matter. However, it is essential that the systems are based on standards, be interoperable, and can aggregate. Keeping in mind how DoD defines the enterprise, it should then pursue the minimally sufficient solution required to address its end-to-end needs.

Finding 1.2: Some DoD business modernization programs have tried to do too much in a single initiative.

DoD has pursued an overambitious strategy with some of its business modernization initiatives. The DIMHRS implementation, for example, is an order of magnitude larger than any previous similar system. When fully operational, DIMHRS will maintain the records for 3 million people—the largest PeopleSoft implementation through 2003 had only 300,000 individual records. DIMHRS was designed to replace 113 legacy systems, and interface with more than 290 across the Components. This level of integration is unprecedented, and presents many known and unknown problems. However, the program chose an initial strategy to implement DIMHRS using a “big bang” approach, beginning with the Army. The program faced significant challenges, and following a November 2008 review, the DIMHRS implementation date for the Army was abandoned until further notice; the future of the program remains unclear.

In contrast, the Defense Logistics Agency 's Business Systems Modernizations program used a strategy of incremental deployment and adequate oversight to ensure that expected capabilities were delivered and unexpected issues were dealt with. This strategy allowed the DLA Program Management Office to test the system extensively and correct deficiencies in support of the full fielding decision. In 2004, after more than 2 years of testing, DLA deployed BSM Release 2.0 and began an incremental roll-out strategy that relied on monthly improvements in systems capabilities until it reached FOC in 2007.

While both programs are large in scope and started around the same time period, the incremental approach of the DLA BSM program has demonstrated more success. The "big bang" strategy, of the DIMHRS program, has proved to be very challenging and is part of the reason why success has been elusive.

Recommendation 1.2: When developing these large, complex systems, programs should avoid an all inclusive "big bang" approach.

Although large scale implementations appear to be "silver bullets" to longstanding problems at DoD, in practice, they create more problems than they actually solve.

Finding 1.3: Customization and unique data interfaces reduce potential cost savings.

While DoD has learned that the customization of Commercial-off-the-Shelf ERP software is a significant barrier to success, owners of legacy systems now advocate the use of specialized data interfaces to avoid changes in current business processes. These interfaces take data from a new ERP system, manipulate it, and feed it into a legacy process and system. These are called "no harm interfaces" because they do not alter the legacy system or process. However, these "no harm interfaces" restrict the realization of the primary cost savings that ERP systems can provide, which is, that they allow an organization to retire legacy systems. The case of the Defense Agencies Initiative (DAI) demonstrates the challenges posed by the use of data interfaces with legacy systems.

Recommendation 1.3: DoD managers need to pursue the "minimally sufficient solution" in order to avoid overspecialization which causes significant delays in the deployment of new business systems.

In order to reduce costs and accelerate the implementation of new business modernization initiatives, DoD managers should pursue the "minimally sufficient solution" and not allow unnecessary expanded or specialized capabilities. One strategy senior managers can use, is to discontinue the practice of requesting information in legacy report format. Agencies that demand these specialized capabilities, before going live, generally have caused significant delays with system implementation and, ultimately, the transformation process.

This problem is also related to business transformation leadership (discussed below); those with the responsibility to drive transformation must have the authority to eliminate funding for legacy systems, and thus reduce the "requirement" for specialized interfaces.

Finding 1.4: Although interfaces with legacy systems pose several problems, transferring legacy data to a new system is also very challenging.

It is not always possible to reconcile data from legacy systems. In order to do so, it may take a huge commitment of manpower by agency leadership to focus on data reconciliation. For example, in the Defense Agencies Initiative (DAI) at the BTA, Director David Fisher had to make data reconciliation the most important priority for a few months and direct all of his staff to stop what they are doing and focus their energy on this task. The task proved to be very challenging, and required the daily involvement of the BTA Director. It is not clear that senior leaders in other organizations will have the same ability to dedicate the required resources to the data reconciliation task.

Recommendation 1.4: DoD should develop a clear policy on how to deal with legacy data, discouraging the use of interface systems.

DoD needs to develop a clear strategy on how to deal with legacy data that focuses on the “minimally sufficient solution” and discourages the use of data interfaces and specialization. This includes developing specific criteria to determine when data conversion or a data interface would be used. For practical reasons, there may need to be some sub-optimal concessions that must be made (some of these may need legislative relief).

Management

Finding 2.1: The many DoD employees, involved with business transformation, often lack the necessary experience and skills to lead the planning and managing of its implementation.

In addition to filling critical leadership roles with personnel that have a background in IT and experience running a large business, DoD must also attract more qualified IT professionals at all levels. DoD needs people that understand how ERP and other IT systems are supposed to work. Over the years, much of this knowledge has been outsourced to private industry. This has occurred in part due to the lack of clear incentives or a career path for DoD personnel to develop expertise in ERP implementation and other IT fields. Additionally, it is difficult to quickly bring in experts from the private sector in part because of the governments rigid personnel system and the inability to offer levels of compensation comparable to the private sector.

However, through the Highly Qualified Experts (HQEs) program, Congress granted DoD the authority to hire as many as 2,500 individuals with the required expertise to fill critical positions with a compensation package more competitive with the private sector. This program allows DoD to hire HQEs for up to 5 years with the potential for a one-year extension. However, the hiring process takes significantly more time than the private sector, and compensation still lags behind what the private sector can offer.

A related human capital challenge is the security clearance requirement. All BTA employees are required to have a security clearance, effectively eliminating the pool of permanent-resident aliens, where much of the requisite experience and talent resides.

Recommendation 2.1. The Congress, the Secretary of Defense, and the Service Secretaries and Chiefs must continue to ensure that Defense Business Transformation effort and the Business Transformation Agency have adequate and stable resources—funding and human resources.

The transformation of DoD's business processes and systems, when complete, will yield significant performance gains and cost savings. The effort, however, will be a decade's long journey. For the transformation to proceed efficiently, the approved supporting programs and initiatives should receive their programmed funds, as long as they continue to demonstrate progress. Funding fluctuations in one program, will not only impact that program, but with the many interdependencies, will generally impact several others. The end result will be to delay or not achieve the overall enterprise objectives.

Moreover, Congress should also allow DoD to retain and expand the authority granted under NDAA 2004, as necessary, so that DoD can access the required private sector experts to help lead an manage the transformation effort. Additionally, since many of these experts are permanent resident aliens, the security clearance requirement should be evaluated, and, when appropriate, removed, to allow permanent resident aliens (that are allowed to serve in the military services) to fill them.

Furthermore, since many of the private-sector workforce with the requisite skills, are foreign nationals, the security clearance requirements for employment within the BTA should be evaluated, and, if appropriate, removed for those positions. Finally, DoD must also work toward

developing the required capabilities organically, by developing clear incentives and career paths for individuals who specialize in business systems and IT.

Finding 2.2: Under Congressional special hiring authority, DoD is allowed to hire highly-qualified employees (HQEs) at a salary equivalent to that of the Vice President.

While Congress authorized DoD to hire HQEs at a salary equivalent to that of the Vice President, internal policies restricts HQE salary to SES pay scale. This hinders the ability of the BTA to attract the needed talent to drive and manage transformation.

Recommendation 2.2 Congress, the new Administration, and especially the Secretary of Defense and Deputy Secretary of Defense, must continue to ensure that Defense Business Transformation effort is able to recruit, hire, train, and retain the required personnel.

DoD has experienced more success in ERP implementation when in-house personnel have a significant role in the design and integration of ERP systems. Many of the best experts, however, are in the private sector, and can generally command salaries that are significantly higher than what DoD can offer. Therefore, DoD needs maximum flexibility in pay, benefits, and other variables so that they can attract, hire, and retain the talented individuals, with the appropriate skills, to oversee the technically complex enterprise system developments. Finally, DoD should alter internal policies to allow agencies to hire HQEs at the salary level set by the Congressional special hiring authority.

Finding 2.3 There is a need for better communication regarding the purpose of ERPs

An important part of driving DoD's transformation is achieving buy-in from all the stakeholders that will be affected by transformation. While the problems of legacy systems are known, yet tolerated, benefits of business transformation such as cost savings, and improved efficiency, are not always obvious or adequately communicated. Unless there is a clear understanding of the benefits of business transformation, stakeholders with legacy systems will question the need to adjust to an entirely new system.

Recommendation 2.3: The BTA, Agencies and the Services need to define output performance measures for transformed business systems.

In order to accurately communicate the benefits of new and integrated business systems, DoD needs to identify expected output performance metrics, so that stakeholders understand not only the costs, but also the benefits. The output performance metrics should include measures such as dramatically reduced cycle times and improve information visibility. One of BTA's internal performance objectives, for example, was to have visibility of BTA-wide obligations within 24 hours. Before the BTA's ERP went live, it would take 45 days for a transaction to be referenced in an accounting system. BTA management is now able to make financial decisions using current information. Clear objective output measures, such as this, are needed to achieve greater buy-in from stakeholders and agencies within DoD.

Finding 2.4: The transformation of DoD’s business processes and systems will require many of DoD’s employees to acquire new skills.

ERPs and other business transformation initiatives will significantly change the nature of many jobs within DoD that require a different skill set. As the future work environment will rely on knowledge workers with strong analytical and IT skills, clerical and data entry jobs are likely to be eliminated. DoD will need to be able to provide more training to its current workforce and be able to recruit qualified workers from the private sector.

Currently there is a lack of ERP expertise within DoD. Because of this, there is a high dependency on outside consultants to guide ERP implementations. ERP expertise is a critical skill now and will be in the future as over 50 percent of DoD’s business systems transformation budget is spent on ERP initiatives. DoD needs to develop ERP expertise in house in order to improve the prospects for success in ERP implementations and reduce the reliance on private sector consultants.

Recommendation 2.4 DoD ERP experts, not contractors, should lead (or co-lead) ERP implementations.

DoD should develop personnel with the skills necessary so that DoD ERP experts, not consultants, lead ERP implementations. This does not mean that consultants would no longer be needed. On the contrary, they would still have an important role such as augmenting program staffs, developing the training programs, and system testing. With DoD employees taking leadership roles for both functional and technical positions, the systems development and the transformation effort will be driven, as it should be, by DoD personnel, and not consultants.

Finding 2.5: The main resistance to ERP implementation comes from those with functional authority at the working level. These are also the employees demanding continued investments in the current legacy systems who act as a distraction to eventual ERP implementation.

In terms of the business transformation budget, DoD has already declared ERPs as the centerpiece to business transformation. However, DoD does continue to fund incremental improvements to the same systems that it hopes to replace with ERP systems. As business transformation initiatives compete with other resources, including funds to maintain legacy systems, using funds to optimize individual legacy systems detracts from the broader, enterprise-wide transformation goals. This resistance and hedging from functional authorities works to both slow progress in the ERP implementation, and keep legacy systems alive—delaying or derailing the transformation effort.

Recommendation 2.5: Leadership at all levels of DoD needs to abandon the hedging strategy, of continuing to unnecessarily support legacy systems.

DoD needs to abandon this hedging strategy and fully commit to their transformation strategy. DoD needs to align business transformation efforts and provide necessary resources across programs to ensure the delivery of end-to-end business processes.

Senior Leadership

Finding 3.1: Leadership emphasis has proved critical to energize DoD's Business Transformation.

Strong and consistent leadership is critical for the success of business transformation initiatives. Large-scale business transformation does not occur without senior leadership guidance, commitment, and advocacy. Completing the scope of change envisioned for DoD's business and financial management systems will require continued and committed leadership; especially from the Secretary and Deputy Secretary of Defense.

Recommendation 3.1: The Secretary and Deputy Secretary of Defense must continue to make Defense Business Transformation one of the top Department of Defense priorities.

With growing pressure on defense budgets, DoD must seek to improve efficiency and reduce costs. While one of the main objectives of defense business transformation is reducing costs and improving efficiency, the overarching goal is improved warfighter support. Some transformation initiatives, such as improve personnel and asset visibility, can directly contribute to improved combat capabilities. Other transformation initiatives, such as improved acquisition and financial visibility, can indirectly support the warfighter through cost savings and better use of human resources. Highlighting the link between defense business transformation and enhancing warfighter support is critical to gaining support from key stakeholders. Stakeholder complacency with the status-quo impedes the transformation process. DoD leadership needs to communicate the urgency of business transformation in order to motivate stakeholders to overcome the organizational, cultural, and technical challenges of business transformation.

Finding 3.2: Initial DoD business transformation efforts were plagued by a lack of stability in leadership at the program level.

The frequent turnover of directors experienced previously, by the BMMP (six program managers in less than 6 years), as well as with the key individuals in specific programs, such as DIMHRS, contributed significantly to their mediocre performance. Such a high level of turnover made the task of maintaining a consistent program vision and strategy difficult, if not impossible. Programs that have had more continuity of leadership, such as DLA BSM and NAVY ERP, have experienced more success.

Since the 2005 NDAA, there has been more continuity of leadership in the transformation process. However, if this is not sustained, momentum for business transformation will be lost and progress reversed.

Recommendation 3.2: The Secretary of Defense, along with the Service Secretaries, must ensure that there is program continuity with IT experienced leaders; especially with key senior leadership.

In order to achieve success, the transformation process requires continuity in leadership throughout the department. Frequent turnover in leadership and other key positions can cause changes in priorities and approach to the business transformation process ultimately leading to

delays and unnecessary costs. The Secretary and Deputy Secretary of Defense need to ensure that, to the extent possible, senior military leaders with IT experience are in charge of large business transformation initiatives, and held accountable for results. Similarly, the Secretaries of the Services must place high ranking officials in leadership roles of Service-level business transformation initiatives, and hold them accountable for results.

Finding 3.3. The current goals of DoD's Business Transformation effort are general and qualitative. Organizations that have successfully transformed their business systems have had clearly stated, well defined, measurable goals. Cisco Systems Inc. (a leading IT company), for example, when transforming their business systems set a goal to achieve a one day close, and cut finance costs in half. DoD, Services, and agencies must be able to monitor the effectiveness of their changes by continuously tracking the effectiveness off their changes against the established strategic goals.

Recommendation 3.3. The Deputy Secretary of Defense, acting in his role as the Chief Management Officer, must develop clear and quantifiable goals and metrics to guide the Departments and monitor its progress and measure the effectiveness of the changes that are made.

Finding 3.4: Within DoD's components, especially in the military services, uniformed leadership is critical, but not always evident.

DoD's Business Modernization programs, that have committed General Officer leadership (3 star level), are generally making good progress. For example, the Navy ERP program began to make significant progress when a Navy Vice Admiral was asked to take ownership and be accountable.

DoD agencies are normally headed by three-star flag officers. The BTA, a DoD agency, is currently headed by a qualified senior civilian, but no plans exist for future military leadership.

Recommendation 3.4: The Secretary of Defense and Service Secretaries must ensure that the Business transformation programs have the necessary, qualified senior military and civilian leadership.

When the time comes to replace the current Director of the BTA, a senior, IT experience military flag officer (three-star) should be named to that post. Assigning a qualified senior military leader to BTA director, instead of a senior civilian, will reinforce the link to, and importance of, business transformation and improved warfighter support.

Finding 3.5: There are several new key leadership positions such as CMO, DCMO, and the Service-level CMOs that will be critical to leading DoD's business transformation.

Through the NDAA of 2008, Congress required DoD to establish the position of DCMO, and that the military departments designate their Undersecretaries to be Service-level CMOs. The NDAA of 2009 went further by mandating the military departments to establish offices of business transformation. Although DoD established the position of DCMO, there is still a lack of clarity regarding the specific roles, responsibilities and authorities these positions will have. The military departments have designated their respective Undersecretaries to the position of Service-level CMOs, but are still in the early stages of responding to these legislative requirements.

Recommendation 3.5: Critical senior positions such as CMO, DCMO and Service-level CMOs should be filled by people who have experience running large businesses, and also have an extensive IT background.

The positions of CMO, DCMO and Service-level CMOs will have a critical role in driving defense business transformation. These positions should be filled people with the required experience, delegated the authority, and provided the tenure to successfully drive the required change. Additionally, their roles and responsibilities relative to other senior DoD officials, need to be clarified (see below).

Governance

Finding 4.1 DoD's business modernization program governance requires a committed steering body of cross-functional senior executives.

The new governance structure created in 2005 got the involvement and attention of the Department's senior leadership, through several different venues, such as the Investment review Boards (IRBs) and the Defense Business Systems Management Committee (DBSMC). Other DoD senior leaders are actively engaged in the governance of business transformation through the Deputy Advisory Working Group, which meets on matters pertaining to DoD enterprise management, business transformation, and operations.

However, clear roles for senior DoD leaders are not always clearly defined. The transformation process is complex even with clearly defined roles, and much more complex when they are not. This problem persists in the DoD transformation effort as the position of DCMO, nominally the vice-chair of the DBSMC, remains unfilled.

Recommendation 4.1. Secretary of Defense and Deputy Secretary of Defense must ensure the changes catalyzed by the NDAA FY 2005 continue.

Finding 4.2: Investment Review Boards in practice do not fully accomplish their intended purpose.

IRBs are intended to assess and make recommendations regarding business modernization investments relative to their impact on the end-to-end transformation within their designated areas of responsibility. However, IRBs have a more technical focus and often do not focus on the larger questions.

The DBSMC is a high level committee that meets only on a monthly basis that deals with big-picture issues such as major investment decisions the development of the BEA and ETP. However, there are many issues that frequently arise in the transformation process that require the attention of senior decision makers. Because the IRBs are technically focused, the DBSMC must also deal with some of the smaller transformation issues, which places more pressure on the members of the DBSMC. This is problematic because the members of the DBSMC are senior officials with numerous duties and responsibilities. Consequentially, important business transformation issues do not always get adequate attention.

Recommendation 4.2: Establish another subordinate board to the DBSMC that is more dedicated to solving the integration problems posed by the business transformation.

The members of this new board should have cross-functional business transformation oversight as a significant portion of their workload. This board should be chaired by the DCMO should include senior enough people to have authority, but are also close enough to the work to understand what transformation means from an operational standpoint.

Finding 4.3: There are three federal laws that continue to complicate the Defense Business transformation (i.e. Goldwater-Nichols, Clinger-Cohen, and the NDAA FY 2008).

Throughout the 1990s, Congress passed a series of legislative initiatives designed to address the issues of financial management and the integration of modern IT in government agencies. The Goldwater-Nichols Act assigned full responsibility for all acquisition activities to the Under Secretary of Defense (for Acquisition, Technology, and Logistics); the Clinger-Cohen Act changed the process for federal agencies to acquire and manage their information technology and systems, assigning responsibility to the CIO (who is the ASD (NII)); and the NDAA of 2008 established the position of Deputy Chief Management Officer responsible for business systems. There are clearly overlapping responsibilities between these three positions as most business transformation initiatives are also major acquisitions. These same issues will potentially emerge at the Service level, as their CMOs, and Directors of Business Transformation are appointed and assume their roles.

Recommendation 4.3. Congress and the new Administration must work to resolve remaining organizational barriers.

The Secretary of Defense should place the Assistant Secretary of Defense for (Networks and Information Integration) in the Under Secretary of Defense (AT&L) organization and suggest to Congress to modify the Clinger-Cohen Act so he/she can remain the Chief Information Officer. Also, the new role of the Deputy Chief Management Officer should be strictly as a strategic advisor to the Chief Management Officer, and should not have any programmatic responsibility (which would still flow from the Defense Business Systems Acquisition Executive (DBSAE) to the Under Secretary of Defense (AT&L) as the Senior Acquisition Executive (SAE). Consequently, the DCMO should be carefully monitored to ensure that the office does not interfere with the responsibilities of the USD (AT&L) as the lead in managing the acquisition of all of DoD's systems; nor of the role of the ASD (NII) as the CIO. The roles and responsibilities need to also be monitored at the Service level, so that the Service-level CMO do not interfere with the responsibilities of the Service Assistant Secretaries

Finding 4.4: Even with the establishment of the Business Transformation Agency, there is still some fragmentation within the DoD's transformation effort.

There are still elements of the OSD staff developing business systems independently, and, other elements of OSD that were not fully integrated into the BTA. For example, the Military Health System (under responsibility of Under Secretary of Defense (Personnel & Readiness)) was not integrated into the ETP until September 2006, and is still developing its own business architecture.

Finding 4.5: The BTA directly manages only some of the enterprise systems, but its involvement with the many other large business information systems managed by the Services and components is necessary, and can be of great value.

The BTA does not directly control the business information systems managed by the Services and components. Currently the BTA facilitates transformation, brings ideas, knowledge and assistance to other decision makers, but is not empowered to drive the transformation process. However, one important influence the BTA has over the business transformation projects of the components is that it ensures compliance with the overall Business Enterprise Architecture.

The components often lack expertise in developing and implementing ERP systems, which can make them dependent on their contractor systems integrators for ERP implementations. The BTA sought to address this by establishing the Enterprise Integration (EI) directorate, responsible for supporting the integration of enterprise-level business capabilities such as ERP systems at both the OSD and components. The BTA (and the EI directorate) for partnerships with components to develop improved business capabilities. A recent example of this is the recent partnership between the BTA and USTRANSCOM to develop and ERP system for its logistics operations.

Finding 4.6: Evolving from DoD’s legacy, stove-piped structure into integrated, enterprise-wide system naturally meets with individual and organizational resistance.

One of the most important problems with the current business systems environment at DoD is that there are too many legacy systems that are not interoperable. Replacing these legacy business systems with enterprise-wide, integrated, and interoperable systems will help solve many of DoD’s longstanding issues in business management. However the integration process has proven to be very challenging in part because of the significant changes to organizational culture that transformation causes.

Despite the challenge of changing an organizations culture, current and future budgetary pressures create an urgent need for change—this is the needed “burning platform”. Business systems can produce efficiency gains and cost savings to help offset budget reductions. However, business systems transformation requires substantial up-front investments while the return on this type of investment is typically years in the future. DoD funding has likely reached its high-water mark for funding; and as budgets are reduced, there will be a tough choice between weapons and business systems.

Recommendation 4.4: The new Administration must work to strengthen the role of the BTA to lead the management of DoD’s Business Transformation.

The Secretary of Defense and Deputy Secretary of Defense should assign all OSD level enterprise programs under the BTA umbrella. This will not give the BTA control over business information systems managed by the Services, but will expand its ability to drive transformation within the OSD. The Secretary and Deputy Secretary must ensure that the BTA has the necessary resources to assist the components in developing systems compliant with the Business Enterprise Architecture (BEA). Adequate and continuous resources are needed to give momentum to business transformation initiatives. The Secretary of Defense should also assign the BTA the pivotal role in providing the control (including with the Services) that ensures compliance with the BEA. This is critical to enable the necessary integration and interoperability between federated business systems.

Part Two: Case Studies

A. *Public Sector Transformation Experiences*

1. A Short History of the Slow Transformation of the IRS

I. Introduction

The operations of the Internal Revenue Service (IRS) are the largest undertaken by any financial entity, public or private, anywhere in the world. It serves 132 million individual taxpayers and 6 million businesses; employs over a 100,000 people; and collects 95 percent of the U.S. government's revenue. In 2005 alone, the IRS collected \$2.1 trillion in receipts. The IRS also provides oversight of the nation's tax-exempt organizations, as well as, managing the nation's largest means-tested benefits program, the Earned Income Tax Credit¹ (IRS 2006). The agency has a budget of over \$10 billion, and employs approximately 100,000 people—the scale of the enterprise is very large.

Since its inception, the complexity of the IRS operation has increased significantly. However, the agency's organization, structure, and technology did not keep up those changes, and had become virtually obsolete. Although several initiatives were undertaken through the mid-1990s to update the technological infrastructure, little real progress was made. This brief review will summarize the previous modernization attempts, the current status, and significant barriers that the IRS has faced in its transformation efforts.

II. Background

Despite being one of the first adapters in the federal government to use computer information systems, the IRS has had difficulty modernizing its operations. The IRS first automated its data processing in the early 1960s, with the installation of IBM 1401 mainframes. The first modernization effort began in 1968 and was known first as the "System of the Seventies" and later as the "Tax Administration System." The goal of the program was to provide IRS examiners with terminal access to the IRS database—a visionary objective for the time. Congress rejected the plan in 1978, however, due to concerns over cost and security, the latter primarily arising from the Watergate scandal and President Nixon's use of the IRS to harass his political enemies (Dworetzky 1986). The second initiative, called the "Equipment Replacement Program," was initiated in 1980. The program made put forth three plans to modernize the IRS information systems, but none progressed past the planning stage. Congress would only approve enough funds for a modest technology improvement. The third modernization attempt, the "Tax Systems Redesign" came in 1983. Congress approved a large budget of \$225 million, but mandated that the system be implemented by 1985. In its haste to meet the imposed schedule, the IRS fielded an untested system. Shortly after its implementation, the system experienced its infamous "Philadelphia Service Center Meltdown," wherein software bugs caused the virtually shutdown of the system (Stengel 1997). The IRS not only received a political black-eye from this incident, but it incurred a significant financial cost from accruing interest on delayed financial payments.

The next major modernization effort, the "Tax Systems Modernization Program", was initiated in 1986 and approved in 1988. The program was an ambitious \$8 billion effort to

¹ The Earned Income Tax Credit (EITC) is a refundable tax credit that reduces or eliminates the taxes that low-income working people pay.

replace all of the IRS's obsolete technology, and replace it with state-of-the-art IT systems by the year 2000. By the end of 1996, the program had spent half of its allotted funds, but was projecting that an additional \$20 billion would be required to complete the program. While the program had made some progress towards its stated goal, significant challenges remained ultimately prompting Congress to cancel the project. Independent analyses determined a number of causes that contributed to poor performance, including the inability of the IRS to manage a modernization initiative of this size and complexity, the IRS's reliance on an all or nothing approach, and the failure to realign its business processes to leverage the rapidly evolving technology (GAO 1996) (Committee on Continued Review of the Tax Systems Modernization of the Internal Revenue Service 1996).

National Commission on Restructuring the Internal Revenue Service

In 1996, Congress passed legislation that directed the formation of a commission—the *National Commission on Restructuring the Internal Revenue Service*—to recommend policy changes to improve the nation's tax collection system and help move the IRS into the 21st century. The Commission's ultimate goal was to restore the American public's confidence in the U.S. government to collect revenues in a fair and courteous manner. One of the commission's initial conclusions was that the IRS had failed to enter the information age. More specifically, the IRS was criticized for not having “a consistent long-term strategic vision to guide the [failed Tax Systems Modernization] project...[and that] the IRS modernization deficiencies show both a lack of business technology integration and a failure to use best practices” (The National Commission on Restructuring the Internal Revenue Service 1997). The Commission recommended broad reforms for the IRS, including bring in new leadership from outside the agency, reorganization of the agency, and modernization of all information systems (Rossotti 2005a). Many of these recommendations were signed into law as the Internal Revenue Service Restructuring and Reform Act of 1998. At the same point in time, after the release of the National Commission report but before the passage of the IRS Reform Act, President Clinton named Charles O. Rossotti, the former chairman of the computer consulting firm American Management Systems, as the new Commissioner of the IRS (Birnbaum 1998).

The Internal Revenue Service Restructuring and Reform Act of 1998

The Internal Revenue Service Restructuring and Reform Act of 1998 put forth three strategic goals. First, the IRS should increase its customer service to improve the image of the agency. Second, the IRS was to maintain taxpayer compliance (GAO 2003). The final goal of the act was to increase the desirability and work environment for employees so that the agency could attract and retain quality employees. Mr. Rossotti believed that the only way to achieve the strategic goals of the IRS Restructuring and Reform Act was to overhaul the organizational structure of the IRS.

III. Reforms under Commissioner Rossotti

Initially, Rossotti was pressured to implement a technology modernization project that supporters thought would be a panacea for the IRS's problems (Rossotti 2005b). Rossotti argued, however, that building new computer systems to support the outdated business practices and unnecessarily complex organization structure would not work—he believed that “computer systems essentially represent a detailed codification of the business practices and organization structure that exist” (Rossotti 1998). As a result, he made the decision to delay the technology

modernization. Instead, he developed a more comprehensive enterprise transformation strategy. The new Commissioner outlined this strategy in his January 1998 testimony before the Senate Finance Committee (Rossotti 1998). This concept included a renewed mission, with emphasis on service and fairness to taxpayers and included changes in five key areas, each one complementing the others. The five elements put forth by Rossotti were:

- **Change the IRS’s organizational structure to focus on meeting taxpayer needs.**

The IRS’s original organizational structure was highly decentralized, with authority distributed over 33 districts and 10 service centers. Each of these 43 units was responsible for fulfilling all taxpayer needs within its defined geographical area. If a taxpayer moved to a new location, a different unit would be responsible for collecting the person’s taxes. Each operational unit performed all functions that the taxpayer required, such as customer service, collection of information and examination activities (Rossotti 1998). This structure was unnecessarily complex, obsolete, and completely undermined the accountability (Rossotti 2005a). A more effective system would require a reorganization around function as opposed to geography.

Rossotti recognized that many large private sector financial institutions organized themselves into different divisions to serve retail customers, small to medium business customers, and large multinational business customers. The U.S. taxpayer base naturally falls into similar groups. He initiated the process to restructure the organization into four operating divisions, each with end-to-end responsibility for all of the key processes for their respective taxpayer segment—individual taxpayers, small business taxpayers, large business taxpayers, and tax exempt entities (IRS 2000).

- **Reengineer IRS business practices to focus on understanding, solving and preventing taxpayer problems.**

The concept was to look at individual business practices such as customer education, filing assistance, and collection, gain greater understanding of the particular problems that taxpayers have with them, and borrow best practices from the public and private sector to continuously improve IRS performance. For example, Rossotti argued that the IRS should provide easily accessible high quality assistance to all taxpayers, making the filing of tax returns easier. Rossotti believed that by tailoring IRS’ services to the needs of particular groups of taxpayers, the agency could dramatically improve their service to taxpayers, as well as their own internal productivity (Rossotti 1998).

- **Create management roles with clear responsibility.**

Under the original organizational structure, IRS examiners and managers were responsible for knowledge relating to all tax payers within a defined geographical space. The new proposed organizational structure would assign examiners and managers the responsibility of serving a relatively narrow and homogenous segment of the taxpaying population. A focused area of interest would enable employees to become more knowledgeable about the needs and problems of their specific customers, enabling better service. This “flatter” structure would also improve communication between the frontline employees and first-line managers with the senior management (Rossotti 1998).

- **Develop balanced measures of performance.**

By the 1990's, the IRS lacked useful performance measures to evaluate the effectiveness of its operations. Enforcement results comprised 70% of the performance metric used to evaluate each district office. Although the performance measure was not designed to evaluate front-line employees, the incentives created by the current paradigm resulted in a misalignment of employees. As a result, performance was negatively impacted. Rossotti believed it was essential to develop organizational metrics that balanced customer satisfaction, business results, employee satisfaction, and productivity. These measures needed to be carefully crafted to create incentives for customer service-oriented behavior (Rossotti 1998).

- **New Technology.**

Mr. Rossotti argued that technology modernization, although required, would only be effective if the IRS underwent a structural reorganization. Therefore, Mr. Rossotti devoted his efforts to the larger problem (Rossotti 2005b). Included in the structural reorganization of the IRS was the creation of a new CIO organization that would provide improved management and oversight for the modernization of the information technology.

Overall, Mr. Rossotti advocated for the restructuring of the IRS to support its mission of collecting revenues for the federal government in an efficient and fair manner by enabling the IRS to focus on customer service. To overcome difficulties, Mr. Rossotti strove to reorganize the IRS along an income basis, centralize operations, along with eliminating organizational and cultural barriers. The IRS took about 3 years to complete this top to bottom reorganization of the agency (Rossotti 2005b).

Technical Modernization

After starting the IRS structural reorganization process, Rossotti began to plan how the technical infrastructure of the IRS should be modernized. When Rossotti first arrived, each of the 15 major units that comprised the IRS managed its own information system. Consequently, the IRS was operating nine disparate databases that were generally not interoperable (Birnbaum 1998). Although the Chief Information Officer (CIO) had direct responsibility for the national office system, the CIO only a loose coordinating authority over the rest of the system. The fragmented nature of the IRS information systems was highlighted in the 2000 when an inventory was taken, and,

the IRS discovered it had over 130 separate computer systems, running on 1500 mainframe and midrange computers, from 27 vendors, and comprising about 18,000 vendor-supplied software products, and 50 million lines of custom computer code. These were connected through three wide area networks and 1182 local area networks. Although the IRS employed 120,000 people during the peak season it had an inventory of more than 200,000 end-user computers, partly because many users needed more than one computer to access the numerous incompatible systems and databases (Rossotti 2005a).

The IRS faced several challenges as it set out to transform its technology infrastructure. First, the ambitious plan aimed to replace the IRS's entire IT environment in a 10-15 year time frame. Due to previous failed modernization attempts, there was a strong possibility that the scope and budget of the project could be reduced if the program encountered technical problems.

Another significant challenge was security; it was paramount that taxpayer data was protected, private, and secure, and this level of protection was generally more than what was required by the private sector. Legacy IRS systems that held sensitive data would need to communicate with the newer systems, although this networking would pose significant security concerns.

The third challenge was related to the IRS customers—the taxpayer. In order to achieve the desired results, taxpayers would need to change their habits and voluntarily start using new on-line services. Consequently, the interfaces and services would need to be very customer friendly and efficient. The IRS' core competence, however, was writing and enforcing tax regulations, not developing and marketing user-friendly information technology.

The final challenge was distributional. Private firms had developed sophisticated software to help companies and individuals file electronic tax returns, which these firms would forward to the IRS. The IRS had to decide whether to stay with these private service providers, or provide these services organically (and, as a result, become a consumer software company) (Rossotti 2005a).

Business System Modernization

The IRS's initiated its new modernization plan, dubbed the "Business System Modernization" plan, in fiscal year 1999. The program was originally budgeted to cost \$10 billion and be fully implemented over a 15 year period. Computer Sciences Corporation (CSC), a leading global information technologies services company, was selected as the prime contractor to assist with designing and integrating new information systems to replace the old ones². The plan includes numerous tax administration, internal management and IT infrastructure projects, expanding taxpayer services and improving internal business efficiencies. The goal of this program is to integrate the business side of the IRS with its technology operations. Within this overall plan, the IRS tries to break down the large projects into 12 month efforts that can quickly show a visible return, while moving toward the long-term objective. The IRS still faces the challenge of changing the implementing reforms while keeping the current system functioning, but Richard Spires, the IRS's former Chief Information Officer and current deputy commissioner for operations support, said he likes such challenges. The process was likened to "trying to change the engines on a jumbo jet while it's in flight, and you don't have a complete set of blueprints to know how the original engine was put together" by W. Todd Grams, the IRS' chief information officer from 2003 to 2006 (Weigelt 2007). Citing cost overruns and schedule slippages, the IRS replaced CSC as the prime system integration for the project in 2005 although the IRS has retained the services of CSC as the prime contractor (Treasury Inspector General for Tax Administration 2008). Performance of the program has improved since the IRS took over management of the project (Treasury Inspector General for Tax Administration 2008).

² Citing cost overruns and schedule slippages, IRS replaced CSC as the prime system integrator for the project, but retained the services of CSC.

IV. Barriers to change

There were, and remain, numerous barriers to change in any transformation process. Some of the key issues are:

Resistance to Change

To successfully transform the IRS, its values, organization, and processes had to be changed. For example, the IRS had spent years developing processes and values that focused on taxpayer compliance. This adversarial focus created an atmosphere of distrust not only between the IRS and taxpayers, but also within the organization itself. IRS employees did not trust management, field managers did not trust the national office, and IRS and Treasury staff did not trust one another. The distrust also undermined the IRS's relationship with other entities, such as its own vendors and Congress (Rossotti 2005a). If the IRS was to successfully meet their new mission, the culture of the IRS would need to change towards a more open and customer service oriented focus. Employees, however, tend to resist disruptive change that alters the status quo, a condition that exists regardless of industry. For this reason, Commissioner Rossotti believed the greatest barrier to transforming the IRS would be to convince his employees that change was necessary and possible. Change would only be successful if he could get his employees to buy into his new vision (Butterfield 2006).

Complex legacy systems

The IRS was dependent upon a patchwork of legacy systems. A central component of the IRS tax processing system, the Master File System, was developed in the 1960s in Assembly language³. Assembly language is seldom employed anywhere today, and has the severe limitations of 40-year-old technology. Additionally, thousands of changes have been made to the files and programs, some very specific to comply with tax code changes or IRS procedures. Finding trained programmers to even make mandatory changes in response to the evolving tax law is difficult, and outside experts are frequently required make even basic updates. The IRS still uses this system to maintain information accounts on all taxpayers—which may be the largest databases in the world. Another major system, the Integrated Data Retrieval System (IDRS), which allows IRS employees to query and send updates to the taxpayer files, last updated in 1985 uses hard to remember codes and is hard to master. Many other systems performing specific functions had been added over the years as the tax code evolved, to provide workarounds or to extract particular data from these two major systems, and as new technology became available (Broache 2007).

This network of systems was never designed or planned to work as a single system. Consequently, current data on taxpayers was often inconsistent, imposing immense burdens on taxpayers and employees who used the systems. Making changes to cope with new tax laws or new services was extremely slow and unreliable. Due to its technical limitations, the IRS could not provide e-government services to its customers. Finally, any modernization of the system would have to take place while the old system remained active—no significant downtime could be tolerated.

³ Assembly language is a low-level language for programming computers that uses difficult to understand commands.

Resources

Successful transformation requires adequate resources, in terms of both personnel and funding. Instability in budgeting can undermine reform efforts by altering the amount and timing of funds available to pursue modernization efforts. For example, the IRS's original modernization program estimated that the project spend \$8 billion and be halfway complete in 2008, but as of June 2008 the program had only spent "\$2.5 billion for contractor services and \$310 million on the program" (Aitoro 2008). Another problem highlighted by the IRS's experience is that a problem in the development or implementation of a reform effort—such as a rise in cost or delay in rollout—can lead to the cancellation of the entire reform program. A business is only as effective as its employees. The IRS needs the right people, with the right training, to do their job well. Due to the restructuring of the IRS, such change may require the hiring of people with different skill sets than current employees—a process that is stymied by the lengthy hiring practices of the federal government.

Political

Congress plays an important oversight function over federal agencies. Due to previous failed modernization attempts, however, Congress may be inclined to micromanage IRS reform. For example, "Congress added numerous mandates to legislate improved service. One provision directed that hundreds of new phone numbers be published despite there being no one at these locations to answer these calls" (Rossotti 2005a). Some legislative efforts ultimately undermine positive reform efforts pursued by IRS leadership. Congress is also responsible for much of the regulation and fiscal instability that limit the resources required for transformation, as described above.

Insufficient knowledge at program initiation

Larger and software intensive projects tend to carry higher risks than smaller projects and non-software intensive project, in part because knowledge associated with both larger and software intensive projects is generally lower than other projects. The Business System Modernization plan was both large and software-intensive. Officials from both IRS and CSC have stated that they underestimated the amount of effort that would be needed to complete the project (Varon 2004). Initial problems compounded as the IRS "did not follow its own procedures for developing the new systems and failed to give consistent direction and oversight" to CSC (Varon 2004). Problems centered on a lack of consensus regarding the purpose and objective of the project, along with constantly changing program requirements.

Successfully overcoming the above barriers and implementing transformative change in long-established organizations requires committed leadership. Without this leadership at the highest level of the agency (i.e. the steadfast leadership of the new Director), this transformation effort would not have been successful. Treasury Department executives and other leaders sought out Mr. Rossotti because of his strong background in private business and significant knowledge and experience in organizational management, as the CEO of a large consulting firm specializing in the modernization of large data systems (Rainey 2006). The Director provided the vision, sponsorship, planning, and resources, while managing the change of the organization's culture. Once the plans were drawn up to reform the organization, he and his leadership team, consulted with every key person who had a stake in their proposal. Rossotti directly communicated the proposed changes and their rationale. He also requested that these key stakeholders participate in

the changes process, securing their “buy in” and building support for the change (Rossotti 2005a).

V. Progress

The purpose of the Business System Modernization program was to update the IRS business systems, elevating them to a level equivalent to best practices in the private and public sectors, while managing the inherent risks of the process. However, in the end, this transformation required not only overhauling the complex and outdated computer systems, but also reorganizing the agency and reengineering processes, on the road to ultimately rebuilding the public’s trust in the agency. The organization was reorganized from top to bottom, including eliminating and refilling more than two thousand executive and senior management jobs while eliminating several management layers. The IRS has upgraded their traditional services, and also offered new online services for filing returns, paying taxes, and getting tax information. Despite a number of successes, however, oversight agencies are still “unclear when this effort will be completed or if it will be fully successful” (GAO 2008c).

Public and Congressional frustration with the operation of IRS prompted a crisis situation that prompted the IRS to change. Notably, the pressure actually served to break through the cultural resistance and enabled the organizational and procedural changes, which has derailed many such efforts in other organizations. This laid the foundation for the technology modernization.

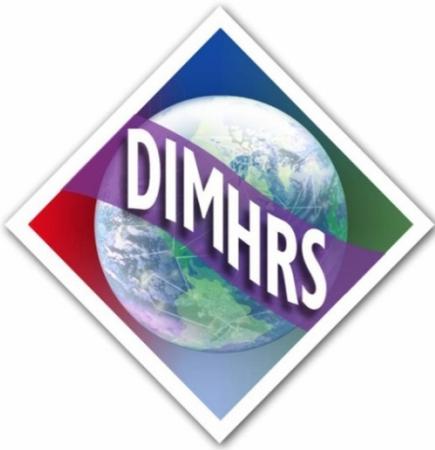
B. Business Transformation Agency Case Studies

1. Defense Integrated Military Human Resource System

I. Introduction

The Defense Integrated Military Human Resources System (DIMHRS) is the DoD's current program to develop and field a comprehensive all-Service, all-Component, military personnel and pay system that will support military personnel throughout their careers and into retirement, in both peacetime as well as war. The program has experienced a number of delays, and in early 2009 was restructured by the Deputy Secretary of Defense; its current schedule is undetermined. This case represents the challenges DoD faces as it attempts large defense business transformation projects.

II. Background



DoD has had longstanding issues with its human resource and payment systems. The issue took on renewed importance after the 1991 Persian Gulf War, which highlighted the deficiencies of the current structure. By that point in time, the services were using a hodgepodge of personnel and pay systems—comprising almost a thousand legacy systems—that were technologically outdated and neither integrated nor interoperable.

This inefficient and outdated personnel and payment structure created many managerial problems for DoD. The military services were unable to provide timely or accurate data on deployment mobilization and in-theater assets. Joint operational commanders were unable to locate deployed military personnel, making it difficult to assess operational capabilities and properly allocate people. When information was required, service members usually had to manually sort through information provided by a multitude of databases that were not interoperable. Often, information was inaccurate and incomplete. These errors and omissions often generated errors in pay, benefits, and service credit—especially for reserves as they mobilized to active duty (Defense Science Board 1996). In the Army, for example, multi-component units (those made up of soldiers from active duty, the National Guard, and the Army Reserve) had to deal with six different personnel systems and three pay systems. Differences in processes and data made and continue to make oversight and management difficult at all levels of the DoD (Swatloski 2007).

In February 1996, the Under Secretary of Defense for Acquisition and Technology Dr. Paul Kaminski, convened the Defense Science Board Task Force on Military Personnel Information Management to advise the Secretary of Defense on the best strategy for supporting military personnel and pay functions (Kaminski 1996). The Task

Force concluded that “the present situation, in which the Services develop and maintain multiple Service-unique military personnel and pay systems, has led to significant functional shortcomings (particularly in the joint arena) and excessive costs for system development and maintenance for the Department of Defense” (Defense Science Board 1996). To address these shortcomings, the Task Force recommended that the DoD transition to a single all-Service and all-component, fully-integrated personnel and pay system, with a common-core software built on a Commercial-off-the-shelf (COTS) human resource software application base (Defense Science Board 1996).

Recognizing the need to modernize and integrate, DoD-wide, its personnel and payroll systems, DoD moved forward with the recommendation to develop and field a new enterprise system. In early 1998, the Under Secretary of Defense for Personnel and Readiness approved the Mission Needs Statement for a single, comprehensive and fully-integrated personnel and pay management system (DoD IG 2003).

The Defense Integrated Military Human Resources System (DIMHRS) as established to address this need. Specifically, DIMHRS would be designed to provide:

1. Accurate and timely personnel data
2. Standard data for comparison across the services and other components
3. Tracking information on reservists for both pay and service credit
4. Tracking information on military personnel in and out of theater
5. Integrated personnel and pay functions (BTA 2009d)

System capabilities

When implemented, DIMHRS plans to provide each Service member with a single, comprehensive record-of-service which he/she can be update. These records can be viewed 24 hours a day, 7 days a week, by Service personnel chiefs, Combatant Commanders, military personnel, and pay managers. A user will be able to initiate requests for assignments, training, retirement, record updates, and many other personnel and pay actions—without the need for traditional, time-consuming and costly written or verbal processes. The system will provide for real-time functionality in a paperless environment.

DIMHRS will have a core system (comprised of software and databases) that provides support to processes that are common to all components and services (see figure 15). This core system will collect, store, pass, process, and report personnel and pay data for all DoD Active Duty, Reserve, Guard, and retired personnel.

Figure 15: DIMHRS Summary

DIMHRS Summary

“The particular system will be the largest rollout in the history of the planet...” Major General Carlos “Butch” Pair, Formerly the DBSAE, Business Transformation Agency

<p>Functionality</p> <ul style="list-style-type: none">a. DIMHRS is a fully integrated personnel and pay systemb. DIMHRS offers Web-based, 24/7 accessibilityc. Improved customer serviced. Offers Combatant Commanders seamless strength management and accountinge. Allows greater flexibility through self servicef. DIMHRS will subsume multiple legacy systems and databasesg. All Business Processes were completely redesigned to eliminate workload and provide the desired results	<p>Implementation</p> <ul style="list-style-type: none">a. DoD-directed implementation; Army is the first user, followed by incremental deployment to other servicesb. Fielding of revolutionary base enterprise system augmented by future department specific modificationsc. Commercial-off-the-Shelf (COTS)
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Initial Contract Structure

In March 2001, after a competitive selection process, DoD selected PeopleSoft as the COTS platform for DIMHRS. The PeopleSoft system was chosen because of its robust human capital management capabilities and the company’s history of working with large institutions (Parth 2004). The Space and Naval Warfare Systems Command (SPAWAR) IT Center in New Orleans, the contracting agency for DIMHRS, then subsequently awarded five \$1 million firm fixed-price contracts to companies to develop system specifications, perform risk assessments and draft program management plans for the complete DIMHRS (Onley 2002). The contract specified that the DoD was committed to using the PeopleSoft base system without modification, except where necessary, to meet mission-essential requirements. Computer Sciences Corp., Falls Church, Va.; IBM Corp., Bethesda, Md.; Northrop Grumman Information Technology, McLean, Va.; Lockheed Martin Systems Integration, Owego, N.Y.; and PricewaterhouseCoopers Consulting, Fairfax, Va. received contracts in September 2002 (Dorobek 2002; Onley 2002). One year later, in September 2003, Northrop Grumman was awarded the full contract to develop and implement DIMHRS (French 2003). Northrop Grumman was also contracted to provide alternatives and recommendations for addressing functional gaps, requirements not supported by PeopleSoft. The contract was valued at \$281 million (Tiboni 2006). When fully operational, DoD believes that DIMHRS will provide service to over 3.1 million service members and replace or subsume approximately 81 legacy personnel and finance systems (Jackson 2003a).

Initial problems

DIMHRS has encountered a number of technical, cost, and schedule issues since project initiation. Initial problems were caused by the extremely ambitious nature and scale of the program, which was not fully appreciated, and concerns over the COTS-based system as PeopleSoft was bought out by Oracle in June 2005. Due to these concerns, the Office of the Secretary of Defense (OSD) leadership team issued a strategic pause, along with a “red team” review, to determine the program’s feasibility in July 2005. A few months later, in December 2005, the red team concluded that the DIMHRS program was viable and should proceed (DoD IG 2003). In December 2005, the Deputy Secretary of Defense decided to continue the program, but also reassigned it from the Navy to the newly formed Business Transformation Agency (BTA)

Navy Schism

In January 2006, the BTA began reevaluating whether one single human management system was the best solution for the military (Tiboni 2006). While the Army and the Air Force believed that DIMHRS would meet their needs, the Navy asserted that the system would not meet its operational requirements. Therefore, the Navy moved forward to implement its own human management system to replace the handful of disparate pay and personnel systems it currently operated. In June 2006, after completing a feasibility assessment, the Navy expressed a preference to use Marine Corp’s Total Force System (MCTFS), rather than DIMHRS. The Navy selected the MCTFS because it was a proven system that would incur less cost and risk to implement.

While the Defense Business Systems Management Committee (DBSMC) initially approved the decision of the Navy to migrate toward the MCTFS system, Congress objected as the operation of two major human management systems was contrary to previous DoD commitments to deploy one system “to provide a joint, integrated, standardized military personnel and pay system across all military components”—an effort that had already invested hundreds of millions of dollars (GAO 2007d; Sprenger 2007a). Congress placed a provision in the National Defense Authorization Act (NDAA) of 2007 that required the Secretary of the Navy to submit a report to the Government Accountability Office (GAO) by April 25, 2007, justifying its selection of MCTFS. This report required a cost/benefit comparison between MCTFS and DIMHRS, along with an analysis of the compatibility of MCTFS and the DoD Business Enterprise Architecture (BEA). In addition, the NDAA 2007 stipulated that the DBSMC determine, within 120 days after the submission of the report to GAO, whether deployment of MCTFS is in the best interest of the DoD.

The Secretary of the Navy’s report justified the Navy’s preference of MCTFS on the grounds that the system was compatible with the prevailing DoD BEA, the system would cost a comparative or less amount to implement, and the system had lower systemic risks than a system still in development (GAO 2007d). In their evaluation of the report, GAO found that the Navy did not adequately justify its decision to invest in MCTFS. GAO stated that the Navy’s comparative analyses of the two systems were not sufficiently comprehensive, accurate, documented, or credible to justify the Navy’s reasoning (GAO

2007d). The DBSMC eventually decided that it was in the best interest of DoD for the Navy to join the other services in implementing DIMHRS (Miller 2007).

DIMHRS deployment schedule and development problems

Originally scheduled to achieve its initial operating capability (IOC) in the early 2000's, DIMHRS has been rescheduled at least 5 times. As of early 2008, the first phase of DIMHRS was scheduled to "go live" in the Army later that year, with subsequent deployments over a short period of time to the Army National Guard, Army Reserve, Air Force, Air Force National Guard and Air Force Reserves (Swatloski 2007). However, due to a number of issues—most notably the lack of adequate testing of the system's performance on payroll processing, that left destabilizing system issues undiscovered until late in the development process—the schedule and scope of the project were reduced. In April 2008, DIMHRS was rescheduled to deploy to the Army in March 2009, but deployment dates for the other services were not set. Following the review of the program in November 2008, the Army announced that the "revocation of the 1 March 2009 implementation date and suspension of DIMHRS until further notice" (Army DIMHRS Program Office 2009c).

The DIMHRS program has been challenged with ensuring that adequate communications are maintained, between the services and the developers. The Army believed, this was a factor in its difficulty in preparing for the implementation. DoD has made the initiative to improve communications with the Army. In late 2008, DoD formed a "Tiger Team"—composed of representatives from the BTA, Army, and the Defense Finance and Accounting Service—to examine the operational readiness of DIMHRS. The primary goal of the team was to enhance communication between the key stakeholders and "encourage prompt resolution of issues that emerge due to potential differences between DIMHRS' capabilities and Army requirements" (GAO 2008b). Further, the DIMHRS Program Office at BTA alleviated some of the Army's concerns regarding the functionality of DIMHRS by offering virtual training courses to Army personnel to allow hands-on experience and allow feedback to improve the system (Army DIMHRS Program Office 2008a).

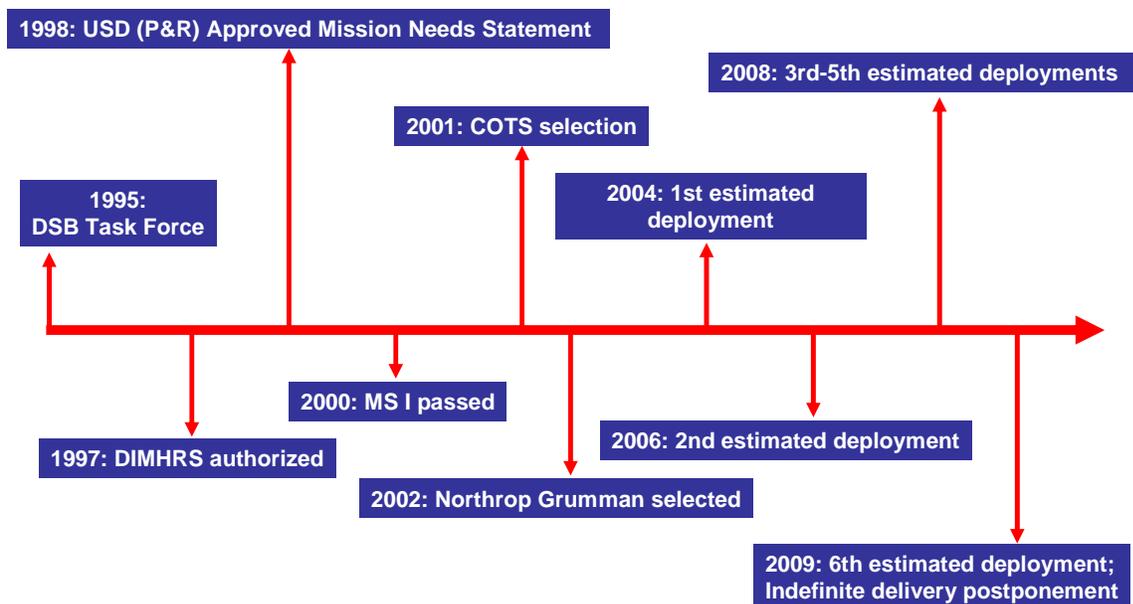
Despite improved communication efforts, DIMHRS continued to experience development problems. In November 2008, Deputy Secretary of Defense Gordon England directed a review of the DIMHRS program to appraise the status and the risks associated with the program's development process. As a result of the review, Deputy Secretary England determined that granting more individual military department level autonomy and flexibility would improve the development process. The military departments, including the Guard and Reserve Components, will agree on the base requirements of the DIMHRS enterprise system, which BTA will then finish developing. After the enterprise DIMHRS system is transferred to individual departments, the individual departments should set up senior level boards to oversee, add on, and implement their own necessary personnel and pay capabilities, although modifications to the base should be kept to a minimum (England 2009). In short, the BTA will develop the base interoperable system, whereupon the military departments will have the opportunity to modify portions of their systems to meet their own specific needs. England believed

that the change of strategy allowing the BTA to complete the core and “pass it on” to the services will speed up the transition to full implementation of DIMHRS within the entire DoD.

The November review postponed deployment of DIMHRS to the Army, without setting a new date, and has adjusted content and date requirements for training. This additional time also allows for an in-depth analysis of the training procedures, and will allow users to become more familiar with DIMHRS prior to implementation through the use of internet resources. This level of training shows a commitment from the Army and DoD to ensure that the soldiers and their supervisors are properly educated and familiar with DIMHRS prior to implementation (Army DIMHRS Program Office 2008b). Despite the focus on training, the delay conveys the continued complexities and communication problems surrounding such a massive business transformation, even, as noted by BTA Director Fisher, DoD “has resisted efforts to tweak the DIMHRS code to its own specifications, which means that the application will be a true commercial system” (Sprenger 2007a). Figure 16 briefly summarizes the complex and long development path DIMHRS has followed.

Figure 16: DIMHRS Development Timeline

DIMHRS Project Timeline



During the lengthy development process of DIMHRS, the cost of the system has increased by several orders of magnitude. The original acquisition cost estimate of

approximately \$6.5 million in 1995 has increased to over \$1 billion in 2008 (GAO 2008b; Murray 2001). Cost estimates in selected years are depicted in Figure 17.

Figure 17: Selected Cost Estimates (June 2001; February 2003; December 2007)

Date	1995	2001	2003	2007
Total Acquisition Cost Estimation (in millions of \$)	\$6.5	\$47.2	\$222.8	\$922.3

III. Potential Benefits

When, and if, fully implemented, DIMHRS should provide significant benefits to the service members, their families, the Services, as well as the combatant commands. Benefits include, first, significantly reducing the occurrence of human errors and lost records, which will improve the overall quality of service the military members and their families receive (Swatloski 2007). Second, the system will allow service members to serve anywhere, with any branch of the service, and still have the ability to handle the administrative functions of their personnel records, as if they were serving on their home base. Third, service members who move from one service to another will find that DIHMRS eliminates the inefficient, error-prone service processes when data are manually reentered into a new component system (Hopkins 2006). Moreover, in multi-component units (active duty, reserve, and national guard), personnel officers in some cases have to deal with as many as six different personnel and pay systems—DIMHRS would cut the interface to one. Fourth, it will help the war planners. Commanders will not only be able to look to a single source for reports and analysis, but will also have the ability to locate soldiers with special qualifications, initiate real-time requests and determine where they have served, particularly in joint combat environments (Swatloski 2007). For example, a commander may want to locate a soldier qualified with Stinger missiles or one that is proficient in Pashto.

IV. Barriers to Change

Skepticism

The scale and scope of DIMHRS have been significantly reduced from its original vision. In contrast, the acquisition cost has increased from approximately \$6.5 million to over \$1 billion, and length of the project is now 15 years (GAO 2008b; Murray 2001). More importantly, as stated by Major General Sean Byrne before the most recent delay, “the program is nowhere near where it should be for a March 1 [2009] fielding” and continues to face significant development challenges ahead (Tice 2009). Overall, many in the armed forces doubt that DIMHRS will be successful. This skepticism may undermine use of and support for DIMHRS.

Cultural Resistance

The military services have tended to resist joint cooperation in order to preserve service traditions and culture. Often, arguments are stated in terms of a DoD-wide system

will not provide a specific service with its own internal specific requirements or a joint system would not be as reliable as service run systems. These issues are highlighted by the Navy's initial resistance to accept DIMHRS. Other sources of cultural resistance arise from those workers who will be negatively impacted by the implementation of a DoD-wide enterprise human management and pay system.

Scale

DIMHRS will provide a comprehensive service to a group of people that is an order of magnitude larger than previous similar systems. As of 2003, the largest PeopleSoft system serviced 300,000 individuals' records. By contrast, when fully operational, DIMHRS will maintain the records for 3 million people (Jackson 2003a). Problems arise because software programs often do not scale easily. Operations that may be sustainable when only a few users access the system do not work when many have access.

Another area of concern is the large number of legacy systems that DIMHRS will need to be interoperable with to operate successfully. At present, DIMHRS will subsume or interface with over 290 legacy information systems in the first deployment phase, up from an original estimate of 113 systems (DoD 2007a; Swatloski 2007). This level of integration presents many known and unknown problems, and presents a significant challenge to implementing a comprehensive DoD-wide enterprise human management system.

Ambitious "Big Bang" Approach

DIMHRS has the ambitious objective of replacing all personnel systems with one single enterprise system. Initially, the program was designed to accomplish this task in one implementation that would provide DoD with revolutionary capability. Even utilizing a COTS based system, DoD quickly discovered that this strategy would have significant difficulty. The current plan, while less ambitious, still represents a significant development challenge. DoD will now field the complete base enterprise system at once, but only to one service, the Army. Subsequent deployments will be fielded to the other services and departments. Individual departments will then have the opportunity to modify the base system to satisfy department-specific requirements. Nonetheless, the Deputy Under Secretary of Defense for Business Transformation Paul Brinkley has referred to the ambitious nature of the first increment as "we're always trying to hit a home run" (Tiboni 2006).

Security concerns

Many critics have raised concerns regarding the security of DIMHRS. The system will retain extensive information on over 3 million service members. The system will be accessible worldwide by service members, commanders, retirees and family members. The DoD, by its nature, provides an enticing target for hackers. How can the system ensure that information will be stored securely, while the information remains reliable and accessible to be of use?

V. Conclusion

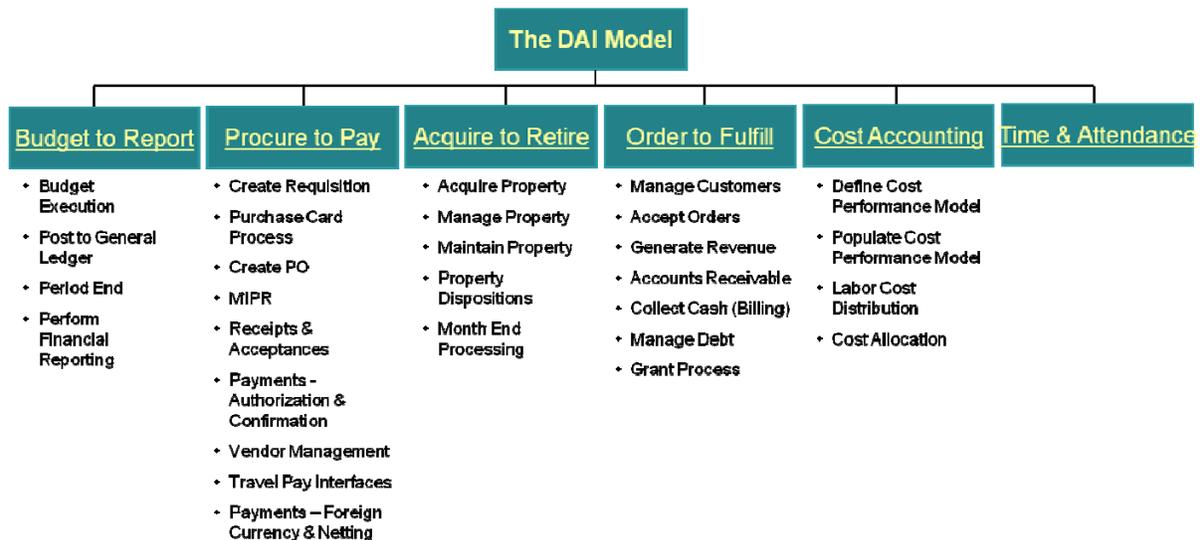
The DIMHRS program provides a great opportunity for DoD to improve its human resources management system by increasing accessibility of information while reducing cost. However, the DIMHRS program has faced, and continues to face, a range of challenges as it attempts to develop and implement one of DoD major defense business transformation projects. DoD leaders have attempted to address these, however, the program continues to be plagued with problems, and its future remains uncertain.

2. Defense Agencies Initiative (DAI)

I. Background

The Defense Agencies Initiative (DAI) represents the BTA’s effort to modernize Defense Agencies’ financial management processes by streamlining financial management capabilities, eliminating documented material weaknesses, and achieving financial statement auditability. DAI is intended to be a standardized financial management solution set for the 28 Agencies and field activities within the DoD. When DAI reaches its initial operating capability, it will provide six end-to-end business functions including: procure to pay, order to fulfill, acquire to retire, budget to report, cost accounting, grants accounting, and time and attendance (see figure 18)

Figure 18: Defense Agencies Initiative End-to-End Capabilities



DAI will provide several benefits to DoD. Specifically, it will provide common business processes and data standards; access to real-time financial data transactions; reduce data reconciliation requirements; enhance analysis and decision support capabilities; standardize line of accounting with the use of the Standard Financial Information Structure (SFIS); and use the U.S. Standard General Ledger Chart of Accounts to resolve DoD material weaknesses and deficiencies. DAI uses a Commercial-off-the-Shelf product (Oracle Federal Financial) that is based on a common global set of configurations--which are based on the Federal Financial Management Improvement Act (FFMIA), Business Enterprise Architecture (BEA), and the out-of-the-box capability of the COTS solution--and industry best practices (DoD 2006e).

II. Business Transformation Agency Pilot

During the design phase of the DAI ERP system, there was a great deal of skepticism that a commercial product could do most of the functions that the many legacy systems were designed to do. This was an important contributor to the resistance from the legacy domain owners. The pilot program at BTA intends to prove that a single ERP system can execute the functions of the legacy systems in a more efficient manner. It will also serve as an example for future ERP implementations at DoD.

In the first wave of deployment for DAI, six agencies will implement the ERP system (see figure 19). The BTA served as the test site for the DAI pilot, but was designed to address only the procure-to-pay capability, while IOC for the first wave of implementation includes the six capabilities mentioned above. The procure-to-pay system went live in October 2008 after 12 months of development and a cost of approximately \$20 million, a large portion of which went towards building the global model that will benefit all the agencies that will eventually implement the DAI ERP (Fisher 2009).

Figure 19: DAI Wave 1 Implementation Schedule

Wave 1 Implementations
Business Transformation Agency (BTA)
Defense Threat Reduction Agency (DTRA)
Defense Advanced Research Projects Agency (DARPA)
Defense Technical Information Center (DTIC)
Missile Defense Agency (MDA)
Defense Information Systems Agency (DISA)

This implementation of DAI at BTA is considered a success for several reasons. First, DAI was designed around end-to-end capabilities, not individual functions. This is in line with the department's business enterprise priorities as prescribed in the Enterprise Transition Plan. Second, only seven interfaces with legacy systems were used. Interfaces with legacy systems can be costly and reduce the potential benefits of ERP systems. Third, the BTA used a minimally sufficient solution to solve the material weaknesses of the agency's financial system. The initial capability of the DAI pilot used the COTS software capabilities to the maximum extent possible and only added on special requirement when it was absolutely necessary. This was possible because there was a single point of accountability, the Director of the BTA. He had the authority to reject requests for specialization in order to get the system deployed sooner. Fourth, there was strong, visible, and consistent leadership that was focused on the development of this pilot program. The Director was involved on a daily basis with the development of the pilot, and was able to direct a considerable amount of resources towards its success. Fifth, other agencies involved in DAI have been very cooperative and helpful. Every agency that is involved in the first wave of deployment has dedicated full time employees and contractors to cooperate with BTA to make process decisions. The agencies themselves have nominated leaders, and have their employees share and participate in the development of the actual system. BTA leadership hopes this will achieve buy-in from the other agencies. It will not be possible, however, to measure the program's success until DAI is implemented at the other agencies. Finally, BTA employees are leading the implementation, not the contractors. Although the contractors still play a major role in providing support staff and developing training material, the programs leaders are government employees. This supports the development of internal ERP implementation skills and experience, which can continue to help drive change in the future.

III. Challenges to further implementation

On the path to the successful implementation of the DAI's procure-to-pay system, the BTA faced significant challenges. From the outset, there were institutional barriers that impeded its

implementation. There are many DoD policies that require the use of specific legacy systems. In order to create an ERP system built on end-to-end capabilities, BTA needed the DBSMC to grant a waiver of these policies. It is not clear how this will be resolved when the DAI expands to the other Agencies in the first wave of implementation.

Moreover, there were major problems with reconciling the legacy data for use with the new system. There are two important steps in the legacy data conversion process: data reconciliation (summary data to line item data), and entering the data into the ERP. For the pilot program, data reconciliation was very challenging; approximately 35-40 percent of the data that was not reconcilable. In order to address this problem, BTA leadership directed the staff to manually reconcile the data. After approximately 70 days and hundreds of hours of painstaking work, virtually all of the data was reconciled (Fisher 2009). Achieving this required the Director to make data reconciliation one of the BTA's top priorities, and, in many cases, tell his staff to stop what they are doing and focus their energy on this task. In the end, this task required BTA's Director to be involved on a daily basis. It is not clear that other agency directors will have the same ability to dedicate this amount of resources to data reconciliation.

Another major challenge going forward is whether or not leadership will have the discipline to stick to the minimally sufficient solution. COTS products are inherently embedded with industry best practices and technologies. Special requirements on COTS products can lead to both cost overruns and deployment delays. Leadership at the other agencies participating in the DAI initiative will need to show leadership and resist the temptation to accommodate COTS software to specific agency needs.

Despite the success at the BTA, the real measure of success of DAI will be how many other defense agencies implement the program.

3. Interim Voting Assistance Program

This was a program that had languished for a long time, and we turned it around in 22 days and delivered it on schedule, this is pretty unprecedented in government.

Paul Brinkley (Onley 2006a)

I. Introduction

Although this program didn't precisely fit into the BTA's Business Enterprise Priorities (BEPs) as prescribed in the Enterprise Transition Plan (ETP), it is an enterprise wide solution to a problem that affects all the components, with the ultimate goal to support the warfighter. The Interim Voting Assistance System (IVAS) is an easy-to-use, secure, online DoD enterprise-wide system that helps overseas military personnel and U.S. citizens request and receive absentee ballot packages. It was developed and deployed by the BTA using Commercial off the Shelf in less than a month.

II. Background

For years, DoD has attempted to improve the process of absentee voting of the Service members and their dependants. The presidential election in 2000, with its narrow margin of victory and associated controversies, raised concerns about the extent to which members of the military, their dependents, and U.S. citizens living abroad were able to vote via absentee ballot. Although, as a rule, individual states and their election jurisdictions control the elections process, states have considerable discretion in how they organize the elections. As a result, there are a variety of processes and deadlines for voter registration and absentee voting (including military and overseas voters). Although the Help America Vote Act of 2002 imposed some requirements on the states, such as statewide voter registration systems, the law did not require that these be implemented uniformly.

The Uniformed and Overseas Citizens Absentee Voting Act (UOCAVA) was enacted in August 1986, during the Reagan administration. This law requires that the states and territories allow certain groups of citizens (members of the U.S. Uniformed Services and merchant marine; their family members; and U.S. citizens residing outside the United States) to register and vote absentee in elections for Federal offices. The Secretary of Defense, or his designee, is designated as the DoD official responsible for carrying out the federal functions under UOCAVA. The Secretary of Defense designated the Under Secretary of Defense for Personnel and Readiness (USD P&R) with the responsibility for administering the program. The Federal Voting Assistance Program (FVAP) manages the program for the Under Secretary. The, then existing, absentee voting process (which was managed using the mail system), was generally slow and inefficient, and frequently numerous ballots were not received in time to be counted.

In September 2004, Congress funded a program to deliver absentee ballots electronically, and DoD implemented the first Interim Voting Assistance System (IVAS), an electronic ballot delivery system, as an alternative to the traditional mail process. The 2004 IVAS was more of a voluntary pilot program for absentee voters to use an electronic method to request and receive ballots, and was only offered in 108 counties in eight states, and one territory. This initial attempt achieved minimal success with only 17 voters downloading ballots (DoD 2006c). For the elections in 2006, Congress wanted to provide a more effective electronic system, and provided a

funding of \$ 2.5 million dollars for its implementation. In August 2006, the Deputy Under Secretary of Defense for Personal and Readiness (DUSD–P&R) was tasked to develop a more effective absentee voting system using information technology, and requested support from the BTA. “They asked us to come over to hear their situation; this is exactly the reason the BTA was stood up at the enterprise level. This was a great little project to hone our skills on;” recalled Major Gen. Carlos “Butch” Pair (Onley 2006a). The challenge was that this enterprise-wide application had to go live in about three weeks.

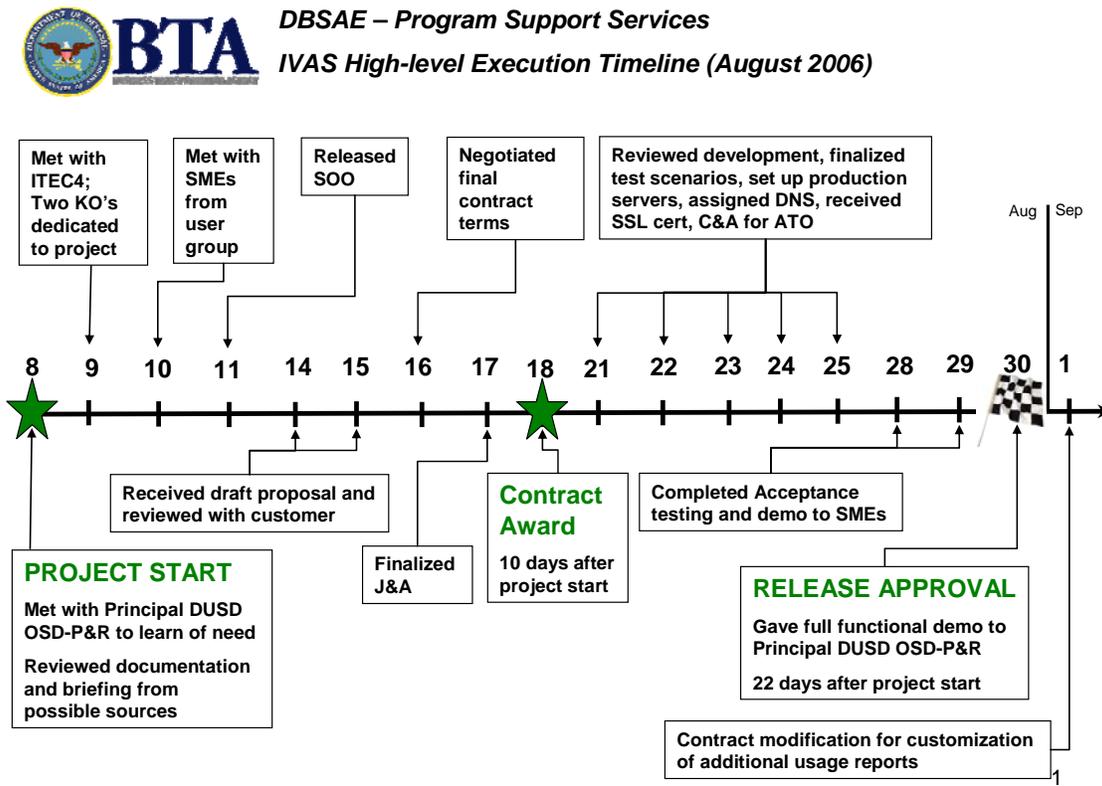
III. The IVAS (2006) Program

Immediately after the initial request and meeting on August 8, the BTA put together a cross-functional team that included systems engineers and two contracting officials. The program’s objective was to allow absentee voters (initially only DoD personnel and overseas DoD contractors with a Common Access Card) to request, receive, and access ballots through a secure (128-bit encrypted) internet connection; and then mail or fax out the filled ballot, according to the applicable state law. The vendor, PostX Corp., offered a secure email product that was used extensively in the healthcare and financial industries, and the BTA helped secure the sole-source contract, valued at \$838,000. The look and feel of this COTS application was customized, with direction from the BTA, to quickly meet this requirement (Ambrose 2007).

In September 2006, also just two months away from an election, FVAP and DoD coordinated to launch the Integrated Voting Alternative Site (also IVAS) as a follow-up to the 2004 Interim Voting Assistance System. A major improvement of the 2006 IVAS was that it provided information on electronic ballot requests and receipt options for all UOCAVA citizens in all 55 states and territories (GAO 2007e).

When completed, the application provided two different log-in screens; one for the absentee voter, and the other for the election official in the voting jurisdiction. When a voter logs-in, the name is validated against DoD’s Defense Enrollment Eligibility Reporting System (DEERS). The absentee voter then follows the step-by-step instructions, using a user-friendly interface, and sends out a request for a ballot. The local voting official uploads a ballot package, which is secured, and is then sent out as a PDF file to the voter. The voter then receives a secure email message, is able to download the ballot, fill it out, and mails it back with a tracking number. When the ballot is received, the voting official inputs the tracking number into the system, which sends out an automated message to the absentee voter and alerts him that his vote has been received. The development and testing of the technical solution was overseen by the BTA, while the coordination with, and training of, the voting officials was managed by the FVAP (Ambrose 2007). The BTA was able to achieve its goal to deliver this enterprise-wide solution in a short time frame; figure 20 proved a high level timeline of the 2006 IVAS initiative.

Figure 20: IVAS Timeline (Ambrose 2007)



IV. Key Challenges

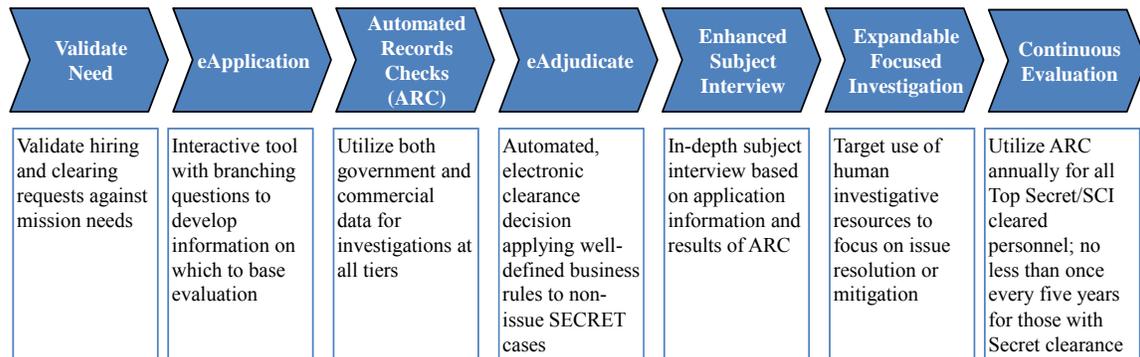
DoD encountered two key challenges during the implementation of IVAS. The first major challenge was the very short program timeline. This enterprise application had to be completed within three weeks so that the program could be rolled out in time for Armed Forces voter week, which is considered the final week for overseas military personnel to submit absentee ballot requests that safely meet most state deadlines. It took two of those three weeks to get the sole-source justification in place and the contract signed (Ambrose 2007). The second major challenge was that the final implementation had to interface with all 55 voting jurisdictions and comply with all the applicable statutes. Then, every appropriate official at the county level had to be trained, and receive a system login ID (Ambrose 2007).

4. Security Clearance Reform

Streamlining the security clearance process has been a DoD priority for several years, since, ultimately, it affects the ability of all agencies within the department to perform their missions.⁴ Additionally, in 2004, Congress passed the Intelligence Reform and Terrorism Prevention Act (IRTPA), which mandates reforms to the process of obtaining a security clearance for all agencies that grant them, including DoD. Specifically, the Act mandates agencies to make decisions on at least 80 percent of all applications for a security clearance within 120 days (90 for investigation and 30 for adjudication). In addition, this Act requires agencies to make a determination on at least 90 percent of security clearance applications within 60 days by December 2009. Furthermore, DoD’s personnel security clearance program was placed on GAO’s high risk list of programs in 2005 (and again in 2007). Although it is likely that DoD will not achieve this goal, it has significantly improved the process.

The BTA, teamed with the OSD Lean Six Sigma (LSS) office, the Office of the Director of National Intelligence, the Office of Management and Budget, and the Office of Personnel Management to transform the security clearance process. Using LSS methodology, the team proposed a solution that employs updated standards, methods, tools, and technologies to ensure effective and efficient performance in the security clearance process across the U.S. government. The challenge was to go beyond using IT to automate the existing process, but to reengineer and optimize each segment of the security clearance process. In their Initial Report on Security and Suitability Process Reform, released in April 2008, the team provided a framework to make the hiring and clearing process more efficient by aligning processes, enabling the application of consistent standards and the reciprocal recognition of investigations. This framework is described in Figure 21 (DoD 2008b).

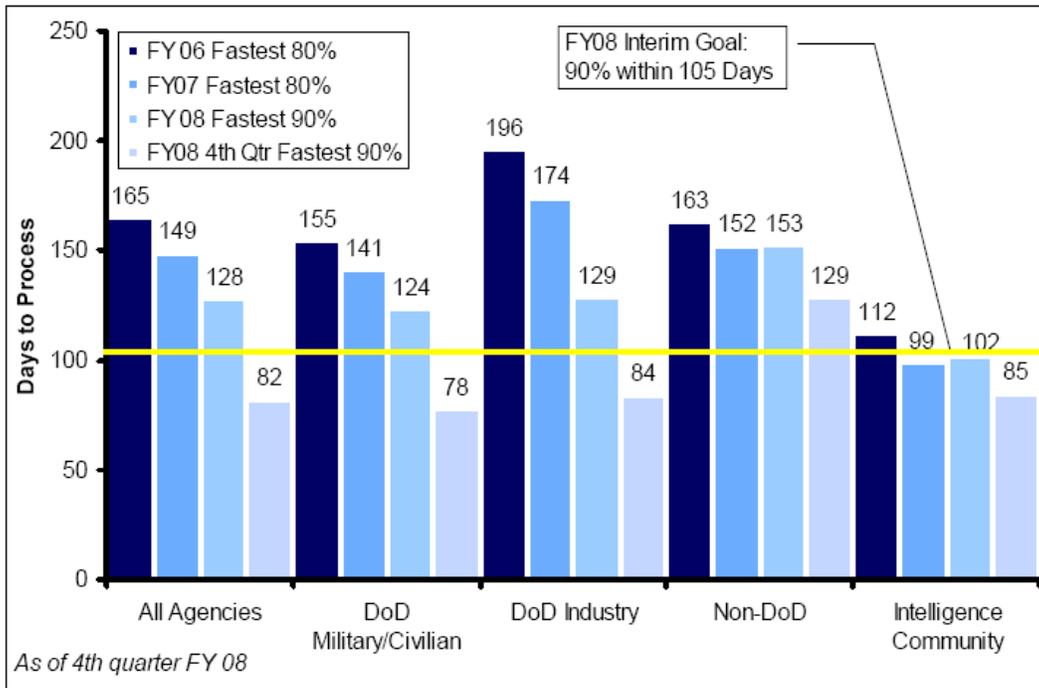
Figure 21: Streamlined Security Clearance Framework



In FY 2008, DoD processed 360,000 of its 450,000 initial application for confidential, secret and top secret clearances within an average of 87 days, up from an average of over 120 days just 2 years before. In addition, DoD is continuing to improve its performance. By October 2008, the wait time for 80% of clearance cases was reduced to about 76 days. Figure 22 demonstrates the results of the improved process (DoD 2009).

⁴ In FY 2008, DoD approved 630,000 personnel security clearances for initial and renewal of confidential, secret, and top secret clearances, for DoD’s military and civilian, as well as industry personnel.

Figure 22: Security Clearance Process Performance Improvement (Current Averages—Initial Investigations)



C. Business Transformation in the Services

1. Navy ERP

I. Introduction

Similar to the situation of DoD, as well as other Components, the Navy still depends on numerous legacy business systems that were originally created in the 1960s that are non-integrated, non-interoperable, and redundant. The maintenance of these legacy systems not only required the skills of experienced software professionals, but they are also expensive to operate and maintain. In 1999, the Department of the Navy (DON) began a transformation program that is now beginning to bear fruit. And although they have achieved considerable progress, major challenges remain.

II. Background

The Navy has tens of billions in assets and an operating budget in FY 2008 of around \$140B (Department of the Navy 2007). The Navy depends on over 900 business systems to manage these assets, its operation budget, and its operations. Included in the FY 2008 budget was about \$2.7 billion for business systems and associated infrastructure, \$2.2 billion of which was allocated to operations and maintenance of existing systems and the remaining \$500M was allocated to systems development and modernization (GAO 2008d). These figures help demonstrate the need to modernize business systems in order to improve efficiency and performance while reducing costs.

The Navy Enterprise Resource Planning (ERP) program began in 1998 when the Navy established an executive committee to look for opportunities to modernize and transform business affairs. The Commercial Business Practices Working Group, which was comprised of members from financial management organizations across the Navy, recommended that the adoption of enterprise resource planning as a foundation for business systems modernization. As a result, the DON established four pilot programs focusing on logistics, financial management, and program management; a primary objective was to create a single source data entry system to eliminate redundancy, and reduce business systems and interfaces, where possible. These pilot programs would test the feasibility of applying COTS ERP solution within the Navy (Carver, Jackson 2006; GAO 2005d; Veit 2005).

III. Navy ERP Pilot Programs

Beginning in 1999, the four pilot programs delivered concrete improvements in operational capability to the Navy component in which they were deployed. Although the Navy allowed each program to independently choose a Commercial-Off-the-Shelf (COTS) ERP software and independent contractor and systems integrator, each pilot program independently selected SAP ERP software. This turned out to be very beneficial as the four pilots were eventually merged into a Navy-wide business solution. If the pilots programs had decided to use different software, their convergence would have been more complicated.

The four pilot programs each had the same goals of producing higher-quality financial information to support better operational and resource allocation decisions, which ultimately support the warfighter. However, each pilot program was designed to address different functional

areas including logistics, financial management and program management (see figure 23) (Veit 2005; DoD 2007a).

SIGMA

The SIGMA pilot was deployed at Naval Air Systems Command (NAVAIR), and is designed to support and link business functions such as program management, contracting, financial management, and human resources management.

Though NAVAIR is just one department of the Navy, it plays a critical role in the achieving the mission of the Navy. NAVAIR provides unique engineering, development, testing, evaluation, in-service support, and program management capabilities to deliver airborne weapons systems that are technologically superior and readily available. All naval aircraft testing and evaluation takes place in one of the eight facilities operated by NAVAIR, which employ over 32,000 civilians and maintains over 4,000 aircraft.

SIGMA was the largest of the four pilot programs and officially began in February 2000. Through a competitive process, NAVAIR settled on the SAP ERP solution and chose KPMG (Now BearingPoint) to be the lead systems integrator of the project. After training for over 22,000 users, SIGMA “went live” in October 2002 (Carver, Jackson 2006).

The SIGMA program, with a total cost through 2004 of \$215.9 M, replaced 59 legacy systems and significantly improved performance (DoD 2005). SIGMA enabled accurate real-time information in one integrated system using common processes with a single integrated database. SIGMA eventually became the financial system of record for NAVAIR and as a result, it reduced financial statement processing time by 66% and cut engineering change proposal approval times from an average of 87 days to 25 days (DoD 2005; GAO 2008d; Veit 2005).

CABRILLO

The CABRILLO pilot was deployed at Space and Naval Warfare Systems Command (SPAWAR), and is designed to support Navy Working Capital Fund financial management. SPAWAR, which aims to deliver knowledge superiority to the warfighter, maintains its stated mission to invent, acquire, develop, deliver and support integrated & interoperable C4ISR, business IT and space capabilities in the interest of national defense.

The main priority of the CABRILLO program was to implement new financial management processes using enterprise resource planning. Through this, SPAWAR put a strong focus on eliminating existing internal business processes and interfaces where possible and to create a single source data entry system in order to improve data integration. The end-state goal was to eliminate 99% of all internal business processes and interfaces, with an immediate goal of 75% (Frye 2001).

Project CABRILLO went live at SPAWAR Support System Center in San Diego in 2001 with 3,500 users. Some major accomplishments of CABRILLO include a 50% reduction in the annual cost of business systems support, and reduced acquisition requisition-to-order processing time from 44 days to 44 minutes (DoD 2005; GAO 2008d; Veit 2005).

NEMAIS

The Navy Enterprise Maintenance Automated Information System (NEMAIS) pilot was deployed at Naval Sea Systems Command (NAVSEA). NAVSEA engineers, builds, buys, and maintain ships, submarines and combat systems that meet the Fleet's current and future operational requirements. It is the Navy's largest acquisition organization with a FY 2008 budget of \$24.8 B, and a force of 53,000 civilian, military and contract support personnel (NAVSEA Staff 2008).

The primary goal of this ERP program was to support shore based regional maintenance activities and human resources. NAVSEA selected the SAP ERP program and IBM as the lead integrator for the project. Preparations for the implementation of NEMAIS began in June 2000, and "went live" in three regional maintenance centers on the East coast in 2003 and two more on the west coast in 2005 with a total of 10,000 users. Some of the benefits accrued by NEMAIS are a 16% reduction in repair time, immediate job rejection notification (compared to 20 days), and a 43% reduction in the number of processes performed (DoD 2005).

SMART

The Supply Maintenance Aviation Reengineering Team (SMART) pilot ERP was tested by both NAVAIR and NAVSUP. This program was designed to replace outdated supply, maintenance, and financial management systems with a modern, responsive, accurate, and integrated system (NAVSUP Staff 2003).

NAVSUP's primary mission is to provide US naval forces with quality supplies and services, and oversees logistics programs in the areas of supply operations, conventional ordnance, contracting, resale, fuel, transportation and security assistance. Before NAVSUP's transition to the SAP ERP program, it was spending around \$55 M annually to operate and maintain legacy systems, and estimated that after full integration it could generate up to \$100 M in annual savings. Through reduced cycle time, improved visibility of inventory and a single integrated database, the Navy would improve performance and reduce costs (Ahern, Olson, Napoli 2003).

The SMART ERP system went live in January 2003, and successfully closed its books at end of its first month in operation. One of the major accomplishments of SMART was that it processed over one million parts inventory transactions with an error rate of less than one half of one percent and lowered warehouse refusal rate from 3.5 percent to 0.5 percent (DoD 2005).

Program Costs and Issues

The Navy spent an estimated \$1 B from 1998 to 2004 on the four pilot programs. Even though the four pilot programs were limited in scope, they did achieve some improvements in capability. In addition, various inconsistencies in design and implementation developed because the pilots were, for the most part, independently developed with different systems integrators. As a result, the pilot programs were not interoperable, and overall efficiency of the Navy, at the enterprise level, was not improved (see figure 24) (GAO 2005d).

Figure 23: Summary of Navy ERP Pilot Programs

ERP Pilot	Organization	Area of Pilot's Focus	Initial Start	Cost through FY 2004 (in millions)
Cabrillo	Space and Naval Warfare Systems Command	Financial Management <ul style="list-style-type: none"> Navy Working Capital Fund 	June 2000	\$67.4
SMART	Naval Supply Systems Command	Supply Management <ul style="list-style-type: none"> Intermediate-Level Maintenance Management, Interface to Aviation Depots 	August 2000	\$346.4
NEMAIS	Naval Seas Systems Command	Regional Maintenance <ul style="list-style-type: none"> Intermediate-Level Maintenance Management, Project Systems Workforce Management 	June 2000	\$414.6
Sigma	Naval Air Systems Command	Program Management with linkage among: <ul style="list-style-type: none"> Contract Management Financial Management Workforce Management 	May 2001	\$215.9
Total				1,044.3

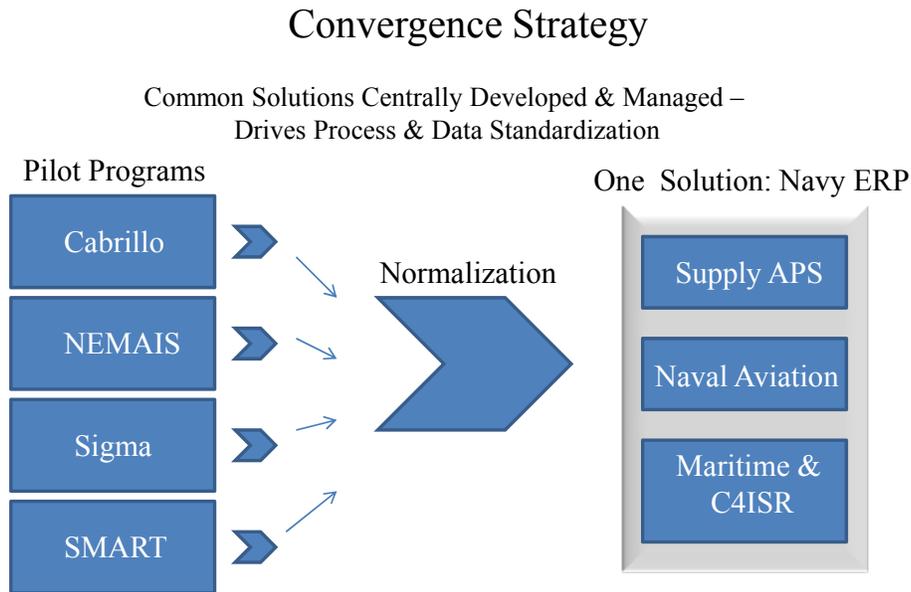
IV. Navy ERP

Convergence of the Four Pilot Programs

Based on the successes (and problems) of the four pilot programs, the Navy decided that it could achieve greater efficiency and mission support capabilities if it were to combine the pilots into a single Navy-wide ERP program. Alone, none of the pilot programs were sufficiently comprehensive and integrated to meet the needs of a Navy-wide ERP. On August 2, 2002, the Secretary of the Navy for Research Development and Acquisition directed the convergence of the four Navy ERP pilot programs (Ahern, Olson, Napoli 2003). In 2003, the Navy ERP Program Office was established under the leadership of Ronald Rosenthal in order to coordinate the development of the Navy ERP using the four pilots as a starting point to produce a seamless, end-to-end business system (see figure 25) (Veit 2005).

The Navy ERP system was a very ambitious business systems modernization program. The end product will be an “integrated business management capability that modernizes and standardizes Navy business operations, provides unprecedented management visibility across the enterprise, and increases the effectiveness and efficiency of the Navy’s support for the warfighter” (Department of the Navy 2008). The Navy ERP will streamline all steps in the current business processes to improve efficiency, improve supply chain integration, reduce costs, and eliminate redundant processes and legacy systems. Navy ERP envisions nine scenarios in which it will integrate business processes: Acquire to Dispose, Plan to Perform, Plan to Pay (including Consignment and External Purchases), Budget to Authorize, Repair to Replenish, Plan to Maintain, Post to Report, Personnel Check In to Check Out, and Create to Maintain — Master Data (The Computerworld Honors Program 2008).

Figure 24: Navy ERP Pilot Convergence Strategy



The Navy is using an incremental strategy to deploy the Navy ERP in order to periodically deliver improvements in operational capability as the program progresses. The first increment, which is also called Template 1 (see figure 26), is expected to be fully deployed in 2013, and will interface with 49 systems, 12 of which are DoD financial systems (GAO 2008d; Robb 2008b). When the final version of the Navy ERP is completed it will upgrade, integrate and standardize business services for more than 83,000 Navy users in 123 locations around the world, and will allow the Navy to eliminate 265 legacy systems (The Computerworld Honors Program 2008).

Figure 25: Navy ERP Template 1 Releases

Navy ERP Template 1 Releases	
Releases	Functionality
1.0 Finance and Acquisition	<ul style="list-style-type: none"> • General Fund and Navy Working Capital Fund finance applications such as billing, budgeting, and cost planning. • Acquisition applications, such as activity based costing, contract awards, and budget exhibits. • Workforce management applications such as personnel administration and training and events management.
1.1 Wholesale and Retail Supply	<ul style="list-style-type: none"> • Wholesale applications such as supply and demand planning, order fulfillment, and supply forecasting. • Retail supply applications such as inventory management, supply and demand processing, and warehouse management.
1.2 Intermediate-Level Maintenance	<ul style="list-style-type: none"> • Maintenance applications such as maintenance management, quality management, and calibration management.

Addressing the Issue of Interoperability

One of the major criticisms of the pilot programs was that there was a lack of centralized oversight of the development of the four pilots. The SAP ERP software includes an important feature that allows a high degree of flexibility so that similar business functions can be processed in different ways depending on how the program is configured. Although each of the pilots chose the SAP software, they each contracted with different systems integrators for support. Each contractor had a different implementation methodology for the ERP software, which contributed to major differences between the software applications for each pilot. Another issue with implementation of the pilots was that each of the developing organizations requested much customization of the COTS software to meet their existing business environment. These two factors contributed to the specialized configuration of the pilots' SAP software, which, in the end, caused integration and interoperability problems at the convergence stage (GAO 2005d).

Based on the successes of the SAP ERP business solution, and in order to maintain continuity from the pilots, the Navy-ERP Program Office decided to continue using the SAP ERP software for the department-wide effort (Robb 2008a). In 2004, the Navy ERP program office awarded BearingPoint a \$176 million contract for full system design, development, and delivery, using the SAP ERP program (GAO 2008d). Contributing to the selection of BearingPoint as the lead systems integrator was that it was also the lead integrator for the largest of the four pilots, SIGMA ERP, at NAVAIR.

BearingPoint remained the lead systems integrator until January 2006, when the Navy ERP Program Office reduced the scope of work from development and integration of the first increment to only development of the first release (Release 1.0 in above table). This change in strategy, by the Navy-ERP Program Office, was based on the need to better manage the systems integrator (BearingPoint), and to minimize the customization of the COTS software. At this point, the Navy ERP Program office assumed full responsibility and accountability for overall systems integration. According to Susan Keen, the technical director of the Navy ERP, this decision was made to reflect observations of ERP implementation in other organizations; specifically, contracting systems integration frequently leads to delays and cost overruns. Assuming the responsibility for overall systems integration allowed Navy ERP Program Office leadership to "manage more at a day-to-day level instead of looking in the rearview mirror 30 days after the systems integrator had been spending money and developing product" (Robb 2008a). This pro-active approach helped to mitigate risks associated with contractors, and ensured greater control over the integration and development process (The Computerworld Honors Program 2008).

The Navy ERP Program Office effectively identified the shortcomings of the management approach taken for the four pilot programs. Through the better use of COTS technology and improved management of systems integration, the Navy has made significant progress toward achieving the Navy ERP program goals.

Avoiding Customization of COTS Products

As identified earlier, one major issue that contributed to non-interoperability of the four pilots was the customization of the COTS software to meet specific needs of the Navy. To avoid this, the Navy ERP Program Office took a different approach. Customizations to the core COTS software are now only allowed in cases where legal or regulatory restrictions mandate (GAO

2005d). A number of benefits were gained from this change in approach. Instead of the COTS software adjusting to the current business practices of the Navy, the Navy will adjust to, and take advantage of, the “best practice” business processes built into the ERP program. This will significantly reduce the risk of creating non-interoperable business systems across different Navy institutions. In addition, the Navy established the Strategy, Architecture, and Standards Group, which supports the Navy ERP transformation and ensures that Navy ERP aligns with the DoD Business Enterprise Architecture and other business transformation initiatives (Navy ERP Staff 2008; GAO 2005d)

This strategy of adjusting business practices to align with those of the COTS software is extremely important, but can also be very challenging. Altering an organization's culture, especially an organization as large as the Navy, can be a monumental task. The Navy understood at the outset of its business transformation effort that if the needs, concerns, and interests of those affected by the organizational change are not addressed, there would be considerable resistance to change. To mitigate this risk, the Navy ERP Program Office established Navy ERP Change Management, which deals with “managing expectations, building relationships, implementing a training program, and above all, the three C's—communication, communication, and communication” (The Computerworld Honors Program 2008).

The efforts of Navy ERP Change Management contributed to achieving buy-in from the operators of the various legacy systems that are to be retired. They did this by providing (and requiring) all prospective Navy ERP users extensive computer-based online training. Other Navy personnel who will be considered “power users”, whose job functions require extensive use and interface with the ERP system, receive additional classroom training (Goodhart 2008). For the implantation of the first release of Navy ERP at NAVAIR, the Navy developed 14 web-based courses and 65 instructor-led courses to train 14,000 users. This has paid off, as employees that have been using Navy ERP for 2 years tend to be more positive about the program than those who have been using it for less time (Robb 2008b).

IT Personnel Recruitment

Another major benefit to having an integrated Navy-wide ERP program is that the skills and knowledge that users and manager acquire through use of the program will be applicable in many other areas of the Navy. With an integrated ERP, other areas of the Navy will use the same set of business processes and support systems. This may not be the case in the current environment with many legacy and stove-piped systems. With non-integrated stove-piped business systems, Navy personnel may develop a strong expertise in the legacy system and not be able to take those skills with them as they advance in their careers. With the enterprise-wide solution, their skills will be more transferable. This will also reduced the need for retraining of its IT professionals and add flexibility to IT career paths in the Navy. This will also improve the Navy's ability to recruit and retain IM/IT professionals, as they will be working with best-practices ERP instead of a legacy system that may eventually become obsolete (The Computerworld Honors Program 2008).

V. Lessons Learned

Effective Implementation of Earned Value Management

One of the major lessons learned from the experience of the first four pilots was that the Navy needed to maintain greater control and oversight over the implementation of the new ERPs. When the Navy decided to create a single department-wide ERP, Navy leadership decided to use an integrated Government and Contractor Earned Value Management System (EVM). This system combines the technical, cost, and schedule parameters of a contract, and measures progress against them. When implemented correctly, it can serve as an early warning system for cost overruns, schedule delays and deviations from project plans (GAO 2008d).

Scale of the Navy ERP Implementation

In October 2007, the Navy deployed the first increment of the Navy ERP to over 14,000 users at eight Naval Air Systems Command (NAVAIR) locations. This alone is one of the largest implementations of an ERP program in the public sector. As the Navy continues with the deployment releases 1.1 and 1.2 in 2010, the number of users will increase to approximately 83,000 at 123 locations world-wide.

The scale of the Navy ERP program presents a number of challenges to Navy leadership and others involved in the transformation effort. A total of 265 legacy systems are scheduled to be retired by the time the Navy ERP reaches full operational capability. One of the major benefits of this ERP program is data uniformity, but much of the old data must be transferred to the new system manually, which was one of the primary causes of the delay of the deployment of Navy ERP to NAVAIR.

In addition, a transformation of this magnitude has required a change in the organizational culture of many components of the Navy. Though ERP represents a major advancement in information technology, the change this brings to an organization is much larger. ERP systems not only represent an improvement in information technology, but also a major change in business processes. A conversion of internal business processes is required to take full advantage of the ERP system. In addition, in order to maximize the benefits of COTS products it is important to minimize the specialization demands the Service places on the vendor. This best practice requires an even greater degree of process realignment. Though organization change in any environment can be difficult, the Navy ERP Program Office recognized that the transformation would be challenging, and took steps to ensure as smooth a transition as possible. Some of the measures include extensive training and communication with all stakeholders.

Control of Systems Integration

As the Navy began its revolution in business affairs in the late nineties, it decided to adopt enterprise resource planning as a foundation for business transformation. Four pilot programs were approved, and each program manager was given the authority to choose their own ERP software provider and systems integrator. At this point the pilot programs began to develop semi-independently. Each pilot chose the SAP software platform, but also chose different systems integrators. Although each pilot was using the same software they were configured in a way that made them significantly different from one another. These pilots successfully improved performance at the pilot locations, but were nonetheless four new stove-piped systems. The lack

of integration between the pilot programs created problems at the convergence stage, when the Navy decided to create a department-wide ERP.

To ensure that the mistakes from the pilots were not repeated, DoD maintained greater oversight of the development of the Navy ERP program. The Navy ERP Program Office:

- Contracted the same systems integrator as the largest of the four pilots in order to take advantage of continuity from the pilot programs.
- Replaced BearingPoint as the lead systems integrator in order to improve oversight of day-to-day business process realignment.
- Declared that modifications to the COTS software would only be allowed where legally necessary.

The policies adopted by the Navy ERP Program Office ensured greater control over the integration and development process, and helped mitigate risks associated with this large-scale transformation. These policies have contributed to successful deployments at NAVAIR in October 2007, and NAVSUP in October 2008.

VI. Current Status of Navy ERP

The Navy ERP program is currently in the production and deployment phase of the DoD acquisitions process. In 2006, when the Navy decided to take over the role as lead systems integrator, it also revised its deployment schedule and life-cycle costs estimates. All releases were delayed and life-cycle costs were significantly increased in part because of the changing role of the systems integrator, a change in the order of releases and problems with data conversion from legacy systems. Although the Navy again had to adjust the life-cycle cost estimates and delays the deployment schedule, it did eventually reach initial operating capability (IOC). Currently the Navy ERP has a 20-year life-cycle cost of \$2.4 B. However, the Navy values the expected benefits of this project at \$8.6 B (GAO 2008d).

The first deployment of the Navy ERP, release 1.0, was at the Naval Air Systems Command (NAVAIR) in October of 2007 (Business Wire Staff 2007). The implementation of this release reaches over 14,000 users at nine locations, and will assist in daily management decisions and improve financial transparency (The Computerworld Honors Program 2008). In addition to training the 14,000 Navy ERP users before the release, the Navy ERP Program Office created the QA/Test Team to ensure that operational requirements were achieved. This team, which was comprised of Navy Personnel with over 20 years of experience in government business process management and testing, ensured that the Navy ERP solution improved effectiveness and cost-efficiency of Navy business operations (The Computerworld Honors Program 2008). The Navy ERP Program Office, along with the QA/Test Team executed a number of detailed test scenarios to sufficiently vet the program before going “live” (Business Wire Staff 2007).

The next deployment of the Navy ERP 1.0 was in October 2008 at the Naval Supply Systems Command. This marked another major milestone for the Navy ERP Program Office, and according to Karen Meloy, the Navy ERP Program Manager for NAVSUP, “significantly enhances [NAVSUP’s] capabilities in the areas of resource and project management.

Future releases of the Navy ERP are scheduled in the following years. The Navy ERP is expected to reach full operational capability in 2013, with periodic releases to the different Navy acquisition agencies. While BearingPoint was contracted for configuration and development of template 1.0, IBM was contracted for releases 1.1 and 1.2 (GAO 2008d). Navy ERP 1.0 will be released to SPAWAR in October 2009, to NAVSEA general fund in 2010 and Navy Working Capital Fund in 2011. Navy ERP 1.1, the Wholesale and Retail Supply Release, is scheduled to be deployed at NAVSUP in February 2010. Navy ERP 1.2, the Intermediate-Level Maintenance Release, is scheduled to be deployed in October 2010.

VII. Conclusion

The Navy Enterprise Resource Planning initiative should be considered a business transformation success. The program evolved from the four pilot programs to one of the largest ERP implementation worldwide. Despite some early setbacks such as the lack of interoperability of the four pilot programs, harsh criticisms from Congress, and the sheer scale of the program, the Navy ERP Program Office was able to recognize these early failures and change policies to set a new direction for the program. The Navy ERP program was put back on track through the implementation of a new strategy that placed the Navy ERP PO as the lead integrator instead of the contractor. This new strategy avoided the customization of COTS software and emphasized the importance of change management, communication and training. As a result, the Navy is continuing to develop more capabilities for the ERP system, and deploy it to more locations.

2. Army Logistics Modernization Program

I. Background

The U.S. Army operates one of the world's largest and most complex logistics networks. Extending across 149 fixed locations in 41 states and 38 countries, Army Material Command (AMC) is responsible for managing a vast network of 6 million items worth \$40 billion in goods and services for approximately 1 million customers annually (SAP 2005).

The 1990 Gulf War exposed the fundamental weaknesses in the Army's antiquated logistics and procurement systems. Back then, the Army then operated with a classic "push" system which sent all of the anticipated supplies into the theater at one time and then distributed accordingly from large stockpiles (Lucyshyn 2004). Unfortunately it resulted in either too many supplies being sent, or not enough within a timely manner. Due to the system's unreliability, the clerks often ordered the same equipment multiple times as a precaution, creating wasteful "iron mountains" of materiel (Myers 2004).

After the Gulf War, leaders in the Army and Department of Defense (DoD) initiated logistics reform planning. The plans acknowledged the need to incorporate private sector business practices. Two principal targets for reform were 30-year-old logistics information management systems: the Commodity Command Standard System (CCSS) and the Standard Depot System (SDS). Written in an outdated computer programming language, Common Business Oriented Language (COBOL), these systems were outmoded, inflexible, complex and expensive to maintain (Carroll, Coker 2007). Furthermore, the Army struggled to find enough professionals who still knew COBOL, to replace their rapidly retiring workforce (Lucyshyn 2004).

In 1997, AMC initiated the Logistics Modernization Program (LMP) to explore alternatives to modernizing the wholesale logistics process with information technology (IT). The Communications-Electronics Command (CECOM) was tasked to develop a plan taking into account strategy, performance based requirements, implications for the current workforce, and an acquisition approach (Lucyshyn. 2004). In 1999, CECOM and the LMP team developed a plan to privatize the effort to a corporation specializing in systems integration. Under this plan, the private entity owns and operates their solution. This was a major shift for the Army, which owned and operated all of its legacy systems (Ferlise 2000).

The project was met with some opposition. The National Federation of Federal Employees (NFFE), a union representing CDA employees, appealed the privatization plan. NFFE claimed the plan should be competitively sourced based on A-76 guidelines⁵ (Gansler 2003). The Army rejected the appeal arguing the A-76 process did apply in this case (Lucyshyn 2004).

II. The Contract

On December 29, 1999, Computer Sciences Corporation (CSC) was awarded a 10-year, firm fixed price plus performance bonus contract, valued at \$680 million (Duncan 2004). The specific details of the contract require CSC to continue to operate the AMC's two legacy systems, CCSS and SDS, until a commercially based Enterprise Resource Planning (ERP) solution was fully developed and implemented. The contract contained two key components: first, CSC tied the highest percentage of their revenues to contract performance of any bidder, and second, CSC

⁵ Circular Number A-76 establishes federal policy for the competition of commercial activities.

offered the best “soft landing” package for existing government workers. They promised to hire all existing government employees for minimum of 3 years with comparable pay and a \$15,000 bonus (Lucyshyn 2004). Government employees accepted 205 of 206 job offers extended by CSC to them (CSC Staff 2008).

III. Implementing LMP

On July 1, 2000, CSC assumed responsibility for the LMP initiative. They were tasked with maintaining and culling data from the AMC legacy systems while developing a replacement system that employed an ERP solution. CSC selected the ERP software package developed by SAP America Inc., a top ERP provider with significant experience in the public sector.

Given the size and complexity of the Army wholesale logistics enterprise, SAP, however, did not have pre-developed software solution to meet all the functional needs of the program. Instead, CSC, the Army, and a variety of subcontractors worked together to develop a special version of SAP software that combined SAP’s Public Sector and Aerospace and Defense solutions programs (Zardecki 2004). This effort was the first time a specialized version had been produced from pre-existing public sector offerings (Thureen 2008). As a result, the program had to contend with additional software integration issues.

LMP officials also faced the challenge of how to incorporate new products not within the old legacy system such as business warehouse (BW), advanced planner optimization (APO) and strategic enterprise management (SEM). This was especially difficult because it was the first time such functions were being integrated into a single ERP system (Zelinski 2008). In addition to functional demands, the ERP solution had to also meet a wide variety of legal and programmatic requirements (Heretick 2002). Currently, LMP is subject to approximately 170,000 laws, public policies and other regulations. Some commonly referenced regulations include the Federal Financial Improvement Act (FFMIA) and the DoD’s Business Enterprise Architecture (BEA) and Radio Frequency Identification (RFID) policy (Zelinski 2008).

The amount of integration issues caused the LMP program to incur its first delay, forcing it to set its implementation back six months, from late November 2002 to February 2003 (Caterinicchia 2002). Given the sheer size and complexity of the LMP project, few were surprised by the delay.

On March 28, 2003, the Army extended CSC’s contract from 10 to 12 years in order to add and deploy Milestone 3 functionality to the Single Stock Fund (SSF), a new Army inventory management system (Thureen 2008). It combines the Army’s disparate wholesale and retail inventories, into one combined system (Sparacino 2002). While the delay allowed the LMP team to expand the functionality of their ERP, it disrupted the end-user education program for Army personnel. It forced the LMP team to implement an adjusted training program that included the latest integrated systems, like SSF. As a result, LMP could not launch until training caught up with the integration testing, forcing a two-month delay (Hardy 2003).

Despite the delays, the first deployment of LMP went live on July 7, 2003, and was made available to an Army community of 4,300 user across six locations (GAO 2004b).^{*} LMP’s first deployment was immediately put to the test. Since legacy systems had been taken offline to

^{*} These locations were Fort Monmouth, CECOM, Tobyhanna Army Depot, Fort Belvoir Army Security Assistance, Defense Finance Accounting Service and Soldier and Biological Chemical Command in Aberdeen Proving Ground.

prepare for the launch, LMP had to withstand a surge of transaction orders, over 90,000 hits in its first day (Jackson 2003b). Within the first month, the LMP pilot system was processing approximately 60,000 to 70,000 transactions per day—an output not possible with the legacy systems (see figure 26) (Jackson 2003b; U.S. Army LMP Press Release 2008c).

Figure 26: Benefits of LMP vs. Legacy Systems

Benefit	LMP	Legacy
Multiple sales order processing and release capability	~ 5 min per batch (45 min daily savings)	~ 5 min per transaction
Maintenance order processing time shortened	~ 2 days	~ 2 weeks
Increased accuracy and higher visibility of maintenance actions	~ 2-3 min	~ 5 min to several days
Easier to input purchase requisitions (PRs)	Can save and return to PRs once required fields are populated	Interruptions require creating PR from scratch
Drill-down capabilities to trace sales and purchase orders	Saves ~ 15-20 min per review	Lack of drill-down capability increases review time
Greater materiel movement oversight	Saves ~ 15-20 min per review	Lack of materiel movement oversight increases review time

IV. Initial Implementation Problems

Although LMP provided location users with improved transaction capability, the system’s first deployment experienced several implementation problems at both the command and depot levels. These problems caused implementation unnecessary delays and cost overruns.

At the command level, there were difficulties in:

- Integration.** In January 2004, the Army reported that LMP had not been interfacing with the Work Ordering and Reporting Communications System (WORCS) since September 2003 (GAO 2004b). WORCS is used to communicate “with customers on the status of items that have been sent to the depot for repair,” and commence “procurement actions for inventory items” (GAO 2004b). Army personnel were forced to revert to manual data entry.
- Financial management.** The first deployment of LMP also did not produce unqualified financial data. Financial irregularities constantly plagued LMP while under AMC command (Carroll 2008). Officials observed LMP was “not (1) generating accurate customer bills; and (2) capturing all repair costs” (GAO 2004b). The LMP system also had trouble transferring contract information needed for distributing payments to contractors (GAO 2004b).

- **Incomplete inventory visibility.** LMP system was not initially able to assess the inventory value at all Army locations. A review by the Army Audit Agency (USAAA) found LMP was only able to compute the value of inventory “in accordance with federal accounting standards at the command level—CECOM—but not at the depot level” (GAO 2004b). This prevented LMP’s implementation elsewhere until the problem was resolved.

At the depot level, there issues with:

- **Unreliable financial reporting.** Army officials indicated the first deployment of LMP at Tobyhanna overstated net operating results by \$74.7 million in FY03 and \$50 million in FY 04. The Army took steps to adjust these overstatements by reducing the FY 06/FY07 Army Working Capital Fund by \$124.7. This addressed the immediate financial difference, but it did not solve the underlying implementation error. In addition, the adjustment impacted future depot prices because accumulated operating results are a factor in developing those prices (GAO 2005e).
- **Irreconciled account balances during data transfers.** LMP encountered difficulty transferring and converting data from SDS, which provides the information management and data required for execution of production, operations, maintenance, inventory management, storage, surveillance, transportation and demilitarization. In late July 2003, officials realized final account balances in the LMP and SDS systems did not match. In some cases, there were significant differences between the SDS and LMP. This was important because account balances are used to develop financial reports, which help shape future budgets (GAO 2005e).
- **Data errors.** As initially deployed, LMP contained unit price and unit-of issue for errors for different parts and supplies. As a result, LMP produced erroneous financial reports that drastically overstated cost and quantity of materials. Incorrect unit prices were compounded by 7,600 items in the LMP listed under the wrong unit of issue—the amount of individual units comprising one item. The initial LMP system did not indicate to user how many units were included in one item for each inventory entry. For example, an employee at Tobyhanna Depot ordered 800 items thinking he would receive 800 individual locking washers, but received 80,000 locking washers instead (GAO 2005e).

V. Strategic Pause

Despite the initial success of the LMP system, the Army and CSC were not able to quickly resolve the persistent problems of data inaccuracy and qualified financial information--these resulted in delays and cost overruns. By 2006, the increasing costs were beginning to threaten the existence of the program. Less than one year after the first go live launch, March 2004, the Army had already spent \$400 million of the \$680 million contract, approximately 59% of the total estimated program cost. Furthermore, internal estimates based on the current rate of cost growth projected the final program costs to exceed \$1 billion (GAO 2004b). By late 2005, it was apparent to Army leadership that LMP could not be maintained at the current rate of development.

In response to the significant cost increases and continual data problems, the Army instituted a “strategic pause” for the LMP system in early 2006 (Onley 2006). The result of the pause was

that AMC and CSC halted any plans to implement the LMP system at locations that were still operating with the legacy systems. At locations where the system had been already implemented, LMP would remain the primary interface.

- 1. Software over-customization.** Instead of reengineering their enterprise architecture around SAP's embedded capabilities, the Army customized numerous "exits" to maintain certain existing business processes. Ultimately, these customizations led to increased software maintenance and personnel costs, software update complications and potential roadblocks to contract re-competition. It required developing a specific software patch for each code change every time the SAP package was updated, hiring additional computer programmers proficient in both SAP and legacy systems to develop the customized software and impaired LMP's ability to keep pace with SAP's overall software package updates. The added complexity of customization has raised concerns about the Army's ability to re-compete the LMP system when the contract expires in 2011 (Albright 2008).
- 2. Cultural resistance.** Cultural resistance from Army personnel was one of the most critical problems facing LMP after the first deployment (Carroll 2008). Personnel at the LMP deployment sites had worked with the SDS and CCSS legacy systems for approximately three decades. Although users recognized the numerous flaws in the legacy systems, they had become specialized experts developed by years of work experience. According to Colonel David Coker, a former project director for LMP, many employees developed "a certain level of comfort, confidence and pride inherent in that attained expertise" (Coker 2006). The initial unwillingness of end users and middle managers to adopt the new system led to additional software customizations and inaccurate system data that negatively impacted program performance (Organik 2008; Carroll 2008). This required the creation of expensive extensions between the LMP and legacy systems and two and a half years more to clean data just for LMP (Carroll 2008).
- 3. Improper Training:** Improper training programs for Army end users and middle management negatively affected the LMP's performance. These programs did not provide a realistic training environment for end users, focused too much on end users over middle management personnel and lacked mechanisms for trainees to submit their input and suggestions about LMP.
- 4. Lack of official acquisition control.** This caused numerous end-user training problems for Army personnel. Despite establishing a basic training program, many Army employees were not trained properly (Albright 2008). Furthermore, AMC leaders did not have enough mid-level support to train end-users about the scope of LMP (Carroll 2008). LMP's leaders did not communicate enough with other logistics modernization projects. This led to uncoordinated development instead of synchronization.
- 5. Inadequate implementation standards.** The Army's unfamiliarity with managing service contracts led to disagreements with the contractor over intellectual property (IP) rights. Although both parties agreed on the IP rights standards written in the initial contract, there was a misunderstanding between parties concerning the interpretation of these rights. After LMP's launch, the Army assumed it had unlimited access to the ERP data, but the contractor disagreed. Under the terms of contract, CSC owned the technical data, computer software, and other information used in the configuration and implementation of the LMP solution.

Although both parties cooperatively resolved this issue in October 2004, it created confusion and setbacks. In addition, it was the cause for brief concern that the Army would have difficulty re-competing LMP (Albright 2008).

- 6. Stove-piped vision.** Instead of looking across the entire Army, officials organized the logistics modernization effort by specific functionality. As a result, each functional area developed its own modernization program independently, rather than being integrated as they matured (Organik 2008). It was only after all of the programs were individually online, then they would be linked together to provide total asset visibility (TAV). This strategy did not take in account the complexity associated with integrating two or more independent ERP solutions. The lack of integration between systems has impaired timely data retrieval.

Gains from the Strategic Pause: Change in Management and IT Compliance

The most influential change made during the strategic pause was moving LMP's management from AMC to the Program Executive Office for Enterprise Information Systems (PEO EIS) in February 2006 (Onley 2006b). There were three reasons for this. First, AMC had struggled since the initiation of the program in 2000 to meet deadlines, cost benchmarks and performance expectations. Second, since the PEO EIS' specialty in IT made it better equipped to implement the LMP system and train Army personnel than AMC. It also was more familiar with service contracting. Third, PEO EIS was already managing all of the other programs under Single Army Logistics Enterprise (SALE) initiative. By consolidating all of the SALE programs under one management office, Army officials believed this would make integration efforts timely deployment of SALE easier (Staff 2006a). The changes were immediate: within the first year, PEO EIS produced unqualified financial reports at both command and depot levels. They also brought cost overruns through increased restrictions on SAP customizations (Carroll 2008).

The transfer of LMP to the PEO EIS provided the program a more comprehensive leadership structure that addressed both end-user demands as well as Army-wide integration issues. Within the PEO EIS, the LMP directed the Army ERP System Integration Task Force. This move allowed the Army to manage all of its three primary logistics modernization programs under one office. The ERP director reports directly to the PEO EIS, who provides an Army-wide perspective from LMP and the entire logistics modernization effort. In addition, the PEO EIS developed an Executive Steering Committee for LMP as a way to involve all Army stakeholders in the decision making process.

Another benefit of the strategic pause between January 2006 and Summer 2007 was the achievement of system compliance with the Clinger-Cohen Act (CCA), implemented between February 2004 and March 2005 (U.S. Army LMP Press Release 2008a). The CCA removed procurement authority away from the General Services Administration (GSA), established the position of Chief Information Officer (CIO) in each federal agency, instituted government-wide IT standards and mandated that the development of performance-based metrics for all procurement programs (DoD 2006d). Through CCA compliance, the LMP better assessed the structural and managerial challenges it faced.

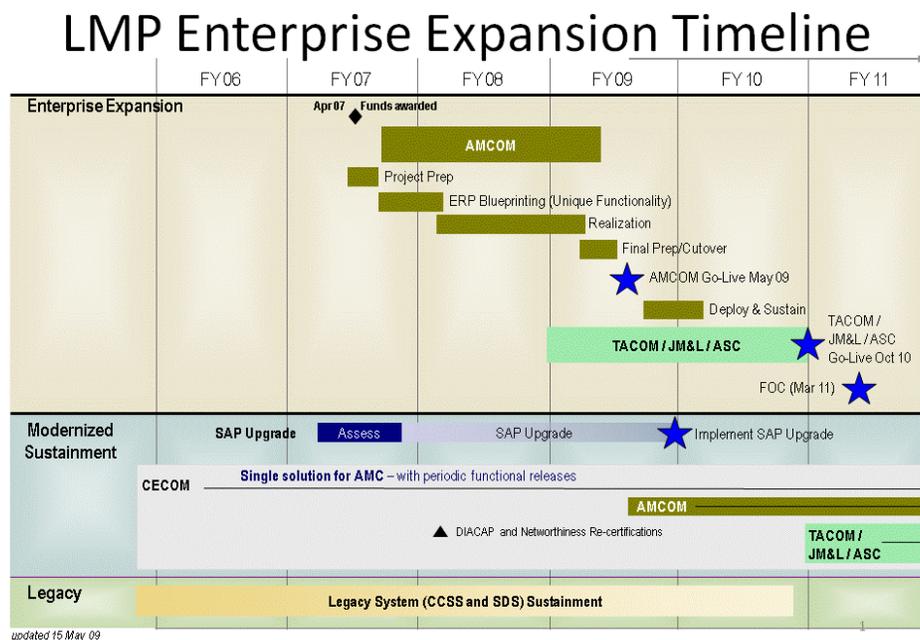
The Army also needed to comply with the Federal Financial Management Improvement Act (FFMIA), which mandates programs implement and maintain sound financial systems. LMP struggled to adhere to FFMIA because it had numerous problems producing auditable records. Due to diligent effort by the Army and the contractor, LMP financial management systems met

all of the FFMIA Bluebook's 757 requirements in May 2007 (U.S. Army LMP Press Release 2008b; Staff 2007).

VI. Current Status

After several years of testing, the Army lifted the strategic pause in the middle of 2007. Since then, LMP has won a number of performance awards including the Government Information Technology Executive Council (GITEC) award for project management excellence and SAP Competency Center re-certification. In response, LMP's program management office developed a new deployment schedule set to reach full operational capability (FOC) by 2011. On May 14, 2009, LMP "went live" at the Corpus Christi Army Depot, Letterkenny Army Depot, and the U.S Army Aviation and Missile Life Cycle Management Command (AMCOM) (Rosenberg 2009). LMP is also scheduled to go live in December 2009 at Tank and Automotive Command (TACOM) in Warren, Michigan, and in September 2010 at Joint Munitions Command/Army Sustainment Command (JMC/ASC) in Rock Island, Illinois (see figure 27).

Figure 27: LMP Timeline & Milestones



Source: Chart provided by CSC, July 2009

After the last deployment, the LMP system will be fully operational. LMP will serve over 17,000 end users located at approximately 1,000 sites and handle more than 1.3 million transactions daily (DoD 2008b). Once LMP is fully operational, the Army will finally be able to realize the benefits provided by its adoption of an ERP solution. Based on the latest Army estimates, LMP's benefit to cost ratio (comparing total benefits to total cost) will be **2.43** (for every dollar spent, the Army will receive 2.43 dollars of benefits); and the return on investment (comparing net benefits to total costs) will be **11.12** (for every investment dollar spent the Army will receive 11.12 dollars of benefits)

VII. Lessons Learned

When LMP program was launched in 2000, the AMC did not fully understand the challenges associated with successfully designing and implementing an ERP system for a business area as large and complex as their wholesale logistics. During the past 9 years, LMP has suffered from a variety of delays, cost overruns, programmatic deficiencies and a yearlong strategic pause. Despite these challenges, the Army and CSC have guided the LMP development onto a path towards a successful ERP implementation. Although LMP has not yet reached FOC, the actions taken by the Army serve as valuable lessons to organizations seeking to adopt the best business practices through an ERP implementation. When planning for such a disruptive change, these organizations should consider the following lessons from the Army's experience with LMP: maintain effective communication, educate personnel about process change, implement comprehensive training programs, establish a centralized management infrastructure, avoid unnecessary modifications, develop an understanding of service contracting and build a close working relationship with the service contractor.

VIII. Conclusion

We believe the Army's Logistics Modernization Program is now on a successful trajectory. Despite the many problems experienced during the first few years of LMP, the Army did not retreat in its transformation effort. Instead, Army leadership used the strategic pause to reevaluate their current approach to ERP implementation. The leaders used the institutional knowledge about ERP and SAP software they had gained over the past six and half years to making the necessary program and leadership changes. As a result, LMP has overcome a variety of the problems experienced during the first deployment, and is now on schedule to reach FOC in 2011.

3. Defense Logistics Agency—BSM

I. Background

The Defense Logistics Agency (DLA) is DoD's largest combat support agency, providing worldwide logistics services to the military Services and several civilian agencies. DLA maintains eight supply chains with over 5.2 million items providing almost every consumable item the military needs to operate ranging from groceries to jet fuel. Moving on from its original mission of supplying consumable commodities, DLA has assumed many additional responsibilities including the management of all DoD depots, disposal and reutilization, cataloging, etc. Although DLA has supported the US military services since the Vietnam War, the demand for the agency's services have greatly expanded since 2001. DLA sales and services more than doubled from \$15.8 billion in FY 2001 to \$42 billion in FY 2008; the increased demand is due mostly to the expanded services DLA offers and the wars in Afghanistan and Iraq. It was during this period that the agency completed a major overhaul of its business systems to deal with the increasing demands for its services.

DLA officially started its Business Systems Modernization (BSM) program in 1998 when it conducted a series of analyses that were initially focused on replacing legacy accounting, order processing, and billing systems. At this time the IT systems that were in use were over 35 years old, obsolete, and were constraining further functional improvements. For years the system was maintained through "work arounds" that added some functional capabilities, but did not solve the underlying inefficiencies of the old IT system. From the conclusion of the analysis of IT system, DLA leadership realized the need for an entirely new IT system and decided it could leverage the benefits of a COTS ERP product.

The BSM program was at the center of DLA's business modernization vision of replacing mission-critical legacy systems with a new enterprise architecture based on Commercial-Off-The Shelf (COTS) software and best commercial practices. With the goal of integrating its supply management and logistics, the agency aimed to reduce inventory cycle times; improve customer service; and implement uniform processes, procedures and performance metrics. At the outset of the BSM Program, DLA was careful to develop a detailed and comprehensive plan for the implementation of a new ERP business system based on several reengineering tenets and guiding principles (see figure 28) (Defense Logistics Agency 2000; Defense Logistics Agency 2002). Using these basic tenets and guiding principles DLA established the required capabilities, performance metrics, system requirements, and a risk reduction plan. The thorough planning of the BSM program would contribute to its eventual success.

Figure 28: DLA BSM Guiding Principles and Reengineering Tenets

Guiding Principles	BSM Reengineering Tenets
We will rely on commercial software.	Use commercial and best business practices.
No more incremental changes unless in anticipation of BSM.	Ensure common processes and data.
“Fundamentally Change” the way we do business.	Be driven by supply chain, not internal organization.
We will change, not the “Code”.	Establish one authoritative record for data
One System – Different Configurations	Embed financial integrity
Common Sharable Data and Technical Infrastructure	Replace legacy systems and extensions
Owning and operating the technical infrastructure is not our core competency.	Incorporate pertinent initiatives
Minimal impact on customer pricing due to BSM.	
An enterprise business system that allows continuous process and technology insertion.	
A disciplined process for introducing change.	
Building the bridges to our customers will be at our cost.	

II. New Capabilities of DLA BSM

There are several major differences between the new BSM ERP system and the legacy system that the agency had been using for more than 30 years. Figure 29 compares the capabilities of the legacy system versus those of DLA BSM (Defense Logistics Agency 2006).

Figure 29: DLA BSM - Legacy System Capability Comparison

Capability Comparison (Legacy Systems vs. DLA BSM)	
Legacy System	DLA BSM
• Decentralized Systems	• Single Integrated System
• Batch Processing	• Near Real-time Updates
• Limited Customer Input	• Customer Collaboration
• Arms-length Supplier Relationship	• Common Jobs and Roles Across Enterprise
• Decentralized Approach to Jobs and Roles	• Variable, Time=Phased Demand/Supply Plan
• Single/Static Forecast	

The new ERP system created many deep structural changes to DLA, and vastly expanded their capabilities. DLA BSM drove a major transformation of the agency’s organizational structure and workforce functions that were more in line with efficient supply chain management. The BSM program enabled DLA employees to improve their ability to manage several key functions in supply chain management including: planning, procurement, order fulfillment, financial management, and technical /quality management (Defense Logistics Agency 2005). The new system marked a shift in focus from managing individual items to managing customers and suppliers, which allows employees to improve management of key functions in the supply chain. The most significant capability improvements and program results are outlined in the 2006 DLA Transformation Roadmap (see figure 30) (Defense Logistics Agency 2005). With these improved capabilities, DLA can expect to reduce inventories, reduce cycle times, improve customer service and operate on uniform policies procedures and metrics (Defense Logistics Agency 2005).

Figure 30: DLA BSM Capability Improvements

DLA BSM Capability Improvements
<ul style="list-style-type: none"> • Identifying future military service needs through collaboration and improved demand plan accuracy
<ul style="list-style-type: none"> • Ensuring inventory is available when and where it is needed with optimized inventory levels and reduced response times
<ul style="list-style-type: none"> • Paying vendors based on receipt through a single contract writing application with visibility of long-term contracts across the enterprise
<ul style="list-style-type: none"> • Delivering quick-order turnaround and improved tracking and tracing of customer orders
<ul style="list-style-type: none"> • Complying with Chief Financial Officer standards and practices
<ul style="list-style-type: none"> • Streamlining item introduction into the supply chain
<ul style="list-style-type: none"> • Standardizing business process improvements across the

III. Early Stages of the Transformation

While DLA began to consider its options to address its pressing needs in 1998, it really began the transformation process in 2001 when it began to develop the COTS based ERP system. DLA leadership established the BSM Steering Group (later renamed BSM Stakeholders Group) to guide the agency through the reengineering process and the BSM Program Management Office to conduct the acquisition of the BSM system. During this initial planning period, DLA developed a set of System Required Capabilities, a set of performance metrics, and a detailed set of functional requirements. These criteria were contained in the BSM Operational Requirement Document (ORD), which was used to determine potential systems integrators. DLA eventually selected an SAP ERP product, an advanced planning and scheduling software from Manugistics, and Program Desktop Defense applications from American Management Systems. In August 2000, DLA awarded a \$390 million, five-year systems integration contract to Accenture (Onley 2004b).

Because of the high price of the business modernization program, DoD declared DLA BSM a major automated information system (MAIS). To ensure the effectiveness of these acquisition programs, they require close collaboration with many stakeholders, especially with the Program Management Office (PMO), the designated operational test agency (OTA), and the Office of the Director, Operational Test and Evaluation (DOT & E) (Falvey 2008). In the case of DLA BSM, the Joint Interoperability Test Command (JITC) at Ft. Huachuca, AZ was the designated OTA. JITC played an active role during the development, testing, and integration phases of BSM.

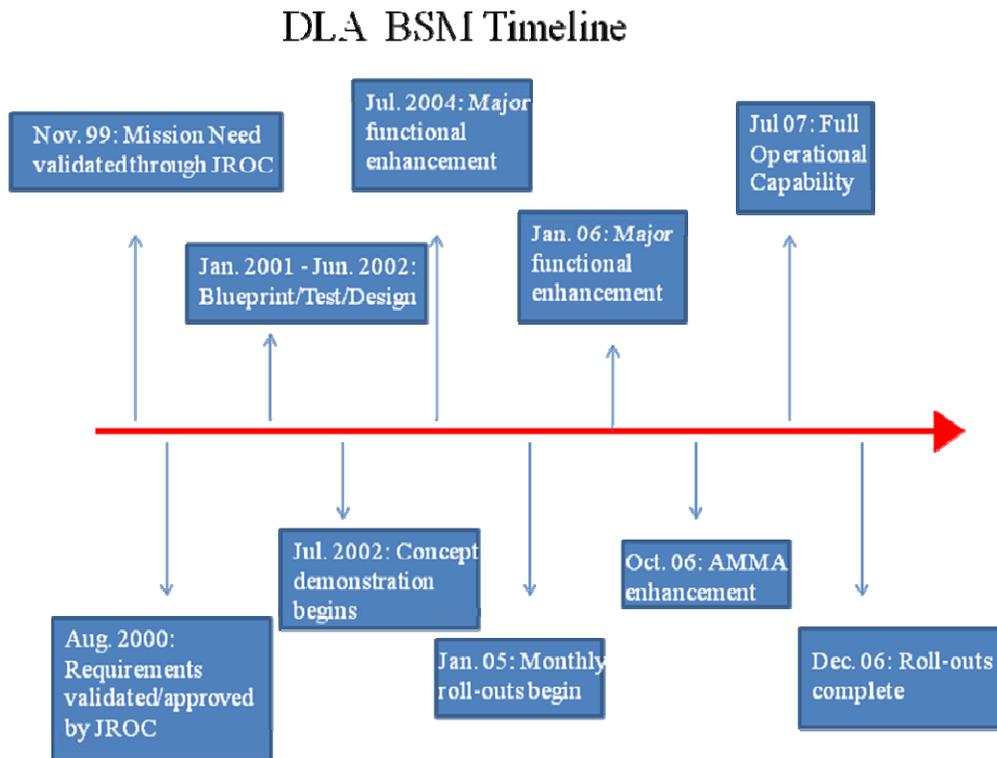
Throughout 2001-2002, DLA developed the blueprint, designed the system, completed the developmental test and evaluation, and performed the necessary business process reengineering, to adapt to the business processes embedded in the ERP software. In 2002, DLA BSM was awarded Milestone C and was set to be deployed at three DLA logistic services facilities in Columbus, OH; Philadelphia, PA; and Richmond, Virginia. However, as JITC tested the first increment of DLA BSM in 2002, DOT&E found that the initial version of BSM was not operationally effective or suitable to support DLA's mission based on the operational performance criteria determined by DLA (Falvey 2008). In other words, BSM could not be satisfactorily placed in field use. This was a major setback, since the PMO expected a seamless transition to the new ERP system. After this assessment, the DLA program manager agreed with the JITC and DOT&E assessments, and immediately devised a plan to make the necessary adjustments and improvements to the new system.

The level of cooperation between the DLA PMO, JITC, and DOT&E was important to understand and address the deficiencies of the original version of BSM. Through a continuous dialogue between the three agencies regarding issues affecting the program, a much higher level of transparency was established. This close relationship expedited the process of refining the system requirements that were either ill defined or were holdover from legacy business processes not applicable to BSM (Falvey 2008). After addressing these issues with the BSM program, JITC continued the testing phase in seven separate locations from 2002-2004. By doing this, the DLA PMO and JITC were able to better manage potential issues with the program and ensure that operational capabilities were met. By the end of the testing phase in August 2004, over 170,000 items and 470 users converted to the new ERP (Falvey 2007).

The three agencies learned several lessons from the initial concept testing phase, and established criteria for going forward with BSM implementation. The most significant lessons were related to the importance of leadership and change management. The high degree of involvement of top leadership from the three involved agencies after the failure of the initial BSM concept led to the finding of efficient and effective solutions. Top leadership was also early to recognize the importance of change management, as the new system would eventually affect virtually all employees at DLA.

The end of this testing phase coincided with the deployment of BSM Release 2.0 in August 2004. The new version of the ERP software included enhancements in 37 functional areas in DLA's business operations. The incremental release strategy continued as the agency began monthly rollouts of the BSM Release 2.0 in January 2005 with about 200,000 items each month (Staff 2006b). DLA continued this methodological rollout strategy through 2007 when the BSM system reach full operational capability, with further functional enhancements in 2005 and 2006 (see figure 31) (Whittington 2009).

Figure 31: DLA BSM Timeline



IV. Outcomes and Benefits

With an investment of approximately \$750 million, the BSM program reached FOC in July 2007 and established the core architecture for DLA's Enterprise Business System as the ERP platform for supply chain management of DLA's 5.2 million hardware and troop support items (Staff 2005; Department of Defense 2008). At FOC, DLA BSM enabled DLA to be compliant with the Joint Technical Architecture and the data exchange standards necessary for DLA to interoperate with its customers and suppliers. This new supply chain management system also provides many tangible benefits to the warfighter including improved materiel availability, reduced customer wait time, reduced cost and improved data integrity (Defense Logistics Agency 2005). The logistics response time for items managed within BSM has improved approximately 16%, and the time from receipt of requisitions to Materiel Release Order has been reduced from hours to minutes (Defense Logistics Agency 2005). Additionally, the system will pay for itself with cost savings by the end of 2009 and allowed DLA to pass a financial audit in 2008.

V. Governance of the Business Systems Modernization Program

The quality of the governance of the DLA BSM program was one of the main drivers of its success. DLA BSM started as an ACAT IAM (Major Automated Information System) with a high degree of OSD oversight, but the milestone decision authority was delegated to the DLA

Acquisition Executive. The Transformation Executive Board (TEB) was one of the primary oversight boards directly involved in the development of DLA BSM. Consisting of senior executives (SEs) from DLA, the TEB was the oversight body responsible for the successful delivery of DLA's long-term transformational commitments. Additionally, the TEB was responsible to the Director and Corporate Board of DLA for executing the agency's long-term transformation commitments.

The guidance, leadership, and involvement of the TEB were major contributors to the program's success. This group of stakeholders met every other Thursday, all day, for 6 years to ensure a successful transition to the new program. This board took the time to really understand the rules and business process that required modification and how the employees were trained. It also ensured that change was driven down the organization and engaged the civilian deputies that would provide continuity to the modernization process. The board itself made decisions based on consensus, and only once did they have to go to the agency director to settle a disagreement (Whittington 2009). The TEB also conducted open forums for DLA employees with questions and concerns regarding the transformation process. Many believe that this oversight body, with its high degree of involvement in almost all aspects of the programs development, was the most important driver of BSM's success.

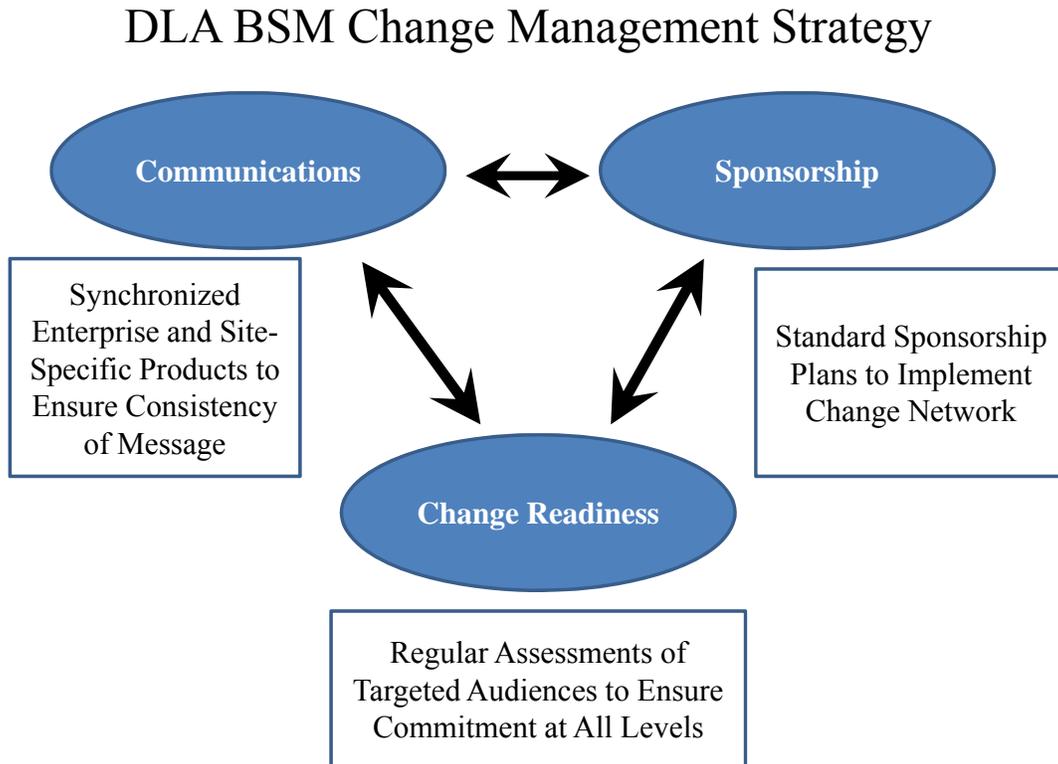
With the TEB guiding the development of DLA BSM, there were also two critical groups of stakeholders intimately involved in the development process: the Program (developers and builders of the new system) and the Functional (the users/does) (Whittington 2009). Within each group there were process owners with extensive knowledge of the "as is" business processes and process leads with extensive knowledge of the new enterprise system. Integrating experts of both the "as is" and "to be" processes in the group contributed to a successful systems/technology integration strategy as well as mitigated some of the risks of change management.

The governance structure of the DLA BSM program allowed the agency to identify and address issues as they arose. For example, in 2002 when the program was deemed not operationally effective or suitable to support DLA's mission, the PMO, JITC and DOT&E were able to collaborate and modify the system to correct the identified deficiencies.

At the outset of this program, DLA identified change management as a critical component to any transformation initiative. DLA leadership developed a change management process based on communication, sponsorship and change readiness (see figure 32) and sought to ensure that everyone was "job ready" by the time DLA BSM went live (Whittington 2009).

Virtually all employees would be affected by the change in some form, but approximately 8,000 employees experienced major changes in their job functions. Before DLA BSM, there were over 1,100 position descriptions, now there are only 167 (Whittington 2009). These employees have new roles and jobs, based on industry best practices. DLA implemented an extensive training program with a balance between the classroom, on-the-job training, and computer-based-training to ensure employees were "job ready" for each rollout. This extensive training program was also necessary to achieve buy-in from the employees, so that they did not feel that they would be replaced.

Figure 32: BSM Change Management Strategy



VI. Lessons Learned

DLA BSM reached FOC in July 2007, and is regarded by many as an example of a successful ERP implementation within DoD. Although DLA BSM is a business system designed for one specific agency within DoD, there are many lessons that can be drawn from its implementation. First, top leadership support and involvement in all aspects of the program are critical for success. The level of involvement demonstrated by the Transformational Executive Board exemplifies the importance of continuity of leadership.

Another major lesson learned from DLA BSM is the importance of change management and the need to mitigate risks associated with organizational change. DLA leadership was early to recognize the organizational challenges that would arise from a new business system, and were able to adjust business processes to the new ERP. DLA BSM was much more than a new software system, and significantly impacted the roles of thousands of employees.

Users of the new ERP program needed training before and after gaining access to the new system as part of an extensive training program that included classroom and computer-based activities (Falvey 2007). These training programs helped achieve buy-in from the thousands of affected employees, and contributed to a smooth transition to the new ERP.

The importance of robust testing procedures before the rollout of a new system became evident when the first version of the system was deemed to be “not operationally effective or suitable to support DLA’s mission” (Favley 2008). The initial testing procedures failed to identify important problems with the new system. After DLA resolved the initial problems with

BSM, it developed a deployment strategy based on fielding small increments with a standard and repeatable rollout plan. This allowed the PMO to demonstrate operational capabilities while keeping the rollouts small enough to manage risk (Falvey 2007). Another important lesson that can be drawn from this project is the need for upfront data cleansing to ensure that the data is current and accurate.

VII. Conclusion

Due to the success of BSM, DLA is moving forward with further initiatives to expand its capabilities and improve performance. DLA's new business strategy, Enterprise Business Systems, is centered on a capability focus rather than a program focus and includes several business transformation initiatives.

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