Implementing the
U.S. Army’s Logistics Modernization Program

by

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and Private Enterprise

School of Public Policy

Revised
August 2009
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Executive Summary

The first Gulf War of the early 1990s revealed the fundamental weaknesses of the Army’s outdated logistics information technology systems. In order to address these problems, the Army has undertaken an aggressive, multi-program effort aimed at adopting best business practices in a Single Army Logistics Enterprise (SALE). SALE represents the Army’s vision for its future logistics enterprise to be fully integrated and based upon collaborative planning, knowledge management, and best business practices (Rhodes 2005). The Logistics Modernization Program (LMP) is a key component of SALE.

LMP is accomplishing these goals by replacing the Army’s 30-year old legacy systems, the Commodity Command Standard System (CCSS) and the Standard Depot System (SDS), with an Enterprise Resource Planning (ERP) system that utilizes the private industry’s best business practices. On December 29, 1999, the Army awarded a ten-year, $680 M contract to Computer Sciences Corporation (CSC) to maintain the legacy systems while developing and implementing the new ERP system. In early 2003, the contract was extended for two more years to address additional program requirements.

The first of LMP’s four deployments occurred on July 7, 2003. The benefits of the new system were immediately noticeable: LMP outperformed the legacy systems in major categories, including data processing time and materiel oversight. Although LMP exhibited superior performance, the system encountered numerous problems, causing delays, inaccurate data, qualified financial information and cost overruns. In mid-2006, the Army instituted a yearlong strategic pause to address these issues and to prove the reliability of the LMP system. During the pause, the Army identified five critical problems of LMP: cultural resistance, improper training, unnecessary software modifications, lack of centralized leadership, and a general unfamiliarity within the Army regarding service contracting.

In order to address these issues and to end the strategic pause, the Army made several key changes to LMP. First, responsibility for the program was transferred from the Army Materiel Command (AMC) to the Army’s Program Executive Office for Enterprise Information Systems (PEO EIS), an organization that had more experience with ERP implementation and service contracting. The PEO EIS established a new centralized leadership structure and altered the end-
user and middle management training programs. Second, the new leadership altered the existing contract structure to allow for greater flexibility to fund the increased development and testing of the new ERP system. Finally, the Army made an assertive effort to achieve compliance with several federal regulations that had eluded program managers throughout LMP’s first deployment.

After the Army made the necessary programmatic changes, it lifted the strategic pause in mid-2007. 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). The remaining deployments are tentatively scheduled for September 2010. After its fourth and final deployment in 2010, LMP will extend across 104 locations with 22,000 users. The program will manage over $40 billion in goods and services, and process over 100,000 transactions daily. At 100 percent functionality, LMP will be one of the world’s largest and most complex ERP systems in operation.

After LMP becomes fully operational and the legacy systems are turned off, the system will be integrated into the Army’s Single Army Logistics Enterprise (SALE) program. SALE consists of three central programs: LMP, Global Combat Support Systems (GCSS) Product Lifecycle Management Plus (PLM+), and GCSS - Field and Tactical (F/T). It will help the Army to achieve total asset visibility (TAV) through one central, end-to-end logistics network. Although the focus of SALE has been the implementation of a convergence solution relying on a single SAP ERP instance, some have argued that the number of ERP instances should not be a concern, as long as each instance is interoperable and can be aggregated at the enterprise level.

This report identifies several lessons learned through the Army’s experience with LMP’s first deployment, and makes recommendations for future ERP implementations.

Lessons Learned:

- **Communication** – A complex program like LMP cannot thrive without effective communication. Uncoordinated and inconsistent communication channels between different management levels and deployment locations during the early period of LMP caused end-users to develop unrealistic expectations about LMP’s capabilities. In order to address this
issue, the Army developed a focused communication plan and is encouraging senior program leaders to play a larger role in LMP implementation.

- **Cultural Resistance** – Persistent cultural resistance was the one of the biggest challenges facing the LMP’s first deployment and had a negative impact on the overall performance of LMP. The prolonged internal resistance to LMP was due, in part, to the ineffective education strategy implemented by program leaders; Army personnel did not fully understand the purpose of switching to a new information system. In order to overcome this problem and to increase personnel support, the Army developed a new, multi-faceted education strategy that aimed to increase dialogue between end-users, middle management, and the LMP program management office (Thureen 2008).

- **Comprehensive Training** – A comprehensive training program is critical to the success of an ERP implementation. The Army’s initial training program for LMP did not focus enough attention on the necessary functions required by the new ERP system, or on the importance of process change in ERP implementations. As a result, users uploaded unnecessary software modifications in order to use their legacy processes in LMP. LMP leadership addressed this issue during the strategic pause with a revamped training program that placed greater emphasis on process change and the adoption of best business practices.

- **Data Errors** – Data errors significantly contributed to the inability of LMP to generate unqualified financial data. LMP officials did not fully understand the scope of the challenge of cleansing and transferring legacy data to the new information system. Inadequate training and communication led to the entry of thousands of incorrect prices and units of issue entered into the system by LMP personnel who did not know that it was their job to fix the data before entering it (Lambert 2009).

- **Program Management Governance** – Having program leaders without extensive experience in ERP implementations led to several problems in the first deployment, including unnecessary software modifications and data errors. The Army addressed this issue during the strategic pause by transferring program leadership to the PEO EIS, which has the central mission to deploy IT and enterprise business management systems for the
Army. The PEO EIS, with greater experience in ERP implementations, was able to put LMP back on track after an extensive internal review during the strategic pause.

- **Unnecessary Modifications** – Unnecessary modification to the SAP software limited the capabilities of the ERP system and increased the risk of data transfer errors between Army locations. After the initial launch of LMP, the Army did not adequately regulate the amount of modifications to the SAP software. The Army ultimately overcame this problem by establishing a comprehensive review board, which oversees and coordinates the effort to unravel unnecessary modifications within the system.

- **Contract Structure** – The use of a firm-fixed-price (FFP) contract for LMP significantly constrained the contractor’s ability to pursue the necessary research, development and system testing. Both the Army and the contractor did not fully understand the scope of the effort, the risk, or the best way to structure an effective contract for such a large-scale, complex ERP development like LMP. The Army addressed this during the strategic pause by modifying part of the contract structure to include a cost-plus-fixed-fee (CPFF) element, which allowed more flexibility for the contractor to develop the new ERP system.

- **Relationship with the Service Provider** – A close partnership between the contractor and the government is vital for effective service contracting (Thureen 2008). Army personnel did not work closely with CSC during the development stage of LMP, which led to some misunderstanding about the Army’s vision for LMP (Albright 2009). If the Army and CSC had developed a closer relationship before the LMP’s launch, many of the issues the program encountered may have been mitigated.

**Recommendations for Organizations Implementing ERP solutions**

- **To fully leverage the investment in an ERP, examine and change business organizations and processes.** ERPs are about process change and adopting best business practices, not simply IT implementation. The natural inclination to adapt the ERP to the extant organization and processes must be fiercely resisted.

- **Develop effective management processes and a governance structure that includes** all stakeholders. A central problem with LMP’s first deployment was the lack of an effective
program governance structure. Before their initiation, ERP implementations should have a
centralized leadership structure, with the necessary boards and review panels in place.
Moreover, given the complexity associated with ERP implementation, it is important that
governance structures have the full support of senior-level leadership.

- **Educate and train all affected management levels.** Process change is not easy, especially
  when end-users have used the same systems and operating procedures for many years (as was
  the case with LMP). Implementing the new ERP system alone will not bring about the
  intended culture change; and in order for employees to adopt new, best business practices,
  they need to be trained and educated for their new roles and responsibilities.

- **Maintain effective communications with all stakeholders.** Communication plays a critical
  role in overcoming cultural resistance and in stimulating the adoption of best business
  practices. All levels of personnel must be kept informed about what is going on in the
  program and why it is happening.

- **Fix data errors before they are entered into the new ERP system.** Transferring data from
  the legacy systems to the new ERP system is a challenging and time-consuming process, but
  is extremely important. Data errors, as experienced during the first deployment of LMP, can
  undermine the success of an ERP implementation. Leaders of ERP implementation should
  develop a clear strategy on how to deal with legacy data.

- **Avoid the “big bang;” deploy incrementally with frequent system tests.** Organizations
  developing an ERP solution should not underestimate the importance of incremental
  deployments and frequent system testing. Although this approach may slow program
  deployment, it is better to identify and address problems early with a limited deployment.

- **Be Pragmatic.** ERP development and implementation is a very complex process. No matter
  how much an organization prepares for the process change, mistakes or data-transfer
  problems are likely to occur. ERP implementation leaders should not view challenges and
  setbacks incurred during an ERP implementation project as program failures, but merely as
  part of the learning process.
I. LMP Background: From Concept to Contract

The Logistics Modernization Program (LMP) is one of the Army’s major business transformation initiatives, and is a key component of the Single Army Logistics Enterprise (SALE). SALE represents the Army’s vision for its future logistics enterprise to have a fully integrated knowledge environment that builds, sustains, and generates warfighting capability through a fully integrated logistics enterprise, based upon collaborative planning, knowledge management, and best business practices (Rhodes 2005). Through vertical and horizontal integration of all levels of Army logistics, and by establishing integrated business processes, LMP will allow the planning, forecasting, and rapid order fulfillment that lead to streamlined supply chains, improved distribution, a reduced theater footprint, and a warfighter who is equipped and ready to respond to present and future threats (Carroll 2007).

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 Materiel 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 Press Release 2005). The Army purchases supplies from manufacturers and transports them to warehouses, depots, and the warfighters through this network. Despite the Army’s increasingly complex operational demands and requirements, the Army’s logistics information systems and networks were relatively unchanged for nearly three decades, until the late 1990s.

The first Gulf War, in 1991, exposed fundamental weaknesses of the Army’s outdated logistics and procurement systems. At that time, the Army’s logistics systems operated with a classic “supply push” approach. Using this approach, the Army would send all of the anticipated supplies into the theater, store them in large stockpiles, and then distribute them as needed (Lucyshyn 2004). Due to the unreliability of this system, supply personnel often ordered the same supplies multiple times, to ensure timely arrival from the warehouses, known as “just in case” stockage. These additional procurements led to large (often unused and unneeded) stockpiles, that were commonly referred to as “iron mountains” (Myers 2004). Additionally, since these storage areas contained so much “stuff,” it was frequently difficult for theater personnel to locate the appropriate items, even when they were available. The problem with this
approach was not only the amount of equipment that needed to be acquired and transported, but also its lack of efficiency and timeliness.

After the Gulf War, Army and Department of Defense (DoD) leadership recognized the shortcoming of the then-current system, and began to consider ways to transform the Army’s outdated logistics systems. They were especially interested in adopting the prevailing best business practices being developed in the private sector.

Commercial best practices have set high standards in logistics, with customer wait-times of 1-2 days domestically and 2-4 days internationally, and with high-reliability. For example, UPS Worldport sorts, routes and tracks 300,000 packages per hour; FedEx Global Hub lands an aircraft every 90 seconds and then moves packages through 300 miles of conveyor belts; Wal-Mart and Dell utilize sense-and-respond supply chains which allow them to react to customer demand within hours; Dell makes a desktop computer every 5 seconds in response to custom-tailored internet orders; Wal-Mart keeps 60,000 suppliers continuously informed about the variation in their products; Benetton also dramatically transformed its total production process to rapidly respond to changing customer demands (Harrington 2005; Staff 2006). Moreover, many of these companies began integrating modern information technology decades before the DoD and the Army. Wal-Mart, for example, began investing in modern supply chain technologies in the mid-1980s—investing in a centralized database, store-level point-of-sale systems, and a satellite network. It also had one of the first supply-chain-wide implementations of bar codes in the retail industry. In the 1990s, Wal-mart developed Retail Link, which gave suppliers access to real-time sales data on the products they supplied (Johnson 2006). The successful implementation of these technologies led to one of the most efficient supply chains in the world.

Despite the growing demand for adoption of best business practices, the Army still depended upon its two 30-year-old information management systems for logistics during the mid-1990s: the Commodity Command Standard System (CCSS) and the Standard Deport System (SDS). Written in an outdated computer programming language, known as Common Business Oriented Language (COBOL), these systems were outmoded, inflexible, increasingly complex, and expensive to maintain. Moreover, since there wasn’t a single, unified system, many subordinate organizations developed independent configurations of the CCSS and SDS, along with a wide
variety of localized software applications designed to support those systems. In addition to its poor efficiency, this amalgam resulted in a lack of financial integrity, and it became clear that the Army would be unable to comply with Federal directives, such as the Chief Financial Officers Act of 1990 and the Federal Financial Management Improvement Act of 1996 (these were enacted to increase the efficiency and visibility of financial operations across DOD) (Carrol 2007). Moreover, the Army struggled to find professionals who still knew how to write computer code in COBOL to replace retiring employees (Lucyshyn 2004). While the Army recognized the need to upgrade the CCSS and SDS systems, it was uncertain how to initiate such a change.

In 1996, U.S. Army Communications and Electronics Command (CECOM) took control of the Army’s central design activity (CDA) logistics centers in St. Louis, Missouri, and Chambersburg, Pennsylvania, from the Industrial Operations Command. These two locations housed the primary mainframes for the CCSS and SDS systems. The transfer of authority to CECOM provided the Army an opportunity to initiate the desired modernization. CECOM officials instituted a full review of the logistics systems and determined that full-scale modernization was desperately needed. In August 1997, General Dennis Benchoff, deputy commanding general of AMC, tasked CECOM to treat logistics transformation as a priority, and emphasized the use of commercial software and best practices, which were far superior to existing public-sector capabilities.

Throughout 1998 and early 1999, the Deputy Director of CECOM’s Directorate of Material Management, led a special review team of CECOM officials that explored alternatives to modernizing the wholesale logistics process with IT. The CECOM team had to develop a modernization plan that took into account strategy, performance-based requirements, implications for the current workforce, and an acquisition approach (Lucyshyn 2004). After months of research and collaboration with industry providers, the CECOM team developed a plan to replace the CCSS and SDS systems with a commercial-off-the-shelf Enterprise Resource Planning (ERP) solution, which would be developed and maintained by a corporation specializing in systems integration. This strategy was known as the Logistics Modernization
Program (LMP). The Army would not own or maintain the ERP, but simply purchase the system capability as a service. This was a bold recommendation because the Army was still new to service contracting. Furthermore, the replacement of existing Material Resource Planning (MRP) systems with an ERP would require the Army to leapfrog thirty years of technological development. LMP would not merely upgrade the Army’s logistics systems; it would completely transform them, as well as the accompanying business practices. According to Colonel Charles S. Lambert, current Project Manager for LMP, the Army was “trying to do a 35-year leap, in terms of technology supporting IT systems, to get modern business processes” (Lambert 2009).

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 contract required CSC to continue to operate and maintain the AMC’s two legacy systems, CCSS and SDS, until a commercially based Enterprise Resource Planning (ERP) solution was fully developed and implemented. CSC was selected for the contract by AMC for three primary reasons. First, in its final proposal, CSC had been willing to tie a greater percentage of its revenues to contract performance. Second, CSC had a record of successfully implementing ERP solutions for government clients. Third, and perhaps most important, CSC offered the best “soft landing” package for existing government workers: it promised to hire all existing government employees for a minimum of three years with comparable pay and a $15,000 bonus (Lucyshyn 2004). Of the 206 job offers CSC extended to former government employees, 205 were accepted (CSC Staff 2008).

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1 Originally, LMP, or Logistics Modernization (LOGMOD), was termed “WLMP,” which referred to Wholesale LMP. Later, LMP was expanded to include retail logistics, and the “W” was dropped from LMP.
II. Implementing LMP

On July 1, 2000, CSC began work on the LMP initiative. Under contract, it was tasked with maintaining and culling data from the AMC legacy systems while developing a replacement system that employed an ERP solution. However, rather than acquire the system, the Army would buy the use of the ERP as a service.

Contracting for an ERP service marked a major change in AMC’s procurement practices. Instead of buying and maintaining the software, the Army is now only required to pay for the rights to use the ERP service. This practice is similar to the sale of licenses for commercial software products, such as word processing programs for personal computers (Ferlise 2000). As the prime contractor, CSC is responsible for maintaining the ERP system by keeping the software up-to-date with the latest IT upgrades, and for preserving the structural integrity of system’s hardware. At the end of the contract period, other system integration companies will have the opportunity compete against CSC to provide the ERP service and maintain the system hardware. This procurement approach was appealing because, in theory, it offered the Army a way to achieve cost savings, as well as superior system performance. By introducing private-sector competition, the contract selection process would encourage cost reductions. Since the ERP software would be provided by a commercial firm that continuously invests in research and development, the system’s software would “keep pace with continuing advances in supply chain management and automation” (Ferlise 2000).

CSC and Army officials evaluated three potential commercial ERP solutions: SAP, Oracle and PeopleSoft. In September, CSC selected the ERP software package developed by SAP America Inc., for LMP because it was determined to offer the best overall value. As one of the world’s leading ERP providers, SAP offered several software programs designed specifically for the public sector. SAP, however, did not have a pre-developed software solution to meet the functional needs of the Army due to the size and complexity of its wholesale logistics enterprise. 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

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2 ERP is a unified method for managing all functions of a company into a few databases. These complex solutions are usually developed with a modular design so the user can focus on particular data modules as opposed to looking through the database.
solutions programs (Zardeki 2004). This effort marked the first occasion when a specialized version had been produced from pre-existing public-sector offerings (Thureen 2008). Furthermore, officials had to incorporate new products that were not a part of the old legacy system, such as business warehouse (BW), advanced planner optimization (APO), and strategic enterprise management (SEM) (Zelinski 2008). The integration of these capabilities was especially difficult because such functions had never been integrated into an ERP system before. In addition to functional demands, the ERP solution also had to meet a wide variety of legal and programmatic requirements (Heretick 2002). LMP must comply with approximately 170,000 laws, 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) policies (Zelinski 2008).

CSC and the Army also had to address the challenge of integrating their ERP solution with existing programs that maintained some similar capabilities. This proved especially difficult for the integration of the Army Workload and Performance Systems (AWPS). Launched in 1999, AWPS is a web-based software solution designed to link workforce requirements and the Army’s budget systems. For instance, the AWPS allows AMC staff to determine the potential impact that budget changes would have on workforce readiness. Since LMP maintained some functions similar to those of the AWPS system, the decision was made to integrate these systems. This proved difficult, since some of the AWPS’s capabilities were beyond the scope of the LMP system. According to an October 2002 GAO report, AMC had the option to develop the programs separately, as originally planned, or it could attempt to consolidate the AWPS program with LMP (GAO 2002). Due to the cost and effort already applied to independent development, AMC decided to keep the two systems independent.

The number of integration challenges, amount of data to transfer, and level of system testing caused the first delay of the LMP program. AMC had originally planned to complete LMP’s systems integration testing by November 29, 2002. However, complications with synchronizing data with legacy systems arose that required six additional months to resolve (the original “go live” launch date was February 2003) (Caterinicchia 2002). Few were surprised by the delay because of the complex nature of the LMP project. In some ways, the Army was still learning about the expansive functionality of its new ERP solution. During the delay, the Army and CSC
realized the LMP system could be expanded to include additional processes relevant to the logistics system. On March 28, 2003, the Army extended CSC’s contract from 10 to 12 years in order to add and deploy Milestone 3 functionality associated with the Army’s new inventory management system, the Single Stock Fund (SSF) (Thureen 2008). Historically, the Army separated the management of its logistics systems into two levels: AMC managed the wholesale level, while the Army’s eight major commands (MACOMs) managed their retail levels independently (Sparciano 2002). SSF was designed to integrate these two levels in order to form one comprehensive inventory system.

While the delay allowed the Army to expand the functionality of its ERP solution, it disrupted the training program for end-user personnel. The training program was originally scheduled to begin after integration testing was completed in November 2002 and to run all the way to the LMP’s first “go-live” launch in February 2003. The delay caused the Army to adjust its training program. However, the adjusted training program did not include training for the latest integrated systems, such as SSF. Since proper training is a critical aspect of program performance, LMP could not be launched until end-user training caught up with the integration testing. The Army evaluated program and personnel readiness through a detailed, 57-element scorecard developed by CSC. Specifically, officials were monitoring system testing at retail sites, data cleansing and end-user training. According to Larry Asch, then-chief of business and operations at CECOM, “in March, that score card told us we were not ready to go live. In June, it told us we were ready” (Hardy 2003, 2).

On July 7, 2003, the first deployment of LMP went live and was made available to an Army community of 4,300 users across twelve locations, including one depot3 (LMP Staff 2002). The first “go live” version of LMP only provided users with about 80 percent functionality of the ERP solution (Haber 2007). Three more incremental deployments, spaced out over the duration of the contract, were utilized to expand LMP’s footprint and increase the system’s total functionality (Zelinski 2008).

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Since the legacy systems had been taken offline for a day to prepare for the launch, LMP’s first deployment was immediately tested with a surge of transaction orders, amounting to over 90,000 hits in its first day. Within the first month, the LMP pilot system was processing approximately 60,000 to 70,000 transactions per day. This level of performance far exceeded that of the previous legacy systems (Jackson 2003). In addition to exponentially shorter transaction times, LMP saved Army end-users and middle managers 15 to 20 minutes for each order review and material oversight review (see Figure 1) (U.S. Army LMP Press Release 2008a). In addition, LMP allowed end-users to save purchase requisitions (PR) in the middle of processing a transaction, as opposed to the legacy systems, which did not have a save and return function. This additional functionality saves the Army an immeasurable amount of time. These technical accomplishments have earned the LMP system recognition from both public and private organizations. After one year in operation, the system won the DoD Award for Seamless Information Technology (U.S. Army LMP Press Release 2008c). In March 2005, LMP received the prestigious SAP Customer Competency Center certification, an award held by less than 1 percent of SAP’s approximately 20,000 North American clients (Carroll 2007).

Figure 1: Benefits of LMP vs. Legacy Systems

<table>
<thead>
<tr>
<th>Benefit</th>
<th>LMP</th>
<th>Legacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple sales order processing and release capability</td>
<td>~ 5 min per batch (45 min daily savings)</td>
<td>~ 5 min per transaction</td>
</tr>
<tr>
<td>Maintenance order processing time shortened</td>
<td>~ 2 days</td>
<td>~ 2 weeks</td>
</tr>
<tr>
<td>Increased accuracy and higher visibility of maintenance actors</td>
<td>~ 2-3 min</td>
<td>~ 5 min to several days</td>
</tr>
<tr>
<td>Easier to input purchase requisitions (PRs)</td>
<td>Can save and return to PRs once required fields are populated</td>
<td>Interruptions require creating PR from scratch</td>
</tr>
<tr>
<td>Drill-down capabilities to trace sales and purchase orders</td>
<td>Saves ~ 15-20 min per review</td>
<td>Lack of drill-down capability increases review time</td>
</tr>
<tr>
<td>Greater material movement oversight</td>
<td>Saves ~ 15-20 min per review</td>
<td>Lack of material movement oversight increases review time</td>
</tr>
</tbody>
</table>
III. Initial Implementation Challenges

Although LMP provided location users with greatly improved transaction time and overall system capability, the first deployment experienced several implementation challenges. At the command level, the LMP’s first deployment experienced system integration difficulties, financial management problems, and incomplete inventory visibility. At the depot level, the system reported unreliable results, did not reconcile account balances during data transfer, and provided erroneous unit prices and unit of issue. These problems caused unnecessary delays and cost overruns.

a. Command Level

1. System Integration Difficulties

In January 2004, the Army reported that LMP had not been interfacing with the Work Ordering and Reporting Communications System (WORCS) since September 2003. The Army uses WORCS to communicate “with customers on the status of items that have been sent to the depot for repair,” and to commence “procurement actions for inventory items.” Due to the system’s unreliability, Army personnel were forced to revert to manual data entry, which was costly, time consuming, and inefficient (GAO 2004).

2. Financial Management Problems

The first deployment of LMP did not produce unqualified financial data. According to Kevin Carroll, former director of the Army’s Program Executive Officer Enterprise Information Systems (PEO EIS), financial irregularities were a constant problem the entire time the LMP system was under AMC’s command (Carroll 2008). Army and DFAS officials noted that operational setbacks with LMP at CECOM had caused the system’s first deployment to generate inaccurate financial management information. They observed that LMP was not (1) generating accurate customer bills, nor (2) capturing all repair costs (GAO 2004). Given the qualified nature of LMP’s financial data, the Army and depot customers were initially limited in their ability to produce accurate depot reports or budget estimates.
The LMP system also had trouble transferring contract information to the Mechanization of Contract Administration Services (MOCAS), which is the primary mechanism used for distributing payments to contractors. The Army had to move quickly to correct the MOCAS interface problem because it could have been held in violation of the Prompt Payment Act (PPA) if there were any failures to provide timely payment to contracted personnel.

3. Incomplete Inventory Visibility

The first deployment of the LMP system did not provide total asset visibility. LMP, which is part of the larger SALE initiative, will not deliver total asset visibility until a suite of other systems are developed and implemented, including: Product Lifecycle Management Plus and Global Combat Support System-Army (GAO 2004). The SALE initiative will not commence until all supporting programs have reached full operational capability (see current status section below).

b. Depot Level

1. Reliable Financial Reporting

Army officials indicated that the first deployment of LMP at Tobyhanna Depot overstated net operating results by $74.7 million in FY03 and $50 million in FY 04. The Army planned to adjust these overstatements by reducing its FY 06/FY07 Army Working Capital Fund budget by $124.7 million (GAO 2005). This action provided a quick fix to the immediate financial difference created by the overstatement, but it did not solve the underlying implementation error. CSC and the Army had to retrace their implementation steps to determine where the inaccurate data transfers were occurring.

2. Data Transfer Errors

The first deployment of LMP experienced numerous problems regarding data integrity. A majority of these errors occurred because the Army personnel transferring the data from the legacy systems to the ERP were not prepared to identify or quickly address data inconsistencies. As a result, inaccurate data remained in the LMP system for months, sometimes years. Two of the most noticeable data transfer data errors occurred in reconciling financial account balances and determining correct unit price and unit of issue.
Reconciling Account Balances

LMP encountered difficulty transferring and converting data from Standard Depot System (SDS), the legacy finance and accounting system. In reviewing the transferred data in late July 2003, Army officials realized that ending account balances in the LMP system did not match those balances listed in the SDS system. This issue was important because account balances are used to help develop financial reports, which are in turn used to develop future budgets. As of January 2005, 18 months after the go-live implementation, the Army and the contractors were still not able to reconcile data between the two systems (see Figure 2) (GAO 2005). As a result, the DFAS officials could not accurately determine Tobyhanna’s earned revenue for FY03 and FY04.

Figure 2: Account Balances Reported in SDS and LMP

| Differences in Selected Account Balances Reported in SDS and LMP as of June 30 2003 (Dollars in Millions) |
|---------------------------------------------------|---------------------|-------------------|
| Account Title                                    | SDS                 | LMP               | Difference  |
| Accounts Receivable - government                 | $15.6               | ($16.6)           | $32.2       |
| Operating material and supplies, net             | $3.8                | $69.6             | ($65.8)     |
| Accounts payable - public                        | ($9.9)              | ($24.9)           | $15.0       |
| Obligations - funds received                     | $716.9              | $804.9            | ($88.0)     |
| Reimbursements earned (revenue)                  | $218.7              | $206.8            | $11.9       |

Unit Price and Unit of Issue

Tobyhanna’s financial reports were also distorted by problems with the unit price and unit of issue. As initially deployed, the LMP system, in some cases, contained the incorrect unit values or units of measure for parts and supplies. As a result, LMP produced financial reports that were inaccurate, and in a few cases, drastically overstated the cost and quantity of materials. For example, wing nuts, screws and locking washers were listed in the system at an incorrect price. A supply order that should have cost the Army $411.04 was computed to cost $2.8 million due to incorrect unit prices (see Figure 3) (GAO 2004). In comparing the actual unit costs of wing nuts and locking washers to the assessed costs, it appears that there
might have simply been a misplacement of a decimal point. According to the Army, there were only two possible explanations for the pricing mistake: either the developing contractor entered the “incorrect unit-of-issue and/or price date into the system or the unit-of-issue and/or price data did not transfer correctly from the SDS legacy system to LMP” (GAO 2005). Colonel David Coker, acting Army project manager of LMP at the time, suggested that problems such as washer unit cost were “often the result of human error” (Buxbaum 2006).

**Figure 3: Incorrect Costs in LMP System**

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
<th>Unit Costs</th>
<th>Total</th>
<th>Actual Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wing Nuts</td>
<td>449</td>
<td>$4,214</td>
<td>1,892,036</td>
<td>$188.58</td>
</tr>
<tr>
<td>Screws</td>
<td>3,000</td>
<td>$138</td>
<td>$690,000</td>
<td>$196.00</td>
</tr>
<tr>
<td>Locking Washers</td>
<td>900</td>
<td>$294</td>
<td>$264,600</td>
<td>$26.46</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$2,346,636</td>
<td>$411.04</td>
</tr>
</tbody>
</table>

In addition to pricing problems, approximately 7,600 items in the LMP system were listed under the incorrect unit of issue—the amount of units comprising one item. For example, one unit item of locking washers contained 100 individual washers. The initial LMP system did not indicate to the user how many units were included in one item for each inventory entry. An employee at Tobyhanna Depot ordered 800 units thinking he would receive 800 individual locking washers; instead, the Defense Logistics Agency (DLA) delivered 80,000 locking washers to the depot (GAO 2005).

Given the voluminous number of items and transactions in the LMP system, it was very difficult for officials to recognize unit of issue problems until cases of noticeable difference in quantity arose. LMP had been operating for over a year before the locking washers incident occurred. Army and contractor personnel acted quickly to correct the system, but
this proved to be very difficult. Under the LMP system, “once the inventory item has been used in the system, those transactions for the item need to be reversed before the change can be made in the system that shows the correct base unit-of-issue value” (GAO 2005).
IV. 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 issues resulted in delays and cost overruns. By 2006, the increasing costs were beginning to threaten the continuation of the program. Initially, most of the cost overruns did not attract much attention because LMP was financed through the Army Working Capital Fund (AWCF). The war in Iraq, however, made the AWCF highly visible since the Army used the fund for vehicle repair and maintenance. According to DoD, the operations in Afghanistan and Iraq more than doubled the workload at Army depots. This created a dramatic cost increase for depot personnel and material, and Army officials noticed the growing cost of LMP and its impact on the entire fund (Carroll 2008). Less than one year after the first go-live launch in March 2004, the Army had already spent $400 million of the $680 million contract—approximately 59 percent 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 2004). By late 2005, it was apparent to Army leadership that LMP could not be sustained 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.

In response to the pause, the Army conducted a full review of LMP based on the evaluation criteria. The review uncovered five major programmatic problems that were the root of data inaccuracies and cost overruns experienced from 2003 to 2005: cultural resistance, improper training, unnecessary software modifications, lack of centralized leadership, and unfamiliarity with service contracting. After identifying these problems, the Army and CSC implemented a series of changes that addressed the immediate problems, as well as greatly enhanced LMP’s overall performance and reliability. The most critical of these changes were transferring management of LMP from CECOM to the Army’s Program Executive Office for Enterprise Information Systems (PEO EIS), modifying the existing contract structure to allow for cost
flexibility on the contractor’s side, and achieving compliance with important federal IT standards (Onley 2006).

a. Identifying Programmatic Problems

1. Cultural Resistance

Cultural resistance from Army personnel was one of the most critical problems facing LMP after its first deployment (Carroll 2008). While such resistance negatively impacted program performance, the initial unwillingness of end-users and middle managers to adopt the new system was certainly natural. 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 through 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 2006a). In order to overcome the entrenched operating procedures built around the legacy systems, the Army needed to enact a clear, multi-faceted communication strategy to educate personnel about LMP, and receive their feedback during the test and integration phase of the program.

Unfortunately, the Army’s efforts to address the workforce’s reliance on the legacy systems were insufficient. According to Kevin Carroll, many of the original deployment sites simply did not adapt themselves to the SAP software. As a result, the implementation of LMP did not bring about the desired adoption of best business practices that was originally envisioned. The learning curve for LMP was steep and long. In some cases, Army personnel actually developed modifications to SAP software, which allowed them to circumvent the embedded business practices in the ERP by extending legacy processes into LMP (Organik 2008).

2. 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 inputs and suggestions about LMP.
First, the Army did not adequately train end-users on the appropriate systems; instead of training with specially modified SAP software similar to the kind used in LMP, users were trained on a standard SAP program (Albright 2008). As a result, they were not adequately prepared to operate LMP after the go-live launch. Furthermore, the SAP training was originally transaction-based, as opposed to process-based. This was a critical shortcoming, because adoption of business practices is the central propose of ERP implementation. According to Col. Lambert, “ERPs are not about IT. They are about people, process and data” (Lambert 2009).

Second, while the training programs provided by the Army were thorough, the strategy focused on delivering the wrong message to the wrong group. The training programs were designed primarily for LMP end-users, and only provided limited instruction to middle managers. The Army adopted this strategy because under the old systems, the middle managers’ role with the actual systems was limited. Since the ERP presented end-users and managers with new responsibilities, managers could not properly direct the data transfer from legacy systems to LMP (see data error section below).

Third, the training process did not provide an opportunity for trainees to submit their insights about the LMP system. “Users are more interested in a new system and new business process,” said Col. Coker, “when they can provide input on how to improve them” (Coker 2006a). The purely top-down training style minimized stakeholder buy-in at the user level. With minimal buy-in, workers at each deployment location maintained a greater dependence on the program office, as opposed to taking charge of their implementation.

3. Data Errors

Data errors significantly contributed to the inability of LMP to achieve unqualified financial data. Figures 2 and 3 (above) demonstrate how minor data errors can have a major impact on aggregated financial data. LMP officials clearly underestimated the challenge of transferring legacy data to the new ERP system, and, as a result, the importance of data cleansing and transfer was not adequately emphasized to LMP personnel through training programs and internal communications. For example, users were transferring bad data into the LMP because they were not fully aware of the need to cleanse data before transferring to the new
LMP system. Since neither the end-users nor the middle management were aware of the cleansing requirement, nor of its importance, bad data transfers continued to occur for some time after the initial launch.

The lack of understanding about the data-cleansing requirement caused complications with the development project deadlines. Army personnel at the LMP locations underestimated how long it would take to transfer all of the data from the SDS and CCSS mainframes. The sites that were a part of the first deployment generally assumed one month for total cleansing. In reality, comprehensive data cleansing took the Army two and half years (Carroll 2008).

4. Unnecessary Software Modifications

The Army initially had difficulty controlling software modifications to LMP. Since no ERP software solution offers “out of the box” functionality, some modifications were necessary in order to adjust the software to meet specific operational requirements. For example, as stated above, the Army and CSC had to develop a customized version of the SAP package to address the wide variety of operational and legal requirements. Unfortunately, the Army also implemented some less-necessary modifications that limited the potential gains from LMP.

There are generally two methods for modifying SAP’s ERP software: SAP supported and SAP unsupported. First, SAP provides all of its users the ability to tailor the software to meet their specific needs. As long as the modifications remain within SAP’s pre-established guidelines, the company guarantees to support those changes throughout the system’s lifespan (Organik 2008). This is ideal for software users because it allows them to leverage the benefits of SAP’s internal investment and software updates, saving the user both time and money. Second, software users can also make “custom code” changes outside of SAP’s guidelines. If SAP chooses to not to support the code changes, the users must develop their own software patches every time the overall system is upgraded. Reminiscent of the Army’s experience with their COBOL legacy systems, custom software development can be expensive and time consuming.

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4 Data cleansing refers to the review of legacy system data before transfer into LMP. For example, the legacy systems often held more than one instance of a transaction. Without data cleansing, end-users would simply transfer all of those instances, but the ERP would read the instances as separate events. This would create inaccurate data.
Given the wide range of products and services included in the Army’s logistics network, numerous modifications to the LMP system were necessary to meet operational requirements (Lambert 2009). The Army’s modifications were not universal across the entirety of LMP, as some locations vary greatly in their missions and require special modifications specifically suited for their demands. For example, Aviation and Missile Life Cycle Management Command (AMCOM) specializes in Army aviation, space and missile programs. Its modifications were designed to address the unique requirements of these operational areas. Alternatively, Tank and Automotive Command (TACOM) specializes in weapons and automotive programs. It requires a different set of system modifications than those implemented at AMCOM.

Although the Army wisely decided to only implement modifications that were supported by SAP, it did not strictly regulate the number of modifications being implemented at each site. Due in part to cultural resistance, Army personnel used software modifications to not only address operational requirements but also to integrate legacy systems processes into LMP. Instead of adopting new business practices based around the ERP system, some system users attempted to maintain the status quo through these modifications. Avoiding change through modifications went against the intended purpose of LMP. “We view change management and business transformation,” said Col. Lambert, “as among the principal priorities that we are engaged in” (Lambert 2009).

5. Lack of Centralized Leadership

The AMC’s absence of a centralized management structure for LMP limited the Army’s ability to halt unnecessary software modifications, adjust the end-user and middle management training programs or increase personnel education programs to combat the level of cultural resistance. First, there was no permanent management process to test and approve, or reject, requests for software modifications. In some cases, the Army had actually delegated its responsibility for product testing to the contractor. As a result, not only was there minimal oversight regarding the necessity of requested modifications, there was also nobody analyzing how well the modifications worked or how they all fit together. This caused some interoperability issues between location systems. Second, without a strong program management office, problems regarding the initial personnel-training program went
unrecognized. As mentioned above, confusion among employees regarding duties caused the transfer of bad data from the legacy systems to LMP. Third and finally, there was no strong leadership commitment to developing an education program aimed at minimizing cultural resistance.

6. Unfamiliarity with Service Contracting

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).

After almost 3 years in operation, it was apparent to the Army and the contractor that the contract was not properly structured to support the research and development requirements of the project (Lambert 2009). The initial LMP contract was structured as a firm-fixed-price (FFP) agreement. Under this arrangement, the Army agreed to pay CSC one flat rate, approximately $67 million per year, over the length of the contract. The prime contractor and its sub-contractors had to develop solutions and troubleshoot problems within that cost structure, as well as maintain the legacy systems. Given LMP’s wide variety of requirements, the contractors had to spend more resources on research, development and testing than it had anticipated. The FFP contract placed most of the risk on the contractor without a good understanding of the effort involved. The contract did not provide the flexibility necessary to spend additional funds on development projects, while at the same time keeping other cost and profit margins in check.
b. Making Changes

To prove the legitimacy of LMP and to lift the strategic pause, the Army and CSC took aggressive steps to address the key problems stated above, as well as each point raised in the 722-item report. The most critical of these steps were the Army’s decision to transfer management of LMP from the AMC to the PEO EIS, alter the FFP contract structure to include a flexible pay schedule, and achieve FFMIA and DIACAP regulatory compliance.

1. Change in Leadership Organization

The most influential change the Army made during the strategic pause was the transfer of management and oversight responsibilities for the LMP system from AMC to the PEO EIS on March 8, 2006 (U.S. Army LMP Press Release 2008d). The reason for the change in leadership was threefold. First, AMC had struggled to meet deadlines, cost benchmarks, and performance expectations since the initiation of the program in 2000. AMC simply did not have the personnel or institutional experience to implement a project as large as LMP. Second, since the central mission of the PEO EIS was to deploy IT and enterprise business management systems for the Army, it was better equipped to implement the LMP system and train Army personnel. In addition, based on the PEO EIS’s previous work, it had greater experience with service contracting. Third, the PEO EIS was already managing all of the Army’s other ERP transformation programs that were a part of the Single Army Logistics Enterprise (SALE) initiative. By consolidating all programs under the office of the Director of the Army ERP System Integration Task Force (see Figure 4), the Army could more effectively manage each individual program, as well as lay the groundwork for the SALE initiative (Army Logistician Staff 2006).
The new LMP program management office, now led by Colonel Scott Lambert and Diane O’Connor, developed a centralized leadership structure that quickly addressed the problems of unnecessary software modifications, data quality, and personnel training and education. First, the new management team created a rigorous oversight body that reviewed the quality of past modifications and assessed the validity of new software alteration requests. All requests for changes in the SAP software must now receive approval from six organizational boards before being integrated into LMP (see Figure 5). Through this oversight process, the number of unnecessary software changes has decreased dramatically (Lambert 2009). Furthermore, the Army uses this management structure to unravel modifications made during LMP’s first deployment.
LMP’s new leadership also redesigned the training and education procedures for Army personnel. Instead of focusing exclusively on end-user transaction training, the Army has started to train both end-users and middle management on process change and transaction methodology. This new training strategy has minimized the amount of bad data transferred from the legacy systems. Furthermore, the program management office has instituted educational programs and internal news releases that explain the reason for switching to an ERP. This approach has been instrumental in decreasing the level of cultural resistance to LMP throughout the Army.

2. Altering Contract Structure

The Army also recognized the need to change the existing structure of the contract to allow for more flexibility in funding program research, development and testing. The existing FFP contract structure had locked in contractors at one total price, which limited their overall ability to support the required development. As a result, in January 2006, the Army modified the contract structure to include a cost-plus-fixed-fee (CPFF) arrangement. Under a CPFF contract, the contractor’s profit margin remains fixed, but the government reimburses the
contractor for additional, allowable costs for particular requirements of the contract. If the additional costs exceed the predetermined ceiling, the contractor’s profit margin is affected. The Army applied the CPPFF arrangement for program development and continued deployment, but maintained the FFP for routine project sustainment. According to Diane O’Conner, the joint CPFF and FFP structure provided a “better balance of risk and cost” (Lambert 2009).

3. Federal Compliances: FFMIA and DIACAP

One the biggest shortcomings of the LMP’s first deployment was its inability to produce unqualified financial data. In early 2006, the Army sought to overcome this long-standing problem by developing a five-step plan toward achieving Federal Financial Management Improvement Act (FFMIA) compliance. The Act requires the LMP system to produce financial data that meet federal management systems requirements, applicable federal accounting standards and conditions for the U.S. Standard General Ledger (USSGL). FFMIA certifies that a program’s financial data is credible and reliable. Achieving such compliance was extremely challenging, especially given the status of LMP in 2006. In order to achieve FFMIA compliance, the LMP system had to meet all of the 2,300 relevant requirements (757 requirements applied to LMP) listed in the DFAS Guide, or “Blue Book” (CSC Staff 2007). Army personnel and the contractor worked closely with the Army Audit Agency (AAA) to verify completion of the Army’s compliance plan. By May 2007, the Army had successfully resolved the numerous systematic problems with LMP’s financial data and had achieved FFMIA compliance (U.S. Army LMP Press Release 2008d).

In January 2007, the Army initiated an additional effort aimed at achieving another rigorous federal IT standard, the DoD Information Assurance Certification and Accreditation Process (DIACAP). This certification required LMP to meet federal “sensitivity and mission requirements” for processing and transmitting data (U.S. Army LMP Press Release 2008b). Since LMP’s users range from inventory management staff in the U.S. to decision-makers on the battlefield, it was vital for the Army to achieve DIACAP compliance. The program management office recruited assistance from the PEO EIS and the Army Software

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5 According to the Federal Acquisition Regulation (FAR), Cost-Reimbursement Contracts, subpart 16.3.
Engineering Center (SEC). Through this cooperative effort, the Army developed a six-step process towards gaining DIACAP compliance: a plan, an internal test, internal remediation, post-remediation testing, formal testing, and a final report. The team successfully accomplished each of these milestones on time and in December 2007, achieved DIACAP compliance valid for three years.
V. Current Status

a. Logistics Modernization Program (LMP)

Due to the comprehensive changes made to LMP, 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 has developed a new deployment schedule set to reach full operational capacity (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” at Tank and Automotive Command (TACOM) in Warren, Michigan and Joint Munitions Command/Army Sustainment Command (JMC/ASC) in Rock Island, Illinois in September 2010 (see Figure 6). After the first deployment, the entire LMP system will upgrade its software from SAP version 4.6c to 6.0, because the newest version maintains capabilities most helpful to LMP.

After the fourth deployment, the LMP system will be fully deployed. At that point, LMP will serve over 17,000 users located at approximately 1,000 sites and handle more the 1.3 million transactions daily (U.S. Army LMP Press Release 2008d). LMP will interface with approximately 70 external DoD systems and will exceed industry ERP standards in response time (with 95 percent of the responses under two seconds, as opposed to 85 percent with the legacy system). LMP will be “one of the world’s largest, fully integrated supply chain, maintenance, repair and overhaul (MRO) planning and execution solutions” (U.S. Army LMP Press Release 2008c). 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 ever investment dollar spent the Army will receive 11.12 dollars of benefits) (see Memo at Appendix A).
b. Single Army Logistics Enterprise (SALE)

Although LMP provides unparalleled visibility across all of the Army’s national-level logistics, it does not reach across the entire Army supply chain. In order to transform its entire supply chain and achieve total asset visibility (TAV), the Army has developed the Single Army Logistics Enterprise (SALE) initiative. The SALE program will integrate a series of independent systems in order to achieve “real-time visibility of personnel, equipment, and supplies anywhere in the distribution pipeline and within the operational environment” (U.S. Army 2008b). The SALE initiative will not commence until all of the supporting ERP systems and other non-ERP integration programs have independently reached their full operational capability.

SALE will replace the Army’s existing logistics management system, the Standard Army Management Information Systems (STAMIS). The Army first launched STAMIS in April 1987 in an effort to standardize operating procedures across all of its logistics systems (Greenmeier 2001). Although STAMIS was supposed to be an integrative system, the program quickly
became stove-piped into vertical information flows (U.S. Army PEO EIS 2008). When the Army initially launched STAMIS, its logistics systems were broken down into six vertical silos: supply, maintenance, transportation, civil engineering, health services, and other services—such as personnel administration, finance and food service (Wallace 2005). STAMIS systems were developed independently for each silo. As a result, STAMIS was unable to achieve end-to-end visibility within the Army’s logistics networks. “Stove-piped” development caused duplicative databases, and inadequate communication between each silo.

SALE consists of three federated components that reach across the entire logistics pipeline: LMP, Product Lifecycle Management Plus (PLM+) and GCSS Army Field and Tactical (F/T) (see Figure 7) (Carrol 2007). An additional modernization program directly related to managing the Army logistics enterprise, but not currently included within SALE, is the Army’s General Fund Enterprise Business System (GFEBS). Preliminary integration tests have proven difficult due to subtle variation in each program’s processes. These other systems are described in Appendix B.

Figure 7: Logistics Modernization Program: A Cornerstone of Army Transformation
c. Convergence of Multiple Systems

The SALE initiative is part of a larger effort within the Army to develop a comprehensive logistics and financial network capable of processing end-to-end (E2E) business transactions. According to a memo distributed by the Deputy Secretary of the Army, the Army is planning to converge several ERPs running “non-synchronized instances of SAP into one instance” (see Appendix A).

While a system running a limited number of ERP instances will certainly be able to transfer data between different business units seamlessly, this approach is at variance with commercial practices. Large, multinational corporations have adopted a different approach to ERP implementation. Instead of relying on limited instances of ERP systems, firms have generally developed an ERP system that is specifically tailored to each business unit (see Figure 8) (Fisher 2009). Given the range of products and services large, diversified firms offer, some believe that developing one or two ERP instances is inefficient, since each business unit’s needs are different from the others. For example, GE manufactures products ranging from light bulbs to washing machines to jet engines. Developing a single ERP to accommodate this broad range of activities would be unnecessarily complicated. GE’s approach is to develop systems tailored for specific operating divisions; however, these must be interoperable and must easily aggregate at the enterprise level.

These different approaches to ERP implementation are likely to receive more attention as software capabilities continue to evolve.
Figure 8: Size and Number of ERP Instances at Fortune 100 and DoD Organizations

VII. Lessons Learned

When LMP was launched in 2000, the Army (specifically 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 its wholesale logistics. During the past nine years, LMP has suffered from a variety of delays, cost overruns, programmatic deficiencies and a year-long strategic pause. Despite these challenges, the Army and CSC have guided LMP’s development toward a successful ERP implementation. Although LMP has not yet reached FOC, the actions taken by the Army serve as valuable lessons for organizations seeking to adopt the best business practices through an ERP implementation. When planning such a disruptive change, these organizations should consider the following lessons from the Army’s experience with LMP: they must effectively communicate, 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.

1. Communication

A complex program like LMP cannot thrive without effective communication. During the early period of LMP, communication channels between different management levels—as well as deployment locations—were uncoordinated and inconsistent. For example, although LMP’s program management was aware that initial productivity would decrease during the transition phase, they did not effectively communicate that with end-users. This caused end-users to develop unrealistic expectations about LMP’s capabilities. When their expectations fell short, users became frustrated with LMP, as well as with management personnel (Coker 2006a). The Army solved this and other communication problems by developing a focused communication plan that encompassed both strategic and tactical elements (O’Connor 2009). For example, senior program leaders are now encouraged to play a larger role in LMP implementation, and to work with end-users “to explain the importance of the program and how it fits into the bigger picture” (Coker 2006a).
2. **Cultural Resistance and Education**

Cultural resistance was the one of the biggest challenges facing the LMP’s first deployment. Although some initial resistance was understandable and perhaps even acceptable, the persistent opposition from Army end-users and middle managers inevitably had a negative impact on the overall performance of LMP. The primary reason for the prolonged internal resistance to LMP was the ineffective education strategy implemented by program leaders. Across the deployment sites, Army personnel did not fully understand why they were switching from the legacy systems to LMP, or what the capabilities of the new ERP system were. Without this understanding, system users had difficulty adopting the best business practices that were structured around LMP’s SAP software. As time went on, and frustration with the new system grew, some users attempted to circumvent these new practices by integrating their old legacy processes into LMP.

In order to overcome this problem and increase personnel support, the Army developed a new, multi-faceted education strategy that aimed to increased dialogue between end-users, middle management, and the LMP program management office (Thureen 2008). The strategy relied on several different mediums—including monthly newsletters, user town hall meetings, video presentations, an interactive website and various discussion forums. Through these mediums, LMP leaders could effectively communicate with site personnel, as well as educate users about the purpose of LMP. This strategy also allowed for feedback from users, which increased stakeholder buy-in. Although the culture change is still ongoing, the new education program appears to have a positive impact.

3. **Comprehensive Training**

The Army did not establish an appropriate training strategy during the early phases of LMP. The initial strategy focused almost exclusively on training end-users to process transactions. While this training was important, it did not have the right scope or the right focus. As a result, Army personnel did not focus enough on necessary functions required by the ERP system. Furthermore, the training did not emphasize the importance of process change. As a result, users uploaded unnecessary software modifications in order to use their legacy processes in LMP. During the strategic pause, LMP’s new leadership addressed this problem with a new strategy that expanded the scope and content of its training. In the new strategy, greater emphasis was
placed on training middle managers about their roles and responsibilities. The focus of the training also changed from transaction-based to process-based in order to increase the adoption and successful application of best business practices.

4. **Data Errors**

Soon after LMP and the legacy systems produced differing financial data, LMP officials realized that data errors were responsible for many of the inconsistencies. LMP officials did not fully understand the scope of the challenge of cleansing and transferring legacy data to the new information system. Inadequate training and communication led to the entry of thousands of incorrect prices and units of issue into the system by LMP personnel who did not know it was their job to fix the data before entering it (Lambert 2009).

5. **Program Management Governance**

When AMC launched LMP in 2000, the program office was originally housed within an AMC subordinate unit, the Communications-Electronics Command (CECOM). Although CECOM had some extremely talented individuals, they did not have the requisite experience, nor were they properly positioned to manage this initiative. Several problems developed as a result. For instance, unnecessary software modifications were integrated into LMP without oversight from an approved board. In addition, the quality of the data transferred from legacy systems to the ERP was not adequately tested, which lead to the incorporation of bad or incorrect data into the system.

As mentioned above, in order to address these numerous problems, the Army transferred LMP governance and oversight from AMC to the Program Executive Office Enterprise Integration Systems (PEO EIS), which reports to the Assistant Secretary of the Army for Acquisition, Logistics and Technology. The newly established program management office developed a rigorous internal review process designed to approve software modification requests, periodically assess data quality, and ensure the appropriate level of documentation. To provide an appropriate level of testing, program management established two independent system-testing teams that are managed by the Army's CECOM Life Cycle Management Command (CECOM LCMC) (Lambert 2009). With the larger Army enterprise perspective, the program office also
created an unofficial executive steering committee that brought in all of the program’s stakeholders (including former LMP personnel still at AMC) (Carroll 2008).

6. **Unnecessary Modifications**

After the initial launch of LMP, the Army did not adequately regulate the number of modifications to the SAP software. Although numerous modifications were necessary for the ERP to meet the Army’s diverse operational demands, personnel also used modifications to integrate legacy system processes into LMP. These modifications limited the capabilities of the ERP system, and increased the risk of data transfer errors between Army locations. In addition, reliance on modifications impaired the Army’s ability to adopt the best business practices built around LMP. The Army ultimately overcame this problem by establishing a comprehensive review board, which oversees and coordinates the effort to unravel unnecessary modifications within the system. Organizations preparing to implement an ERP system should not hesitate to modify the software to meet their particular needs, but they should limit such modifications to mission-critical areas.

7. **Contract Structure**

Despite their desire to change their business processes, neither the Army nor the contractor fully understood the scope of the effort, the risk, or the best way to structure an effective contract for such a large-scale, complex ERP development like LMP. The Army’s adoption of the FFP contract constrained the contractor’s ability to pursue the necessary research, development and system testing. This inherently created problems with data quality and system integrity. During the strategic pause, the Army modified the contract structure to include more flexibility for research projects. The LMP contract was redesigned to include Cost Plus Fixed Fee (CPFF) for the development portion and FFP for the maintenance of the legacy systems.

8. **Relationship with the Service Provider**

A close partnership between the contractor and the government is vital for effective service contracting (Thureen 2008). In the case of LMP, the Army and CSC did not address IP rights and program management before the program’s first deployment. As a result, there was confusion regarding ownership of the data and service quality control. Furthermore, Army personnel did not work closely enough with CSC during the development stage of LMP.
(Albright 2008). This led to some misunderstanding about the Army’s vision for LMP. If the Army and CSC had developed a closer relationship before LMP’s launch, many of these issues would have been mitigated.
VIII. Recommendations

The Army’s experience with LMP provides valuable insights for program developers, supporting contractors, and users into the challenges presented by an ERP implementation. While the benefits of process change and new technology are certainly attractive, leaders in public or private organizations should not underestimate the level of investment necessary to successfully initiate process change through an ERP implementation. Without the appropriate level of leadership, personnel training and system testing, any ERP system, like LMP, can face problems that ultimately result in a strategic pause—or much worse, program cancelation. Although LMP was able to recover successfully from its initial rough start, companies seeking to learn from the Army’s experience should adopt strategies to help them avoid such program delays and cost overruns. When considering an ERP, business leaders and government officials should consider the following:

1. **To fully leverage the investment in an ERP, examine and change business organizations and processes.**

ERPs are about process change and adopting best business practices, not simply IT implementation. The natural inclination to adapt the ERP to the extant organization and processes must be fiercely resisted.

Modern ERP software packages probably offer most organizations more functionality than what they currently use. There may, however, be an inclination to view the ERP implementation simply as a replacement to the existing legacy system. Leaders should reject this mindset and use the ERP as a means to evaluate, reengineer processes, and realign their organization’s internal structure. Existing vertical and horizontal business units were formed in particular, individual ways due to the limited functionality of legacy information systems. An ERP implementation should be viewed as an opportunity to challenge this structure and realign it as appropriate. Additionally, the full benefits of the ERP cannot be leveraged without adoption of “best practices” embedded in the ERP system. The emphasis should, to the greatest extent possible, be to align the organization and its processes with ERP.
2. **Develop an effective management processes and governance structure that includes all stakeholders.**

A central problem with LMP’s first deployment was the lack of an effective program governance structure. Without the appropriate boards and oversight panels, the program management office was slow or unable to address the issues of unnecessary SAP software modifications or inadequate training programs. After the transfer from AMC to the PEO EIS, the program’s new management established an organized internal review process that effectively dealt with lingering problems such as overabundant software modifications.

Before initiating an ERP transformation project, an organization should make sure to develop a centralized leadership structure with the necessary boards and review panels. This decision-making apparatus should provide mediums for end-user and middle management feedback.

While the governance structure plays a significant role, it is also important that individuals who are familiar with process change and ERPs fill positions within the structure. While AMC is a key player in LMP, it alone does not have enough personnel who are experienced in implementing ERPs and enforcing process change. Given the complexity associated with ERP implementation, it is important that governance structures have the full support of senior-level leadership. Executive support is vital for providing legitimacy to the governance structure, and helps drive an implementation program when it encounters serious roadblocks. For example, during the Army’s strategic pause, senior leadership could have decided to simply cancel the project. Instead, senior leadership recognized the necessity of LMP and acted pragmatically to preserve the existing program while making the necessary adjustments.

3. **Educate and train at all affected management levels.**

Process change is not easy, especially when end-users have used the same systems and operating procedures for years (as was the case with LMP). Implementing the new ERP system alone will not bring about the intended culture change. In order for employees to adopt new best business practices, they need to be trained and educated for their new roles and responsibilities with the ERP. Without adequate training, employees are likely to become frustrated with the new program—decreasing employee morale, increasing the risk for errors in the transferred data, and
fueling cultural resistance. In the case of LMP, the training program had the wrong scope. As a result, many end-users and middle managers did not complete their tasks because they were not aware of them. Although end-users interface with the ERP the most, it is important that a training strategy includes middle managers, as they are responsible for monitoring end-user progress.

4. **Maintain effective communications with all stakeholders.**

Communication plays a critical role in overcoming cultural barriers and stimulating the adoption of best business practices. All levels of personnel must be kept informed about what is going on in the program and why it is happening. A communication strategy should include not only a wide variety of mediums to inform employees, but also mechanisms for employees to discuss their thoughts about the ERP system and the implementation process. Communication channels for feedback have the potential to increase program efficiency, as well as to instill a sense of ownership among the employees.

5. **Fix data errors before they are entered into the new ERP system.**

Transferring data from the legacy systems to the new ERP system is a challenging and time-consuming process, but is extremely important. Data errors, as experienced during the first deployment of LMP, can undermine the success of an ERP implementation. The thousands of data errors encountered in the first LMP deployment can be attributed, in part, to inadequate communication and training regarding the importance and purpose of data cleansing. After the strategic pause, LMP’s new leadership, PEO EIS, developed a new training and education strategy that focused on training both end-users and middle management in process change as well as transaction methodology. This new training strategy significantly reduced the amount of bad data transferred from the legacy systems to LMP.

6. **Avoid the “big bang;” deploy incrementally with frequent system tests.**

Organizations developing an ERP solution should not underestimate the importance of incremental deployments and frequent system testing. Although this approach may slow program deployment, it is better to identify and address problems early with a limited deployment.
For example, the unit price and unit of issue problem experienced at Tobyhanna Depot required Army personnel to review thousands of transactions manually, which was timely and expensive. Recognizing this problem, the Army developed a system requiring LMP operational sites to send personnel to future deployment sites (Lambert 2009). These personnel serve as experts on comprehensive system testing at locations preparing to deploy LMP. This corrective action ensures a smoother transition, with less disruption, at subsequent sites.

7. *Be Pragmatic.*

ERP development and implementation is a very complex process. No matter how much an organization prepares for the process change, mistakes or data transfer problems are likely to occur. Leaders should not be hesitant to address any issues that arise, to include changing the existing contract structure if necessary. During the eight-plus years the Army has been working with LMP, program management officials have extended the contract, renegotiated the payment structure, and experienced a year-long strategic pause. Ultimately, these actions allowed the Army to appropriately address programmatic problems, as well as to improve its relationship with the primary service provider. Thus, company managers should not view challenges and setbacks incurred during an ERP implementation project as program failures, but merely as part of the learning process.
IX. Conclusion

The Army’s Logistics Modernization Program should be deemed an ERP success story. In 2000, the Army did not have the experience or institutional knowledge to effectively manage a program like LMP. As a result, the program suffered from a variety of setbacks, data errors and cultural resistance, amounting to program delays and cost overruns. Despite these problems, the Army did not retreat in its transformation effort. Instead, Army leadership used the strategic pause to reevaluate its 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 make 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.
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Appendix A: Economic Viability for LMP Memo

DEPARTMENT OF THE ARMY
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FINANCIAL MANAGEMENT AND COMPTROLLER
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WASHINGTON DC 20310-0106

SAFM-CEA-C

JUN 10 2009

MEMORANDUM FOR PROGRAM EXECUTIVE OFFICER, Enterprise Information Systems (PEO EIS); ATTN: SFAE-PS-A, 8350 Hall Rd, Suite 148, Fort Belvoir, VA 22060-5526

SUBJECT: Economic Viability for the Logistics Modernization Program (LMP)

1. References:
   a. FY05 Ronald Regan National Defense Authorization Act (NDAA), Section 332.
   b. LMP Investment Review Board (IRB) FY10 Certification Package.

2. In accordance with the FY05 Ronald Reagan NDAA, the Business Management Modernization Program (BMMP) requires the Army to complete an Investment Review Board (IRB) Certification package for IT programs with investment costs of $1M or more. The certification package includes a section on Economic Viability (EV). EV is determined by calculating the Benefit to Cost Ratio (BCR) and Return on Investment (ROI). The DOA EA Manual guidance states that a program is economically viable if its BCR and ROI are greater than one.

3. My staff reviewed the documentation for the BCR and ROI calculations for the LMP FY10 IRB certification package. The methodologies used to calculate costs and benefits are acceptable and the calculations are accurate, therefore we concur with the program office’s findings of a BCR of 2.43 and ROI of 11.12. A BCR of 2.43 means that when comparing total benefits to total cost, for every dollar spent, the Army will receive 2.43 dollars of benefits. A ROI of 11.12 means when comparing net benefits to total investment costs, for every investment dollar spent, the Army will receive 11.12 dollars of benefits. See attached sufficiency review for details.

4. Point of contact is Mr. Patrick N. Winemiller, (703) 601-4159.

Stephen T. Bagby
Deputy Assistant Secretary of the Army
(Cost and Economics)

Encl
Appendix B: Convergence Letter

MEMORANDUM FOR BUSINESS MISSION AREA EXECUTIVE BOARD

Subject: Consolidated ERP Integration Strategy

1. A decision was made by the Army Business Mission Area (BMA) Executive Board at its meeting on September 26, 2008, to approve the plan for a transition from the current federated Enterprise Resource Planning (ERP) integration path, which will be maintained until 2011, to a combined ERP post-2011. The decision is consistent with direction from the OSD Business Transformation Agency (BTA) and the Defense Acquisition Executive.

2. The combined ERPs will run on a combined SAP product that is already integrated for End-To-End (E2E) business transactions. A benefit of this approach will be to combine separate, non-synchronized instances of SAP into one instance. Actions on the path to the post-2011 consolidated program will include an SAP enterprise license buy; a consolidated Program Manager structure within PEO EIS; and a new acquisition strategy. It is essential that the PEO EIS now move from the analysis phase to planning and execution.

3. The Board requested the Director, BMA, and the PEO EIS, in collaboration with the appropriate functional organizations, to bring to the next Executive Board meeting on October 24, 2008, a concept for planning and executing the combined ERP. Planning should make use of existing governance bodies, including the BMA Council and Executive Board, and the newly formed Enterprise Process Owners Council, as well as planning mechanisms within PEO EIS.

4. It is critical as the Army moves to an automated logistics program and a clean financial audit, on the path to broader total asset and resource visibility, that the transition from federated to integrated ERPs be deliberate, effective, cost-aware, and rapid. We require a clear framework for, not only the consolidated ERP effort, but also the broader management of business processes and the associated information technology systems.

5. The Director, BMA, CIO/G-6, and the functional areas, need to accelerate the production of an Army business enterprise architecture aligned with the major Army E2E business processes and the OSD Business Transformation Agency’s Business Enterprise Architecture. Updates from BMA/PEO EIS on the Army business enterprise architecture and on collaboration with the important work of the Army Enterprise Task Force (ETF) should be included in the BMA Executive Board briefing on October 24th and monthly thereafter.

Thomas E. Kelly III
Appendix C: Single Army Logistics Components

GCSS Army Field and Tactical (F/T)

In 1997, the Army established the GCSS-Army program to correct the numerous problems of the STAMIS system, such as minimal asset visibility and poor communications. The long-term goal of GCSS-Army was twofold: (1) replace existing legacy systems and (2) integrate all of the Army’s tactical logistics functions into one comprehensive program. Unlike LMP, the development strategy for GCSS-Army has changed several times since the program’s inception. Initially, the Army employed a custom software solution, but this strategy was canceled in 2003 due to cost and integration problems (GAO 2007). In order to minimize costs and to leverage capabilities in the commercial sector, the Army replaced the custom-designed software with an ERP solution using SAP software. Given the complexity of GCSS-Army, officials have planned to roll out the program in two segments. The first segment will focus exclusively on direct support supply operations and operational assessments. The second segment will include additional capabilities such as maintenance and ammunition functionality (DoD 2008). The GCSS Army is divided into two components: GCSS – F/T and GCSS – PLM+.

GCSS – F/T is a fully integrated automated logistics system that will “serve as the definitive source for Warfighting logistics requirements and enables tactical unit sustainment in garrison and war.” When the F/T reaches FOC, it will have replaced thirteen Army tactical legacy systems (U.S. Army LMP Press Release 2008b, 2). The system will serve as the single point of entry for tactical end-users by providing a variety of capabilities, including a real-time common operating picture (COP) of Army logistics (U.S. Army 2008c). This COP will provide logisticians with real-time visibility of tactical goods, supplies and assets throughout the entire pipeline.

Product Lifecycle Management Plus (PLM+)

PLM+ will serve as the single point of entry and exit for interfaces with external systems, as well as the two internal logistics systems: LMP and GCSS F/T. The system will also “define a standard interface to databases, systems and services dealing with finance, human relations, commercial trading, and joint logistics” (U.S. Army LMP Press Release 2008b). Specifically,
PLM+ key enterprise systems have not been historically linked together—including systems such as TRANSCOM, personnel systems, defense logistics agency (DLA), DFAS, defense automatic addressing system center (DAASC) and the original equipment manufacturer (OEM). Upon reaching FOC, PLM+ will “provide total lifecycle management, enterprise master data, business intelligence, and SAP Enterprise Portal capabilities” (Coker 2006b, 35-36).

General Fund Enterprise Business System (GFEBS)

Although it is not officially included in the SALE initiative, GFEBS plays an important role in achieving TAV. The Army established the GFEBS program in 2004 to provide standardized control over all non-working capital funds (likewise, LMP develops the financials for the working capital fund). When fully deployed, GFEBS will manage over $140 billion in funds for almost 79,000 users located at approximately 200 locations (U.S. Army 2008a). The main purpose of GFEBS is to increase the reliability of the Army’s entire financial data (GAO 2007). The program is scheduled to reach FOC by 2010.
Appendix D: Terms and Abbreviations

Advanced Planner Optimization (APO)
Army Audit Agency (USAAA)
Army Material Command (AMC)
Army Material Systems Analysis Activity (AMSAA)
U.S. Army Security Assistance Command (USASAC)
Army Workload and Performance Systems (AWPS)
Business Enterprise Architecture (BEA)
Business Transformation Agency (BTA)
Business Warehouse (BW)
Clinger-Cohen Act (CCA)
Commodity Command Standard System (CCSS)
Communications and Electronics Command (CECOM)
CECOM Life Cycle Management Command (CECOM LCMC)
Chief Information Officer (CIO)
Commercial-Off-The-Shelf (COTS)
Common Operating Picture (COP)
Cost Plus Fixed Fee (CPFF)
Communications Security Logistics Activity (CSLA)
Defense Automatic Addressing System Center (DAASC)
Defense Finance and Accounting Service (DFAS)
DoD Information Assurance Certification and Accreditation Process (DIACAP)
Defense Logistics Agency (DLA)
Department of Defense (DoD)
DoD Office of the Inspector General (DODIG)
Enterprise Architecture (EA)
Enterprise Resource Planning (ERP)
End-To-End (E2E)
Federal Financial Improvement Act (FFMIA)
Firmed Fixed Price (FFP)
Full Operational Capability (FOC)
Government Accountability Office (GAO)
Global Combat Support Systems (GCSS)
GCSS Army - Product Lifecycle Management Plus (PLM+)
GCSS Army - Field and Tactical (F/T)
General Fund Enterprise Business System (GFEBS)
Government Information Technology Executive Council (GITEC)
General Services Administration (GSA)
Global War on Terror (GWOT)
Intellectual Property (IP)
Information Technology (IT)
Integrated Material Management Center (IMMC)
Logistics Modernization Program (LMP)
Major Commands (MACOMs)
Most Efficient Organization (MEO)
Mechanization of Contract Administration Services (MOCAS)
Material Resource Planning (MRP)
National Federation of Federal Employees (NFFE)
Operating Location (OPLOC)
Original Equipment Manufacturer (OEM)
Program Executive Office for Enterprise Information Systems (PEO EIS)
Prompt Payment Act (PPA)
Purchase Requisitions (PR)
Radio Frequency Identification (RFID)
Report, Interface, Conversion and Extension (RICE)
Single Army Logistics Enterprise (SALE)
Soldier and Biological Chemical Command (SBCCOM)
Standard Depot System (SDS)
Standard Financial Information System (SFIS)
Single Stock Fund (SSF)
Standard Army Management Information Systems (STAMIS),
Strategic Enterprise Management (SEM)
Supplies total asset visibility (TAV)
Work Ordering and Reporting Communications System (WORCS)
Acknowledgments

This research was sponsored by the Naval Postgraduate School, and we are especially grateful for the support provided by Rear Admiral Jim Greene (USN Ret) and Keith Snider for their patience, encouragement, and support. The authors are deeply indebted to Ryan Lewis and Jeffrey Hughes, graduate assistants at the Center for Public Policy and Private Enterprise at the University of Maryland’s School of Public Policy, who assisted in the research and editing of this report. We would also like to thank Colonel Scott Lambert and his staff, as well as Ms. Sheri Thureen, of the CSC LMP program office, for their cooperation and support. Finally, we want to thank our co-worker, Caroline Dawn Pulliam, for her assistance with planning, coordinating, and reviewing of the manuscript.

Opinions, conclusions, and recommendations expressed or implied are solely those of the authors and do not represent the views of the Department of Defense or any other agency of the Federal Government or of the sponsors.
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The Honorable Jacques S. Gansler, former Under Secretary of Defense for Acquisition, Technology, and Logistics, is a Professor and holds the Roger C. Lipitz Chair in Public Policy and Private Enterprise in the School of Public Policy, at the University of Maryland; and is the Director of both the Center for Public Policy and Private Enterprise and the Sloan Biotechnology Industry Center. As the third-ranking civilian at the Pentagon from 1997 to 2001, Professor Gansler was responsible for all research and development, acquisition reform, logistics, advance technology, environmental security, defense industry, and numerous other security programs. Before joining the Clinton Administration, Dr. Gansler held a variety of positions in government and the private sector, including Deputy Assistant Secretary of Defense (Material Acquisition), Assistant Director of Defense Research and Engineering (electronics), Executive Vice President at TASC, Vice President of ITT, and engineering and management positions with Singer and Raytheon Corporations.

Throughout his career, Dr. Gansler has written, published, and taught on subjects related to his work. Gansler recently served as the Chair of the Secretary of the Army’s “Commission on Contracting and Program Management for Army Expeditionary Forces.” He is a member of the Defense Science Board, and also a member of the National Academy of Engineering and a Fellow of the National Academy of Public Administration. Additionally, he is the Glenn L. Martin Institute Fellow of Engineering at the A. James Clarke School of Engineering, an Affiliate Faculty member at the Robert H. Smith School of Business and a Senior Fellow at the James MacGregor Burns Academy of Leadership (all at the University of Maryland). For 2003 – 2004, he served as Interim Dean of the School of Public Policy. For 2004 – 2006, Dr. Gansler served as the Vice President for Research at the University of Maryland.

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Current projects include: modernizing government supply chain management, identifying government sourcing and acquisition best practices, and department of defense business modernization and transformation. Previously, Mr. Lucyshyn served as a program manager and the principal technical advisor to the Director of the Defense Advanced Research Projects Agency (DARPA) on the identification, selection, research, development, and prototype production of advanced technology projects.

Prior to joining DARPA, Mr. Lucyshyn completed a 25-year career in the U.S. Air Force. Mr. Lucyshyn received his Bachelor Degree in Engineering Science from the City University of New
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