STRATEGY RESEARCH PROJECT

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TRANSFORMATION – REVOLUTION IN MILITARY LOGISTICS

BY

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TRANSFORMATION – REVOLUTION IN MILITARY LOGISTICS

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ABSTRACT

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The CSA has stated "the transformation objective is to field a force that is strategically responsive and dominant every point on the spectrum of operations." To support this vision, Army logistics requires a quantum leap in strategic responsiveness. This change is called "Revolution in Military Logistics," to know what the customer, the Warfighter, needs before he requests it. This study examines proposed improvements in automation, communications, and business practices; reshaping command and control relationships; and development of distribution technologies that will facilitate rapid throughput and follow-on sustainment to support the CSA's vision. This study evaluates all components of RML and discusses the strategies that should be adopted by the logistics community as part of the Army's Revolution in Military Logistics.

TABLE OF CONTENTS

ABSTRACT iii

LIST OF ILLUSTRATIONS vii

TRANSFORMATION – REVOLUTION IN MILITARY LOGISTICS 1

- AUTOMATION 2
- COMMUNICATIONS 3
- BEST BUSINESS PRACTICES 4
- INTEGRATED SUPPLY CHAIN MANAGEMENT 5
- SINGLE STOCK FUND 7
- C2 - INFRASTRUCTURE AND REDUCED LOGISTICAL FOOTPRINT 9
- DISTRIBUTION-BASED LOGISTICS 13
- AMC'S ROLE IN RML 15
- SUMMARY AND CONCLUSIONS 16

ENDNOTES 19

BIBLIOGRAPHY 23

LIST OF ILLUSTRATIONS

FIGURE 1 14

TRANSFORMATION – REVOLUTION IN MILITARY LOGISTICS

Logistics is the lifeblood of any Army. Changing how we fight influences changes in how we support. The Chief of Staff of the Army (CSA) has stated "the transformation objective is to field a force that is strategically responsive and dominant every point on the spectrum of operations."[1]

> American military might must draw on new technologies and strategies in the 21st century. ... We must build forces based on revolutionary advances in the technology of war that will allow us to keep the peace by redefining war on our terms. ... a future force that is defined less by size and more by mobility and swiftness. That force will be easier to deploy and sustain and will rely heavily on U.S. advantages in stealth, precision weaponry and information technologies.[2]

This transformation challenges the Army to balance near-term readiness and force modernization in an environment of increased missions and fewer resources. The logistics pipeline must be shrunk, the load lightened, and the closing time cut. At the joint level, change started with Joint Vision 2010 and Focused Logistics; at the Army level, change started with the Revolution in Military Logistics (RML). The RML is not only central to preparing for future military operations; it is the fulcrum of the Army's effort to balance readiness and modernization.[3] Army transformation is about changing the way we fight. It is the process of converting the army's focus and structure from a Cold War construct to a full spectrum combat force that is strategically responsive and dominant at every point on the spectrum of conflict. It is more than technology; it's doctrine, training, leadership, organizations, materiel readiness, installations, and soldiers.[4] These changes are vital for a RML. The first wave of RML focuses on exploiting improvements in automation; communications; business practices; reshaping command and control relationships to provide better unity of command and reduced logistics footprint. RML is also developing distribution technologies that facilitate rapid throughput and follow-on sustainment as the Army builds it's future Objective Force. This study evaluates all components of RML and discusses the strategies that should be adopted by the logistics community as part of the Army's Revolution in Military Logistics. The single Combat Service Support (CSS) operator at each level of command must capitalize on technologies such as smart diagnostics, prognostics, and the latest information technology to help reshape CSS products and practices. The next section will address the automation implications in support of the Army's RML.

AUTOMATION

The Revolution in Military Logistics requires more than just changes in technology. RML teams technology with new support techniques and dynamic logistics doctrine. The precision delivery of combat service support (CSS) is anticipatory; it provides significant efficiencies in both supply and distribution. To harness these economies, the Army must capture, process, and manage the disparate data and communications systems that make CSS occur. At the heart of the CSS information system is the Global Support System-Army (GCSS-Army). This system is much more than a close combat coordination and CSS delivery information system. It integrates and fuses information from the factory to the foxhole- coordinating, expediting, and managing the numerous activities in between. Performing these functions requires communications and interactions not only within and between command layers and theatres, but also between sister services. Knowledge gives leaders necessary awareness. Precise, real-time knowledge of the disposition of their assets allows commanders to maneuver CSS assets as quickly as they maneuver combat elements, thereby shaping the battle.[5] As the Army continues to streamline its operations, both in peace and in combat, a passive approach to logistics simply is not acceptable. Waiting for support is not a strategy.

GCSS-Army is an evolutionary logistics information system that builds on the functions and processes of existing systems to generate data, integrate databases, and fuse CSS information from external sources as necessary to execute the RML.

GCSS-Army modernizes CSS automation through its integration of three hardware configurations, seven operating systems, eight programming languages, and five communication protocols into a single system baseline. Initially, GCSS-Army will integrate the existing functions in the current logistics Standard Army Management Information Systems (STAMIS) into a single database with a common programming language and operating environment. It will provide dynamic new capabilities in command management and materiel management. Later versions will incorporate wholesale and retail integration and modernization. Ultimately, GCSS-Army will integrate with joint systems to serve as the land force combat support system. The designated operating system is Microsoft NT. Establishment of a single baseline, operating system, and language will enable the materiel developer to be more responsive to the needs of the user community and ultimately should reduce the cost of systems upkeep and software enhancements.[6]

GCSS-Army software will be delivered in a number of modules, according to the particular function needed. Each module will have common components and share a common database. The maintenance module will facilitate maintenance management at all levels, from organization

up, and provide maintenance management information to logistics staff elements. The property accountability module will capture accountable property data, build and track hand receipts, provide management data for cross-leveling, and eliminate excess. Ammunition and supply modules are designated for support organizations with supply support activities and ammunition supply units. The integrated materiel management center (IMMC) module allows MMC-level users to "see" and manage the stocks on the ground and in-transit in their support area. The management module will give commanders and staff officers visibility and management information for CSS assets in their areas of responsibility. Additionally, the management module will fuse information from non-GCSS-Army databases, such as the Standard Installation/Division Personnel System, Transportation Coordinators' Automated Information Management System II, and others as needed.[7]

Without doubt, GCSS-Army is an ambitious program. But it is well within the bounds of current technological capabilities and warfighting doctrine. By integrating tested CSS functionalities, redesigning business processes, and exploiting proven technologies, GCSS-Army will galvanize RML and totally support the Objective Force.

COMMUNICATIONS

Revolution in Military Logistics will also require a dynamic new approach to logistics support. A seamless logistics system that ties all parts of the logistics community into one network of shared situational awareness and unified action can be achieved only in an environment dominated by global, wireless, assured communications. Many world-class commercial companies have reduced inventories significantly and now rely on real-time information, coupled with rapid transportation, to meet customers' demands. Substantial cost savings in acquisition, warehousing, packaging, and transportation have been achieved by reducing inventories. Much of their inventory is in motion in the logistics "pipeline." To manage their reduced inventories, these companies employ global, wireless communications systems that give them up-to-the-minute status on shipments and deliveries.[8]

In the future, by leveraging information technologies, logisticians will be empowered to provide the right support at the right time at the right place. They no longer will rely on "historical" data. Rather, they will have real-time, predictive information to make intelligent decisions and optimize force readiness. Global wireless communications will provide soldiers the capability to reach and "see" virtually anywhere on the battlefield or in the world.

Today some 200 communications satellites orbit the Earth. It is predicted that there will be over 2,000 by the year 2010. The market for commercial use of global wireless communications,

both voice and data is growing exponentially. Therefore, providers are scrambling to increase total capacity by putting up more satellites and to increase the speed of information flow by improving technology. Competition for market share is driving down the size and cost of mobile equipment, while battery life is increasing steadily.[9]

These types of communications systems are being developed for a global commercial market, but have broad applications for military use at the strategic, operational, and tactical levels. These technologies can provide the capability to receive, transmit, store, and retrieve information in a single seamless logistics system supporting a modern force in tomorrow's Army.

BEST BUSINESS PRACTICES

Methodologies and applications used in private industry that elevate a commercial enterprise above the competition are referred to as "commercial best practices." Best practices enable leading-edge organizations to deliver world-class standards of performance to their customers.

These best practices and standards of performance have generated much interest within the Army logistics community, which is constantly being asked to do more with less. The emergence of commercial best practices took place because of downsizing and a hunger for profitability, or doing more with less, so it stands to reason that there could be a great deal of benefit to Army implementation of these best practices.

Leveraging of commercial best business practices is a popular topic in the literature and presentations concerning the Army of the future, the RML, and the Objective Force. RML, as a precursor and roadmap to the Objective Force, could be accelerated greatly by investigating and embracing many commercial logistics best practices. Integrated supply chain management, industry's changing view of logistics, electronic commerce, automated identification technology, direct vendor delivery, load optimization, outsourcing, and smart simple design are all examples of commercial best practices that could be very useful in helping the Army achieve the RML.[10] The Army Materiel Command (AMC) will transform into a more responsive Army Support Provider (ASP). This ASP will ensure: sustainability is designed into future systems with enormous improvements in reliability, availability, and maintainability; a single command, control, communication, computers/information and technology (C4/IT) architecture provides logistics information at all levels; centralized contracting information is always available; and, embedded diagnostics/prognostics and Automatic Identification Technology (AIT).[11] The next few paragraphs will briefly discuss the emerging trends, capabilities, and best practices of commercial firms that perform the logistics function and move assets and information

throughout the supply chain. The parallels with the RML and the Army's modernization of business practices and information technologies are striking.

INTEGRATED SUPPLY CHAIN MANAGEMENT

The Massachusetts Institute of Technology defines integrated supply chain management (ISCM) as a process-oriented, integrated approach to procuring, producing, and delivering products and services to customers. In this context, ISCM has a broad scope that includes suppliers, customers, and internal information funds flows. Thus, the scope of supply chain management includes the supplier's supplier and the customer's customer. In recent years, supply chain management software providers and consultants have emerged as multibillion-dollar businesses.[12]

The information technology and software solutions offered by global vendors, many of whom have Fortune 500 client lists, offer the tools, visibility, and connectivity to facilitate supply chain management, integration, and optimization. Supply chain management solutions have been most successful when a holistic, end-to-end approach is employed and when processes and information are integrated throughout the enterprise.

Implementation of software to manage the supply chain must integrate many different processes, including supply and demand planning, transportation and distribution management, and advanced planning and scheduling (for asset management or manufacturing operations). This approach can result in inventory reductions, increased on-time deliveries, reduced total product cycle (make-to-sell) time, increased revenues, and better customer service.[13] All of this adds up to significant savings and an important gain in competitive advantage.

Applying tailored, integrated, enterprise-wide business process management software suites when implementing supply chain management techniques is creating a growing revolution in corporate-wide logistics management. This holistic approach is revolutionizing corporate-wide logistics management. Many companies are promoting their logistics chiefs to executive vice presidents and senior vice presidents for logistics. Senior logisticians are being included as members of executive committees. This trend illustrates the institutionalization of the value of logistics to the bottom line. Likewise, using logistics metrics in the corporate suite for planning and policy decision-making also is increasing.[14]

Electronic technologies and applications have expanded to affect many aspects of logistics. U.S. companies have used electronic commerce to increase productivity as they enhance business transactions, data and information exchanges, business process reengineering, organizational changes, and process automation.

With increased ability to handle tremendous volumes of transactions and the ability to amass, analyze, and control large quantities of specialized data, organizations have improved efficiency and accuracy and reduced costs while providing faster, more reliable, more convenient services. These capabilities and the concomitant benefits will be further enabled by rapidly developing intelligent agent technologies that greatly enhance information filtering, search, retrieval, and off-line delivery. Electronic commerce and the sharing of information among entities and organizations facilitate vendor-managed inventories (VMI), paperless contracting, collaborative forecasting, and workflow management.[15]

Through VMI, suppliers can control inventory and replenishment, as well as manage forecasting for improved customer service and increased inventory rotations. With VMI, suppliers can generate more accurate forecasts, which can lead to better production scheduling and reduced operational costs.

Electronic catalogs post product information on the Internet. Many sites offer interactive capabilities such as on-line ordering. Internet purchasing and electronic catalogs are being used to streamline order cycle times, cut administrative costs, and speed product delivery to the customer. The ability to order supplies over the Internet can reduce cycle times drastically throughout the supply chain. This means that a low-cost, web-based, distributed procurement and resupply system can be delivered by standard web browsers.[16]

Automatic identification technology (AIT) includes bar codes, radio frequency (RF) tags, satellite tracking, "smart" cards, and laser cards. Commercial Off The Shelf (COTS) satellite tracking provides real-time monitoring of transportation assets and customer products. Bar codes, the most widely used form of AIT, and the visibility they provide have enabled a great deal of the agility found in today's world-class manufacturers and retailers. The visibility of goods and assets in storage, in transit, and in process has resulted in reduced inventory levels and order and ship times and improved overall responsiveness to customers.[17]

Outsourcing non-core competencies is a recognized best practice. The reasons for outsourcing logistics functions include lower costs, a streamlined labor force, access to top personnel, and cutting-edge technologies. According to the Outsourcing Institute, 85 percent of companies now outsource work they used to do in-house. The key reasons to outsource a function are cost and performance. Third-party logistics providers can leverage their core competencies to improve enterprise-wide performance. They provide significant economies of scale through their specialization.[18] By partnering with world-class providers of logistics services, companies dramatically improve service, profitability, and response times.

The key to some of the best practices found in world-class organizations is an integrated information system with total, real-time asset and activity visibility. The technology and expertise currently exists to leverage best business practices into Army operations and execute the RML. Industry has found that, to have successful implementation of these best practices, which would have system-wide impact and/or result in extensive change, it must also have top leadership's commitment, support, and involvement.[19] The Army Objective Force cannot be successfully supported with the resources and infrastructure that are currently projected. We need best-in-class logistics practices. The Army must partner with world-class logistics providers when appropriate and become a world-class provider itself by leveraging the best industry has to offer. The challenge is to determine where and when to pursue each of these industry-proven strategies.

SINGLE STOCK FUND

The Single Stock Fund (SSF) was a Headquarters, Department of the Army (HQDA), initiative to reengineer inventory management functions and associated financial processes throughout the Army. SSF represents one of the most sweeping changes to logistics functions and business processes in recent memory. Once completed, the SSF will consolidate management of current wholesale, theater, corps/installation, and division authorized stockage list inventories into a seamless logistics and financial system, thus creating a single, virtual supply and maintenance organization.[20] SSF is fundamental to achieving the Revolution in Military Logistics.

Secondary items for weapon systems have traditionally been funded by two revolving capital funds. These stock funds have been structured around wholesale practices that were managed by Army Materiel Command (AMC) and retail activities that were managed by other major Army commands (MACOM's) at the installation level.[21] The traditional separation between wholesale and retail systems has served us well in the past. But as force structure and technology have changed and the need for speed and agility has increased, the old way has become cumbersome. It reduces efficiency, because it involves nonintegrated determination of requirements, disjointed maintenance and repair requirements processes, accumulation of excess stocks, and duplication of workload and infrastructure. Consider these current problems:

- Lack of stockage visibility between the wholesale and retail levels causes retention of redundant inventories.
- Customers wait too long while items are purchased from manufacturers.

- Poor communication channels between wholesale and retail inventory managers cause retail managers to maintain stocks "in case of need."
- Retail and wholesale management decisions are made independently. Thus, these decisions often reflect perceived local priorities at the expense of Army-wide stockage goals and objectives.
- HQDA separately issues stock fund obligation authority to the wholesale level and eight retail divisions. Each element independently manages its own logistics and financial processes.
- The wholesale and retail activities have differing credit rates and credit polices for turn-in of serviceable and unserviceable items.

The Army began to focus on these problems in 1987 with a study of its stock fund operations. At the same time, the Department of Defense (DOD) was turning its attention toward reducing its logistics "footprint" and associated costs through the Defense Management Review Decision (DMRD) process. DMRD 927J, Consolidating Retail and Wholesale Systems, and DMRD 901, Reducing Supply Systems Costs, mandated that the Army integrate its business practices to produce process improvements and reduce costs.[22]

Additionally, the DOD Logistics Strategic Plan and the Army Strategic Logistics Plan (ASLP) were introduced to serve as the roadmaps for logistics modernization. The ASLP calls for the development and implementation of a single system "to provide its managers with system-wide asset visibility, superior responsiveness to customer refund costs (credit), and the authority to direct redistribution of assets to locations." The SSF process became a means to accomplish both DMRD and ASLP goals.[23]

In mid-1997, the Deputy Chief of Staff for Logistics, Department of the Army, commissioned a review of the Army's SSF initiative. From that effort, a group of senior logistics and financial experts developed the current four-phased campaign plan. This campaign plan, approved by the Vice Chief of Staff of the Army in November 1997, establishes the blueprint for current efforts. This blueprint calls for a single Army Working Capital Fund-Supply Management Army (AWCF-SMA) account.[24] The SSF schedule follows:

- Milestone 0 ran from January through September 1998. It was the initial planning phase for the SSF.
- Milestone 1A began 1 October 1998. It sets the conditions for SSF by integrating financial management actions of the retail stock fund elements with the wholesale stock fund. During fiscal year (FY) 1999, the Army demonstrated its ability to link existing

wholesale and retail information systems to create a single point of sale, one point of credit, and an integrated requirements determination process.

- Milestone 1 built on the foundation of Milestone 1A and merged existing wholesale and retail stock funds into a single fund.
- Milestone 2 extended the scope of AWCF-SMA operations down to division authorized stockage level.
- Milestone 3, planned to begin in FY 2002, will extend the fund through the division authorized stockage level.

At Milestone 3, or shortly thereafter, the Global Combat Support System-Army (GCSS-Army) will be the single, seamless system to deliver SSF business practices throughout the Army.[25]

SSF serves as the mechanism to reengineer current Army horizontal logistics business practices into a seamless vertical arrangement. This vertical management and visibility will create a virtual, single inventory for the Army, offering much more flexibility to maximize Army-owned assets. It will also integrate the Army's maintenance capability from depots down through installation's directorates of logistics.

C2 - INFRASTRUCTURE AND REDUCED LOGISTICAL FOOTPRINT

The RML requires increased agility in a number of dimensions. Army logistics will have to become more agile—structurally, physically, and mentally—in order to cope with the demands of dynamic RML support to the agile and mobile forces of the Objective Force, the goal of the current Revolution in Military Affairs (RMA).

Structural agility will be accomplished through total integration of all Army components, as well as incorporation of support teams from other services, allies, and the Army's partners in industry to meet the demands of specific missions. Teaming and task-organizing are key RMA skills that apply especially to RML support forces. Logistics task forces need to be able to scale up and down in size, as well as in technical expertise. Personnel, teams, and units from all components should be capable of deploying and moving independently to an in-theater rendezvous location. Active and reserve component units must be ready to accept, employ, and in some cases support Department of the Army (DA) and Department of Defense (DOD) civilian augmentation, as well as contractor personnel and equipment. All must be prepared to integrate with allied and host nation support organizations.[26]

Physical agility enhances the ability to deploy and maneuver the operational infrastructure of the distribution-based logistics system. Distribution-based logistics depends on an integrated,

intermodal network of information systems, distribution platforms, and automated materials-handling equipment. To keep pace with fast-moving Objective Forces and to stay one jump ahead of an opponent's long-range weapons, the logistics units and personnel operating this network must be able to maneuver the component systems and control the movement of the distribution platforms on the fly. And they must be able to do so without degrading the throughput of sustainment to the fighting forces.[27]

Mental agility refers to attitude. RML logistics is fast logistics. All logistics managers in the supply chain need to think several steps ahead, all of the time. Real-time, 24-hours-a-day, 7-days-a-week operations will be the norm. Organizations need to staff for this tempo and train team members to work in such a fast-paced non-stop environment. Additionally, many of the initiatives in the Revolution in Business Affairs that streamline and improve logistics, acquisition, and financial processes contribute to this new, heightened agility.[28]

Acquisition agility is a key Army goal in RML. In order to keep pace with the fast-changing demands of RMA warfare and RML support, the acquisition system must support rapid and flexible access to a wide range of commercial sources of supply. The agile acquisition system also will be crucial to designing, building, and fielding the advanced systems and modernization packages that will make the Objective Force a reality. Reduced development cycles will provide state-of-the-art technology to our forces in the field at a price the nation will be willing to pay—if we are agile enough to exploit it![29]

Army logistics has risen to the challenge of RML and responded with a viable concept, backed up by a plan that provides previously unheard-of levels of capability as well as previously unheard-of levels of efficiency and economy. But there always will be a limit to how small the logistics system can get without sacrificing support to the combat units and accepting too much risk.

Maintaining an adequate logistics footprint involves a number of things. First is presence in the theater of operations. In today's complex world, there is always a significant tradeoff between capability and force protection. Commanders in chief (CINC's) are understandably reluctant to have any more soldiers and civilians placed in harm's way than is absolutely necessary. When the theater force must be limited due to force caps, shortages in lift assets, or force protections requirements, cutting support forces is an attractive option. Unfortunately, these support forces are often the key to sustaining the dominant combat power of modern U.S. fighting forces. Operational planners should be sensitive to the sustainable force level as well as to the total deployed force level. The readiness maintenance and enhancement capabilities of logistics support forces need to be considered when force packages are being designed.[30]

Future CSS units must enable aggressive reduction in the maneuver sustainment footprint with fewer vehicles and leverage reach-back capabilities.[31] Ideally, combat forces are empowered by logistics, not encumbered by logistics!

Operational logistics infrastructure also assumes a new configuration in the RML. As envisioned in the Objective Force Operations Support Command (OPSCOM), the RML logistics support for an engaged CINC will be operationally, not geographically, focused. This means that the CINC's logistician—the OPSCOM commander—will command and direct forces, units, agency offices, and contractor operations on a global basis, all focused on the CINC's operations. This will give the CINC and his OPSCOM commander great flexibility in moving work to workers and workers to work. However, care must be taken in sizing future logistics organizations so that when missions are moved to allow a reduction at one level of command, they are not given to organizations whose capabilities have been reduced under previous mission transfers.[32] In other words, we must avoid making a shell game of our total logistics capability.

Maintaining a viable logistics infrastructure between operations is also vital. Today's logisticians throughout the Army and DOD currently perform numerous essential tasks every day, efficiently and with little fanfare. The ability to project a sustainable force on a few hours' notice is possible only through their constant effort. In the same way, institutions need to maintain and pass on a corporate memory and corporate culture to remain great. Army logistics does this well at all levels and in all components. However, the toll of the recent series of drawdowns has had its effect. In future sizing decisions, the viability of institutions to continue operations and grow leaders must be considered. To do less is mortgaging our national future.

Creating an adequate logistics footprint involves more than structural change. It also involves the development and refinement of concepts, ideas, and materiel. The Army Training and Doctrine Command is using a series of wargames to bring together senior defense policymakers to participate in scenario-driven exercises and discuss critical strategic and operational issues that will shape the Army. Product improvements and block materiel replacements will change the way the Army develops, tests, acquires, and maintains equipment. There will be increased reliance on split-based operations to reduce the logistics footprint in the theater of operations. The number and type of weapon systems needed by land forces in the battlespace to hold and dominate terrain will change, and so will the operational and tactical logistics requirements.

Resupply, maintenance, and other combat service support functions will be accomplished in completely different ways or in the relative safety of a rear-area or continental United States

location. It is this relocation of functions that offers the greatest potential for reducing the logistics footprint in the theater of operations.

Modularity and new commercial best practices will be leveraged to minimize the logistics footprint without sacrificing capability. Smart simple design, a commercial industry best practice, has reduced the costs, assembly, and manufacture cycle times. It has reduced the number of parts in commercial systems and increased the serviceability of these systems. Army acquisition programs must emulate smart simple design or similar initiatives to improve manufacture, assembly, and serviceability. Weapon systems or major end items that have fewer parts and thus are easier to repair and maintain will require lower levels of inventory and fewer maintenance personnel to support them. Use of this methodology for Army weapon systems could reduce logistics demands and contribute to an adequate logistics footprint.[33]

Other potential contributors to a responsive and efficient logistics footprint include robotics, unmanned vehicles, intelligent agents, diagnostics and prognostics, smart/brilliant munitions, real-time communications, and fuel and energy efficiencies. Advanced robotics technologies will replace people in missions such as reconnaissance, materiel movement, and transport. The use of unmanned transporters may range from aerial vehicles to tanks.[34]

Sensors, advanced information technology, diagnostics, and prognostics alone could have tremendous impacts throughout the Army logistics system and are key components of the RML. The incorporation of prognostics in digitized weapon systems will drive the numbers of weapon systems, materiel, and maintainers required in the battlespace. The ability to predict system failures before they occur will improve repair lead-times and prevent failures during mission-critical operations. Parts that diagnose themselves and requisition their own replacements or needed components will reduce the number of soldiers involved in the supply process. Assured communications and telemaintenance applications will allow the expertise, but not necessarily the expert, to travel. The increased speed of repair and the enhanced capabilities will reduce the number of weapon systems required for adequate lethality on the battlefield and in inventory.[35]

This lethality will be achieved through the use of smart munitions and lighter, ultra-reliable weapon systems, as opposed to the mountains of ammunition employed in the past. One-to-one or better kill ratios mean lower ammunition support requirements and fewer weapon systems needed to complete fire support missions. The incorporation of advanced materials, biomimetics (materials that mimic the properties of those found in nature), manufacturing technologies, and design methodologies will result in lighter, ultra-reliable systems. All of these will have an impact on the logistics footprint.[36]

Finally, fuel most likely will continue to be a significant part of the support burden faced by Army logisticians. But with fewer, lighter weapon systems and advances in hybrid systems, this requirement will also decline significantly.

Adequate logistics footprint, as an RML tenet, is not just about reduction. It is about balancing the right size, the right amount, and the right knowledge to do the job in supporting 21st century operations. It is the result of a reduced logistics demand, more lethally efficient weapons, information technologies that focus directly on the Warfighter, a seamless logistics system that allows for streamlining redundant support functions and organizations, and a transformation from a supply-based to a distribution-based logistics system. The next section explores the concept of distribution-based logistics.

DISTRIBUTION-BASED LOGISTICS

The operational concept Distribution-based logistics (DBL) relies on distribution velocity and precision, rather than redundant supply mass, to provide responsive support to warfighters. It reduces the mass required to compensate for the lethal uncertainties of war by reducing uncertainty across the Joint Theater. DBL rests on three pillars: visibility, capacity, and control.

Visibility: The acquisition of near real-time situational understanding, or visibility, has been a major objective of Force XXI. The Army is continuing this effort, fielding the first digitized division in December 2000, to be followed by the digitized corps in 2004. The advent of the new Army Vision has only emphasized the need for improved visibility.[37]

Visibility can be grouped into three major categories. First, there is visibility of the supported warfighting units, which includes the unit's prioritized requirements, the commander's priorities among units, and the current and projected commander's intent. Situational understanding of the supported unit is the most essential element of the visibility tenet, since the status of the warfighting unit defines the logistic mission and establishes priorities.[38]

The second category of visibility is logistic capabilities and constraints. The logistician must have real-time situational understanding of his own capabilities and constraints. These include visibility of elements of capacity such as infrastructure, materiel systems, inventories, transportation resources, personnel skills and training, and the logistic implications of the situation.[39]

The third category of visibility includes logistic requirements and priorities to the supporting organizations at the theater and strategic levels. Conveying situational understanding to supporting logistics organizations, such as from the corps support command to the theater support command or the Defense Logistics Agency, becomes increasingly

important, particularly as the Army loses autonomy to strategic-level providers, even within the theater of operations.[40]

Capacity: The logistics force must have the physical capacity to act on the knowledge provided by realtime visibility. This includes the array of materiel systems: the lean but adequate inventories; road, rail and facilities infrastructure; and skilled personnel. These capabilities include the materiel for physical distribution within theater and from the Continental United States by military or private vendors. Enhancements to new and improved materiel systems, such as embedded sensors and prognostics, are essential to anticipating logistic requirements.[41]

Control: Some of the most important logistics modernization efforts fall under the tenet of control. These include the tactical force structure of the brigade combat teams; the theater support command; and the single seamless Army logistics organization, the Army Readiness

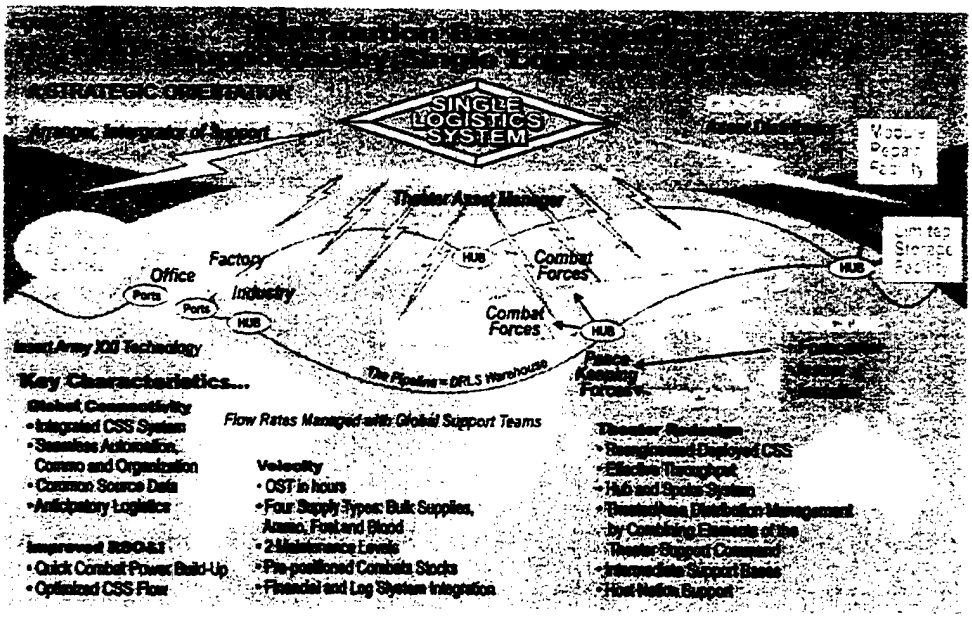

FIGURE 1[42]

Command. Control also includes the necessary doctrine (at the operational and tactical levels) and law, policy and regulation (at the strategic level). Control encompasses the expert leaders and artisans who apply logistic capabilities to satisfy prioritized operational requirements.[43]

The DBL is the envisioned RML end-state. DBL will comprise a system of innovative policies, doctrine and concepts; reengineered logistic functional processes; redesigned organizations; new materiel systems with embedded sensors and prognostics; advanced

information, decision-support and command and control systems; and well-led, highly trained soldiers and civilians to operate and manage it. Figure 1 depicts DBL and some of the more important initiatives that will make it a functioning reality.[44]

AMC'S ROLE IN RML

The Army Materiel Command (AMC) is primarily responsible for the Army's Revolution in Military Logistics. It is responsible for sustaining the force, power projection, weapon system management, and technology integration. However, the greatest challenge will be whether AMC can successfully change its culture to effect transformation. It must transition from being the "owner" of the Army's materiel and logistics systems to being the Army's "integrator." Army personnel reductions, extremely slow acquisition processes, and limited budgets for Research and Development and procurement are making it very difficult for AMC to accomplish its currently assigned tasks and missions, let alone to effect a RML. Additionally, the Base Realignment And Closures (BRAC) and reductions mandated in the first Quadrennial Defense Review (QDR) have also had a significant negative impact on AMC's own organizational structure by significantly reducing its force structure. Continued limited resources, increasing OPTEMPO, and an unclear threat are exposing the chinks in AMC's armor. It's time for a new approach. One possibility is leveraging support from other services, our allies and from industry. To manage the increasing work load with reduced resources, AMC has formed a general-officer led Overarching Integrated Product Team (OIPT) to develop options and recommendations for reengineering AMC so it will be capable of accomplishing the mission of equipping and sustaining soldiers. The OIPT serves as a "guiding coalition" of leaders charged with devising and implementing a strategy to effect transformation and make RML a reality. However, the effectiveness of OIPT's recommendations may depend upon whether the strategic leaders can adequately change the culture. This requires not only acceptance of AMC, but also the acceptance of supported commanders in the field and their respective logisticians.

The Army has transitioned from a threat-based force to a capabilities-based force. Presently, two divisions are converting to the new digitized Army XXI structure.[45] Additionally, two "interim Brigades" have been formed but are not operational and four additional brigades are planned to be converted. To support future contingency forces, the logistics system must become capability-based. The Army Materiel Command (AMC) commander has stated that his organization must be "modular for flexibility, able to anticipate and predict logistics requirements sooner, have a total asset visibility, focus limited logistics resources at the point of need, and

able to react faster than ever before."[46] Moreover, these functions must be synchronized with the rapid OPTEMPO of future operations.

SUMMARY AND CONCLUSIONS

The Army's need to transform is like that of many other organizations undergoing dramatic change. The Army is facing many of the same challenges. World-class companies must transform their support structures if they expect to continue to dominate their business sectors. To sustain their competitive edge, these commercial industries have re-engineered their processes, contracted out services and products when such outsourcing provided better performance at a lower cost, incorporated emerging technologies, and overcame institutional resistance when many wanted to maintain the "status quo." The Army must revolutionize its logistics program and provide support on time, in the right place and in the right quantity. It must become predictive, anticipatory, and responsive.

Our logistics system must be able to anticipate problems before they occur. Technology can enable accurate predictability. Through the implementation of state-of-the-art information systems, the Army can monitor consumption of expendables supplies (such as fuel, repair parts, ammunition, rations) on a daily basis at the national level as well as at the unit level. Fully exploited, these systems can also automatically deliver supplies at the level required, consistent with available resources on a competing priority basis.

RML aims to improve our logistics processes by implementing business practices that leverage the advantages of technology and automation. For example, AMC is implementing a single stock fund (SSF). The SSF eliminates multiple agency processing of sustainment supplies, maintenance, and funds. Instead, it creates one centralized system integrating the Army Working Capital Fund, its inventory supply management, and its financial management. SSF promises commanders on the ground a better system for supply and a reduction in logistics and financial management burdens. Ordering supplies directly from a field unit to AMC depots bypasses all the former levels of supply management.

AMC has taken advantage of better diagnostics and prognostics to correct problems before they occur. Program executive officers and combat and materiel developers are now integrating their problem-solving diagnostic equipment, produced by the Program Manager for Test, Measurement, and Diagnostic Equipment (TMDE), into the acquisition and development process of the current generation of equipment. This significant change should have a tremendous impact on the future readiness rates of equipment fielded with this capability.

RML will depend upon a distribution–based and seamless logistics system for managing logistics operations. RML includes proactive monitoring and management of Army unit readiness and the correction of identified shortfalls with tailored logistics packages through the acquisition and delivery of required supplies and services within an intensively managed, real-time distribution and total-asset visibility system. To build such a system, the Army, Air Force, Defense Logistics Agency (DLA), and U. S. Transportation Command must work together with industry to integrate a number of systems and standards. Now is a most opportune time to develop a dynamic distribution-based logistics system integrating the Army with its industrial base.

The corner stone of RML is the Global Combat Support System-Army (GCSS-Army). This evolutionary information system builds on the functions and processes of existing systems to generate data, integrate databases, and fuse CSS information from external sources into a stand-alone system. GCSS-Army is planned to transform the old stovepipe Standard Army Management Information Systems (STAMIS) into a single logistics (retail, wholesale, and joint) automated system that will replace the current STAMIS and interface with existing battlefield automations systems. The logistical transformation depends, in large part, on the successful integration of GCSS-Army with all related systems that will not only provide a "common logistics picture" but also permit the real-time proactive management of logistical support functions. In and of itself, GCSS-Army provides only an incremental improvement to existing systems. However integrated with the future systems designed for total asset management and real-time delivery, it will serve as the foundation for the predictive, anticipatory and responsive logistics system of the future.[47]

The Army's plan to transform its logistics system presents a monumental challenge. In response, the logistics community has taken significant steps to support the CSA's vision. The RML is fundamental to the transformation and has been communicated throughout the logistics community. The RML strategy is well-defined and guided by a coalition of leaders committed to its implementation. The ongoing implementation of current systems and development of future systems has also begun to shift the Army's culture increasingly towards acceptance of the centralized logistics system beyond the control of lower commanders and their logistics officers. However, this "acceptance" has been very reluctant, partly due to the immediate higher costs and inefficiencies experienced by the organizations when initially implementing new systems and processes. What is clear, however, is that the Army must make quantum strides to bring the requirements, technology, acquisition, and the logistics communities closer together to make RML a reality for soldiers on tomorrow's battlefield.

Word Count: = 6,577

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