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Department of Defense (DoD) logisticians can utilize commercial best business practices along with the Joint Logistics imperatives to streamline processes and break parochialisms to best support and prepare for tomorrow's battles. The imperatives of unity of effort, Joint Logistics Enterprise (JLEnt)/domain wide visibility, and rapid and precise response remain the cornerstone for a unified DoD with true Joint Logistics services vice just paying lip service to the term Joint Logistics. Through the three imperatives, the civilian best business practices analyzed by the Defense Business Board,

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MASTER OF MILITARY STUDIES

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Executive Summary

Title: Joint Logistics Operations in Future War: Can Incorporating Civilian Best Business Practices Advance Our Capabilities?

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Thesis: Department of Defense (DoD) logisticians can utilize commercial best business practices along with the Joint Logistics imperatives to streamline processes and break parochialisms to best support and prepare for tomorrow's battles.

Discussion: The DoD must lead its departments in true supply chain integration and overall Joint Logistics initiatives. This is only achieved when the DoD mindset changes and all services within the DoD understand that everything they do affects and interacts with the other; they must truly learn and understand Joint Logistics and Supply Chain Management (SCM). Beginning with that change in mindset, a governance process designed to establish accountability, responsibility, and reliability must be established to facilitate and coordinate end-to-end logistical support through SCM. The approach must seek to optimize logistical support as maintained by the fiscally constrained environment while still improving readiness through permitting the integrated Information Technology (IT) system, enterprise level common procedures, and other logistical improvements to allow for a better decision-making process with the most accurate information available. End-to-end performance measures, from strategic to tactical, will be the only way to truly measure the success of Joint Logistics, correlated with the principles of logistics, and ultimately indicated by the ability for the Joint Force Commander (JFC) to accomplish the mission.

Conclusion: The imperatives of unity of effort, Joint Logistics Enterprise (JLEnt)/domain wide visibility, and rapid and precise response remain the cornerstone for a unified DoD with true Joint Logistics services vice just paying lip service to the term Joint Logistics. Through the three imperatives, the civilian best business practices analyzed by the Defense Business Board, and by using the principles of logistics as a litmus test, the SCM issues identified by the Government Accountability Office (GAO) will be addressed and a paradigm shift in DoD logistics will occur. A unified and streamlined DoD, supported by all logistics professionals with common metrics, process, procedures, and systems with which to achieve true Joint Logistics will ultimately best sustain the joint force for tomorrow's battles through more effective and efficient Joint Logistics.

DISCLAIMER

THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

Figures

Page

Tables

Page

Table of Contents

Page

Preface

Founder of the Statler Hotel company, visionary hotelier, and father of the modern American hotel E. M. Statler had a mantra, which was "Life is service." As a Supply Officer in the United States Marine Corps, this hospitality inspired quote has held true and guided me in my endeavors within the Marine Corps. Supplying the "pointy end of the spear" is of the utmost, life dependent at times, importance to me. Improving a supply system with the fiscal restraints both already here and forecasted will pay dividends to the future sustainability of the Marine Corps and its warfighters. Furthermore, leveraging Joint Logistics in order to accomplish this is the only way the armed forces as a whole can move forward in this age of fiscal austerity.

This Masters in Military Studies (MMS) paper is dedicated to my wife, Kellie Buck-Izquierdo and daughter, Mika Izquierdo who have supported me in this journey. Thanks to the mentorship provided by Dr. Gordon and the assistance of Stase Wells without whom I could not have honed a massive topic such as Joint Logistics into a practical and meaningful paper. I would also like to thank some influential Marines who have assisted me in becoming a better Supply Officer, Logistician, and overall Marine Officer: Colonel Richard E. Jordan, Colonel Dudley R. Griggs, Colonel Jason A. Beaudoin, Colonel Timothy R. Bryant, Colonel Ronald C. Braney, Lieutenant Colonel Michael S. Castellano, Lieutenant Colonel Keith G. Nunn, Lieutenant Colonel Ronald J. Peterson (ret.), and Lieutenant Colonel Warren Driggers (ret.). To Lieutenant Colonel Joseph Janczyk (USA), Dr. Jonathan Phillips, Dr. Mathew Flynn, and the rest of "the Ocho," thank you for a memorable year for which I have been able to develop my knowledge, leadership, and Professional Military Education at Command and Staff College. Lastly, to Chief Warrant Officer 2 Scott M. Dowen, you are missed but never forgotten, brother.

Only a commander who understands logistics can push the military machine to the limits without risking total breakdown.

- Major General Julian Thompson, Royal Marines

I. Introduction

The importance of logistics on the battlefield cannot be overstated; General Robert H. Barrow, 27th Commandant of the Marine Corps noting in 1980 that "amateurs talk about tactics, but professionals study logistics."[1] United States Department of Defense (DoD) supply and logistics professionals, those who should be at the cutting edge for all logistics matters as national defense depends on it, use antiquated business practices to sustain the joint force when compared to their civilian counterparts. It is universally agreed upon across the DoD that Joint Logistics is crucial for the timely sustainment of the warfighting commander and his warfighters. The challenge lies in coordinating the competing interests amongst the services for a logistics initiative, which synergizes the forces' capabilities for maximum output. Commercial logistics professionals have doctrinally sound best business practices, which the DoD could pull from to better its Standard Operating Procedures (SOP) and Joint Publications (JP). DoD logisticians can utilize commercial best business practices along with the Joint Logistics imperatives to streamline processes and break parochialisms to best support and prepare for tomorrow's battles. This Master in Military Studies (MMS) paper will address Supply Chain Management (SCM) issues as identified by the Government Accountability Office (GAO) and use civilian best business practices analyzed by the Defense Business Board, to provide imperatives to streamline DoD logistics and better sustain the joint force.

While implemented at the strategic and operational level, these best business practices should measure their success based on the tactical level effectiveness and efficiency of their application and the logistical support provided to the Joint Force Commander (JFC). It is the warfighters at the end of the supply chain and the logisticians or aviators supporting them that ultimately need the requisitioned supplies to carry out the national policy through military means. Joint Logistics is an interwoven process that requires accountability, guidance, and support from the top officials, and successful evaluation metrics from all levels to make certain the joint force is successful and continues to improve its effectiveness when conducting Joint Logistics support throughout the DoD.

II. Joint Logistics Defined

Joint Logistics is defined as "the coordinated use, synchronization, and sharing of two or more Military Departments' logistic resources to support the joint force."[2] Logistics synergy is the true purpose of Joint Logistics; such synergy can only be accomplished through deliberate and improved sharing of service wide resources to reduce both redundancies and costs.[3] No one single service can provide all logistical support needed for themselves or for others, especially in an expeditionary environment conducting distributed operations; but combined, the joint force provides Combatant Commanders (CCDR) with the ability to ably prosecute America's campaigns with superior logistical support. Joint Logistics ensures the "best use of limited resources to provide maximum capability to the supported commander."[4] Specifically the JFC, where the rubber meets the road in employing a joint force, relies on the synergy provided by the use of Joint Logistics to conduct his mission effectively. Properly sustained forces give the JFC the flexibility he needs to efficiently utilize his force to reach his operational objectives. Success

in supporting the JFC is attained as a result of a cumulative effort across the Joint Logistics environment.[5]

To understand Joint Logistics, it is essential to review its core functions and the principles of logistics, which guides its effectiveness. The core functions of logistics include deployment and distribution, supply, maintenance, health services, logistics services, operational contract support, and engineering.[6] The principles of logistics are responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability.[7] Together, these functions and principles provide a framework and reference in which to measure the successfulness of any logistical endeavor from the strategic to the tactical level. Specifically for the purposes of this MMS, they will also serve as the litmus test for future Joint Logistics practices when paired with civilian best business practices, to ensure the efficiency and effectiveness of their implementation.

The line between disorder and order lies in logistics....

- Sun Tzu, *The Art of War*

III: Current DoD Joint Logistics/Supply Chain Management Concepts

The DoD uses a Joint Logistics Enterprise (JLEnt) concept in which it is able to provide a logistically ready force able to provide relative combat power. JP 4-0, *Joint Logistics*, states "[t]he JLEnt is a multitiered matrix of key global logistics providers cooperatively structured to achieve a common purpose."[8] The JLEnt leverages not just internal DoD assets but also Non-Governmental Organizations (NGO), interagency resources, and multinational resources through operational contract support, to provide a highly integrated and flexible logistics network to support the JFC.[9] In addition to the JLEnt, there are three Joint Logistics imperatives, which

include unity of effort, JLEnt visibility, and rapid and precise response. Combined, these imperatives outline the synergy the Joint Logistics systems, processes, and organizations must reach to successfully adapt to a dynamic, continually changing operational environment to logistically support the JFC.[10] The JLEnt concept is sound in theory but is lacking some key enablers, which prevent it from no longer just being a concept and becoming DoD-wide doctrine. Key enablers to enhance and flesh out the JLEnt concept for application in the joint force will be addressed throughout this MMS as increased Joint Logistics support and interoperability are examined.

The Joint Concept for Logistics (JCL) proposes a model on how the JLEnt would support integrated worldwide operations in the future, 2020-2034 timeframe. Within the JCL, the concept of Globally Integrated Logistics (GIL) is set to support the joint force throughout the Range of Military Operations (ROMO) from Theatre Security Cooperation (TSC) to major armed conflict. The JCL will utilize JLEnt to provide modular logistics, leveraging a comprehensive information environment to best manage limited DoD resources and quickly shift supplies between and within theaters to include prepositioned stock to best support the logistics needs of all the joint forces. Using a flexible worldwide network, the goal of JCL is to open and maintain lines of communication globally throughout the ROMO as the future environment will seek to deny access to not only ground forces but also the logistical support required to sustain them.[11]

Led by the Secretary of Defense for Logistics and Materiel Readiness (L&MR), the Joint Supply Chain Architecture (JSCA) is a supply chain model designed to conduct enhanced SCM at the enterprise level. This SCM model is able to maintain and improve materiel readiness by utilizing an end-to-end perspective and focusing on providing the best value measured by

responsiveness. In her article "Joint Supply Chain Architecture," from *Army Sustainment*, May P. Fletcher states "[t]he creation of JSCA resulted from the recognition that the Department of Defense (DoD) needs to improve supply chain effectiveness and efficiencies within the services, CCDR, and Defense agencies."[12] The three supply chain issues JSCA is seeking to address are a lack of "enterprise-wide" SCM and optimization, DoD-wide common performance metrics, and the increased awareness of the need to improve the effectiveness and efficiencies of DoD SCM. JSCA utilizes the plan, source, maintain and repair, deliver, and return process to increase the efficiency of Joint Logistics. JSCA has also addressed the need for standard metrics emphasizing DoD-wide reliability, speed, efficiency, and cross-cutting metrics.[13]

Of note, the Defense Logistics Agency (DLA) is the DoD Executive Agent (EA) for many of its classes of supply, which include class I (subsistence), III (bulk fuel), IV (construction materiel), and VIII (medical material); all high demand use items vital to conducting dispersed, and expeditionary operations (see Appendix A for all the classes of supply).[14] Integral to the study of SCM, DLA is a central part of the collaborative logistics network. DLA manages the global distribution network, provides weapons systems reparables, leads efficiency through the reutilization of end items, the reutilization of repair parts, and the disposal of hazardous materiel and waste.[15]

While there are seven core functions of logistics, the concentration of civilian best business practices focuses on the supply chain and SCM. Supply chain refers to the global network, which provides "materiel, services, and equipment to the joint force."[16] The ultimate goal of the supply chain is to forecast requirements to ensure force readiness through the optimal allocation of joint resources; ultimately allowing the JFC to effectively employ the forces without any logistical constraints. JP 4 states "[t]he DoD's supply chain responsiveness and

reliability affects the readiness and capabilities of US military forces and is critical to the overall success of joint operations,"[17] which is why supply chain and SCM will be the focus in integrating civilian best business practices.

The core logistics functions for supply include management of supplies and equipment, inventory management, global supplier network management, risk management, and assessment of all joint requirements, resources, and capabilities. JP 4-0 defines SCM as involving the "identification and coordination of requirements, planning and synchronizing joint supply activities throughout DOD, and managing key global suppliers to support CCDR requirements."[18] In order to ensure SCM is successful, requirements must be understood and prioritized for material as well as mission critical weapons; forces and material must be visible as they transit both throughout the battlefield and the distribution pipeline; demands for sustainment must be forecasted to best support the force; and supply tasks must be prioritized within the joint force and its area of responsibility (AOR) to allocate the right sources to the right forces at the right time. Planning for these requirements requires mission priorities, risk assessments, and force protection considerations especially when in an operational theater; a requirement that needs to be highlighted when comparing DoD and civilian best business practices as civilian logistical companies seldom need to worry about force protection issues when coordinating logistics and conducting SCM.[19]

> Sound logistics forms the foundation for the development of strategic flexibility and mobility. If such flexibility is to be exercised and exploited, military command must have adequate control of its logistic support.
>
> - Rear Admiral Henry C. Eccles, USN

IV: Future Joint Logistics Environment and Challenges

With Joint Logistics defined and current Joint Logistics practices, specifically SCM practices, reviewed, the future Joint Logistics environment and its challenges will be evaluated to ensure the proper ways and means are applied to reach the desired operational end state. As the past decade of war has taught the DoD, future operations will continue to take place in non-permissive, dispersed, hostile, and increasingly dynamic environments with not only physical, Diplomatic, Informational, Military, and Economic (DIME) challenges, but added cyberspace challenges as well, affecting all facets of DIME. Complicating an already difficult dynamic, Joint Logistics assets rarely fall under one command, adding a layer of complexity that involves additional synchronization and coordination.[20] To meet the challenges of this rapidly changing environment, JFCs and their staffs must truly understand and plan for the synergistic use of Joint Logistics if they want to be successful, as future globally integrated operations will be exceedingly logistics-intensive in nature.[21]

Despite the fiscally austere environment the DoD continues to face, the DoD must ensure that SCM practices meet the dynamic needs of the JFC operating in the future Joint Logistics environment. The Return On Investment (ROI) provided by sound SCM practices begun today will reap enormous benefits for the future of the DoD. More efficient SCM systems will also boost the efficiency of the DoD as a warfighting organization by increasing readiness to meet the future operating environment challenges. An investment into current logistic challenges must be made now to address the demands associated with logistically supporting the force of the future. These challenges not only deal with the physical networks and the Information Technology (IT) systems associated with logistics support, but also an organizational wide way of thinking. The parochialism that is embedded in the DoD, to include best business practices and processes, must

be open to rejuvenation, open to expand into non-traditional ways of thinking to meet the ever-changing environment. Then and only then can change be truly instituted in such a way that it becomes common practice, SOP across the DoD, and not just the latest trend or current short-lived initiative.

V: Supply Chain Management High-Risk Areas

SCM has been listed on the U.S. Government Accountability Office (GAO) high-risk list since 1990. According to the 2015 GAO SCM High Risk Analysis summary, which is presented in figure 1, the three areas within SCM that were found to be high-risk were inventory management, materiel distribution, and asset visibility. Inventory management practices and procedures were found to be ineffective and inefficient due to high levels of excess inventory and due to a lack of accuracy in the forecast of demand requirements. Materiel distribution was also found to face challenges in its distribution process when it came to unmet delivery standards as well as a lack of delivery data, which has kept the DoD from deliberately addressing unmet delivery standards due to a lack of solid metrics. Asset visibility had weaknesses in maintaining visibility and therefore accountability of its supplies while in transit due to inadequate Radio-Frequency Identification (RFID) information. Both supplies and equipment lacked much needed in-transit information on them which is required to maintain good accountability, from inaccurate information to no information at all. According to the 2015 GAO report, moderate progress had been made in addressing the weaknesses of the identified high-risk areas within SCM, but several long-standing issues had not been resolved.[22]

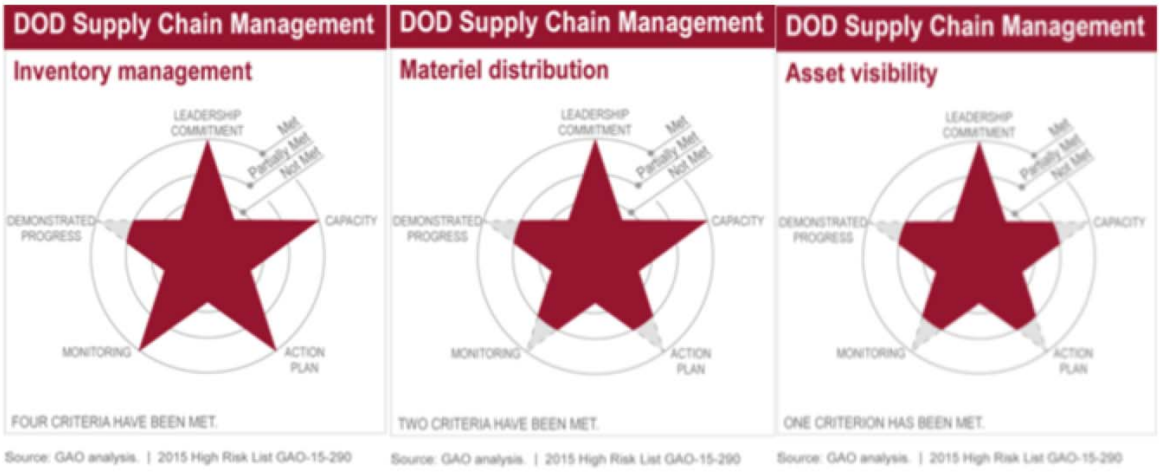

Figure 1. 2015 GAO SCM High Risk Analysis[23]

Inventory management has most notably improved in leadership commitment with leaders such as the Assistant Secretary of Defense for L&MR, top leaders within each military service, as well as the DoD's strategic level lead organization in SCM, the DLA. The DLA is critical to the improvement of inventory management as it manages $20.8 billion of the DoD's $98 billion in inventory. All additional categories including capacity, Corrective Action Plan (CAP), and monitoring showed improvement with the exception of demonstrated progress. Capacity is crucial to laying the groundwork for sustained improvement; the DoD has ensured that it has the personnel and resources to capitalize on its improvement in place to continue the positive trend. In regards to demonstrated progress, the DoD has made significant headway in reducing on-hand and excess inventory from 9.4% in 2009 to 7.3% in 2013. However, according to the GAO report, the DoD still faces challenges in reducing excess inventory and demand forecasting due to continued ineffective and inefficient inventory management practices and procedures. It is recommended that in addition to tracking and regularly reviewing established

performance data, that the DoD continue to ensure the established criteria are sustainable in reducing on-order and on-hand excess inventory. In regards to demand forecasting, to improve forecasting metrics, the DoD should establish a baseline and finalize improved demand forecast metrics to set the standard to measure if the established metrics contribute as value added to the process.[24]

Materiel distribution has also shown a substantial improvement in its leadership commitment, having the support of all the major players identified for inventory management with the addition of the Commander of United States Transportation Command (TRANSCOM), the leader for all of the DoD in materiel distribution. Monitoring materiel distribution has improved with established metrics and goals for certain segments such as time-definite delivery, which measures the total time from the requisition until the end item is issued to the customer. Metrics reviews by the newly established TRANSCOM metric branch are assisting as well; however, established distribution goals are still not being met on a consistent basis. The biggest issue in maintaining standard metrics is the segmented oversight of the DoD-wide global distribution pipeline. Currently, it is fragmented between TRANSCOM and the Geographic CCDR in the maintenance of visibility and tracking the performance of delivery metrics: a breakdown in ownership of the process between the strategic/operational level and the tactical level. It is recommended that a comprehensive measure of performance, from strategic to the tactical level be implemented to identify the source cause for performance gaps to achieve better solutions and goals for those solutions.[25]

The DoD continues to struggle when it comes to asset visibility making accountability of supplies and equipment, while in transit, deficient from where it should be. With the goal of leadership commitment set forth by the GAO met, capacity, monitoring, and demonstrated

progress are still lacking. While the DoD has associated costs to build capacity to meet the GAO comprehensive strategic plan, the DoD's estimates lack transparency as they are generally at an aggregated level. Due to their lack of transparency, factors such as human capital, the IT systems needed to maintain asset visibility, and other resources needed may not be available to make informed decisions about asset visibility. The DoD has established an Asset Visibility Working Group, forming some structure to monitor and coordinate efforts for the enhancement of asset visibility; however, service level reports to the working group concentrate on individual initiatives and not a DoD wide level of achievement of asset visibility goals.

Regarding demonstrated progress for GAO identified high-risk areas, 6 out of the 22 outlined initiatives have been fully implemented, to include an integrated IT system for DoD-wide asset visibility. The DoD even published a 2014 *Strategy for Improving DoD Asset Visibility* as part of its correction action plan; however, it is too early to assess truly measurable outcomes to DoD level strategic goals and initiatives. GAO improvements to asset visibility include more detailed information in human capital and IT, cultivating strategy by capturing cost elements and metrically analyzing costs associated in CCDR execution plans. Improved asset visibility has also established a clear linkage between existing performance measures in the DoD level strategy and the initiatives set forth to implement them, coupling the two together. Lastly, improved asset visibility has given the DoD the capability for a re-assessment, with refinement if necessary, of existing performance measures for the individual initiatives set forth.[26]

VI: Best Business Practice Analysis

In July of 2014, the Defense Business Board submitted an in depth report to the Secretary of Defense (SECDEF) titled *Implementing Best Practices for Major Business Processes in the Department of Defense*. In it they analyzed civilian best business practices and narrowed them down to the most applicable ones for the unique mission of the DoD. Table 1 shows all of the recommended best business practices in detail with applicable key benefits for each one. In summary, the best business practices were to integrate the supply chain with strategies, strategic sourcing, utilizing a global information system for real-time backbone, inventory optimization, and utilizing emerging technologies and techniques to improve business processes. Most important, pertaining to the already and ever increasing fiscally austere environment that DoD is facing, according to the SECDEF report, effective logistics SCM practices could save the DoD anywhere from $18-23 billion in addition to increasing readiness.[27]

Best Business Practice	Key Benefits
Integrate Supply Chain with Strategy	• Creates more efficient overall supply chain management • Achieves cost and competitive advantages
Strategic Sourcing	• Private companies typically leverage 90% of their procurement spending through strategic sourcing for savings of 10-20%
Utilize Global Information System for Real-Time Backbone	• Reduces fulfillment cycle times of 30-60% resulting in faster delivery • Reduces excess inventory and costs • Increases accuracy of forecasting • Ability to quickly reset distribution and delivery patterns • Improves visibility of direct and indirect costs throughout the lifecycle
Inventory Optimization	• Reduces inventory carrying costs • Right sizes investments in property, plants, and equipment
Utilize emerging technologies and techniques to improve business processes	• Enhances service delivery and reduces costs through re-design and automation • Creates enduring application of techniques like Lean Six Sigma and strategic sourcing

Table 4. Logistics and Supply Chain Management Best Business Practices and Key Benefits

Table 1. *Implementing Best Practices for Major Business Processes in the Department of Defense:* SCM Recommendations.[28]

With SCM as a concentration, integrating supply chain with strategy coupled with inventory optimization are two best business practices, which directly impact SCM and could lead to cost and competitive advantages. These concepts are coupled together because inventory optimization is dependent on an integrated supply chain to allow just in time ordering and delivery to decrease unnecessary inventory and increase an overall efficient ordering process. Integrating the supply chain with strategy addresses the issue of multiple disconnected DoD branches bargaining costs for products with disconnected processes and procedures. This duplication from the disconnected services causes overlaps and limits inventory visibility across services, ultimately increasing costs. Inventory optimization reduces inventory carrying costs and costs associated with excess warehouse capacity.[29] This directly addresses the GAO identified high-risk area of inventory management. With a strategically integrated supply chain, truly integrated material distribution and asset visibility from the strategic to the tactical level, from warehouse to warfighter, can better be achieved. The DoD identified risk of inventory management across the services can be addressed through a strategically integrated supply chain.[30] With the DoD logistics enterprise comprising $171.2 billion of the annual budget, significant cost and competitive advantages can be achieved by applying these best business practices, a must do in this time of fiscal austerity.[31]

Strategic sourcing is another recommended best business practice recommended by the Defense Business Board to the SECDEF in the 2015 report. Strategic sourcing is defined as "a method of managing procurement processes for an organization in which the procedures, methods, and sources are constantly re-evaluated to optimize value to the organization."[32] Benefits to strategic sourcing as outlined in figure 2 include reduction in cost per unit, change in consumption volume, improved operating efficiency, and improved supply management.

According to the Defense Business Board report, private companies normally leverage the strategic sourcing of their products for a 10-20% savings.[33] Not all commodities could be supported through DoD-wide strategic sourcing due to the nature of a military system, which emphasizes effectiveness, to be most ready when the nation is least ready, over efficiency. But for those commodities which would benefit from strategic sourcing such as common user items, even 5-10% savings in an over $150 billion a year budget would not only be significant for the DoD but also for the American taxpayers.

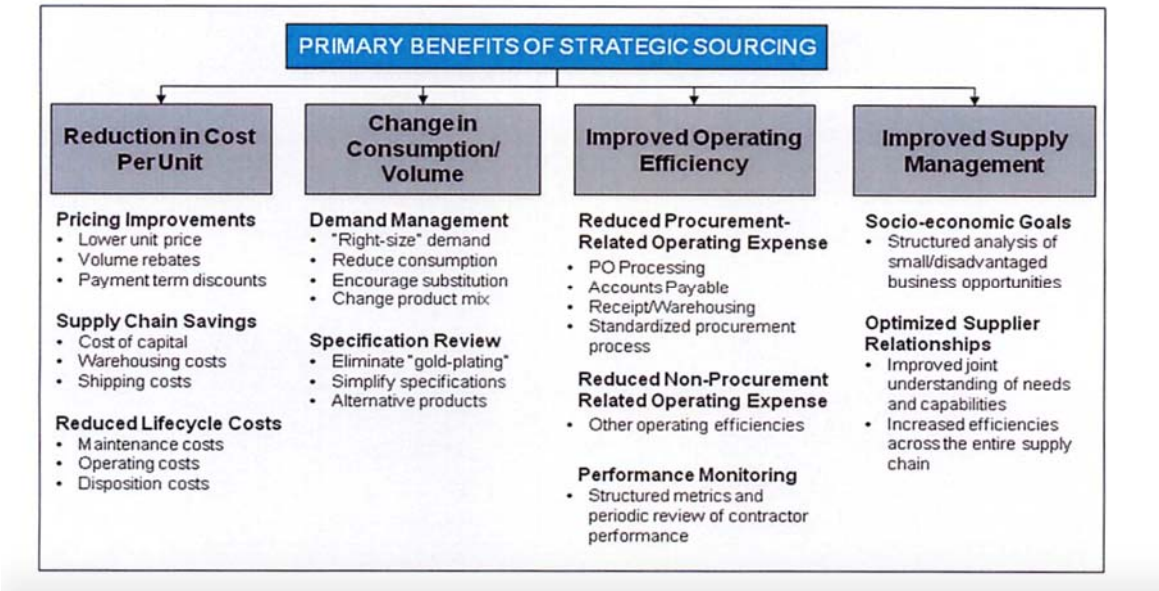

Figure 2. Benefits of Strategic Sourcing.[34]

There is a DoD-Wide Strategic Sourcing (DWSS) Program Concept of Operations set forth by the DoD Procurement and Acquisition Policy, dated June 2013, which provides "guidance to DoD components on the structure, management, and operation of the DWSS program."[35] Specifically, the DWSS concept identifies key stake holders to describe the DoD environment for DWSS, defines the DWSS structure to connect those stakeholders and ensure a

sustainable framework, outlines the roles and responsibilities of key DWSS participants, and defines the strategic sourcing framework to develop DWSS initiatives. This continuous process must be updated periodically as new policies or priorities emerge.[36] With the strategic sourcing concept in place, what the DoD is lacking is end-to-end, strategic to tactical, direct integration with its suppliers. This integration would cut mean times from requisition to getting the desired supplies and equipment into the end users' hands. This ties back to material distribution and its fragmented accountability between the strategic and operational level with the tactical level distribution. To best employ the DWSS concept, strategic sourcing must connect the strategic to the tactical level, leveraging the abilities of those civilian companies that the DoD is sourcing from. Furthermore, a DoD level metric branch must provide that linkage from warehouse to warfighter in lieu of a dual system in which a TRANSCOM specific metric branch tracks supplies at the strategic and operational level and a separate Geographic CCDR branch tracks supplies down to the tactical level.

Utilizing a global information system for real-time backbone and utilizing emerging technologies and techniques to improve business processes are two separate but interrelated best business practices recommended by the Defense Business Board. The first recommendation refers to the actual information system used to process information. The agile real-time backbone allows for improved accuracy, fulfillment cycle times, visibility of direct and indirect costs, and the reduction of excess inventory and associated costs. This is opposed to the system of daily courier cycles that the military was using less than ten years ago, which produced latency and delay in the ordering process and did not allow for real time interface. The latter recommendation refers to further using the IT systems to improve the techniques and processes used in optimizing SCM and Joint Logistics as a whole. The real-time information system

backbone enables technologies to be utilized in such a way that analysis can be done using techniques such as Lean Six Sigma (LSS) and the best business practice of strategic sourcing. Due to the plethora of data available because of the real-time information system, the data to conduct proper analysis with the metrics to correlate the findings through data mining is available. Furthermore, in the analysis of the system, efficiencies in the form of system re-design through the removal of bottlenecks and automation to reduce processing times will enhance the overall SCM for the DoD.[37]

VII: Final Recommendations

Together as the DoD, all military branches need truly to have a joint focus in order to make Joint Logistics applicable to the future of the force. Individually, each branch knows there are efficiencies to be gained but has separate agendas for service specific initiatives creating a duplication of effort and not truly integrating as a whole for a genuine Joint Logistics solution. Existing doctrine JP-4 and authors such as C. V. Christianson agree on a set of three imperatives to ensure Joint Logistics remains successful in the future: unity of effort, JLEnt/domain wide visibility, and rapid and precise response.[38] Together, these imperatives can unite all within the DoD with a unified understanding of Joint Logistics and more importantly a strategy from which to integrate the currently disconnected departments into a cohesive one. With a combined Joint Logistics outlook, true change can begin and new initiatives will be accepted and implemented to strengthen the joint force and its Joint Logistics capabilities.

Unity of effort indicates effective organizational level, in this case DoD wide, authorities, priorities, and critical processes. Only with a unity of effort can the DoD connect the services within the department, streamlining their processes, and creating a true Joint Logistics enterprise.

The DoD has partially addressed this as according to the GAO report, across all of the high-risk SCM factors identified, leadership commitment has across the board met the expectations for improvement suggestion by previous year's reports.[39] This, however, does not necessarily constitute DoD wide priorities or processes in which to bring the services to a common metric from which to measure SCM success and improvement. The DoD must not be satisfied with a partial unity of effort provided by leader buy in each of their military departments but must lead with an unswerving position to align all of the services within the DoD. An agreed upon and shared system of performance metrics and processes is essential to improve enterprise wide management of Joint Logistics.[40] Furthermore, integrating supply chain with strategy and expanding strategic sourcing initiatives assist the supply chain in having a unity of effort, increasing the effectiveness of SCM, and maximizing process improvement across the DoD. An integrated supply chain means enterprise level supply chain decisions and thus automatically ensures the DoD is acting in synchronization and not working in silos.[41]

Domain wide visibility refers to connectivity, a global focus over the process, and standard enterprise data architecture across the DoD. Of note, contrary to what one might conclude in integrating SCM across the services within the DoD via a single information management system/Enterprise Resource Planning (ERP) tool, the Defense Business Board accurately warns to avoid the temptation of an "all inclusive" system. The IT systems within the DoD should, however, increase the DoDs ability to connect the services with strategic level assets such as DLA and other DoD departments. The standard enterprise data architecture should also be allowed the flexibility in their design to evolve with future increases towards integration.[42] It should be noted that there are also severe policy and statutory issues that would prevent a DoD wide joint supply chain, which is also why a unity of effort, beginning with

institutional change, is the first and main source to begin making a force that truly utilizes Joint Logistics.[43] This goes back to the first imperative of unity of effort as an ERP system is not the forcing function for change, but an organizational willingness to change its behavior and cultural norms should be the driving force with the ERP being a tool to further assist the DoD.[44]

Rapid precise response for Joint Logistics and the supply chain equate to speed, reliability, visibility, and efficiency. What will facilitate this imperative is the DoD utilizing an ERP that operates through a global IS for real-time backbone. Speed in the Internet age cannot be understated, and rapid access to a Joint Logistics Network with global reach means instant access to the data required to effectively forecast to support the logistical needs of a JFC. Rapid response is key because the "DoD's supply chain responsiveness and reliability affects the readiness and capabilities of US military forces and is critical to the overall success of joint operations."[45] Accurate forecasting directly impacts the rapid and precise response a joint force can receive and represents potential savings and adaptability if properly leveraged. A Research and Development (RAND) study titled *Integrating the Department of Defense Supply Chain* concluded forecast errors are caused by long lead times and not due to the aptitude of the DoD's current forecast methods. Furthermore, large order quantities multiply the effect of long lead times by increasing excess inventory ultimately impacting the forecasted demand, which is calculated utilizing this excess inventory and again increasing lead-time forecast. Lead-time reduction and order quantity rectification should be prioritized to support the rapid and precise response initiative. *Integrating the Department of Defense Supply Chain* advocates the DoD utilize a global, real time information system as its ERP, which "…should encompass how DoD selects, manages, and collaborates with its suppliers; demand and supply planning practices; and organizational design, capabilities, and accountabilities."[46] In the theme of a technology-backed

unity of effort, the DoD must place an entity in the lead of managing overall DoD logistics.

In addition to the three imperatives, Robert P. Mann recommends an additional functional component command to oversee the overall DoD SCM process, unofficially titled United States Logistics Command (LOGCOM). LOGCOM's mission would be to be the overarching DoD logistics synchronization effort, overseeing all aspects of SCM and equipment accountability, from inception through disposal. One SCM process owner for DOD would be in line with civilian best business practices "and is the linchpin in creating a factory-to-foxhole supply chain."[47] LOGCOM would consist of two major components, one responsible for distribution and the other responsible for Integrated Life-cycle Management (ILM).

TRANSCOM would serve as that distribution sub-unified command with the ILMs managing the supplies, providing the right item at the right time for TRANSCOM to deliver to the end user. Not mentioned in his article, but DLA, DoD's already existing EA for many classes of supply, would best serve as the sub-unified Combat Support Agency (CSA) to lead the ILM branch of the proposed LOGCOM. To further integrate LOGCOM as a joint force and gain efficiencies through joint interoperability across the DoD, Robert P. Mann also recommends the ILMs be organized by functional groups rather than by component (Army, Marine Corps, Navy, and Air Force). The suggested functional groups include ground, air, sea, and command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR). Figure 3 graphically depicts Robert P. Mann's recommended LOGCOM structure as the lead supply process owner by overseeing lifecycle managers and distribution managers in meeting the needs of the CCMDRs. The true unified effort established by LOGCOM would lead in ending the silo parochialism within the DoD by being the sole force wide Joint Logistics manager.[48]

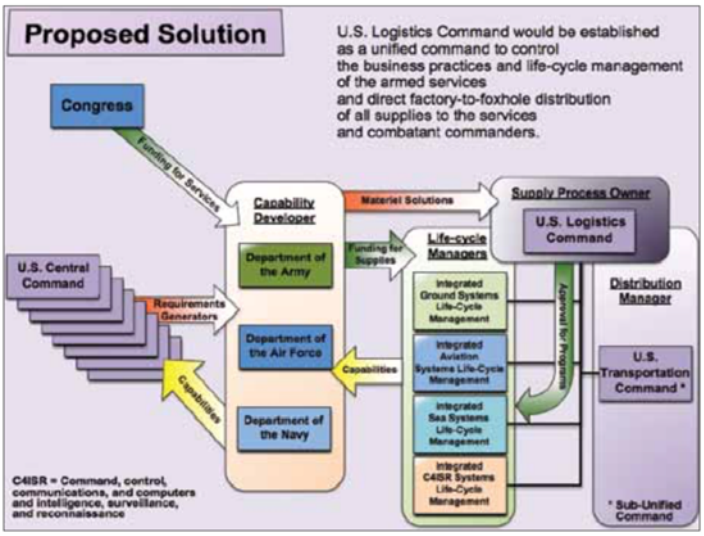

Figure 3. LOGCOM Proposed Structure[49]

With all of these final recommendations being implemented at the strategic and operational level, success must be measured at the tactical level using the principles of logistics: responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability. However, success depends on the operational level setting the conditions by linking the tactical and strategic levels. C.V. Christianson best sums this up by saying "[t]he operational level is where the joint logistician must bridge service, coalition, agency, and other organizational elements and capabilities, linking national and tactical systems, processes, and organizations to achieve the freedom of action that the JFC expects."[50] The principles of logistics in turn can assist the JFC in assessing the implementation of Joint Logistics in supporting his forces, which allows him to effectively conduct his mission. The imperatives of unity of effort, JLEnt/domain wide visibility, and rapid and precise response permeate all the way to the tactical level, as there is a high tactical price to pay for inefficiencies at the strategic or operational levels.[51]

...in its relationship to strategy, logistics assumes the character of a dynamic force, without which the strategic conception is simply a paper plan.

- Commander C. Theo Vogelsang, USN

VIII: Conclusion

As noted in the RAND study *Integrating the Department of Defense Supply Chain*, "joint" is often thought of only when services are obligated to work together. The DoD must lead its departments in true supply chain integration and overall Joint Logistics initiatives. This is only achieved when the DoD mindset changes and all services within the DoD understand that everything they do affects and interacts with the other; they must truly learn and understand Joint Logistics and SCM. Beginning with that change in mindset, a governance process designed to establish accountability, responsibility, and reliability must be established to facilitate and coordinate end-to-end logistical support through SCM. The approach must seek to optimize logistical support as maintained by the fiscally constrained environment while still improving readiness through allowing the integrated IT system, enterprise level common procedures, and other logistical improvements to allow for a better decision making process with the most accurate information available. End-to-end performance measures, from strategic to tactical, will be the only way to truly measure the success of Joint Logistics, correlated with the principles of logistics, and ultimately indicated by the ability for the JFC to accomplish the mission.[52]

The imperatives of unity of effort, JLEnt/domain wide visibility, and rapid and precise response remain the cornerstone for a unified DoD with true Joint Logistics services vice just paying lip service to the term Joint Logistics. Through the three imperatives, the civilian best business practices analyzed by the Defense Business Board, and by using the principles of logistics as a litmus test, the SCM issues identified by the GAO will be addressed and a

paradigm shift in DoD logistics will occur. A unified LOGCOM, with functionally based ILMs leading SCM through the DLA and TRANSCOM serving as the DoD wide distribution manager would also serve in ending the silo parochialism within the DoD by having a single force wide Joint Logistics manager. A unified and streamlined DoD, supported by all logistics professionals with common metrics, process, procedures, and systems with which to achieve true Joint Logistics will ultimately best sustain the joint force for tomorrow's battles through more effective and efficient Joint Logistics.

Endnotes

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Appendix A. Classes of Supply

Classes, Subclasses of Supply, and Common-User Logistics Suitability

Class	Symbols	Subclass	Common-User Logistics (CUL) Capability
I. **Subsistence:** Food		A - Nonperishable dehydrated subsistence that requires organized dining facilities C - Combat rations includes meals, ready to eat (MREs) that require no organized dining facility; used in combat and in-flight environments. Includes gratuitous health and welfare items R - Refrigerated subsistence S - Non-refrigerated subsistence (less other subclasses) W- Water	Fully suited to CUL
II. **General Support Items:** Clothing, individual equipment, tentage, organizational tool sets and tool kits, hand tools, material, administrative, and housekeeping supplies		A - Air B - Ground support material E - General supplies F - Clothing and textiles G - Electronics M - Weapons T - Industrial supplies (e.g., bearings, block and tackle, cable, chain, wire, rope, screws, bolts, studs, steel rods, plates, and bars)	Limited CUL suitability
III. **Petroleum, Oils, Lubricants (POL):** Petroleum (including packaged items), fuels, lubricants, hydraulic and insulating oils, preservatives, liquids and compressed gasses, coolants, deicing, and antifreeze compounds, plus components and additives of such products, including coal		A - Air W- Ground (surface) P - Packaged POL	Excellent CUL candidate (with some limitations)
IV. **Construction/Barrier:** Materials that support fortification, obstacle and barrier construction, and construction material for base development and general engineering		A - Construction B - Barrier materials	Fully suited for CUL
V. **Ammunition:** Ammunition of all types (including chemical, radiological, and special weapons), bombs, explosives, mines, fuses, detonators, pyrotechnics, missiles, rockets, propellants, and other associated items		A - Air W - Ground	Limited, primarily to small arms, selected larger munitions
VI. **Personal Demand Items:** Nonmilitary sales items		A - Personal demand items not packaged as ration supplement sundry packs (RSSP) M- Personal and official letter and packaged mail. Does not include items in other classes such as spare parts P - RSSP	Fully suited for CUL
VII. **Major End-Items:** A final combination of end-products ready for intended use; e.g., launchers, tanks, racks, adapters, pylons, mobile machine shops, and administrative and tracked vehicles		A - Air B - Ground support material (includes power generators, fire-fighting, and mapping equipment) D - Administrative and general purpose vehicles (commercial vehicles used in administrative motor pools) G - Electronics J - Tanks, racks, adapters, and pylons (US Air Force only) K - Tactical and special purpose vehicles (includes trucks, truck-tractors, trailers, semi-trailers, etc.) L - Missiles M - Weapons N - Special weapons X - Aircraft engines	Not suitable for CUL
VIII. **Medical Material/ Medical Repair**		A - Medical material (including repair parts special to medical items) B - Blood and fluids	Fully suited for CUL
IX. **Repair Parts (less medical special repair parts):** All repair parts and components, including kits, assemblies, material power generators sub-assemblies (repairable and nonrepairable) required for all equipment; dry batteries		A - Air B - Ground support material, power generators, and bridging, fire-fighting, and mapping equipment D - Administrative vehicles (vehicles used in radio administrative motor pools) G - Electronics K - Tactical vehicles (including trucks, truck-tractors, trailers, semi-trailers, etc.) L - Missiles M- Weapons N - Special weapons T - Industrial supplies (e.g., bearings, block and tackle, cable, chain, wire, rope, screws, bolts, studs, steel rods, plates, and bars) X - Aircraft engines	Not suitable for CUL except for common items; requires special coordination to ensure proper support
X. **(code as zero '0'):** Material to support military programs, not included in classes I through IX		None	Fully suited for CUL

Glossary

Corrective Action Plan (CAP)

Combatant Commander (CCDR)

Combat Support Agency (CSA)

Department of Defense (DoD)

Defense Logistics Agency (DLA)

Diplomatic, Informational, Military, and Economic (DIME)

DoD-Wide Strategic Sourcing (DWSS)

Enterprise Resource Planning (ERP)

Executive Agent (EA)

Government Accountability Office (GAO)

Information Technologies (IT)

Joint Concept for Logistics (JCL)

Joint Force Commander (JFC)

Joint Logistics Enterprise (JLEnt)

Joint Publication (JP)

Joint Supply Chain Architecture (JSCA)

Logistics Command (LOGCOM)

Logistics and Materiel Readiness (L&MR)

Masters in Military Science (MMS)

Non-Governmental Organization (NGO)

Research and Development (RAND)

Range of Military Operations (ROMO)

Return On Investment (ROI)

Secretary of Defense (SECDEF)

Standard Operating Procedures (SOP)

Supply Chain Management (SCM)

Theater Security Cooperation (TSC)

Transportation Command (TRANSCOM)

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