

ORGANIZING DEFENSE LOGISTICS: WHAT STRATEGIC STRUCTURES
SHOULD EXIST FOR THE DEFENSE SUPPLY CHAIN?

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Strategy

by

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ABSTRACT

ORGANIZING DEFENSE LOGISTICS: WHAT STRATEGIC STRUCTURES SHOULD EXIST FOR THE DEFENSE SUPPLY CHAIN? by MAJ Edward Deacon Maddox, 100 pages.

This thesis focused on the fundamental changes to logistics mandated by Secretary of Defense Donald Rumsfeld through his designations of Defense Logistics Executive and Distribution Process Owner. The primary research question of this study was: What strategic organizational structures should exist within the Department of Defense to facilitate further integration of the defense supply chain? To answer this question, this thesis analyzed successful strategies from three supply chain paradigms: Academic, Military, and Corporate. A research model was developed to evaluate and compare the three paradigms according to six criteria. Each criterion represented a strategic structural requirement for an organization integrating its supply chain. Based on qualitative analysis, it concluded that there were four fundamental requirements for designing a strategic governance structure to facilitate supply chain integration in an organization. Finally, this thesis applied the research conclusions to the existing state of the Department of Defense supply chain and recommended a strategic structure to facilitate further integration.

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ACRONYMS

CASCOM	US Army Combined Arms Support Command
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CLO	Chief Logistics Officer
DBB	Defense Business Board
DLA	Defense Logistics Agency
DLB	Defense Logistics Board
DLE	Defense Logistics Executive
DLGSCMS	Defense Logistics and Global Supply Chain Management System
DMI	Define, Measure, Improve
DoD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DPO	Distribution Process Owner
DTTF	Distribution Transformation Task Force
DUSD (L&MR)	Deputy Under Secretary of Defense for Logistics and Materiel Readiness
EPIT	Enterprise Process Integration Team
ESMG	Enterprise Supply Management Group
GAO	Government Accounting Office
IPT	Improvement Process Team
IT	Information Technology
JLB	Joint Logistics Board
JLG	Joint Logistics Group
JP	Joint Publication
LCO	Logistics Communications Office

LMI	Logistics Management Institute
LMP	Logistics Master Planning
Lt. Gen.	Lieutenant General
OIF	Operation Iraqi Freedom
OIPT	Operational Improvement Process Team
OPIT	Operational Process Integration Team
PIT	Process Improvement Team
RFID	Radio Frequency Identification Device
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference
SecDef	Secretary of Defense
SIT	Site Improvement Team
TRANSCOM	United States Transportation Command
USD (AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
USD (SCO)	Under Secretary of Defense for Supply Chain Operations
VM	Velocity Management
VP	Vice President

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CHAPTER 1

INTRODUCTION

Overview

During the latter half of the 1990s, the Department of the Army made great strides in improving the distribution of repair parts to its mechanics and operators around the world. With the assistance of the RAND Corporation, the Army scrutinized its supply management and distribution systems and developed a three-step model for improvement: Define, Measure, Improve (DMI). The DMI model decomposed the Army's material distribution systems into sequential subprocesses (Define), evaluated each subprocess independently (Measure), and implemented changes to the subprocesses to make each more efficient (Improve).

The Army called this initiative "Velocity Management" (VM). It emerged during the Army's quest for lessons learned after Operation Desert Storm, and required the full attention of a succession of the senior-most logisticians in the Army. It also required strategic organizational structures to coordinate the effort and to facilitate partnerships between Army logistics agencies, the Defense Logistics Agency, US Transportation Command, and civilian logistics contractors.

The leading VM structure was the Velocity Management Board of Directors, also known as the Velocity Group. This was the decision-making body for VM initiatives and its membership included the Deputy Chief of Staff for Logistics from Army Headquarters at the Pentagon, the Deputy Commanding General of Army Materiel Command in Alexandria, Virginia, and the Commanding General of US Army Combined Arms

Support Command (CASCOM) headquartered at Fort Lee, Virginia. In addition to serving on the Velocity Group, the Commanding General of CASCOM also supervised the implementation of VM initiatives through the CASCOM Implementation Cell at Fort Lee (see figure 1) (Dumond, et al. 2001, 12).

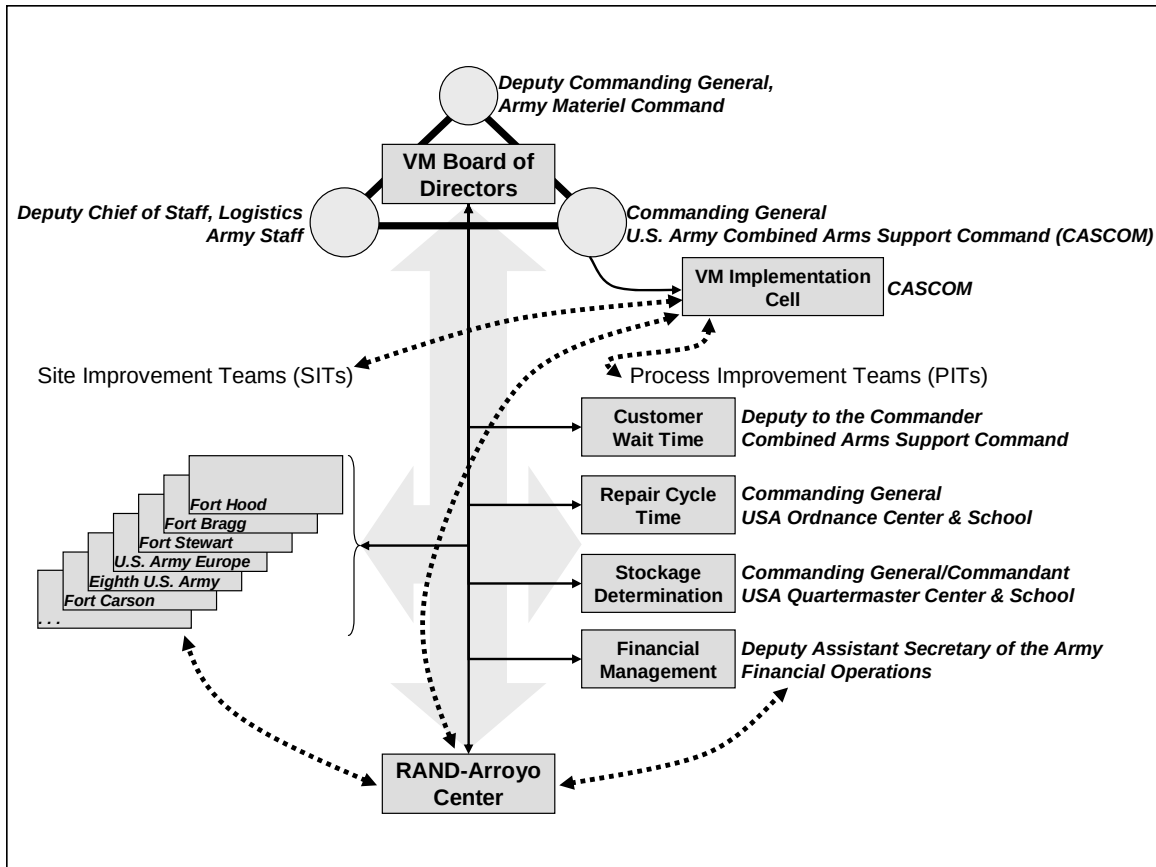


Figure 1. US Army Strategic Organizational Structures for Velocity Management
Source: Dumond et al., *Velocity Management: The Business Paradigm That Has Transformed U.S. Army Logistics* (Santa Monica: RAND, 2001), 15.

Four Process Improvement Teams (PITs) reported to the Velocity Group, each responsible for a specific logistics function. The first was the Customer Wait Time PIT, headed by the Deputy to the Commander of CASCOM, and responsible for reviewing the

Army's processes for requesting and distributing supplies. Another team was the Repair Cycle PIT, led by the Chief of Ordnance, which reviewed processes related to reparable item management and other maintenance tasks that returned overhauled, repaired and reconditioned assemblies to the supply system.

The Quartermaster General headed the Stockage Determination PIT which sought to improve the Army's methods for identifying supplies and the level at which each should be stored. The remaining PIT was that of Financial Management, and was chaired by the Deputy Assistant Secretary of the Army for Financial Operations. This team reviewed the Army's processes for controlling, reconciling, and managing its operations and maintenance accounts and the Army Working Capital Fund.

In addition to the process teams were Site Improvement Teams (SITs) located at each Army installation worldwide. These teams used the DMI model to examine the internal processes at their respective installations and made improvements in accordance with VM principles. The SITs coordinated their efforts with the Velocity Group and through the VM Implementation Cell at Fort Lee.

RAND employees acted as guides by consulting with the various teams worldwide, and providing recommendations and advice. RAND also acted as a data clearinghouse by providing VM literature, segment measurement tools, data analysis and progress reports to all involved (Dumond et al. 2001, 13-15).

With VM, the Army quickly realized improvements in its supply and distribution processes. Between 1995 and 2000, continental United States-based installations Army-wide experienced great reductions in the number of days required to fill repair parts orders, with most installations reducing the time necessary to order and receive a repair

part by 50 percent or more. Installations outside the continental United States experienced similar reductions, with the average order fulfillment time for repair parts by air dropping forty-eight percent (Dumond et al. 2001, 27-29).

The intent of DMI was to improve the whole by improving the parts, and the Army largely accomplished its intent. In 1998, just three years after embarking on the VM initiative, Vice President Al Gore presented the Army with the Golden Hammer Award for excellence and efficiency in government.

The DMI model was the military equivalent of Supply Chain Management (SCM), a proven civilian concept for integrating functional capabilities such as inventory, production, billing and customer service. In the context of DMI, each defined subprocess could be seen as one link in a company's supply chain. Like DMI, SCM was a holistic approach to business, encompassing the supplier's suppliers as well as the customer's customers.

In 1995, the Department of Defense (DoD) embarked on its own supply chain integration initiative. Compared to VM, however, DoD's progress was much slower. After eight years, DoD leaders had studied and defined what the transformed defense supply chain should look like, but had not taken any steps toward structuring the department's strategic logistics organizations to fulfill these plans.

In 2003, Secretary of Defense Donald Rumsfeld instilled a sense of urgency in DoD for transforming the defense supply chain through a memorandum entitled "Actions to Improve Logistics and Global Supply Chain Management." Through this document, Secretary Rumsfeld gave purpose and authority to the defense SCM initiative by

assigning new responsibilities to senior defense logistics leaders to include the Defense Logistics Executive (DLE) and the Distribution Process Owner (DPO).

Eighteen months after Secretary Rumsfeld's directive, DoD's transition to an integrated supply chain was clearly underway. Defense leaders had established a number of boards, task forces and teams to study aspects of the supply chain and to make recommendations on how DoD should proceed in its implementation initiatives. It had adopted the Supply Chain Operations Reference (SCOR), a proven civilian business model for identifying core processes and tailoring an enterprise-level supply chain to serve those processes. It had clearly identified leaders with high authority, able to make decisions that crossed service boundaries. Yet, DoD leaders had not attempted to reorganize the strategic logistics structures to facilitate this transformation, choosing to emphasize partnerships and cooperation over more enduring changes to the defense logistics establishment.

This thesis examines the DoD supply chain from the aspect of strategic organizational design. Using its research questions as a guide, it establishes and compares the current state of the defense supply chain to supply chain practices from academia, the corporate sector and the Army's VM program. It draws conclusions from these comparisons and makes recommendations for how leaders might structure DoD to facilitate further supply chain integration.

Research Questions

The primary research question of this thesis was: What strategic organizational structures should exist within DoD to facilitate further integration of the defense supply chain?

In order to answer this question, it was necessary to know the existing supply chain framework and the proposals leaders had made for supply chain integration. Hence, a secondary research question was: What were the existing or proposed governance structures for integrating the defense supply chain?

It was also necessary to determine precedents and trends observed in successful SCM implementations in the academic, corporate, and military paradigms. An analysis of these precedents and trends would allow one to determine the basic requirements for structuring an enterprise to accomplish supply chain integration. There were three additional secondary questions that would provide this information. What did academic business experts consider critical for leaders designing an organization that wanted to transition to a more integrated supply chain? How did US Army leaders structure their organization to facilitate VM? How did successful corporate leaders structure their organizations at the enterprise or strategic level to achieve supply chain integration?

From these secondary questions, a third level of questions was developed to further guide research. What were the roles and relationships of senior executives and steering committees within organizations that had integrated supply chains? What level of integration was desired for commercial and military supply chains? How much change resulted in organizations that attempted to integrate their supply chain? What model, if any, did organizational leaders use to guide them in their approaches to integration?

Operational Definitions

The following terms occurred frequently throughout this work. The operational definitions of these terms are provided.

Distribution. Logistics activities that include “requisitioning channels, distribution depots, and other storage locations, transportation channels, tracking systems, and other activities involved with the delivery, sale, or disposal of materiel.” (DOD 4140.1-R, 2003, 90)

Supply Chain Management. “The planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers . . . an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the Logistics Management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance and information technology” (Vitasek 2005, 97).

Structure. An entity that exists to administer an identified function or group of functions. A structure can be an individual, a governmental agency, board, committee or any other body with the capability and authority to exercise command and control, make decisions and provide guidance.

Limitations and Delimitations

Research of this topic entailed two significant limitations. First, the defense supply chain was far too vast and complex for an effective treatment by a paper of this scope. By its nature, SCM is a holistic approach to business that incorporates many different functions.

The delimitation for this weakness was to focus research on the strategic organizations that may have been required by the DoD supply chain initiatives. The research questions would narrow the focus enough to make a thorough analysis sufficient to form similarly narrowed recommendations.

The second limitation was the fact that there was no boilerplate solution for supply chain integration. In the commercial world, no two SCM solutions were exactly alike. Likewise, no two military supply systems were exactly alike. There were many similarities between the military and business, but it was impossible to transfer a business paradigm such as SCM to the military without significant modifications. Thus, any solution would have to be intuitive, relying on business practices tempered and modified by military realities.

To delimit the second weakness, research sought business solutions and identified the adaptations that could be made. Additionally, representatives from major corporations were interviewed to gain insight on how the business world actually integrates supply chains.

Significance of Research

The significance of this research was in its recommendations for an efficient strategic governance structure for future defense logistics organizations. It was assumed

that efficiency at the strategic level would cascade down throughout the entire logistics establishment, tying together subordinate efforts to integrate the defense supply chain. This efficiency would result in higher readiness of combat equipment on future battlefields as well as increased savings of federal resources and taxpayer dollars.

CHAPTER 2

LITERATURE REVIEW

The review of literature will focus on three main areas: Defense Supply Chain Literature, Supply Chain Management Literature, and Business Management Literature.

Presented is a chronological synopsis of the defining events in the development of the defense supply chain and the documents that facilitated or described the changes that resulted from those events. The intent was to provide an understanding of the current state of the defense supply chain and how this state evolved over time. Also reviewed are works dealing with strategic organizational design and leadership in civilian organizations.

Defense Supply Chain Literature

Leaders in DoD first began considering supply chain integration in 1995. At that time, the Deputy Under Secretary for Logistics contracted the Logistics Management Institute (LMI) to provide recommendations for “reducing costs and increasing the effectiveness of procurement, materiel management, logistics, manpower support activities, and other related subjects” (DoD News Release 111-95, 1995, 1).

In June 1999, LMI published a report entitled *Supply Chain Management: A Recommended Performance Measurement Scorecard*, by Larry S. Klapper, Neil Hamblin, Linda Hutchison, Linda Novak, and Jonathan Vivar.

In this report, the authors recommended that DoD integrate its supply chain. They also recommended that DoD adopt the SCOR model as a basis for defense supply chain decisions (Klapper et al. 1999, 3-3). Additionally, the authors recommended a slate of

measurements, or metrics, DoD should use to compare supply chain performance to published goals and objectives. The authors termed this slate of metrics a “Performance Scorecard” (Klapper et al. 1999, iii-v).

Following the release of *Supply Chain Management: A Recommended Performance Measurement Scorecard*, the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD (AT&L)) published two key documents that committed DoD to supply chain management. The first was *FY2000 DoD Logistics Strategic Plan*, published on 1 August 1999. In this document, the USD (AT&L) stated DoD’s mission, vision, performance goals, and measurement criteria for implementing an integrated supply chain.

The second was Department of Defense Instruction (DODI) 4140.61, *Customer Wait Time and Time Definite Delivery*, which the USD (AT&L) published in December 2000. This document converted the vision and goals from *FY2000 DoD Logistics Strategic Plan* into instructions for implementation. It also formally directed the departmental use of the Customer Wait Time metric, a measurement that the RAND Corporation had introduced to the US Army in the VM program. Oddly, the USD (AT&L) made no mention of the recommendations from the LMI report in either the DoD Strategic Plan or DODI 4140.61.

Beginning in the fall of 2002 and extending through late winter 2003, the United States prepared for a military campaign in southwest Asia leading up to Operation Iraqi Freedom (OIF) in March 2003. During OIF and in its aftermath, reports of logistical inefficiency surfaced in the press and in the military’s After Action Reports.

One gains an appreciation for the magnitude of the logistical problems US forces encountered during OIF in *Sustainment of Army Forces in Operation Iraqi Freedom: Executive Summary*, written by Eric Peltz, Marc Robbins, Kenneth Girardini, Rick Eden, John Halliday, and Jeffrey Angers. This report summarized a RAND Corporation study commissioned by the Army G4 entitled *Army Logistics in OIF: Key Issues for the Army*.

OIF seemed to spur the acceleration of the DoD supply chain initiatives. In May 2003, the Deputy Under Secretary of Defense for Logistics and Materiel Readiness (DUSD (L&MR)) published policy for supply chain integration in Department of Defense 4140.1-R, *DOD Supply Chain Materiel Management Regulation*. This regulation revived the LMI report, and its contents closely mirrored the LMI recommendations. Most notably, DOD 4140.1-R codified the department's adoption of the SCOR model. For those familiar with SCOR and its methodology, DOD 4140.1-R was instantly recognizable as the document was organized along the five SCOR processes: Plan, Source, Make, Deliver, and Return.

At roughly the same time as the release of DOD 4140.1-R, defense leaders began searching for a strategic organizational construct capable of integrating the defense supply chain. Secretary Rumsfeld tasked the Defense Business Board (DBB) to explore the possibility of a merger between United States Transportation Command (TRANSCOM) and the Defense Logistics Agency (DLA) as one structural option.

In June 2003 the DBB chairman, retired Army Lieutenant General William G. Pagonis, presented the DBB's findings along with a three part recommendation to Secretary Rumsfeld, the thrust of which was: Do not merge TRANSCOM and DLA. Lt. Gen. Pagonis stated that making DLA a part of TRANSCOM would not harmonize the

supply chain in and of itself. The two organizations should collaborate and synchronize their supply chain activities, but without a command relationship between them.

Lt. Gen. Pagonis suggested that Secretary Rumsfeld should create a new Under Secretary of Defense for Global Supply Chain Integration to synchronize the supply chain activities of TRANSCOM, DLA and the Armed Services. He further recommended that the new position be held by a civilian with extensive corporate SCM experience for a fixed term of no less than six years with sufficient administrative authority to make supply chain policy and control the distribution budgets of the defense organizations involved in the supply chain. Lt. Gen. Pagonis further recommended that Secretary Rumsfeld modify the chain of command so that the DLA Director and the TRANSCOM Commander reported to the new Under Secretary of Defense for Global Supply Chain Integration (Pagonis, 2003).

On 16 September 2003, Secretary Rumsfeld published a memorandum that incorporated many of the recommendations from Lt. Gen. Pagonis's report. The memorandum was entitled "Actions to Improve Logistics and Global Supply Chain Management."

In this document, Secretary Rumsfeld outlined the rough shape of the supply chain initiative along two main axes: integration of the defense supply chain and improvement in distribution processes. He designated the USD (AT&L) as the Defense Logistics Executive (DLE) with the "authority to make changes necessary to integrate the global supply chain." He specifically stated that the DLE responsibilities were additional to those the USD (AT&L) already had. To advise the DLE in his duties, Secretary

Rumsfeld directed the establishment of a Defense Logistics Board (DLB) similar in composition and role to the Defense Acquisition Board (Rumsfeld 2003, 1).

Secretary Rumsfeld made the commander of United States Transportation Command (TRANSCOM) the Distribution Process Owner (DPO) to “improve the overall efficiency and interoperability of distribution related activities” (Rumsfeld, 2003, 1).

With regard to command and control, Secretary Rumsfeld assigned supervisory responsibility for TRANSCOM to USD (AT&L) through the DLB; however, the language of the memorandum made it clear that the TRANSCOM Commander, as a Unified Combatant Commander, would continue to report to the Secretary of Defense in that capacity. Possibly recognizing the potential for conflicts in command relationships, Secretary Rumsfeld directed the TRANSCOM Commander, US Air Force General John W. Handy, to reply with a draft directive clarifying the command and control relationships and responsibilities in this new arrangement (Rumsfeld 2003, 2).

In the draft directive, circulated throughout DoD in early fall 2003, General Handy and his staff established an aggressive action plan with a broad expansion of TRANSCOM’s responsibilities. The draft directive also appealed to the other national logistics providers to form partnerships with TRANSCOM to make the DPO initiative successful.

General Handy’s draft directive proposed the creation of several boards, process teams, and task forces. He recommended responsibilities for key “stakeholders,” and outlined the strategic organizational hierarchy for both the DLE and the DPO (see figure 2).

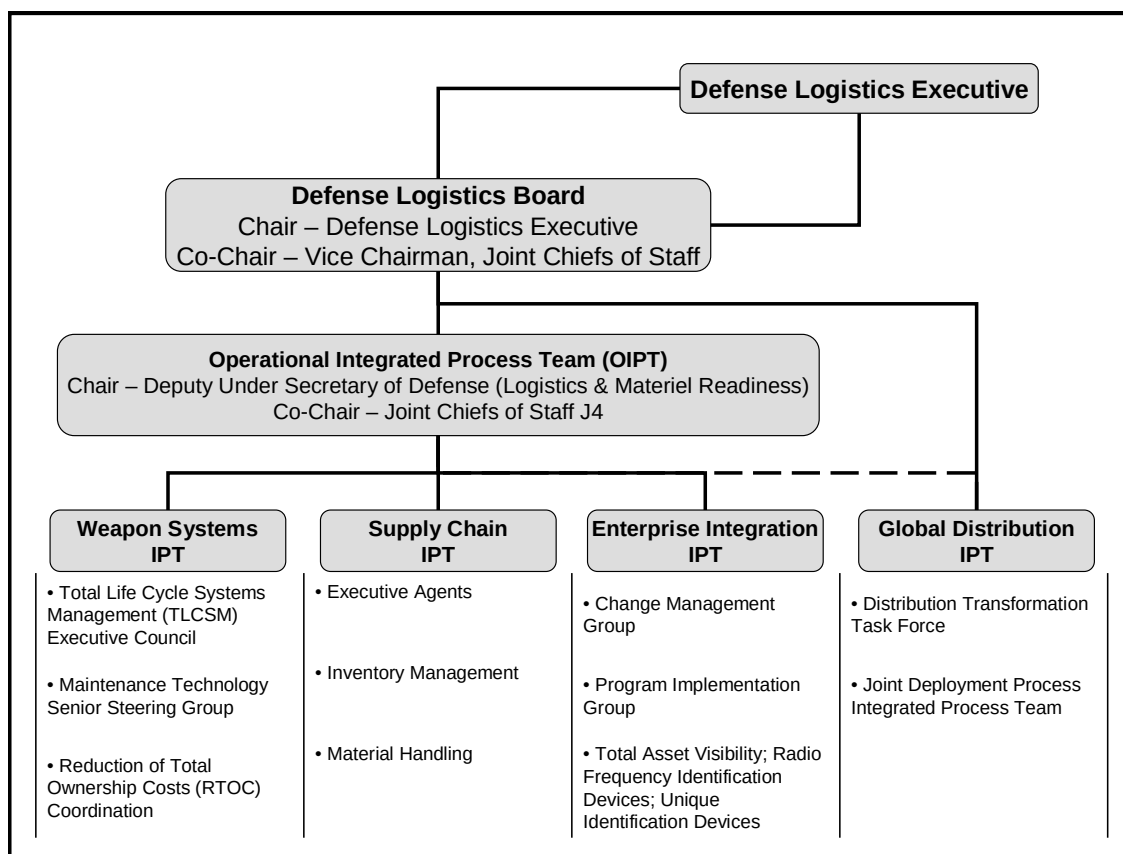


Figure 2. Proposed Structures for the Defense Logistics Executive
 Source: General John W. Handy, “Defense Logistics Board Charter, Structure, and Procedures” (briefing, Defense Logistics Board, 5 December 2003), slide 7.

Addressing the structures that DoD should establish under the DLE, General Handy proposed four Improvement Process Teams (IPTs) to address the areas of Weapons Systems, Supply Chain, Enterprise Integration and Global Distribution. These IPTs would report to an Operational IPT (OIPT) created to review the work completed and resolve disputes if necessary. The OIPT was to report to the Defense Logistics Board, which in turn would advise the Defense Logistics Executive (2003, slide 7).

At TRANSCOM, General Handy implemented a similar structure for the DPO (see figure 3). He formed six “pillars,” each addressing a unique function of distribution:

integrated distribution, human realm, financial, information technology, end-to-end (E2E) processes, and execution. The functional personnel staffing these pillars presented their recommendations to the DPO Pillar Steering Group. Between the pillars and the steering group was the DPO Pillar Working Group, which integrated the pillar recommendations, resolved disputes and provided guidance and advice. The Steering Group finalized the pillars' work and made cross-functional process recommendations to the DPO Executive Board. The TRANSCOM Commander then proposed the DPO recommendations to the Defense Logistics Board (US Transportation Command 2005, slide 1).

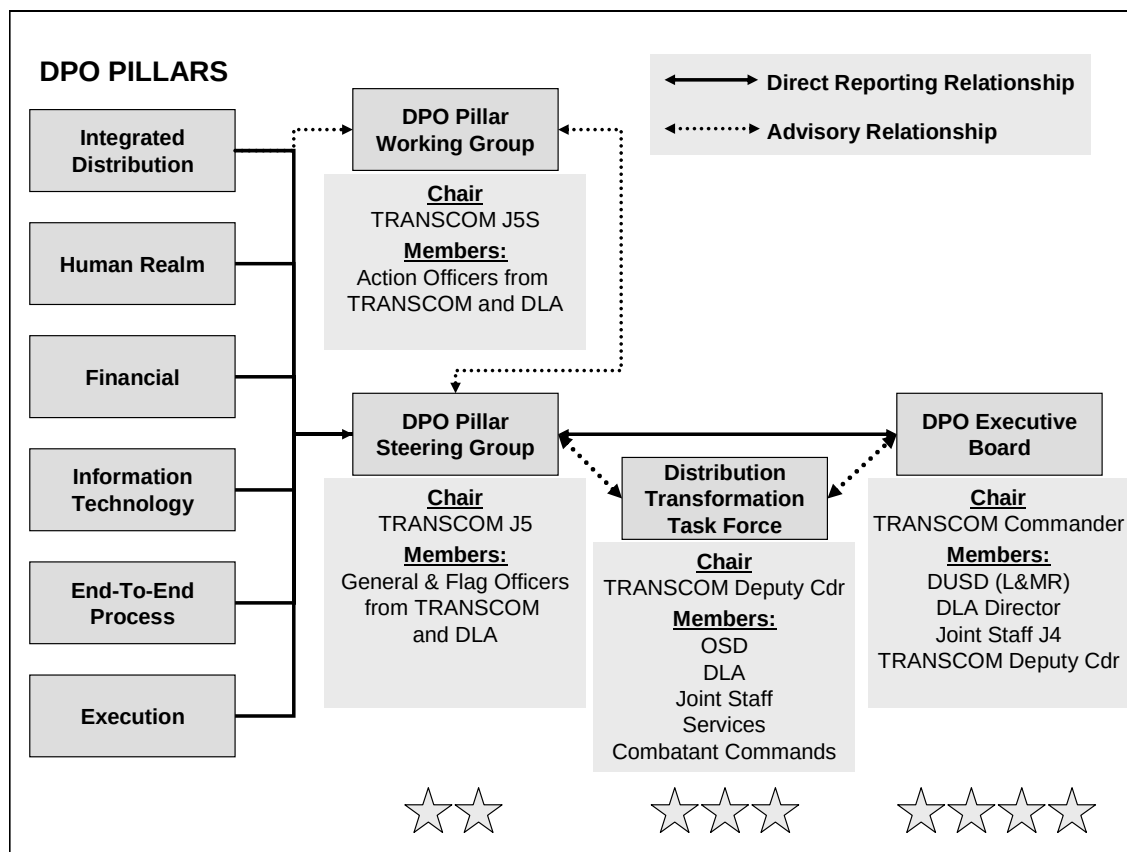


Figure 3. Structures Implemented by the Distribution Process Owner
 Source: US TRANSCOM, "DPO Reporting Relationships," Informational chart forwarded to author following telephonic interview, 30 March 2005.

To facilitate the DPO structures and to “accept transformation responsibilities,” General Handy reorganized TRANSCOM headquarters. He highlighted these changes in testimony before the House Armed Services Committee on 17 March 2004. The main new structure that emerged from the reorganization was a “light, lean, execution-focused Operations Directorate (J3)” that was oriented on the distribution process and aligned “functionally . . . along core business processes” (US Congress, House 2004c, 11).

Other key components of the draft directive were the assignments of responsibility to other DoD logistics organizations. For the DLE, General Handy did not go far beyond the guidance Secretary Rumsfeld issued in his 16 September memorandum. In addition to those duties assigned by Secretary Rumsfeld, General Handy recommended that the DLE “provide policy for improving and maintaining (the) Defense Logistics and Global Supply Chain Systems (DLGSCMS) processes,” and “harmonize the DLGSCMS with the Joint Deployment System (JDS) in architecture, processes, planning, and execution.” General Handy also recommended that the DLE promulgate department-level “directives, instructions, and decision memoranda for coordination, to include the (Chairman of the Joint Chiefs of Staff), as required” (2003, slide 3).

General Handy recommended that the DLE share leadership of the Defense Logistics Board with the Vice Chairman of the Joint Chiefs of Staff. The DLE and Vice Chairman would oversee the DLB in three main duties. First, the DLB would advise the Defense Logistics Executive on all matters pertaining to supply chain integration. Second, the board would reconcile recommendations coming from the DPO Pillars and IPTs with Secretary Rumsfeld’s directives, as published in *Defense Planning Guidance*.

Third, the DLB would work with the Chairman of the Joint Chiefs of Staff to identify “statutory and regulatory” issues and recommend related changes to the DLE. As for who would sit on the DLB, General Handy stressed integration, recommending the senior-most leaders within DoD from critical functional areas such as human resources, information technology, budget, joint doctrine and policy, and finance. General Handy also recommended high-level service and Joint Staff participation on the DLB, calling for leaders from the services’ materiel commands, general staffs and the Joint Staff (see table 1). The DLE followed these recommendations (Handy 2003, slide 4).

Table 1. Proposed Membership of the Defense Logistics Board

Under Secretary Defense - Acquisition, Technology and Logistics – Chair
Vice Chief Joint Chiefs of Staff – Vice Chair
Under Secretary of Defense – Comptroller
Under Secretary of Defense – Policy
Under Secretary of Defense – Personnel and Readiness
Under Secretary of Defense – Program Analysis & Evaluation
Assistant Secretary of Defense for Networks and Information Integration (NII)
Deputy Under Secretary of Defense (Logistics and Materiel Readiness)
Joint Staff Deputy J-4
Vice Chief of Staff, Army
Deputy Chief of Naval Operations
Assistant Commandant of the Marine Corps
Vice Chief of Staff of the Air Force
Commander, US Joint Forces Command
Commander, US Transportation Command

Source: US TRANSCOM, “Proposed Defense Logistics Board Membership,” Informational chart forwarded to author following telephonic interview, 30 March 2005.

In defining the DPO’s responsibilities, General Handy greatly expanded the role of TRANSCOM. In summary, General Handy recommended that the DPO be overall responsible for the Strategic Distribution System, to include issuing directives and

regulations, making decisions, and making distribution policy. He also recommended that the DPO be responsible for research and development in the defense distribution field. Most importantly, the DPO would “establish distribution liaisons with (Joint Task Forces), (Combatant Commands), Services, and Agencies providing a single distribution face to the customer” (Handy 2003, slide 5).

In dividing responsibilities between the DLE and the DPO, General Handy classified storage of supplies and the pre-positioning of stock as parts of strategic distribution, thus under the supervision of the DPO. He recommended that the DLE be responsible for acquisition activities such as sourcing, supplier management, manufacturing and disposal (Handy 2003, slide 6).

On 18 December 2003, the General Accounting Office (GAO) issued a report to Congress entitled *Defense Logistics: Preliminary Observations on the Effectiveness of Logistics Activities during Operation Iraqi Freedom*. This was a mostly critical report that discussed logistics failures during Operation Iraqi Freedom and the related costs to the United States government. GAO included in its report a DoD response, which stated that Secretary Rumsfeld’s assignments of DPO and DLE would fix some of the problems noted in the report.

In the wake of the GAO report, the Readiness Subcommittee of the House Armed Services Committee held a hearing on logistics performance during OIF on 30 March 2004. The Readiness Subcommittee chairman, Congressman Joel Hefley, set the tone for the hearing in his opening remarks. Referring to a speech former Secretary of Defense Paul Kaminski gave in 1995, in which Kaminski spoke of the need for DoD to integrate its logistics effort, Congressman Hefley stated:

(DoD) has spent billions of dollars trying to improve the logistics systems since the first Persian Gulf War. Much has improved, but too much of the 1995 speech is still true today. The services have stove piped systems; the systems need to be integrated; and there is a need for total asset visibility. I would like to hear from the witnesses today to what extent the words from Dr. Kaminski almost ten years ago are still true today. I also need the witnesses to diminish my skepticism that despite the best of intentions, we will not in ten years be asking why the services still have stove piped systems and the combatant commander is still in search of total asset visibility. (U.S. Congress, House 2004a)

Immediately following these hearings, Deputy Secretary of Defense Paul L. Wolfowitz issued Department of Defense Directive (DODD) 4140.1 on 11 April 2004. This directive underscored the department's commitment to revamping the defense supply chain by reiterating the basic tenets DUSD (L&MR) had established in DOD 4140.1-R and codifying the duties and responsibilities Secretary Rumsfeld had assigned in his memorandum of 16 September 2003.

In July 2004, DoD published two notable memorandums related to the defense supply chain. The first appeared on 28 July 2004 with the subject: "Management of the Distribution Systems Portfolio: Sustainment and Force Movement." In this document, the authors, Mr. Bradley Berkson (Acting DUSD (L&MR)) and Vice Admiral Gordon S. Holder (Joint Staff J-4) assigned to the DPO the responsibility for developing and managing the information technology systems that furnished "key capabilities in support of distribution (sustainment and force movement) related activities." In this task, the authors wrote that the DPO would share his duties with the Joint Staff J4 and be supervised by the DUSD (L&MR) (Berkson and Holder 2004, 1-2).

With regard to the scope of the assignment of the Distribution Systems Portfolio, Mr. Berkson and Vice Admiral Holder included a listing of DoD definitions that identified the logistics systems that the DPO would manage. From these definitions, the

authors implied that the DPO would assume management responsibilities for all information systems related to “requisitioning channels, distribution depots, and other storage locations, transportation channels, tracking systems, and other activities involved with the delivery, sale, or disposal of materiel.” In clarifying the level to which the DPO would manage, the authors included a definition that set the limits at “the point of receipt into the military system . . . to the point of issue to using activities and units” (Berkson and Holder 2004, 3).

The DLE Mr. Michael W. Wynne issued the second memorandum of importance on 30 July 2004 with the subject: “Radio Frequency Identification (RFID) Policy.” This document mandated the use of RFID technology throughout DoD. RFID is used to locate and track shipments. It relies on a small radio transponder attached to a supply item that signals that item’s physical location to interrogators placed at critical distribution nodes in the supply chain. The interrogators relay the transponder’s location information to a web-enabled database that DoD users can query to monitor the status of inbound shipments. The ability to see the status of inbound shipments is known as “asset visibility.”

Hailing RFID as a “key enabler for the asset visibility support down to the last tactical mile that is needed by our warfighters,” Mr. Wynne set out RFID implementation timelines and business rules for contractors and DoD personnel to follow when shipping items to, from, and between DoD supply activities (2004b, 1-3).

To gain insight into the current status of the DPO and DLE initiatives, one must consider a briefing entitled “Joint Logistics Governance,” presented to the Joint Logistics Board on 15 March 2005. This briefing showed how the roles and responsibilities of the

boards and councils developed to integrate the global supply chain had expanded over time to form a confusing and overlapping web, with no one board able to speak authoritatively on behalf of the “Logistics Community.” The presentation identified other problems with the DLE and DPO governing structures: several boards tapped the same people, with three-star officers particularly taxed in the meeting process; many of the DLE and DPO boards had neither a clear mission nor a written mandate; and personnel participating in these boards felt that, “Authority, purpose & relationships (were) not clear” (Joint Logistics Board 2005, slide 3).

To solve these problems, the Joint Logistics Board (JLB) proposed to review the senior-most boards and cut out or merge those that were excessive. The JLB also proposed to elevate itself as the single voice for the logistics transformation effort, changing its name in the process to the “Board of Directors.” The JLB proposed a new, more junior advisory structure to screen distribution issues prior to consideration by the Board of Directors. This new structure would be known as the Joint Logistics Group (Joint Logistics Board 2005, slide 5). The JLB recommended other streamlining changes or mergers between existing boards in many different functional areas, and placed the Joint Logistics Group as the sole recipient and reviewer of the collective effort. The intended effect was to have the Joint Logistics Group filter and refine issues before they reached the civilians and three star officers sitting on the JLB (Joint Logistics Board 2005, slide 22).

Supply Chain Management Literature

Supply Chain Management (SCM) is a successful civilian business practice with great relevance to military logistics transformation. There are literally hundreds of books related to the SCM discipline in print, but few that focus exclusively on the strategic organizational structures required in a company to facilitate SCM. Most authors key on the “tactical” applications of SCM: setting and maintaining relationships between suppliers and retailers, the quantitative analysis involved in measuring and evaluating supply chain segments and automated information technology required to implement advancements in SCM.

Ram Ganeshan, Eric Jack, M. J. Magazine and Paul Stephens provided a documented summation of the leading SCM literature in a chapter from the book *Quantitative Models for Supply Chain Management*, entitled “A Taxonomic Review of Supply Chain Management Research.” In addition to chronicling the evolution of SCM over the preceding fifty years, the authors summarized what leading SCM authors said about company structures and the “scope of responsibility” for supply chain managers (Ganeshan et al.1999, 3-4).

According to Ganeshan, companies adopted an organizational structure that reflected the priority and importance of the supply chain within that company. The authors implied that as a company increased the importance of its supply chain, it also increased the level of responsibility for those assigned to manage it. The authors identified two basic schools of thought with regard to corporate management of the supply chain. The first was management by one empowered individual or “dominant member.” The second was management by “a system of partnerships requiring well-

developed cooperation and coordination.” In both cases, the authors stressed that what distinguished SCM from other management disciplines was its strategic nature: “SCM reaches out beyond the boundaries of cost containment and links operating decisions to strategic considerations within and beyond the company . . . these issues are now part of the responsibilities of upper management” (Ganeshan et al. 1999, 4).

The strategic importance of SCM was apparent in other literature as well. In *Strategic Supply Chain Management: The Five Disciplines for Top Performance*, Shoshanah Cohen and Joseph Roussel discussed what they saw as a requirement for a company to shape its organization into a closely integrated group centered on the supply chain processes it managed. They recommended four precepts for leaders to follow when establishing an integrated SCM organization: Leaders should design their organization around the processes it will execute; There should be one person clearly responsible for the supply chain; Identify, develop and maintain the firm’s fundamental competencies; and develop the organization based upon the expertise required, not the expertise that is currently present (Cohen and Roussel 2005, 111).

In terms of leadership, Cohen and Roussel were adherents of Ganeshan’s “dominant member” approach. They wrote, “It is critical to have a strong leader in charge of the overall supply chain and ultimately accountable for its success. Ideally, a senior-level manager on the executive team, this person mediates between functions and maintains an overall vision of the end-to-end process” (Cohen and Roussel 2005, 114). They were strong advocates of the SCOR model, and cited the model’s five processes as critical to achieving integration within an organization. Although they stated that massive reorganizations were not always necessary, the authors did note that in order to achieve

true integration, companies implementing the SCOR processes within the context of their four precepts would likely require a significant shift in organizational structure (Cohen and Roussel 2005, 101-2).

Edward Frazelle recommended that company leaders follow a five-step approach when determining how to structure their logistics organizations in his book, *Supply Chain Strategy: The Logistics of Supply Chain Management*. The first step was to create a Logistics Council with representatives from the various functional organizations involved in the company's supply chain. Frazelle recommended that this council serve as a central planning body for supply chain integration. The second step was to map the supply processes and determine effective metrics for measuring the company's logistics performance. The third step was to train employees on the newly integrated processes. The fourth step was to tie employees' salaries and bonuses to performance under the organization's new metrics. The fifth and final step was to align the corporation with its logistics processes according to one of eight models he had observed throughout his career as a supply management consultant (Frazelle 2002, 320).

Frazelle's eight models ranged from the traditional method of isolated processes organized along functional lines to various degrees of cross-functional integration. Frazelle advocated the "Integrated Logistics Organizational Model" above the others but added that a company's choice of model must be based on its values, type, nature and competencies (2002, 322-329).

Frazelle, like Cohen and Roussel, advised that one senior executive should have responsibility for an organization's supply chain. The integrated model that Frazelle recommended established a full-time "Chief Logistics Officer" (CLO) to oversee and be

accountable for the company's supply chain. The CLO would be in charge of four critical benchmarks: the logistics bottom line, customer demand satisfaction, "logistics cycle time," and output efficiency. Frazelle recommended that the company establish four divisions under the CLO to handle customer relationships, inventory, distribution and planning. Each division would be cross-functional and report to the CLO in terms of the four benchmarks (Frazelle 2002, 325).

Frazelle wrote that the Integrated Model had been successful for two reasons. First, it lined up a company's organizational structure with measurable standards of performance. Secondly, Frazelle believed that it was the best model at harmonizing the disparate skills and individual personalities inherent in a company's pursuit to achieve efficiency in cross-functional processes (2002, 325-6).

Michael Hugos also recommended that companies empower one individual to be responsible for the supply chain. In his book *Essentials of Supply Chain Management*, Hugos identified six tenets leaders should follow when designing an SCM program. The first tenet dealt with leadership and the organization. He stated that a company should identify one "full-time leader" to be accountable for the SCM project. In that person, the company should vest "the appropriate authority" to see the project through to completion.

Of committees, Hugos wrote:

It is good to have a steering committee or management oversight group in place that the project leader reports to, but a committee cannot make decisions in a timely manner. If there is no one person in this role, then the project progress and cost will reflect that. Progress will be slow or nonexistent and costs will be high. (Hugos 2003, 208)

The SCM literature suggested that there was a strong preference among the authors to integrate a company's supply chain across functional boundaries, and to assign

one individual -- a full-time “dominant member,” -- to direct the transformation. Furthermore, this individual must have sufficient authority to implement strategic decisions that affect the entire organization. The SCM literature did not denigrate the role of committees. In fact, the literature suggested that committees play an important role in the integration of a company’s supply chain; however the assignment of a committee to lead the organizational change was not preferred.

Business Management Literature

The “dominant member” theme identified by Ganeshan and others (1999, 3), was also evident in literature describing organizational change. Peter F. Drucker referred to the dominant member as “Master” (1999, 13). Denis R. Towill called these individuals “Predators” (1997, 37). In Six Sigma literature, this person was known as a “Champion” (Barney 2002, 15). John P. Kotter, author of the aforementioned *Leading Change* simply referred to them as “Leadership” (1996, 25).

Whatever the name, business leadership literature suggested that people responsible for implementing change in an organization must come from within the senior executive core of a company. Further, this person must have the ability to make strategic decisions regarding change, and the authority to make these changes “stick,” that is, make them permanent (Kotter 1996, 22).

In the military forces of the United States, the name for people responsible for directing an organization is “Commander.” In United States Joint doctrine, the notion of a dominant member is known as “Unity of Command” and is thus described:

Unity of command means all forces operate under a single commander with the requisite authority to direct all forces employed in pursuit of a common purpose. It

is the foundation for trust, coordination, and teamwork necessary for unified action and requires clear delineation of responsibility among commanders up, down, and laterally (Joint Chiefs of Staff 2001a, III-1).

While the duties and responsibilities of business executives and military commanders with regard to directing organizational change may not be exactly congruent, the literature in the fields of leadership and organizational change suggested that these two groups of people had much in common, not the least of which was the nature of strong, individual leadership within an organization.

CHAPTER 3

RESEARCH METHODOLOGY

The primary research question of this paper was: What strategic organizational structures should exist within the Department of Defense to facilitate further integration of the defense supply chain?

The methodology used in answering this question involved six steps:

1. Status of DLGSCMS. Examine the current state of the Defense Logistics and Global Supply Chain Management System initiative (DLGSCMS)
2. Identify Paradigms. Identify and research three different supply chain paradigms. The paradigms identified were Academic, Military, and Corporate.
3. Develop a Research Model. Develop a model by which to analyze each paradigm. Critical strategic organizational elements, as identified by reviewing literature and through case study interviews, became the model's criteria.
4. Analyze Paradigms. Analyze each paradigm according to the research model's criteria.
5. Analyze the Completed Model. Analyze the completed research model to determine the fundamental requirements in designing strategic organizational structures to integrate and oversee a supply chain.
6. Make a Recommendation. Make recommendations for the design of strategic organizational structures required to govern an integrated defense supply chain under the DLGSCMS initiative. Base these recommendations on analysis of successful supply

chain paradigms and comparison of these paradigms to the governance structures DoD is currently using.

The synopsis of DoD supply chain literature in Chapter 2 accomplished the first step of the methodology by describing the current status of the DoD supply chain initiatives. This answered the secondary research question: What were the existing or proposed governance structures for integrating the defense supply chain?

The remaining secondary research questions necessitated the identification of a set of paradigms to evaluate. Because corporations had originally developed the concept of supply chains, it logically followed to consider literature and case studies from the corporate sector in this thesis. From the corporate sector came two paradigms, one involving academic advice (Academic) and the other involving corporate practice (Corporate).

As noted in the introduction, the RAND-Arroyo Center had recommended supply chain practices specifically configured for military application to the US Army as part of the VM program. The Army's implementation of VM represented a third paradigm (Military) for consideration in this thesis.

Thus, the three paradigms identified were Academic, Military, and Corporate.

In order to develop these paradigms, the author researched the following secondary research questions:

1. What elements of strategic organizational design did academic business experts consider critical for leaders desiring an integrated supply chain?
2. How did US Army leaders structure their organization at the strategic level to facilitate VM?

3. How did successful corporate leaders structure their organizations at the strategic level to achieve supply chain integration?

Academic Paradigm

The views of four authors represented the academic paradigm. These authors and their works were: Shoshanah Cohen and Joseph Roussel, *Strategic Supply Chain Management: The Five Disciplines for Top Performance*; Edward Frazelle, *Supply Chain Strategy: The Logistics of Supply Chain Management*; and Michael Hugos, *Essentials of Supply Chain Management*. The most significant criterion for selecting these authors and their works was the authors' treatment of strategic considerations in their work. While there were many SCM publications available for review, only a few addressed strategic organizational requirements. None addressed the topic exclusively.

Another consideration in the selection of Academic paradigm literature was the type of publication. There were several types of SCM literature available for review, including textbooks and courseware for collegiate SCM programs and informational books at the novice, intermediate, and expert skill levels. The works selected were informational books at the novice and intermediate levels that approached SCM from the aspect of how to create a supply chain, as opposed to how to improve an existing supply chain.

Military Paradigm

The primary source of data for the military paradigm was the RAND-Arroyo Center Publication entitled *Velocity Management: The Business Paradigm That Has*

Transformed U.S. Army Logistics by John Dumond, Marygail Brauner, Rick Eden, John R. Folkeson, Kenneth J. Girardini, Donna Keyser, Ellen M. Pint, and Mark Wang.

During the course of research for this thesis, a number of RAND documents were reviewed; however, the source selected was one devoted exclusively to summarizing the various VM initiatives.

In addition to summarizing VM, the selected source contained a semidetained narrative of how and why the Army established its strategic governance structures, and the roles and responsibilities of each.

Corporate Paradigm

A case study of one corporation operating in the heavy equipment manufacturing and vehicle manufacturing sectors served as the primary source of qualitative data for the corporate paradigm. The corporation selected for case study analysis was Deere & Company (John Deere) of Moline, Illinois. This corporation was selected without consideration for existing systems, models or organizations within the corporation. The primary consideration in the selection of Deere & Company was the author's access to a logistics director within the corporation.

To accomplish the case study, the author conducted a multi-part interview with the Director of Supply Management for Deere & Company's Worldwide Parts Services division. Research also involved review of the corporation's annual reports for the year 2004, as required by the Securities and Exchange Commission. The questions developed for the interviews mirrored the criteria, with additional questions asked to clarify corporate information provided in the company's annual report (see Appendix A).

In order to evaluate the different supply chain paradigms against criteria that would facilitate future analysis, this paper developed a research model entitled “Strategic Supply Chain Organization” (SSCO) Model. The criteria selected for comparison within the model represented the views of leaders or academic experts from the supply chain field with regard to the roles of the fundamental organizational elements that may or may not be required to integrate an enterprise-wide supply chain.

These criteria stemmed from the following tertiary research questions:

1. What were the roles and relationships of senior executives and steering committees within organizations that had integrated supply chains?
2. What level of integration was desired for commercial and military supply chains?
3. How much change resulted in organizations that attempted to integrate their supply chain?
4. What model, if any, did organizational leaders use to guide them in their approaches to integration?

Based on the information gathered, six criteria were developed. To be a valid criterion and qualify for analysis within the research model, the qualities had to appear in each of the three paradigms. This commonality enabled qualitative comparisons and analyses between the paradigms.

The criteria included in the model were:

1. “Role of Executive” (C1)
2. “Executive Involvement” (C2)
3. “Role of Committee” (C3)

4. “Degree of Integration” (C4)

5. “Use of SCM Model” (C5)

6. “Degree of Change” (C6)

C1 represented the level of authority an organization had vested in the executive responsible for integrating that organization’s supply chain. Possible evaluations included “High Authority,” “Medium Authority,” “Low Authority,” and “None.” The level of authority was based upon the separation between the overall head of the organization and the executive responsible for the supply chain. If the supply chain executive reported directly to the head of the organization, C1 was “High Authority.” If the supply chain executive was twice removed from the head of the organization, C1 was “Medium Authority.” If the supply chain executive was more than two levels below the head of the organization, C1 was “Low Authority.” If there was no person assigned to lead the organization’s supply chain or the organization assigned a committee to perform this function, C1 was “None.”

C2 represented the level of commitment that the organization should or did assign to the supply chain executive. There were three possible evaluations for C2: “Full-Time,” “Part-Time,” and “None.” If integration of the organization’s supply chain was the primary duty of the person assigned, the evaluation was “Full-Time.” If supply chain supervision was a secondary or additional duty, the evaluation was “Part-Time.” If there was no person in charge of SCM or a committee was in charge, C2 was “None.”

C3 reflected the roles assigned to committees and teams in support of supply chain integration. Possible evaluations were “Planning,” “Decision-Making,” “Supervisory,” “Advisory,” “Execution,” or “None.” “Planning” described a situation

where a committee or team existed to recommend changes to the supply chain executive based on the functional experience of the committee members. “Decision-Making” reflected the committee’s responsibilities to direct supply chain integration in lieu of a supply chain executive. “Supervisory” was an indicator that the committee should exercise oversight over the process leader, similar to a board of directors. “Advisory” meant that the committee served to provide advice to the decision-maker and to validate proposals. “Execution” meant that a supply chain executive formulated the plans, and the committee existed to supervise implementation of the plan. “None” indicated that no committee existed at the strategic level to perform a role in SCM.

C4 was the level of integration desired by the organization. If the organization desired a complete integration, C4 was “High.” If the organization desired a mix of functional and integrated processes, C4 was “Medium.” If the organization preferred more functional processes than integrated processes, C4 was “Low.” If the organization desired no integration, C4 was “None.”

C5 indicated the SCM business model, if any, after which the organization patterned its supply chain. No evaluation of this criterion was necessary, as it existed to signal trends in model preference, if any, within the paradigm. Leading models included the Supply Chain Council’s Supply Chain Operations Reference Model (SCOR), the Toyota Production System and Motorola’s Six Sigma quality model. If the organization used an SCM business model, C5 was the name of the model selected. If the organization chose to develop its own model, C5 was the local name it gave to the internal model.

C6 represented the amount of restructuring required for the organization to achieve an integrated supply chain. If the organization required a massive restructuring,

including the assignment of new core processes, C6 was “High.” If the organization maintained its core processes but required significant restructuring, C6 was “Medium.” If the organization maintained its core processes and required little or no restructuring, C6 was “Low.”

The analysis of the paradigms closely followed the framework of the research model and used the criteria to draw out the key points of each paradigm. Once each of the criteria was addressed, the author presented a table summarizing the results of the analysis. Once all three paradigms were analyzed, the author presented another table that placed the three paradigms side-by-side to facilitate comparison (see table 2).

Table 2. Strategic Supply Chain Organization Model

Criteria	Paradigm				
	Academic			Military	Corporate
	Hugos	Cohen and Roussel	Frazelle	US Army	Deere & Company
C1 ^a					
C2 ^b					
C3 ^c					
C4 ^d					
C5 ^e					
C6 ^f					

^a “Role of Executive” Range of possible evaluations: High Authority, Medium Authority, Low Authority, or None.

^b “Executive Involvement” Range of possible evaluations: Full-Time, Part-Time, or None.

^c “Role of Committee” Range of possible evaluations: Planning, Decision-Making, Supervisory, Advisory, Execution, or None.

^d “Degree of Integration” Range of possible evaluations: High, Medium, Low, or None.

^e “Use of SCM Model” Data depends on SCM Model selected by the data source. If no SCM model was used, “None” was entered. If the source developed a model internally its local name was entered.

^f “Degree of Change” Range of possible evaluations: High, Medium, or Low.

CHAPTER 4

ANALYSIS

This chapter analyzes the three paradigms: Academic, Military and Corporate across the six criteria identified in the Strategic Supply Chain Organization (SSCO) research model.

Three works represented the academic paradigm: *Strategic Supply Chain Management: The Five Disciplines for Top Performance* by Shoshanah Cohen and Joseph Roussel; *Supply Chain Strategy: The Logistics of Supply Chain Management* by Edward Frazelle; and *Essentials of Supply Chain Management* by Michael Hugos.

The primary source of qualitative data for the military paradigm was the RAND-Arroyo Center Publication entitled *Velocity Management: The Business Paradigm That Has Transformed U.S. Army Logistics*, by John Dumond, Marygail Brauner, Rick Eden, John R. Folkeson, Kenneth J. Girardini, Donna Keyser, Ellen M. Pint, and Mark Wang.

A case study of one corporation operating in the heavy equipment manufacturing and vehicle manufacturing sectors served as the primary source of data for the corporate paradigm. The corporation selected was: Deere & Company of Moline, Illinois.

In chapter 3, the author developed a research model to compare the academic, military, and corporate paradigms in the context of six criteria developed from answers to the tertiary research questions. These criteria represented what experts and enterprise leaders viewed as the critical elements of strategic organizational design for supply chain integration.

Academic Paradigm

There was a consensus within the academic paradigm regarding the role of a supply chain executive in an organization. All authors agreed that one individual at the executive level should be responsible for the supply chain within an organization. Of the three works reviewed, two strongly advocated that this executive should work supply chain issues on a full-time basis, while a third work implied that a full-time executive was necessary.

Frazelle recommended a full-time senior executive to oversee and be accountable for the company's supply chain in *Supply Chain Strategy: The Logistics of Supply Chain Management*. He described several different organizational models from which corporate leaders could choose. Frazelle did not recommend any of the models that were not integrated; however he listed them in an attempt to present all supply chain organizational options as he knew them. For each of the integrated organizational models Frazelle presented, he placed a single person in charge with titles such as "Chief Logistics Officer," "Global Logistics Officer," or "Chief of Operations." Whatever the title, Frazelle advocated one person in charge on a full-time basis (2002, 325-9).

In *Essentials of Supply Chain Management*, Hugos stated that a company should identify one "full-time leader" to be accountable for the SCM project. In that person, the company should vest "the appropriate authority" to see the project through to completion (Hugos 2003, 208).

Hugos felt strongly about the nature and role of a senior executive in supply chain integration because through his supply chain experiences, he observed "if there is no one

person in this role (full-time leader), then the project progress and cost will reflect that. Progress will be slow or nonexistent and costs will be high” (2003, 208).

In *Strategic Supply Chain Management: The Five Disciplines for Top Performance*, Cohen and Roussel wrote, “It is critical to have a strong leader in charge of the overall supply chain and ultimately accountable for its success. Ideally, a senior-level manager on the executive team, this person mediates between functions and maintains an overall vision of the end-to-end process” (Cohen and Roussel 2005, 114).

Cohen and Roussel were more descriptive than their counterparts in the academic paradigm in justifying their advice to vest authority in one senior executive. They wrote that because SCM was completely driven by metrics, functional team members within an organization were prone to developing reports which highlighted their successes at the expense of others within the organization. The authors felt that objective leaders were best suited to guard an organization from this type of sniping by focusing the organization’s efforts on the supply chain processes instead of the functions serving the processes (Cohen and Roussel 2005, 115).

There was a consensus within the academic paradigm to assign one senior executive the highest degree of authority for integrating an organization’s supply chain. As a result of this consensus, Criteria C1 was rated as “High Authority” for each author represented in the academic paradigm.

For criterion C2, Cohen and Roussel were not specific in advocating full-time employment for the person in charge of the supply chain. The way in which the authors emphasized strong executive involvement in forming the supply chain vision and resolving day-to-day conflicts suggested that the executive’s involvement should be full-

time. The other authors were specific in their advocacy of a full-time senior executive in charge of the supply chain. Therefore, criterion C2 was rated as “Full-Time” for each author in the academic paradigm.

The authors were not in similar agreement regarding the role of committees (C3). Cohen and Roussel made no mention of committees. Instead, the two authors emphasized top-down planning, with executives charting the course the supply chain enterprise would follow. Frazelle and Hugos, on the other hand, both saw a need for committees in an integrated supply chain.

Frazelle advocated the creation of a Logistics Council with representatives from the various functional organizations involved in the company’s supply chain. He also recommended that Logistics Council serve as a central planning body for supply chain integration, acting on recommendations from representatives within the company—in effect, creating a “bottoms-up” approach to planning (Frazelle 2002, 320).

Hugos wrote of a “steering committee or management oversight group,” to which the supply chain leader reported; however, he stressed that this committee should not be a decision-making body. Hugos felt that individuals made decisions faster than committees, and that the effectiveness of committees was limited when chartered with a decision-making role. The nature of planning in the organization, as Hugos implied in his advice, should be top-down (2003, 211-2).

The wide disparity in opinion among the authors selected for the academic paradigm with regard to the roles of committees may have stemmed in part from the audiences the authors intended to address. Frazelle wrote at the macro level, addressing large corporations. Due to the size and complexity of these organizations, it was

reasonable for him to expect that leaders would want more input in the planning process. In general, as corporations became larger, its executives became increasingly removed from day-to-day operations. Planning committees that reported to the organization's decision-makers closed this gap, but sacrificed fast decisions in the process.

Hugos spoke in terms of supply chain "projects," with the implication of either lower-level processes as part of a larger supply chain or smaller, more intimate corporations (2003, 212). Hugos may have written this because of the notion that smaller companies and lower-level supply chain processes limit complexity and tend to have flatter organizational structures. It is reasonable to expect that these smaller organizations or processes afford more control to those in charge, with the result being a supply chain executive closer to the day-to-day activities of the organization and having less need for representative committees.

Cohen and Roussel aimed their book at middle-sized to large corporations, effectively striking a balance between Frazelle and Hugos. One reason why Cohen and Roussel left committees out of their recommendations might be in the authors' advice to follow the SCOR model. By adopting a proven model such as SCOR, executives can more easily determine planning requirements and lessen the need for a more participative approach. Although this is only an analysis of the authors' intent, their adherence to the SCOR model and their descriptions of the application of SCOR were evident throughout their work.

Thus, in evaluating the role of committees (C3) in the academic paradigm, the authors were split. Hugos advocated a supervisory role for committees to monitor the

progress of supply chain projects. Frazelle saw a planning role for committees. Cohen and Roussel did not mention committees in any capacity.

Authors within the academic paradigm were not in agreement on criterion C4 or “Degree of Integration.” Each of the authors wrote that integration of an enterprise’s supply chain was necessary for the organization to realize its full operational potential; however, there were significant differences among the authors in this criterion with regard to the types and degree of integration required.

By far, Cohen and Roussel were the strongest proponents for a highly integrated supply chain. This was most likely due to the authors’ advocacy of the SCOR model, which touted integration as a key to supply chain success.

Frazelle was more objective in his advocacy of supply chain integration. He presented a number of different options, ranging from the traditional functional model to one of total integration. Frazelle wrote that company leaders had to decide what was right for their organizations, but that ultimately, competition and technology would compel these companies to embrace integration in their organizational designs.

Frazelle wrote of the importance of cross-functional metrics as an impetus for enterprise integration, and asserted that functional metrics were inadequate for accurately portraying an organization’s logistics performance. These types of measurements were misleading because they presented data only in the context of the function by itself. If all functional indicators showed improvement, yet total logistics costs rose, or customer satisfaction fell, how could executives know what to correct?

To solve this problem, Frazelle advocated the use of four critical cross-functional metrics as a means for measuring performance: Total logistics cost, perfect order percentage, total logistics cycle time and logistics productivity (2002, 323).

Perfect order percentage is particularly illustrative of the cross-functional nature of these metrics. It measures the rate at which the enterprise delivers the correct product to the correct place at the correct time. In terms of cross-functionality, this metric considers the ordering process and whether the sales team collects the right data from the customer (shipping address, price quote, etc.). It measures the distribution processes by determining if the item shipped matched the one ordered; that the correct mode of transportation was selected, and that the product arrived within the timeframe requested and undamaged. Perfect order percentage provides an integrated view of a process, instead of measuring the individual functions within the process (Vitasek 2005, 75). A logical outgrowth of this metric is a reasonable company goal to improve in this key metric.

To achieve goals set for integrated metrics such as perfect order percentage, Frazelle stated that an integrated organization aligned with its core processes was necessary, and that when “the organizational structure (was) at odds with the metrics that (were) in use, the total organizational performance (would) suffer” (2002, 325-6).

Hugos did not write in great detail about integration within a company’s supply chain. He did address integration from an outsourcing perspective, writing that a company should focus on its core processes and contract non-core processes to organizations external to the company. One possible reason for this lack of emphasis was that he intended his book as an overview of the fundamental principles of SCM. As such,

a comprehensive discussion about supply chain integration was beyond the book's limited scope. Another reason was his apparent target audience of small business leaders. Moving to a cross-functional footing in a smaller business could stretch human resources to the point where employees lost sight of the company's core competencies. In these cases, it would be more beneficial for smaller enterprises to outsource functions in what Hugos termed "virtual integration" (2005, 21).

For criterion C4, Cohen and Roussel advocated a "High" degree of supply chain integration in accordance with the SCOR model. Frazelle wrote that in his experience as a supply chain consultant, the most successful companies had supply chains with a high degree of integration owing to their use of cross-functional metrics for total logistics performance. He advocated a "High" degree of integration. Possibly due to a target audience of small business managers, Hugos did not advocate cross-functional integration. He advised his readers to use caution when considering cross-functional integration, and recommended outsourcing as an alternative. For these reasons, Hugos was evaluated "Low" for criterion C4.

Within the academic paradigm there was no consensus on the use of a SCM model among the authors selected. There was a consensus in the academic paradigm that a SCM model of some kind was a critical necessity. Frazelle captured this sentiment when he wrote:

Because logistics is fraught with interdependencies between its activities (customer response, inventory planning, supply, transportation, and warehousing) and the activities it impacts in other areas of the corporation (sales and marketing, regulatory compliance, human resources, research and development, and finance), if there is no formal methodology for planning, the planning process typically implodes, frustrates the planning team, and/or winds up with the most forceful

member of the team driving the plan toward his/her objectives. (Frazelle 2002, 332)

Frazelle recommended to his clients a model that his company developed called the Logistics Master Planning (LMP) methodology. LMP was an iterative three phase cycle built upon a system of comparisons to “world-class” logistics standards. At the heart of LMP were logistics processes as opposed to functions. Surrounding these processes were metrics, organizational design and computer technology. LMP sought to examine processes that spanned logistical functions, compare measurements of these processes to world-class standards, devise a strategy to meet or beat the world-class standards, implement the strategy, and then monitor progress (Frazelle 2002, 332-3).

Hugos, Cohen, and Roussel were strong advocates of the Supply Chain Operations Reference (SCOR) model. Hugos devoted two full chapters of his book to explaining SCOR. Similarly, Cohen and Roussel wrote in great detail about SCOR. In many instances throughout their book, Cohen and Roussel couched their advice in terms of the SCOR model and its five core processes: Plan, Make, Source, Deliver, and Return.

Cohen and Roussel wrote, the SCOR model “is the most widely accepted supply chain reference model in use.” Unlike Frazelle’s relatively simple and straightforward LMP, SCOR is a complex and comprehensive model that spans four levels of analysis. It proceeds from the five core processes listed above in level 1, to sub processes in level 2, to activities in level 3 and finally to individual tasks in level 4. It involves metrics, performance goals, corporate strategy, and detailed mappings of an enterprise’s entire supply chain across each of the five processes.

One could thus summarize criterion C5, (Use of SCM Model) as Hugos, Cohen, and Roussel advocating SCOR and Frazelle advocating an internally developed model called LMP.

The sixth criterion in the analysis of the academic paradigm was Degree of Change, or C6. The overarching consideration from the academic paradigm regarding the level of change required in strategic organizational structures was the alignment of the organization with its core processes. Two of the three authors believed outright that the functional organizations typical of the 1970s and 1980s were no longer feasible and could not compete with the more efficient integrated organizations.

Frazelle asserted that the commonly-held belief that sub-optimization within the “silos” of a functional enterprise would result in a more efficient organization was simply not true. He stated that “...customer/shareholder value is only really enhanced when the functional, political, and technical silos are shattered and restructured/refocused to target customer, shareholder, and employee satisfaction.” In Frazelle’s opinion, the way to achieve this was through creating an integrated logistics organization (2002, 322-3).

Cohen and Roussel echoed Frazelle when they directly addressed the reader stating “improving end-to-end supply chain performance is extremely difficult in an organization with a functional structure and management responsibilities. This is why any integration of your supply chain processes likely will require major organizational change to align your people, processes, and metrics to support your strategy” (Cohen and Roussel 2005, 111).

Hugos focused his writing on the tactical facets of SCM, and did not specifically address strategic reorganization or change as a means for integrating a company's supply chain. Hugos cannot be evaluated for criterion C6.

Cohen, Roussel, and Frazelle were proponents of organizational change leading to an integrated supply chain. These authors were evaluated as emphasizing a high degree of change at the strategic level to accomplish integration.

In analyzing the academic paradigm, one notices that with the exception of C3, at least two authors share similar views in every criterion. Considering these similarities, research in the academic paradigm strongly suggests that there should be one senior executive within an organization responsible for integrating the supply chain, and that the organization should vest in this person a high level of authority to accomplish this task. Additionally, research strongly suggested that the person in charge of supply chain integration be devoted full-time to the effort (see table 3).

Table 3. Summary of Academic Paradigm Evaluation

Criteria	Hugos	Cohen and Roussel	Frazelle
C1 - Role of Executive	High Authority	High Authority	High Authority
C2 - Executive Involvement	Full-Time	Full-Time	Full-Time
C3 - Role of Committee	Supervisory	Not Addressed	Planning
C4 - Degree of Integration	Low	High	High
C5 - Use of SCM Model	SCOR	SCOR	LMP
C6 - Degree of Change	Not Addressed	High	High

There was no clear preference within the academic paradigm for the role committees played in determining a strategic organizational design to complement supply chain integration. What the model did suggest in this regard was that committees did

have a role in supply chain integration at the strategic level. Within the academic paradigm, given the role of the corporate executive expressed in criterion C1, one could logically assume that the role of any committee would be determined by the preferences of the senior executive in charge of supply chain integration.

In determining the extent of integration for which an organization should strive, the academic paradigm held that a high degree was necessary for the integration effort to be successful. This meant that organizational leaders should align their enterprises with core logistical processes. Additionally, the model suggested that in executing this design, leaders should be prepared for a high degree of change within the organization, especially if the organization was then on a functional footing.

Finally, analysis suggested that in the academic paradigm, the Supply Chain Operations Reference model was the methodology of choice for strategic leaders seeking to integrate their organization's supply chain.

Military Paradigm

In *Velocity Management: The Business Paradigm That Has Transformed U.S. Army Logistics*, the authors John Dumond, Marygail Brauner, Rick Eden, John R. Folkeson, Kenneth J. Girardini, Donna Keyser, Ellen M. Pint, and Mark Wang described the US Army's successful application of supply chain principles to military logistics. The views of Dumond and others in this publication were analyzed for qualitative analysis within this paper's SSCO Model and represented the military paradigm.

In assessing criteria C1 and C2 of this paper's research model, there was no single civilian executive or military equivalent in charge of the Army's VM initiatives.

Therefore, criteria C1 and C2 were both assessed as “None.” This does not imply that the VM initiatives were adrift. In fact, senior leaders at the very top of the Army’s logistics community guided VM implementation; however, not having one person in charge went against the way the Army usually conducted its affairs, and seemed to violate the closely held military principle of “unity of command.”

As Dumond and others explained, it was impossible for the Army to achieve unity of command for VM from start to finish because of the frequent personnel turnover in the Army’s senior ranks and the long-term nature of the VM initiatives. The Army needed a strategic structure that could sustain the VM effort over an extended period of time with many different leaders coming into and leaving positions of authority. They stated that the “...Army’s formation of the Velocity Group helped to solve the problem of how to sustain an initiative that by its nature must outlast the tenure of any given general officer, and even any cohort of general officers” (Dumond et al. 2001, 57).

The Velocity Group was a high-level committee that acted as a board of directors for the implementation of VM. The core members included the Deputy Commander of the Army Materiel Command (AMC), the Commanding General of the United States Army Combined Arms Support Command (CASCOM), and the Deputy Chief of Staff for Logistics (DCSLOG) from the Army Staff. Through its membership, the Velocity Group wielded a considerable amount of authority. As a body, the Velocity Group was empowered to make decisions and direct change across the breadth of the Army’s logistics community at the strategic, operational, and tactical levels. In light of this role, the evaluation of criteria C3 within the military paradigm is “Decision-Making.”

In addressing the degree of integration (criterion C4) required by Velocity Management, Dumond and others asserted that the Army had shifted its focus from one of function to one of process. Indeed, the Army had adopted many of the traits traditionally associated with a process-oriented supply chain organization. Army leaders had developed performance-based metrics such as Customer Wait Time that cut across functional lines and centered on customer satisfaction (Dumond et al. 2001, 17).

Dumond and others contended that the Army had fundamentally changed its view of logistics from that of logistics provider by function (transporter, maintainer, quartermaster) to a “Customer view, by process (including) order fulfillment, repair, inventory management, (and) financial management” (2001, 55). In terms of criterion C4, the Army under VM had integrated its supply chain to a “High” degree.

Under VM, the Army, with RAND’s assistance, developed an iterative three step model for improvement: Define, Measure, Improve (DMI). The DMI model decomposed the Army’s materiel distribution systems into sequential subprocesses (Define), evaluated each subprocess independently (Measure), and implemented changes to the subprocesses to make each faster (Improve). Thus, with regard to criterion C5, the military paradigm had a unique military SCM model: DMI.

Arguably, organizational change is one of the most difficult tasks to accomplish within the military paradigm. There are congressional issues as well as budgetary constraints that limit initiative when military leaders contemplate a change to an organization. The establishment of ad hoc committees and the publication of policies and regulations do not represent changes in structure at the strategic level. In fact, the Army

made no modifications to its strategic structures to facilitate VM. Therefore, the degree of change for the military paradigm is evaluated as “Low.”

Table 4. Summary of Military Paradigm Evaluation

Criteria	US Army
C1 - Role of Executive	None
C2 - Executive Involvement	None
C3 - Role of Committee	Decision-Making
C4 - Degree of Integration	High
C5 - Use of SCM Model	DMI
C6 - Degree of Change	Low

Corporate Paradigm

Analysis of the corporate paradigm was based upon a case study of Deere & Company (Deere). A synopsis of this case study is in Appendix A. Deere is governed by a Board of Directors, the chairman of which is also the Chief Executive Officer (CEO) of the company. The company has a corporate headquarters in Moline, Illinois, and is divided along the lines of its major production lines: Agricultural Equipment, Commercial and Consumer Equipment, Construction and Forestry Equipment, and John Deere Power Systems. The presidents of each of the production divisions report to the CEO along with the Chief Financial Officer (CFO), the General Counsel and the president of John Deere Credit, a financing institution for Deere consumers.

Deere’s supply chain executive is the Vice President (VP) of Worldwide Supply Management, a centralized position at corporate headquarters. He reports to the Chief Financial Officer (CFO) and is two levels removed from the overall head of the corporation. According to the evaluation criteria for this paper’s research model, this

equates to “Medium” for criterion C1 (Role of Executive). Figure 6 included in the Appendix shows the strategic organization at Deere and specifies the positions of key supply chain personnel.

For criterion C2, the involvement of the supply chain executive at Deere is “Full-Time.” The VP of Worldwide Supply Management has two main responsibilities. The first is to supervise the Enterprise Supply Management Group (ESMG), an integrated strategic structure that aligns the corporation’s supply chain with core processes. The second is to monitor the “Directors of Supply Management,” within each production division (Alessandra 2005).

The ESGM is composed of three functional groups and one integrated group. The functional groups are the Enterprise Indirect Materials Group, the Enterprise Supply Management E-Technology Group, and the Worldwide Logistics Group. The cross-functional body under the ESGM is the Enterprise Supply Management Operations Group (Alessandra 2005).

The Enterprise Indirect Materials Group supervises the acquisition of goods and services that facilitate administrative operations such as employee travel, hand tools, durable goods, and other similar goods and services. The E-Technology group manages the software and hardware that make electronic commerce possible between Deere and its suppliers and dealers. The Deere supply chain is almost entirely electronic and the E-Technology group keeps the automation equipment updated and functioning. The Worldwide Logistics Group manages all transportation requirements for the corporation, including movement of finished goods to dealers worldwide, movement of parts and assemblies between factories, and movement of repair parts to dealers (Alessandra 2005).

The cross-functional organization in the ESMG is the Operations Group, which is divided into two sections, Purchasing and Process. The Purchasing section is made up of Enterprise Supply Managers who acquire materiel used across the entire enterprise. Such materials include steel, plastics and resins, bearings, and batteries. The Process section is subdivided into two groups that focus on supply chain activities related to the Order Fulfillment and Product Delivery processes. Under the Process section is a third group called the “Achieving Excellence” Group with the responsibility of supporting the division’s evaluations of the corporation’s worldwide suppliers (Alessandra 2005).

The management of manufacturing at Deere is decentralized, with the individual divisions responsible for the output of their respective products. Each division has one or more Directors of Supply Management who maintain their own supplier relationships and synchronize supplies with production schedules. As such, the directors formally report to Manufacturing VPs within their divisions; however, as noted above, Deere centrally manages enterprise-wide supplies through the ESMG. The splitting of supply responsibilities between the enterprise level and the production divisions requires that the VP of WSM maintain close ties to the Directors of Supply Management on an assortment of issues ranging from tactical, such as major deliveries, to strategic, such as supplier selection. This arrangement requires continuous communication between the directors and the VP of WSM (Alessandra 2005). In short, the role of the VP of WSM as a supply chain executive is a full-time position.

Deere uses a system of teams called “Communities of Practice” to provide feedback and recommendations to the leadership of the production divisions on a wide range of issues, including those related to the supply chain. These teams are cross-

functional, meet biweekly, and can focus exclusively on the division from which they are formed or on common, enterprise-wide processes. They exist at what one might consider the “operational” level and wield a great amount of influence on improving “tactical” performance. The Communities of Practice deal with supply chain issues but only as one of many issues they address. They maintain an informal reporting relationship with the supply chain executive through the ESMG Process section, but they take directions from their division directors as appropriate (Alessandra 2005).

At the strategic level, the VP of Worldwide Supply Management holds a monthly Strategic Sourcing meeting with each division’s Director of Supply Management. These meetings provide an opportunity for division supply chain representatives to discuss suppliers, voice concerns and recommend changes as part of Deere’s commitment to continuous process improvement. This meeting is also a chance for the supply chain leadership to review and revise goals and metrics to optimize performance. There is no formal reporting relationship between the VP of Worldwide Supply Management and the directors of supply management, although the directors do provide courtesy reports to the VP of Worldwide Supply Management on a regular basis. Deere refers to these meeting attendees as the “Strategic Sourcing Group” (Alessandra 2005). For criterion C3, the role of the Strategic Sourcing Committee corresponds to “Planning.”

Regarding integration, Deere has historically been a functional organization dominated by its agricultural equipment division. Over the past two decades, however, Deere has gradually migrated to a more centralized organization with corporate leaders asserting more control over an increasingly diversified operation. The company’s supply chain and its focus on strategic sourcing played an important role in this migration, and

the strategic structures that Deere put into place to facilitate SCM reflect a high degree of integration (Smock 2001).

Indicative of this integration is the Enterprise Supply Management Group. As described above, this strategic organization has an Enterprise Supply Management Operations Group that is aligned with two of Deere's core business processes, Product Delivery and Order Fulfillment. It is also responsible for all transportation within the company. This group also maintains linkages to the Directors of Supply Management within each production division. The purchasing section in this group partners with suppliers around the world. These relationships set the conditions for both Deere and the supplier to benefit. All of this occurs under the supervision of one responsible executive, the VP of Worldwide Supply Management (Alessandra 2005). Relative to criterion C4, the supply management arrangement at Deere represents a "High" degree of integration.

Deere executives completely reengineered their supply chain in 1999. During this transformation, the corporation did not follow an industry model for designing its supply chain. The primary reason why Deere went without a model was because it was a unique manufacturer with no truly comparable counterpart. Another reason was that the executive Deere recruited to make the changes came with over 40 years of supply chain experience. This executive was able to apply his experience to the Deere's unique situation to reengineer the company's supply chain (Smock 2001)

Since the supply chain transformation at Deere occurred, the company has developed an internal model known as the Strategic Sourcing Process (SSP). This coincides with the company's new emphasis on the relationships it maintains with its numerous suppliers. The SSP is an intensive process that requires detailed analysis of

data from internal organizations, as well as from industry benchmarks, competitors, potential suppliers, and customers to determine metrics and selection criteria. It integrates a multifunctional team for the purpose of obtaining a consensus on the strategy developed and the source of supply selected to meet the strategy. It facilitates continuous improvement through the monitoring of established metrics, and requires a high degree of communication, both internal and external to the company (Alessandra 2005).

Deere links the SSP to its core processes through its supply strategy. This strategy is built on the premise of a “Value Chain,” a contemporary business concept that relates business processes to the amount of value each returns to customers, shareholders and employees. At the base of the strategy are guiding principles such as mutually beneficial relationships with suppliers and strategic global sourcing that are described above. At the next higher level are “Fundamental Drivers,” which are basic factors that allow the supply chain to add value to the core processes. The two core processes of “Product Delivery” and “Order Fulfillment” are in the next level up the value chain in the section “Fundamental Process Integration” (see figure 4) (Alessandra 2005).

From the two core processes, the Deere supply chain strategy moves up the value chain to a level that describes quality goals, couched in terms of Six Sigma. The numbers represent “Parts Per Million”--the total quantity of errors that are acceptable for ensuring the highest quality. In the center is a goal to reduce supply chain cycle time by 50 percent. This is in keeping with the corporation’s goal of becoming more of a “build-to-order” manufacturer, a goal made possible through improvements in SCM. In the next higher level are goals for reducing costs and inventory. The final, highest level of the value chain is a corporate goal of realizing a 20 percent Operational Return on

Operational Assets (OROA), thus delivering value to customers in the form of reduced prices, and to shareholders in the form of higher dividends and Shareholder Value Added (SVA), Deere's other largely communicated measurement to Wall Street (Alessandra 2005).

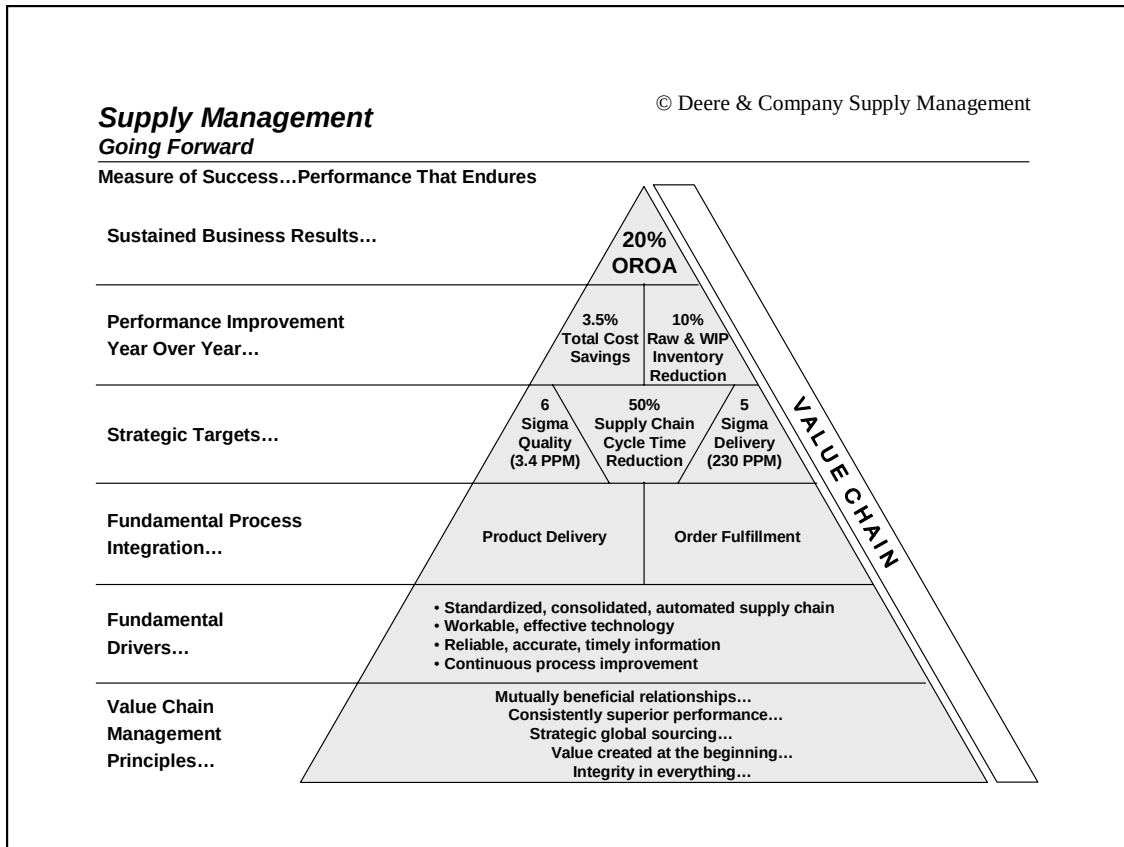


Figure 4. Deere and Company Supply Management Strategy
Source: John Deere Supply Network, *Supply Management: Going Forward*, 2005
Diagram on-line. Available from http://jdsupply.deere.com/about_us/strategy.htm.
Internet.

In summarizing the analysis of Deere with regard to Criterion C5, the company chose to develop its own methodology instead of adopting one when it transformed its

supply chain. The processes and strategy that grew out of this decision have proven to be successful, as Deere had a record year in 2004, increasing its revenues by 29 percent and doubling its profits from 2003. In 2001, Purchasing Magazine awarded Deere & Company its Medal of Professional Excellence for its supply chain. For Criterion C5 (Use of SCM Model), the corporate paradigm was evaluated “Strategic Sourcing.”

Regarding Criterion C6 “Degree of Change,” Deere would require sweeping changes of its organization in order to realize the total integration of its supply chain. Each of the corporation’s production divisions has unique challenges in producing special-use equipment. Its worldwide scope of operations in both manufacturing and marketing introduces foreign influences and preferences for consideration through its employees and global suppliers. At 167 years, it is one of the oldest industrial manufacturing corporations in the United States. As such, it is a highly traditional and conservative organization that strongly identifies with its agricultural machines. Total integration for such a diverse enterprise could have significant drawbacks and limitations upon implementation (Alessandra 2005).

When Deere executives designed the company’s supply chain, they took these factors into account. They deliberately left a large portion of its supply chain decentralized and under the control of the production divisions. Deere’s philosophy for procuring common supplies relies on economies of scale to realize enterprise-wide savings. For items unique to a particular product, the company depended on its production divisions to make sourcing decisions. This was in keeping with the corporate goal of strengthening supplier relationships (Smock, 2001, 1). It also allowed the

production divisions to preserve a degree of individuality that employees felt was important in a company as old as Deere.

Thus, for criterion C6, the degree of change required for total supply chain integration is assessed as “High;” however, this evaluation comes with the caveat that this is the way Deere wants it. The company’s supply chain is already highly integrated at the enterprise level, and to completely integrate it might cause irreparable damage to the company.

Table 5 summarizes the evaluations of the Deere as part of the corporate paradigm.

Table 5. Summary of Corporate Paradigm Evaluation

Criteria	Deere & Company
C1 - Role of Executive	Medium
C2 - Executive Involvement	Full-Time
C3 - Role of Committee	Planning
C4 - Degree of Integration	High
C5 - Use of SCM Model	Strategic Sourcing Model
C6 - Degree of Change	High

As evidenced by the data in the completed Strategic Supply Chain Organization Model (see table 6), there was a wide variety of solutions for organizing an enterprise at the strategic level for supply chain integration. There was no unanimity among the paradigms for the evaluated criteria; however, the research model did suggest that the criteria selected for analyzing the supply chain paradigms were valid, and that from these criteria sprang four fundamental organizational requirements.

Table 6. Completed Strategic Supply Chain Organization Model

Criteria	Paradigm				
	Academic			Military	Corporate
	Hugos	Cohen and Roussel	Frazelle	US Army	Deere & Company
C1 ^a	High Authority	High Authority	High Authority	None	Medium Authority
C2 ^b	Full-Time	Full-Time	Full-Time	None	Full-Time
C3 ^c	Supervisory	Not Addressed	Planning	Decision-Making	Planning
C4 ^d	Low	High	High	High	High
C5 ^e	SCOR	SCOR	LMP	DMI	Strategic Sourcing
C6 ^f	Not Addressed	High	High	Low	High

^a “Role of Executive” Range of possible evaluations: High Authority, Medium Authority, Low Authority, or None.

^b “Executive Involvement” Range of possible evaluations: Full-Time, Part-Time, or None.

^c “Role of Committee” Range of possible evaluations: Planning, Decision-Making, Supervisory, Advisory, Execution, or None.

^d “Degree of Integration” Range of possible evaluations: High, Medium, Low, or None.

^e “Use of SCM Model” Data depends on SCM Model selected by the data source. If no SCM model was used, “None” was entered. If the source developed a model internally its local name was entered.

^f “Degree of Change” Range of possible evaluations: High, Medium, or Low.

The research model strongly suggested that successful supply chains have some form of structure at the strategic level to govern supply chain integration. The academic and corporate paradigms both suggested an individual leader as in criterion C1, while the military paradigm suggested governance by committee in criterion C3. Importantly, research suggested that if the military personnel system allowed its senior military leaders to have longer terms, the military paradigm would likely follow the principle of “unity of command” in governing its supply chain.

Regardless of whether it was an individual like the VP of Worldwide Supply Management at Deere or a committee like the Army’s Velocity Group, the primary purpose of the strategic structure was to provide the organization with one responsible

entity for all matters pertaining to the supply chain. Inherent in this role was the responsibility to set goals and provide vision for the supply chain across the enterprise. Another reason was that because proper integration required the coordination and acquiescence of the enterprise's functional departments, a structure at the strategic level with a high amount of authority was required.

The second requirement strongly suggested by the research was that if an organization opted to place its supply chain under the supervision of one executive, this person should have no other responsibilities beyond those of managing the supply chain. The Deere case study showed that the duties of such an executive could be extensive. Furthermore, it is possible that in assigning supply chain responsibility as an additional duty, the workforce could make the interpretation that the supply chain is not a high enough priority to justify the addition of a full-time executive. This requirement validated criterion C2.

The third requirement for designing an integrated supply chain was the adoption of a proven SCM model. This model could be developed internally, as seen in the military and corporate paradigms, or adapted from models proven in other organizations as seen in the academic paradigm. The research model did not suggest a clear choice of model in this regard; however, SCOR did appear more than the others. This corroborated the collective view of Cohen and Roussel, who wrote that the SCOR model was the most-widely accepted SCM model. It also showed that criterion C5 was a valid consideration for organizational design.

The requirement for an SCM model was suggested because models facilitate planning. It provides the using organization a framework upon which to build and refine

its own unique processes, and guides planners by showing them the essential factors that must be considered. A common feature of each of the models examined was an expectation of continuous improvement. This was not assumed; it was required. The research suggested that companies adopting a SCM model or designing their own should never consider the process complete: Continuous improvements and further adaptations will be required.

The fourth and final requirement for designing a strategic supply chain organization was to integrate logistics functions and align the enterprise according to its core processes. There were variations in the degree of integration across the paradigms, but these were differences of degree, not absolutes. An institutional shift to a more process-oriented and integrated organization was suggested because an integrated approach to SCM has proven to be a quantum leap for improving efficiency and adding value to the organization. Integration breaks down barriers within an organization and causes the enterprise to optimize its core processes instead of sub-optimizing its individual functions. Integrated organizations are more responsive, more adaptable, and better suited to a dynamic environment because they are situated to facilitate instant collaboration across functional areas with fewer and more accountable decision makers.

An integrated organization aligned with its core processes is also in a better position than functional organizations to leverage and respond to cross-functional metrics such as perfect order percentage and customer wait time. The importance of supply chain integration as seen in all three paradigms validated criteria C4 and C6 as the two were closely related.

This chapter analyzed the academic, military, and corporate supply chain paradigms according to six criteria identified in the Strategic Supply Chain Organization Model, a research methodology developed for this thesis. It also proved the validity of the criteria as the analyses suggested four fundamental requirements for organizing an enterprise for supply chain integration. In the final chapter, this thesis takes these fundamental requirements and applies them to the current state of the Defense Logistics and Global Supply Chain Management System to address the primary research question: What strategic organizational structures should exist within DoD to facilitate further integration of the defense supply chain?

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This thesis presented a chronological synopsis of the origins, progression, and current state of the Defense Logistics and Global Supply Chain Management System (DLGSCMS) based on a review of extant literature.

It showed that defense supply chain initiatives began in 1995, when the Department of Defense (DoD) commissioned the Logistics Management Institute to study and recommend ways in which DoD could reduce logistics costs and boost logistics capability (DoD News Release 111-95, 1995, 1).

From this study came the report *Supply Chain Management: A Recommended Performance Measurement Scorecard*, which DoD adopted as its guiding methodology for implementing SCM. This report drove the publication of Department of Defense 4140.1-R, a regulation that committed DoD to a performance-based logistics system based on the Supply Chain Operations Reference (SCOR) model.

DoD literature showed how the Secretary of Defense (SecDef), in his search for a strategic organizational solution to facilitate SCM, turned to the civilian executives composing the Defense Business Board (DBB) for advice. At issue was whether DoD should merge the US Transportation Command and the Defense Logistics Agency to provide this structure or pursue an alternate solution. The DBB, chaired by retired Army Lieutenant General William G. Pagonis, made three recommendations for how the SecDef should structure the department (Pagonis 2003)

These recommendations informed the SecDef's memorandum of September 16, 2003, which designated the Under Secretary of Defense (Acquisition, Technology and Logistics) as the Defense Logistics Executive (DLE), and the Commander of the United States Transportation Command (TRANSCOM) as the Distribution Process Owner (DPO). In this memorandum, the SecDef also directed the creation of the Defense Logistics Board (DLB) to advise the USD (AT&L) in his new duties as the DLE (Rumsfeld 2003, 1).

The literature showed that the DPO, in a draft directive, recommended that the DLE form the Defense Logistics Board on a cross-functional basis with civilian members from the highest offices of DoD and senior military members from the Services and the Joint Staff (Handy 2003, slide 4). The draft directive also established a system of boards and committees within DoD to study aspects of the defense supply chain and make recommendations to the DLE. This document directed sweeping changes to TRANSCOM's organizational structure and established a similar board system to recommend solutions for the DPO. TRANSCOM became the lead agency for planning and implementing distribution policy across DoD, with input from its strategic partners, the Defense Logistics Agency (DLA) and the Joint Staff (US Transportation Command 2003).

As of this writing, the Distribution Transformation Task Force, one of the structures the DPO created at TRANSCOM, was monitoring logistics performance metrics established in DOD 4140.1-R, and providing status reports and data measurements to the numerous committees, teams and boards that convened on a regular basis to plan supply chain integration. TRANSCOM was the most visibly active defense

organization in the supply chain, and had maintained a productive relationship with its strategic partners, DLA and the Joint Staff.

In summary, the Department of Defense was advancing on its goal to integrate the defense supply chain. Secretary Rumsfeld issued a clear mandate to the department to achieve this goal, and he established several strategic structures to govern the effort, including the Defense Logistics Executive, the Defense Logistics Board, and the Distribution Process Owner. DoD had committed to using the Supply Chain Operations Reference model as it patterned its supply chain, and TRANSCOM was leading the effort through its commander's role as the DPO.

In comparing the status of the defense supply chain initiatives to the supply chain paradigm analysis from Chapter 4 of this paper, it is clear that DoD leaders understood the importance of the fundamental principles that this paper's Strategic Supply Chain Organization (SSCO) Model suggested.

Where the SSCO Model suggested in criteria C1 and C3 either an empowered individual or committee to oversee the integration effort, DoD had adopted both. In fact, one could argue that by elevating the DPO to what the research model would evaluate as a "High Authority" level, the SecDef may have vested too much authority at the strategic level and created confusion in the process. The March 2005 briefing by the Joint Logistics Board highlighted these problems and showed that more leadership and guidance were required in the operational layers of the SCM structure.

Some of this confusion may have been unavoidable. Joint doctrine clearly aligns the military chain of command with the combatant commanders who report directly to the SecDef. In this regard, Secretary Rumsfeld would have been required to demote a

unified commander in order to subordinate the DPO to the DLE. Instead, he chose to retain the command relationship between the SecDef and the TRANSCOM Commander and create an additional channel by which the TRANSCOM Commander acting as DPO could report to the DLE on matters pertaining to supply chain integration.

There was no precedent for this type of arrangement in any of the paradigms analyzed; however, the research suggested that it has nonetheless been fruitful. TRANSCOM has contributed to pushing the supply chain initiatives forward through its reorganization to a more process-oriented command and its willingness to partner with other strategic level DoD organizations such as the Joint Staff and the Defense Logistics Agency.

With regard to criterion C2 (Role of Executive), DoD does not compare favorably to the consensus of the research model which was ‘Full-Time.’ Neither the DLE nor the DPO have the defense supply chain as their primary responsibility. The DLE’s primary duty is acquisition (procurement) of DoD materiel. The DPO’s first priority is the administration of the air, land, and sea modes of transportation for DoD personnel and equipment. Secretary Rumsfeld plainly states the level of executive involvement in his memorandum of 16 September 2003: “The Under Secretary of Defense (Acquisition, Technology & Logistics) is designated as the Defense Logistics Executive (DLE) *in addition to his other duties* [emphasis added by author]” (2003, 1).

Thesis research suggested that an enterprise must be prepared to shift from a functional footing to one that is more process-oriented and integrated as explained in criterion C4 (Degree of Integration). DoD leaders have shown that they are willing to implement such a shift, but not to a high degree. TRANSCOM has taken the lead in this

regard. It assumed risk to reengineer its organization to align itself with the distribution process for which it was given responsibility. The risk was made greater by the fact that DoD was immersed in large-scale military operations in Afghanistan and Iraq at the time. From all indicators, this risk has resulted in a more integrated organization without a lapse in support of the Global War on Terror. A similar reengineering effort is required at DoD to align and integrate defense core processes with the SCOR model.

With the selection of the SCOR model as a methodology upon which to design the defense supply chain, DoD leaders validated criterion C5 (Use of SCM Model). The SCOR model is proven and widely accepted as an industry standard. It is a process-oriented, metrics-based approach that compares the current state of logistics management to “best-in-class” benchmarks from like businesses to derive a strategy for improving supply chain performance. It maps out processes and highlights shortcomings therein, thus facilitating enterprise-wide solutions on a continuous basis.

SCOR does not provide a method for designing a strategic organization. It provides a suite of tools that are configurable for specific needs, but success with SCOR depends on the organization’s ability to select the proper tools and align the enterprise with the appropriate SCOR configuration. This is a critical point, because as analysis of criterion C6 (Degree of Change) suggested, an organization must be prepared to change its organizational strategic structures to facilitate supply chain integration. While Secretary Rumsfeld has made some important changes by designating senior executives to be responsible for the supply chain, DoD logistics organizations essentially remain separated functionally at all levels except at the very top of the chain of command.

Recommendations

This thesis concluded that the strategic structures DoD formed to integrate the defense supply chain compared favorably to the conclusions of the research model with regard to criteria C1 (Role of Executive), C3 (Role of Committee), and C5 (Use of SCM Model). It further concluded that there are shortcomings in the current state of the DoD supply chain initiatives with regard to criteria C2 (Executive Involvement), C4 (Degree of Integration), and C6 (Degree of Change). Further changes to DoD's strategic logistics organizations are necessary to address these shortcomings and achieve Secretary Rumsfeld's goal of integrating the defense supply chain.

In order to increase both the level of executive involvement (C2) and the degree of integration (C4) of the defense supply chain, this thesis recommends that the Secretary of Defense align DoD's strategic logistics structures with the core processes and SCOR configuration identified in DOD 4140.1-R.

To facilitate alignment with the SCOR model, this thesis proposes a substantial reorganization of the office of the USD (AT&L) to include the office of the DUSD (L&MR) as well as major changes to the organization of TRANSCOM.

Secretary Rumsfeld should make supply chain integration the full-time responsibility of the USD (AT&L) and shift existing responsibilities for acquisition, research, and development to a new deputy position focused on the Sourcing process. He should focus the DUSD (L&MR) exclusively on the Maintenance process and move responsibility for supervising DLA from the DUSD (L&MR) to the TRANSCOM Commander. Adding DLA to the TRANSCOM organization integrates the components of the Deliver process.

Figure 5 outlines these changes in greater detail and superimposes the recommended structural changes over the SCOR model.

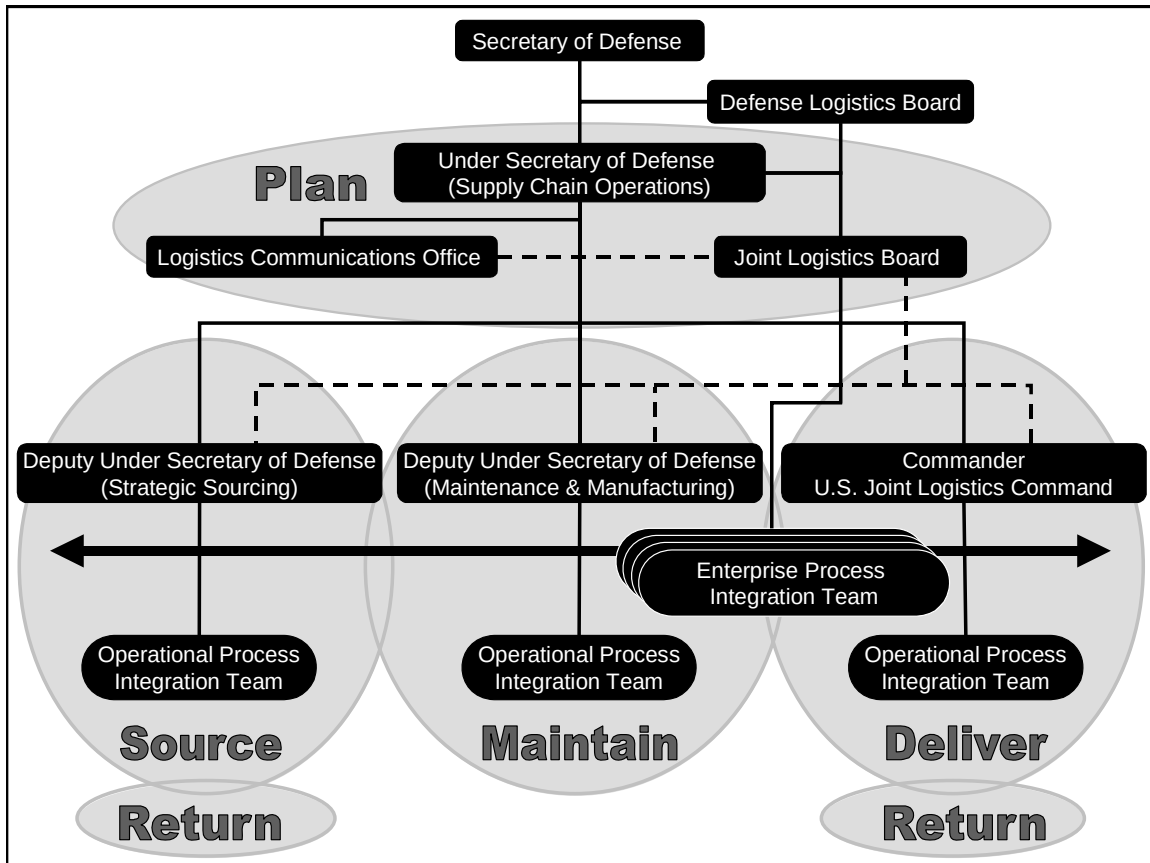


Figure 5. Recommended Structures for the Department of Defense
 Source: (The interlocking circle design and SCOR processes) Supply-Chain Council, *Supply-Chain Operations Reference-model: Overview Version 7.0*. Diagram on-line. Available from <http://www.supply-chain.org/galleries/default-file/SCOR%207.0%20overview.pdf>. Internet.

To complement these structural changes, it is recommended that the Secretary of Defense change the titles of the executives in charge of the reorganized offices to reflect their new roles and missions within the integrated supply chain. Although some might consider changing names trite, the new names coupled with substantive changes send a

clear message to DoD that the defense supply chain is important, and that the department is serious about integrating logistics functions. The Under Secretary of Defense for Acquisition, Technology and Logistics should become the Under Secretary of Defense for Supply Chain Operations. The Deputy Under Secretary of Defense for Logistics and Materiel Readiness should become the Deputy Under Secretary of Defense for Maintenance and Manufacturing. The newly formed position for the sourcing process should be named the Deputy Under Secretary of Defense for Strategic Sourcing. The United States Transportation Command should become the United States Joint Logistics Command.

Currently, the US Senate must confirm the USD (AT&L), the DUSD (L&MR), and the TRANSCOM Commander. Senate confirmation requirements should remain for the changed structures and apply to the newly created Deputy Under Secretary of Defense for Strategic Sourcing.

Merging TRANSCOM and DLA to form the US Joint Logistics Command is arguably the most controversial recommendation this thesis proposes. A TRANSCOM-DLA merger changes what is currently an ad hoc relationship built on strategic partnerships to a permanent structure less prone to upheaval caused by frequent changes in leadership. A Joint Logistics Command fuses supply and transportation by assigning responsibility and high authority for both functions to one commander, and aligns DoD with the SCOR process of Deliver. It follows the conclusions of the research in both the academic and corporate paradigms. The commander of this unified command should report to the Secretary of Defense as a combatant commander and to the Under Secretary of Defense for Supply Chain Operations for issues related to the Deliver process.

Additionally, this thesis proposes a number of structures to further align the defense logistics establishment with the SCOR model.

Secretary Rumsfeld should establish a Logistics Communications Office (LCO), to plan and monitor supply chain integration in accordance with DOD 4140.1-R. The LCO should be responsible for the SCOR Plan process. It closely resembles the VM Implementation Cell established by CASCOT by serving as a nexus of information related to the defense supply chain. It publishes the vision and goals set by the USD (SCO). It tracks performance against supply chain metrics, and updates the balanced scorecard. It receives informal reports from the Enterprise and Operational Process Integration Teams, fields information queries from the supply chain organization and provides doctrinal responses, and drafts policies and regulations regarding the defense supply chain. It provides a permanent staff and administrative support to both the Joint Logistics Board and Defense Logistics Board.

It is recommended that DoD establish a network of Enterprise Process Integration Teams (EPITs). These teams focus on logistics performance with regard to strategic-level (SCOR Level 1) metrics. They validate an assigned group of metrics, evaluate performance against established goals, pinpoint deficiencies, and facilitate continuous improvement. The basis of forming these teams should be flexible, but with no less than one for each core process. EPITs are composed of functional logistics experts from the Services, and seek integrated solutions for core processes. The EPIT leaders report to the Joint Logistics Board, but provide informal reports and feedback to the DLE as well as the LCO.

The forming of EPITs correlates to a number of examples seen in research for this thesis. They mimic the Process Improvement Teams used by the US Army in Velocity Management, and represent a variation of the Distribution Transformation Task Force used by the DPO. Michael Hugos wrote about similar structures in the academic paradigm. EPITs are similar to the “Communities of Practice” seen in the Deere case study, only at the strategic (enterprise) level.

This thesis also recommends that DoD establish a network of Operational Process Integration Teams (OPITs). These teams are identical in composition to the EPITs; however, their mission is different. The OPITs focus on the development and evaluation of SCOR Level 2 metrics and are analogous to Deere’s Communities of Practice. They formally report to an executive in the command or office to which they are assigned, but provide feedback to the Joint Logistics Board and Logistics Communications Office. The basis of allocation for OPITs is one per SCOR process.

Finally, this thesis recommends that DoD retain the Defense Logistics Board, Joint Logistics Board, and Joint Logistics Group as advisory bodies for leaders at various levels of the supply chain. The DLB should continue to serve as an advisory council for the USD (SCO). The JLB should become the principle planning structure for the defense supply chain and the primary recipient of feedback from the EPITs and OPITs. The JLG should become the advisory council for the Commander, Joint Logistics Command.

In summary, these recommendations did not represent a total solution; rather they represented a start point for reengineering the strategic logistics structures within the Department of Defense given the fundamental requirements suggested by the research and analysis conducted in this thesis.

The intent of these recommendations was to answer the primary research question: What strategic organizational structures should exist within the Department of Defense to facilitate further integration of the defense supply chain? The recommendations were unconstrained views based on a wide variety of thought in the academic, corporate and military paradigms.

Recommendations for Further Study

An admitted weakness of this paper is in its having only one case study for the corporate paradigm. One recommendation for further study is to validate the findings of this paper using three or four corporate case studies. As a variation on this recommendation, one might validate the research model used in this paper and its suggestions for the design of strategic structures.

Noticeably absent from the recommendation were the roles of the services, the combatant commanders and the Joint Staff which all arguably have strategic responsibilities. Also absent were important topics such as information technology, budgeting, and legislation. Another recommendation for further study is to examine the impact of changes of this magnitude on logistics within a selected service or on a Joint Task Force.

The formation of a “Joint Logistics Command” has long been a subject of contentious debate within the logistics community. DoD has considered the formation of such a command several times in the past, including the instance in the summer of 2003 as outlined in this paper. Another recommendation for further study is to examine the necessity of a truly integrated logistics command, especially in light of TRANSCOM’s

assignment as Distribution Process Owner and the actions General Handy has taken as the DPO.

Finally, one might study Deere's Strategic Sourcing Process to see if it is applicable to the DoD acquisition process. Certainly, the logistics transformation at Deere holds lessons for DoD, especially with regard to purchasing. R. David Nelson, the man behind Deere's supply chain resurgence, had a great amount of acquisition experience, and one might glean several "best practices" for adoption in DoD from Nelson's work.

APPENDIX A

DEERE AND COMPANY CASE STUDY

John Deere is a Fortune 100 company based in Moline, Illinois. In 2004, the company had revenues of approximately \$20 billion. John Deere's Worldwide Parts Division shipped approximately 20 million lines of repair parts in 2004 to dealerships around the globe.

John Deere manufactures about 30 percent of its repair parts and gets the remainder from contracts. Contracted manufacturers mostly ship finished repair parts in bulk (although sometimes in John Deere prepackaged boxes) to a 3rd party packager (3P). The 3P breaks the bulk items down into unit of issue (UI) packs, places them in John Deere boxes, affixes the correct label identification (bar coded) and ships the packaged parts to one of two John Deere Source Warehouses, either in Milan, Illinois or Indianapolis, Indiana. The Indianapolis site stores the 35,000 most active parts in the John Deere inventory. The Milan site handles all others, focusing mainly on low volume and over-sized items. John Deere periodically shifts lines between Indianapolis and Milan based upon demand and forecasting.

The John Deere Source Warehouse receives the packaged parts and processes them into the automated stock management system. The automated system dynamically assigns a bin location for the item, using available space based upon weight, cube and turnover rate. In general, higher turnover parts are assigned locations on the lower shelves while lower turnover parts go higher up on the shelves. Each primary location also has a reserve location, usually placed on the upper shelves. There are no conveyors. Warehousemen operate powered carts, driving up and down the aisles to hand-pick parts based on computer-plotted trips. Computer-assisted parts picking is also based on weight and cube for an average person to pull in one foray.

The two source warehouses push parts forward to eleven depots, positioned in strategic geographical areas in the United States and Canada for dealer stock orders and depot replenishment. These depots typically carry approximately 80,000 SKUs of stock. John Deere also operates warehouses overseas in a similar fashion, and there is some cross-leveling of stocks between storage sites in the United States and around the world.

To push parts to these depots, John Deere uses a variety of carriers, to include leased tractor-trailers as part of the John Deere Parts Express program, next-day parcel through an overnight company, contracted carriers such as Yellow and Roadway or independent long-haul specialists. Distribution is the responsibility of the Worldwide Logistics Group (WLG), a John Deere division under the Enterprise Supply Management Group based in Moline, Illinois. The WLG handles all transportation contracting for outbound and inbound repair parts, end item shipment from factory to dealer, foreign imports and domestic exports.

The eleven depots push parts to habitually-supported John Deere dealerships using WLG-contracted trucks. Stockage at the John Deere dealerships is limited; however, some is required to accomplish end customer equipment services and common repairs. John Deere provides an incentive to dealers to stock more at the dealerships by

giving a five percent discount on the dealer price plus picking up the cost of shipping for those items ordered on a stock order. For parts needed on an emergency basis (generally by 8:00 AM the next day), the dealer must pay the normal dealer cost plus shipping.

There are two types of supply transactions at John Deere. The most common are routine repair parts replenishments for stocked items, either in the depots or at a dealership. The other transactions are for what John Deere terms “Machine Down” or MD repairs. These are emergency requests for repair parts required to fix a consumer-owned John Deere machine at a dealership. John Deere divides its stock accordingly, placing a percentage of selected items in reserve at each storage site, to be used for MD requests only.

Supply and distribution are separate entities at John Deere, and there are clear lines of demarcation, although each division collaborates closely with the other. John Deere is a diversified company, producing a range of equipment to include agricultural, construction, and commercial/consumer products such as mower, gators, military gators and ATVs. John Deere also has a division for the production of engines for its various product lines. Each of these divisions is responsible for designing and fielding their respective product lines. Once fielded, however, responsibility for supporting the product moves to the Materials Group for repair parts supply and the Enterprise Supply Management Group for distribution. The reason is that supply and distribution is not a core competency for the producing divisions. Another reason is that if each producing division managed its logistics operations independently, the corporation as a whole would incur waste, inefficiency and unacceptable costs. Currently none of the four divisions maintain any stockage aside from that required to manufacture their respective end items.

By centralizing supply and distribution at the corporate level, John Deere has realized savings between 10- and 20 percent in its operating costs. John Deere made this move twenty-five years ago. The move has not been without some drawbacks. Because of the diversity of John Deere’s business, each division has different needs. For example, the needs of those John Deere dealers specializing in forestry operations differ from those supporting Midwestern grain farmers. The idea that one size fits all does not apply in these situations, and John Deere must tailor its centralized operation to some degree to accommodate these differing support requirements. This has resulted in a loss of individuality in the divisions.

Another drawback of centralization is related to John Deere’s international presence. Because John Deere’s supply and distribution operations are centralized in the United States, there has been a tendency to do things around the world “the American way.” This has caused disagreements at times.

Because of the international aspect, John Deere employs distribution representatives around the globe to expedite shipments and troubleshoot supply chain problems. John Deere often uses these representatives when filling orders in locations where John Deere dealers are not located, such as Turkmenistan. In these exceptions, WLG may sometimes rely on the representative to coordinate shipments at their location. In the case of Turkmenistan, a representative in Germany coordinated the shipment.

With regard to in-transit visibility, John Deere dealers in North America have the ability to see stock status. With this visibility, dealers can know what is on hand in the various depots and source warehouses. The dealers also can query a line to see what is on

reserve for potential “Machine Down” requests, what is available for routine replenishment, and what is on backorder. Dealers can also see when their part has been picked at the warehouse, when the part was loaded onto a truck, when the truck left and when it arrived at the supporting depot.

Summary of interview with Alec Alessandra, Director, Supply Management, Worldwide Parts Division, John Deere, 21 DEC 2004

Addendum

Pursuant to further guidance from my advisory committee, I contacted Mr. Alessandra again on 15 MAY 2005 for additional information.

Questions Asked:

How is the supply chain at John Deere structured at the corporate level? Distribution at JD is centralized, and is the responsibility of the Worldwide Logistics Group (WLG), a subordinate organization to the VP of Worldwide Supply Management. The WLG handles all transportation contracting for outbound and inbound repair parts, end item shipment from factory to dealer, foreign imports and domestic exports. Likewise, supply at JD is centralized under the Enterprise Supply Management Group (ESMG). Each of the four main divisions is responsible for stocking the parts necessary for its individual assembly lines. Once the end items are finished and shipped, repair parts become the responsibility of the Worldwide Parts Services.

Who reports to whom? Basically, there are 4 divisions at John Deere: Agricultural Equipment, Commercial & Consumer Equipment, Construction & Forestry Equipment, and John Deere Power Systems. Additionally, John Deere has a Senior Vice President for General Counsel and a Senior Vice President as Chief Financial Officer. The CFO has the broadest span of control with ten separate vice presidents reporting to him, including Worldwide Supply Management and Worldwide Parts Services, both of which play an integral role in the company’s supply chain. The vice presidents reporting to the CFO are largely independent.

See Figure 6 at the end of this appendix.

What are the roles of committees, if any? The Board of Directors is the highest committee and acts as the governing body. The CEO acts as the Chairman of the Board of Directors. The Board offers guidance during its quarterly meetings. JD does have lower boards in a system known as “Communities of Practice.” These are ad hoc committees that are cross-functional, meet bi-weekly, and report to company directors (CoP → Director → Vice President → President/Senior VP → CEO → Board of Directors). Each division participates in various CoPs, and the mission of each is to improve integration across the company.

What is the degree of integration at John Deere? The company equates integration with centralization. Owing to the fact that the company is broadly diversified, John Deere is not entirely integrated. There are areas where JD is quite integrated, such as Parts and Transportation. Other areas, such as Information Technology are not as integrated.

What are John Deere's core processes? How is the company structured to support these processes? JD has four core processes around which the business is built: Customer Acquisition (getting new customers, keeping existing customers); Product Delivery Process (New Product Design); Order Fulfillment Process; and Customer Support. Human Resources and Information Technology are considered "Encompassing Processes" as these two realms serve the core processes. Other functions, called "Spur Processes" serve one or more of the core processes. Examples of Spur Processes include Supply Management and Technological Development.

Is it the corporation's intent to be fully integrated? Yes, but not any more centralized. The intent is to increase cross-functionality in the core processes without consolidating authority at the corporate level, thereby stripping the divisions of individuality. There are some areas that probably should be further centralized to realize economies of scale, but these are related more to specific suppliers than overall functions.

When was the last adjustment made to the enterprise organization? Why? April 2005. There were some retirements, and the company saw an opportunity to save money by spreading these duties among existing executives as opposed to hiring new executives to replace the ones that retired.

What model, if any, does John Deere use for its supply chain? JD doesn't adhere to an industry standard model for supply chain operations. JD has its own seven-step strategic sourcing process and its own production system based loosely on Ohno's *Toyota Production System*.

Is there an overall head of the corporate supply chain? Who is it? Yes. The Vice President for Worldwide Supply Management is the overall head of the John Deere supply chain. He reports to the CFO.

What degree of change would be required for John Deere to fully integrate its SC? To fully integrate JD at once would require a monumental effort and would most likely be very costly. Conceivably, JD could integrate commodity by commodity to lessen the impact of reorganization by spreading the task out over time. A piecemeal approach would not be difficult for the company to accomplish.

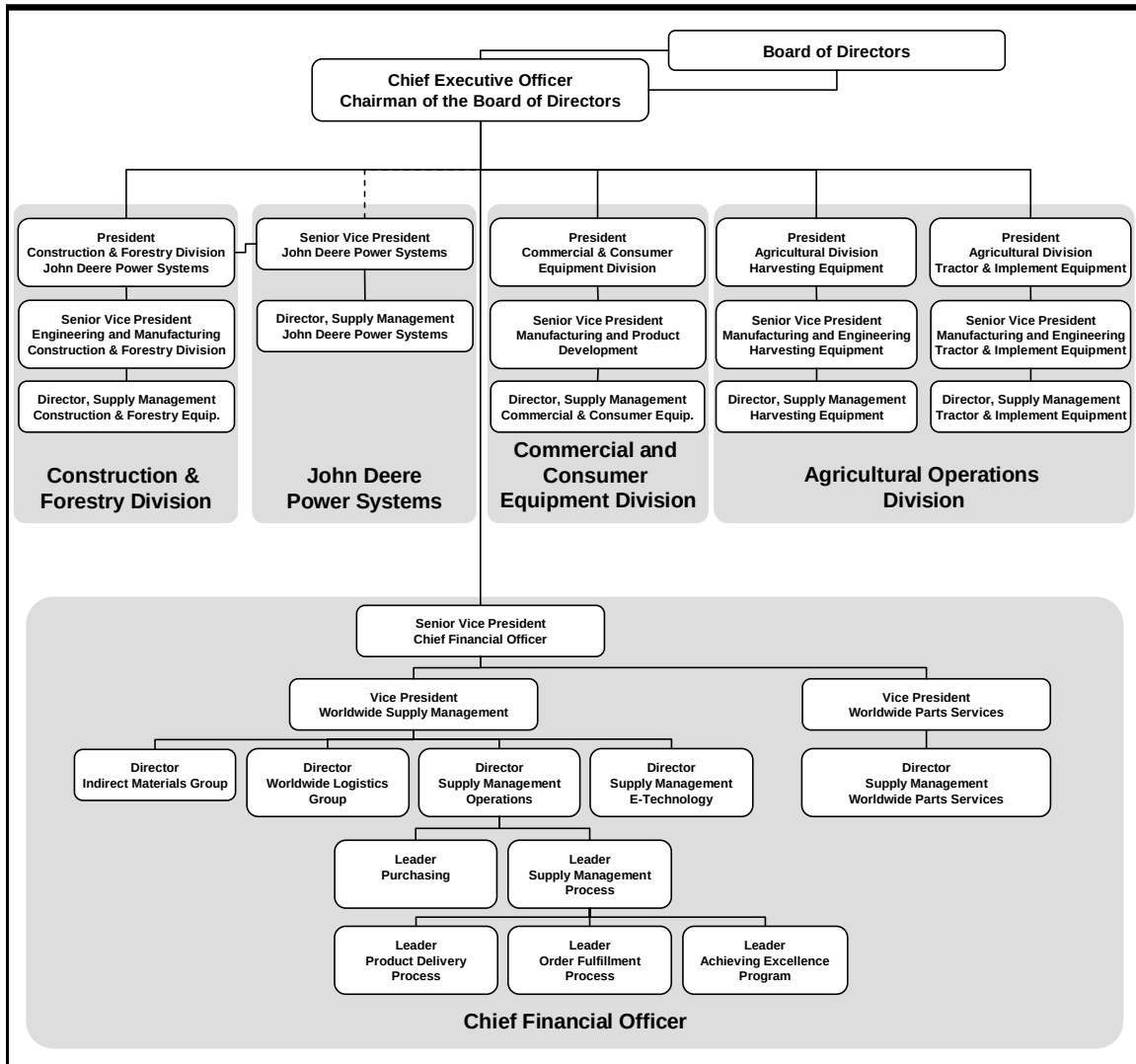


Figure 6. Deere & Company Enterprise Organizational Chart
 Source: Alec E. Alessandra, Director of Supply Management, Deere & Company, 2005.

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