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'For Want of a Nail the Campaign was Lost'

DND's Supply Chain: A State of Performance Paralysis

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ABSTRACT

In 1987, the Auditor General performed an Audit of Materiel Support in DND and found that the service delivery satisfaction for immediate operational requirements (IOR) hovered between 12 and 17 percent. Over twenty years later, in 2008, the Auditor General performed an audit of Support for Overseas Deployments and found that less than 10 percent of operationally critical items were delivered to theatre before their required delivery date (RDD). While the service standard is deplorable in its own right, it is the longstanding 20-year trend of such service that makes the situation even more appalling.

Industry is undergoing a major transformation of its service delivery operations under a field of management science referred to as Supply Chain Management (SCM). Thomas L. Friedman in his book, *The World is Flat*, describes the concept of SCM as one of the few great forces responsible for transforming the whole of the world economy in the 21st century. Other militaries have embraced the SCM revolution and sought to translate the forward leaning experience of industry onto the modern battlefield.

The purpose of this paper is to argue that DND needs to adopt a strategic SCM program that tailors the best practices of industry into a specific Canadian Forces (CF) solution. A major SCM transformation of the existing DSC will have immediate positive effect on the force employment capacity of the CF and contribute vitally to the overall national defence strategy.

The case for SCM transformation is built by analyzing each of the five core SCM disciplines presented by Cohen, Shoshanah and Russell as they apply specifically to DND. It is demonstrated that the DSC is failing to meet even the most fundamental of requirements in each of the SCM core disciplines. At the heart of the issue is the fact that the CF has failed to view the departmental supply chain as a strategic asset and that the DSC is fundamentally not designed for performance.

SCM transformation will require a comprehensive change management program and critical to success is the need for a change champion. As it pertains specifically to the DSC, the most important of all transformation efforts would be the appointment of CANOSCOM as the undeniable DSC process owner with the authority to execute the supply chain across all DND stakeholder organizations. Unfortunately, without an initiating SCM spark there can be no fire and it would seem that in the current vacuum of senior departmental SCM awareness, aspirations for a much needed transformation will remain a distant but fading hope of current DSC personnel.

FOREWARD

In 2006, I was posted to ADM(Mat) into the Directorate of Materiel Policies and Procedures (DMPP) and into the specific sub-directorate of Materiel Management (DMPP 7). One of my portfolios was the responsibility for ensuring compliance with materiel policy and procedures throughout the department. As part of that compliance program, DMPP 7 would send a small team of personnel out to the various Bases and Wings across the Canadian Forces and with the help of a compliance checklist, teams would verify that personnel were acting in accordance with existing materiel policy. Upon conclusion of a visit, a report of shortcomings and recommendations would be produced and sent from DMPP to each of the respective Base or Wing Commanders. The formal name given to this process was a Staff Assistance Visit (SAV) and the core members of the SAV program included Captain Linda Boyd as the team lead and WO Josee Doucet and Sgt Natalie Fortin as the resident supply experts.

As the leader of the SAV team, Capt Boyd was deeply passionate about the supply trade and one could not help but get caught up in what became her extraordinary quest for supply chain excellence. To this end, the team had embarked upon an ambitious plan to 'SAV' every base installation across the CF over a period of 2-years. It would be an aggressive mandate but fuelled by a strong sense of commitment and determination, the team lived out of a suitcase for two years and worked tirelessly towards the cause.

As the SAV program matured, the team never lost sight of its primary purpose to monitor materiel policy compliance but the program also offered a grand opportunity to monitor and observe upon the entire spectrum of DND supply operations. The team's efforts were nothing short of inspiring and owing to their unrelenting passion for improvement, it came to be realized that many of the supply problems were systemic in nature and well beyond the scope of the team to resolve. It was during this time that the team dragged me out west to participate in my first SAV visit and it was during this particular visit that I came to realize the full extent of the supply problem.

Our inspection occurred at the supply installation of one particular army base over a period of three days. The SAV checklist is rather exhaustive and one area of focus dealt specifically with the operation of the spare parts warehouse embedded within the local base maintenance organization. After a long morning of pouring over Canadian Forces Supply System (CFSS) reports and talking to the supply technicians who managed the warehouse inventory, we decided to informally debrief the Sergeant in charge of the warehouse. After collating the initial feedback from the team, we applauded the Sergeant for what appeared to be a solid warehouse operation. Inventory counts were being carried out under a well-managed stocktaking program, a random stock count generated excellent accuracy standards and write-offs of materiel were carried out exactly in accordance with policy. By all accounts, it was a textbook operation and according to the SAV team, a rare sight.

After hearing our words of praise, the Sergeant, a seasoned supply technician, asked to speak to myself and WO Doucet off to the side. He immediately launched into a aggravated account of he and his team's struggle to keep pace with the service demands of his customers under what he deemed to be a cumbersome and ineffective supply system (supply chain). This Sergeant, who I shall choose to remain nameless, had visibly

reached an exhaustive state of frustration with the current state of DND's supply chain. It turns out that he and many of the supply technicians in his section had been working six day weeks and twelve hour days over the previous three months in an effort to keep up with the pace of operations. It turns out, he wasn't alone. SAV reports from across the CF supported his plight and it became readily apparent that the success of the supply system was being driven on the backs of the people as a result of a poorly designed supply chain. From one SAV report to the next, the story began to unfold into themes of major supply chain shortcomings. It wasn't one particular base or even one particular ECS, no; the fundamental supply system was broken. All the while, the SAV team was wielding a big policy stick in an effort to monitor and enforce a program of materiel policy compliance but what was coming across loud and clear was a desperate plea for help.

For the next two years, we cultivated the wealth of knowledge and experience of the entire DMPP 7 team and tried in vain to make some headway on those supply matters within our sphere of responsibility and influence. Owing to the dispersal of supply chain accountabilities, the lack of a central process owner and our team's small place of influence in the world, hope for major and immediate change proved futile.

The field of Supply Chain Management is sweeping across corporate boardrooms world wide and holds a potentially powerful key to right sizing the Defence Supply Chain (DSC) and importantly, renewing the spirits of frustrated supply technicians who are struggling to make the system work despite all its shortcomings. This paper is the culmination of fifteen years of personal experience working in various capacities of the DSC and a growing sense of frustration over the lack of movement on a number of major DSC shortcomings. It is far from a step-by-step recipe for a supply chain transformation but at the very least, it will offer some insight for consideration by senior departmental leaders. Capt Linda Boyd retired from the CF in 2007 and as I close in on the deadline for this essay submission, WO Doucet will be releasing from the CF. Only Sgt, now WO Fortin remains in the CF of the original SAV three. In 2007, the SAV program was formally disbanded in favour of a broader MA&S compliance program and while much of the SAV team's work has precipitated a renewal in the materiel accountability framework across the department, the deeper seeded supply chain issues continue to go unnoticed.

I chose to write this paper for the Supply Sergeant who had the strength to tell it like it is and I also write this paper for the approximately 2200 other supply technicians who may be struggling under similar competing pressures. I write this paper for my former DMPP 7 team who contributed greatly to my broader understanding of the issues and perhaps most importantly, I chose to write this paper for Capt Boyd, WO Doucet and Sgt Fortin whose passion and perseverance for supply excellence has inspired me to continue their personal SAV legacy of simply attempting to make a difference.

> "In today's highly competitive global marketplace the pressure on organizations to find new ways to create and deliver value to customers grows even stronger. There is an increasing recognition that it is through efficient and effective management of the supply chain that the twin goals of cost reduction and service enhancement can be achieved."[1]

Over a two-year period, National Semiconductor, a producer of analog and mixed-signal semiconductors, reduced distribution costs by 2.5 percent, decreased delivery time by 47 percent and increased sales by 34 percent.[2] Titeflex, a small U.S. manufacturing firm, moved from a 15 percent on-time delivery performance to over 80 percent over a similar 2-year period.[3] The benefit for commercial firms to reduce delivery times and step up service reliability is paramount in a new globalized economy where companies have little choice but to seek out innovative new means of confronting ever-rising customer expectations. In fact, industry is closing in on a 100 percent service delivery standard whereby customer demands are being satisfied on or before the customer's requested date for every single order.[4] The risk of failure is a pure and simple survival of the fittest where visionary companies such as Toyota, Ikea and Wal Mart reign supreme.

This stands in stark contrast to the current levels of performance being experienced in the Department of National Defence (DND). In 1987, the Auditor

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[1] Dr. Peter Steiger, Head of Swatch Group Logistics, Biel; available from http://www.mba-scm.org/index.php?id=30; Internet; accessed 13 March, 2009.

[2] David Simchi-Levi, Philip Kaminsky, and Edith Simchi-Levi, *Designing and Managing the Supply Chain*, 2nd Ed (New York: McGraw-Hill Companies Inc., 2003), 115.

[3] John Dumond, R. Eden, J. Folkeson, *Velocity Management: An Approach for Improving the Responsiveness and Efficiency of Army Logistics Processes*. Report prepared by the RAND Corporation, 1995, 13

[4] Simchi-Levi, Kaminsky and Simchi-Levi, *Designing and Managing the Supply Chain*, 215

General performed an Audit of Materiel Support in DND and found that the service delivery satisfaction for immediate operational requirements (IOR) hovered between 12 and 17 percent.[5] Over twenty years later, in 2008, the Auditor General performed an audit of Support for Overseas Deployments and found that less than 10 percent of operationally critical items were delivered to theatre before their required delivery date (RDD). Imagine taking your car into the dealership for a warranty recall and the service manager telling you that the required part will take 2 days to arrive from the central warehouse. Two days later, you return to find that the part has not yet arrived and the service manager explains that it may take a few more days. How many times would you return to this dealership before you took your business elsewhere? Based on the Auditor General findings, roughly 9 out of every 10 customer requirements are missing their delivery target and to make matters worse, from a DND standpoint, this is considered premium service.[6] While the service standard is deplorable in its own right, it is the longstanding 20-year trend of such service that makes the situation even more appalling. When you consider all combat equipment awaiting repair in Afghanistan and 65 percent of this equipment downtime is attributable to waiting for parts, the pieces of the puzzle begin to fit together and the severity of the situation starts to emerge.[7] It is not a

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[5] The CF customer relays his inventory requirements to the supply system via customer demand. The CF supply process is constructed around a 4-tier priority system with Immediate Operational Requirements (IOR) constituting the highest priority of customer demand with an associated service-level of 48 hours to deliver the requirement to the customer. Canada, Department of National Defence. *Canadian Forces Supply Manual*; available from Supply Manual; DWAN; accessed 13 March, 2009, 1-3B-024

[6] IORs are the only customer requirements authorized the use of premium distribution service. *Ibid.*, 3-23A-008

[7] Canada. Auditor General. *Support for Overseas Deployments – National Defence*. Report of the Auditor General of Canada to the House of Commons (Ottawa: Minister of Public Works and Government Services Canada, May, 2008), 15

corporate profit or loss scenario; Canadian military operations are at risk and by default, so are the lives of the people entrusted to carry out those operations.

The transformation of National Semiconductor and Titeflex is attributed to a field of management science referred to as Supply Chain Management (SCM). Thomas L. Friedman in his book, *The World is Flat*, describes the concept of SCM as one of the few great forces responsible for transforming the whole of the world economy in the 21st century.[8] Peter Drucker, regarded by some as the founder of modern management, states that SCM is one of the last frontiers of opportunity for organizations wishing to improve their organizational efficiency.[9] Other militaries have embraced the SCM revolution and sought to translate the forward leaning experience of industry onto the modern battlefield. The United States Department of Defence (DoD) is showing that the life and death nature of military operations can truly benefit from the SCM strategies of profit-driven corporations. The US Army, for example, has streamlined its order fulfillment process under a program called High-Velocity Infrastructure (HVI) in such a way to reduce the spares delivery time by half and cut repair depot cycle times from between 32 and 46 days to between 6 and 8 days.[10] The U.S. Air Force is following suit with its own SCM program dubbed Lean Logistics aimed at improving weapons availability by 20% while reducing overall support costs.[11] The U.S. Marines are employing a Precision Logistics initiative with much the same goals as each of the other services. On the whole, the U.S.

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[8] Thomas L. Friedman. *The World is Flat* (New York: Farrar, Straus and Giroux, 2006), 50

[9] Peter F. Drucker, "The Economy's Dark Continent," Fortune (Apr, 1962), 103

[10] Dumond, Eden and Folkeson, VM, 61

[11] Timothy L. Ramey, *Lean Logistics: High-Velocity Logistics Infrastructure and the C-5 Galaxy* (Project Air Force: RAND Corporation, 1999), 62.

Department of Defense (DOD) is embracing SCM in an attempt to reduce the support footprint in theatre, reduce or redirect costs, deliver improved weapon system performance and ultimately, more effectively support U.S. military strategy.[12] The DoD Defense Science Board Task Force on Logistics Transformation states, "For the U.S. military to maintain its position of global leadership, it must transform its logistics system."[13]

From a Canadian military perspective, the SCM success story is virtually non-existent. With the exception of a few title changes and a limited attempt to re-brand a longstanding supply governance model as the Defence Supply Chain (DSC); the management transformation that enables SCM success is lacking in DND. Despite commercial SCM enlightenment, DND has failed to incorporate this last frontier of opportunity into its transformational mix. The purpose of this paper is to argue that DND needs to adopt a strategic SCM program that tailors the best practices of industry into a specific Canadian Forces (CF) solution. A major SCM transformation of the existing DSC will have immediate positive effect on the force employment capacity of the CF and contribute vitally to the overall national defence strategy.

The paper will begin with a description of the evolution of SCM and highlight the key SCM disciplines in order to set the context for an explanation and analysis of the department's existing supply chain operation, hereafter referred to as the Defence Supply Chain (DSC). The SCM journey is not a standardized scientific approach and it is

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[12] United States. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. *Logistics Transformation – Phase II*. Defense Science Board Task Force (Washington, January, 2001), 1.

[13] *Ibid*., 2.

unfortunate, but too many organizations have fallen into the trap of blindly adopting flavour-of-the-day supply chain initiatives without a core understanding of the SCM philosophy. While the focus of this paper will be on the analysis of the five core SCM disciplines as they pertain to the DSC, critical to the success of any SCM transformation is the establishment of a solid grounding in the value chain theory behind its origin. Following the theoretical framework will be a comprehensive analysis of the DSC along with a series of recommendations based on industry and the US military that would allow DND to benefit significantly from a strategically transformed supply chain. The DSC is an extremely complex process with a wide variety of stakeholders and to this end, the focus of the paper will be kept at a strategic level. A detailed SCM organization chart is not the goal of this paper nor is it a recipe for a predetermined set of performance objectives. Rather, it will seek to present a broader understanding of the existing supply chain issues and to propose the strategic conditions necessary for the launch of a successful SCM program within DND. In closing, the major SCM transformation challenge will be presented along with some closing thoughts on the likelihood of DND moving on this initiative any time soon.

There is little dispute over the origins of logistics as a military discipline. History has demonstrated a general trend of amassing larger and larger armies. By the time of WWII and the age of industrialization, the horse as a primary means of maneuver was replaced by a tank that depended on a large umbilical chord of parts, fuel and ammunition. The immense size of the armies combined with the introduction of more and more complicated weapon systems demanded more and more supplies.[14]

Furthermore, the nature of early 20th century warfare witnessed wide operational fronts with supporting lines of ammunition, fuel and spares amassed well behind these lines. Layered echelon support of redundant supplies positioned ever closer to the fighting forces provided for flexibility and assurance against the uncertainties of war and the long and highly variable replenishment pipeline back to the industrial homeland. This echelon of support became the lifeline of fighting forces and the field of logistics evolved into a prominent discipline within the operational art of war.[15]

The long lines of communication between the front line fighting forces and the national inventory warehouses created the challenge of maintaining accurate inventory consumption rates balanced against lengthy re-supply forecasts. This led to a common logistics practice of amassing layered inventory stockpiles behind the fighting forces as a simple but inefficient method for buffering against the uncertainty of demand. Mass beget mass, and with an increased number of inventory stockpiles came a corresponding increase in the resources required to control and account for each inventory echelon. These principles forged into doctrine and as militaries retreated back into Cold War posturing, a mindset of mass and redundancy was institutionalized as the logistical means of tackling the uncertainty of military operations.[16]

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[14] See Van Creveld for a compelling look back at the transformation of logistics throughout history. Martin Van Creveld, *Supplying War: Logistics from Wallenstein to Patton*. 2nd ed (Jerusalem: Cambridge University Press, 2004).

[15] Administration was the term first used in WWI to describe the management field charged with responsibility for this support tail. See Ian Malcolm Brown for a detailed account of the evolution of administration in WWI. Ian Malcolm Brown, *British Logistics on the Western Front* (Westport: Praeger Publishers, 1998).

[16] Van Creveld gives a good account of the birth of mass logistics. The concept is further supported in other works, namely, Lt. General William Pagonis who introduces 'iron mountain' as the term to describe the mass-based approach of the US Army logistics in the Gulf War. Pagonis, Lt. General

Meanwhile, the business world was transforming itself through a period of industrialization and the rapid spread of Henry Ford's concept of assembly line manufacturing. Consumer products such as the car, the airplane, televisions and computers became increasingly complicated in their materiel requirements and matching the inventory of raw materials to the requirements of the assembly line to the uncertainties of consumer demand seemed as challenging as matching the military requirements in time of war. As such, lessons from military logistics were seen to have potential application in a seemingly different profit-driven world. Industry naturally adopted many of the same military logistics principles and built redundancy and mass into its inventory pipeline to offset the inefficiencies of its manufacturing process along with the uncertainty of the consumer-driven market place. Logistics as an actual management discipline began to emerge and by the 1970's, the first degrees were offered in logistics management.[17] While logistics emerged as a separate management discipline, it was predominantly viewed as a secondary support function and merely an enabler of manufacturing as the true heart and soul of business operations.

The field of logistics management underwent normal adaptation and evolution until two major forces descended upon the management world to enable the emergence of SCM. One of these forces was an unassuming Harvard Business Professor by the name of Michael E. Porter who introduced management executives to the idea of horizontal strategy and the concept of a 'value-chain'.[18] Essentially, in the swipe of a pen, Porter

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William, and Jeffrey L. Cruikshank. Moving Mountains: Lessons in Leadership and Logistics from the Gulf War (Boston: Harvard Business School Press, 1992)

[17] Dr. Stephen Hays Russell, "Supply Chain Management: More than Integrated Logistics," *Air Force Journal of Logistics* (Summer 2007): 56.

flipped the longstanding paradigm of a vertically structured industry on its head. In his book, he presented a broader process view of a company (see Figure 1.1) beyond the traditional manufacturing process to envelop inbound logistics, operations, outbound logistics, marketing, sales and service with the ultimate consumer of a company's goods, the customer, as the final and most important leg of the overall process.[19]

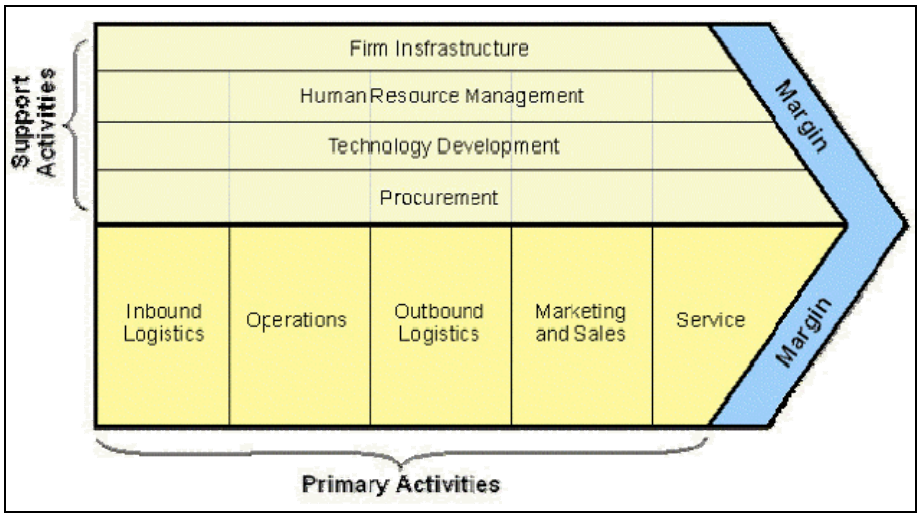

Figure 1.1 Value Chain

Source: Porter, Competitive Advantage, 48

Porter stated that a value-chain is a system of interdependent activities that must work together to bring value to the customer.[20] Important to the value chain concept are the premise of working together and the linking of these interdependent activities into a seamless value chain. Traditionally, these activities are physically and technologically distinct and according to Porter, the key to competitive advantage is the ability to establish and nurture these all-important linkages. For

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[18] Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance* (New York: The Free Press, 1985), 48.

[19] *Ibid.*, 48

[20] *Ibid.*, 48

example, take a manufacturing company where the procurement personnel are willing to sacrifice on the quality of raw materials for the sake of price because there is little understanding of the linkage between reduced quality and the down stream increase in after-sales costs as a result of increased product defects. These procurement actions were properly motivated in accordance with the budgetary incentives of the procurement department rather than the budgetary considerations of the entire value chain. The existence of such incongruent goals working at cross-purposes to the overall objective of the entire value chain is commonly referred to as working in 'functional silos' or organizational 'stovepipes.'[21]

The 'stovepipe' phenomenon is a direct consequence of organizational structure, particularly those firms with a tradition of decentralized decision-making and vertical alignment where information, decisions and resources flow vertically.[22] The underlying key to leveraging superior value chain performance is the ability to think, measure, incentivize and resource horizontally. Thus, the concept of horizontal strategy is born.[23] Horizontal strategy is the process of aligning the goals and strategies of all interrelated value chain activities supported by integrating mechanisms to strengthen the interrelationships and linkages across the value chain. Unfortunately, "Interrelationships will not occur by accident or by fiat," and positive organizational mechanisms must be put in place to encourage value chain homogeneity.[24] These linkages can be forged

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[21] Michal Hammer and James Champy, *Reengineering the Corporation* (New York: HarperCollins Publishers, Inc., 1993), 66.

[22] Porter, *Competitive Advantage*…, 384.

[23] *Ibid*., 364.

through a number of integrating mechanisms but at its genesis; the design of the organization is deemed the most critical.[25]

The most effective design proven to exploit the benefits of horizontal strategy is the organization that groups its interrelated business units under a single executive.[26] The ability to make this transition, however, rests on the ability to identify the underlying value chain that exists within the organization. Michael Hammer reports in his book, *Reengineering the Corporation*, "Most companies lack process owners because in traditional organizations people do not tend to think in process terms."[27] This is a critical observation that has direct and consequential bearing on the transition of the DSC's organizational design, an issue to be dealt with later in the paper.

Finally, in the context of a value chain, considerable effort must be invested to understand the nature of the customer and what they consider to be of value within the company's value-chain. Traditionally, customers have placed value on one of cost, service or quality, and companies continually struggle to align the value demanded by customers with the value delivered in the value-chain. For example, managing a value chain on cost and efficiency will fail to meet the demands of a customer who values high service and quality. In industry, companies lose revenue when value-chains don't align with customer expectations and this becomes the obvious incentive to adapt and improve or risk losing it all. In DND, the customer does not have the luxury of taking its business elsewhere and, thus, there is little incentive for the DSC to evolve. A clear indication of

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[24] *Ibid*., 394.

[25] *Ibid*., 59.

[26] *Ibid*., 395.

[27] Hammer and Champy, *Reengineering the Corporation*, 108

this lack of incentive is the repeated observations over a twenty-year period by the Auditor General of consistently poor DSC performance.[28] Therefore, a company's value-chain must be aligned to its targeted customer and horizontal consistency within the value-chain must be managed to ensure that sub-optimization of one sub-process does not undermine the entire process. Porter's horizontal value-chain strategy found a receptive audience in corporate boardrooms around the world and the 1990's marked an era of reengineering as companies endeavoured to capitalize from a better design and management of their value-chain.[29]

The second major force to hit corporate executives was the advancing capability of information technology (IT). It was not actually one program or particular application but rather the coming together of a general information systems capability and a management awareness of the broader enterprise process.[30] The uncertainty and speculation of supply and demand information in wartime had generated large inventories and redundancy as fundamental logistics strategies. Industry made the discovery that it was less about the nature of war and more about the lack of information that prompted a mass-based approach to logistics. If uncertainty and speculation error could be

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[28] The 1987 Auditor General Audit, *DND – Materiel Support*, reported that the departmental materiel satisfaction rate goal of 80 per cent is consistently not achieved. It also reported that between 12 and 17 per cent of immediate operational requirements are being delivered on or before their required delivery dates. The 1996 Auditor General Audit, *Materiel Management in the Federal Government*, reported that DND lacks value for money in its materiel management practices. It also reported that many of the reported deficiencies still exist since 1980. The 2008 Auditor General Audit, *Support for Overseas Deployments – National Defence*, reported that less than 10 per cent of operational critical items were received in Kandahar by the required delivery date and that 16 per cent of items requested from the main depot in 2007 were temporarily out of stock.

[29] Hammer and Champy's *Reengineering the Corporation*, 1993, offered companies a 'how-to' guide for implementing a horizontal process-based management approach.

[30] Richard L. Daft, *Organization Theory and Design.* 8th Ed (Mason, Ohio: Thomson Learning, 2004), 296.

minimized with real-time access to inventory consumption and replenishment information, it might be possible to disrupt the longstanding inventory paradigm of mass and redundancy. Furthermore, Enterprise Resource Planning (ERP) systems were allowing companies to monitor operations and costs across the full value-chain such that full spectrum inefficiencies could be spotted and remedies sought.

Further adding to the mix of management tools is the emergence of a total quality management discipline that allowed companies to finely tune their value-chains towards an ultimate panacea of back-end replenishment perfectly matching real-time front-end consumption.[31] The Just-In-Time philosophy was born as a result and logistics began to take center stage as a strategic opportunity to leverage competitive advantage. Companies such as Wal Mart, Dell and Toyota eagerly embraced Porter's value-chain and coupled it with strong IT support systems to emerge as dominating industry frontrunners. The rest of the world would take note and by 2000, the first supply chain executives were being recruited, master's degrees in Supply Chain Management were being offered and Supply Chain Management would explode onto the scene as the last untapped frontier of modern management science.

The two terms of logistics and supply chain are used in seemingly similar contexts. In fact, the distinction between logistics and supply chain is difficult to nail down. There are a plethora of definitions and some attempts to differentiate but in the end, the two terms describe relatively the same principles and encompass generally the same activities. Dr. Stephen Hays Russell notes that, "The Department of Defense gave industry logistics, industry gave Supply Chain Management back to the Department of

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[31] Benjamin S. Blanchard, *Logistics Engineering and Management.* 6th ed (New Jersey: Pearson Prentice Hall, 2004), 40.

Defense."[32] Perhaps the subtle difference lies in the customer-driven approach of SCM, although this can arguably be applied to a military context. No matter, the terms are rather interchangeable and for the purposes of this paper, logistics will be used in the more traditional military context while supply chain will refer to the modern evolved form of SCM.

The supply chain, in essence, is simply a more refined version of Porter's value-chain and can be defined in a number of ways. Benjamin S. Blanchard provides the following,

> "A set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flow of products, services, finances and/or information flow from a source to a customer." [33]

The notion of a set number of entities, three or more, is misleading as it is less about the physical organizational construct as it is the functions being performed. However the concept of flows of information and product are important. Another more broad definition provided by Sunil Chopra and Peter Meindl captures the generality of the process but ignores the important aspect of information and product flows,

> "A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request…the supply chain includes all functions involved in filling a customer request."[34]

Lastly, Dr. Stephen Hays Russell offers that,

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[32] Russell, "SCM…", 62.

[33] Blanchard, *Logistics Engineering and Management*, 6.

[34] Sunil Chopra and Peter Meindl, *Supply Chain Management: Strategy, Planning and Operation* (New Jersey: Prentice-Hall, Inc., 2001), 3.

> "A supply chain is the sequentially-connected organizations and activities (from Mother Earth to the ultimate customer) involved in creating and making a product available."[35]

The main points to take away from each of the definitions are that a supply chain is about flows of information, funds and product, it involves many different functions and it can be all-encompassing, from Mother Earth to the ultimate customer. Ultimately, the supply chain is about translating the raw inputs of a company into measurable value for the customer. The ability to do this seamlessly and more effectively and efficiently than the competitor is the principle focus of Supply Chain Management.

It therefore follows that Supply Chain Management is,

> "The systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purpose of improving the long-term performance of the individual companies and the supply chain as a whole."[36]

As a concept, the return on investment from a successful SCM investment,

> "…seeks utopian performance in commerce: all activities up and down a supply chain orchestrated and coordinated (as though a single entity) to synchronize supply and demand at all levels, the sharing of information and technologies to increase innovation and to shorten product development cycles, reduction in order cycle time, replacing stocks with flows, effectively and efficiently responding to customer demands, reduced costs, and increased customer satisfaction."[37]

The payoff for SCM implementation with organizations such as Titeflex, National Semiconductor and the DoD is quantifiable and enduring; the challenge lies in figuring

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[35] Russell, "SCM…", 58.

[36] Blanchard, *Logistics Engineering and Management*, 6.

[37] Russell, "SCM…", 58.

out where to start and how to proceed. Compounding the challenge is the fact that there is no single step-by-step recipe to walk companies through the trials and tribulations of executing a comprehensive and integrated SCM program. The solution is unique to each operating environment and what works for one organization may not necessarily translate to another.

The key to success is a greater understanding of the SCM philosophy rather than a blind adoption of the constituent components. Domestic automakers have suffered this fate to their own peril as they feverishly attempted to duplicate the impressive management models of the Japanese. Toyota, in particular, renown for its superior Toyota Way production system, would invite executives of even its closest competitors to witness first hand the workings of their production system.[38] Visiting executives would return to their trenches and begin hasty transformations of their processes, quickly embracing some of the tangible nut and bolt differences such as the layout of the assembly line and the adoption of Kanban, a system of visual production aids espoused by Toyota.[39] Then, they sat back and waited. Performance improvements came but they amounted to far less than expected. What these executives failed to grasp was that the Toyota Way was less about Kanban and JIT and assembly line layouts, the Toyota Way was grounded upon a pervasive culture and philosophy that carried from the boardroom table down to the production floor. Stronger than its constituent parts, executives at Toyota lived, ate and breathed a culture of continuous improvement and empowerment,

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[38] GM executives were invited to tour Toyota manufacturing facilities on numerous occasions. Jeffrey K. Liker, The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer (New York: McGraw Hill Companies, Inc., 2004), 184

[39] *Ibid.*, 23.

known as the Toyota Way.[40] Kanban and a whole host of other process improvement methodologies such as Lean and Six-Sigma were merely chosen means of achieving an end. In this respect, SCM can be compared with the Toyota Way because it is best to understand the overarching philosophy of SCM than its piecemeal components. On this front, industry and other militaries have led the charge into SCM and a number of overarching principles have begun to emerge. Shoshanah Chopra and Joseph Russell translate over fifteen years of experience in the field of SCM into five main disciplines in their book, *Strategic Supply Chain Management.*[41] These disciplines (see Table 1.1) must form the foundation of any SCM program and they have direct application to DND. A cursory overview of each of these disciplines will be presented and then a more in depth analysis of how DND measures up to these disciplines will follow with a view to understand the degree of effort required to pursue a SCM program. Throughout the analysis, the underlying value chain concept will continue to provide a philosophical SCM backdrop.

Table 1.1 – Core SCM Disciplines

1. View Supply Chain as a Strategic Asset
2. Develop End-to-End Process Architecture
3. Design Your Organization for Performance
4. Build the Right Collaborative Model
5. Use Metrics to Drive Business Success

The first of these disciplines is the need to view the supply chain as a strategic asset. "End-to-end SCM is not just about logistics, its about building a core competency that will lead to your future competitiveness and contribute mightily to your top and

[40] *Ibid.*, 27.

[41] Shoshanah Cohen and Joseph Roussel, *Strategic Supply Chain Management: The Five Disciplines for Top Performance* (New York: McGraw Hill Companies, Inc., 2005).

bottom lines."[42] Companies are quickly recognizing the strategic relevance of their supply chains and it is not difficult to understand why. In its simplest form, adopting a program of SCM leads to higher levels of customer service at a reduced cost. It is a win-win scenario. Higher levels of customer service will lead to increased customer demand, which ultimately leads to more revenue. At the same time, SCM will reduce overall costs and again, contribute directly to the bottom line. As such, it is critically important that an organization's SCM strategy directly supports and drives forward the overall business strategy.[43] Wal Mart manufactures nothing and yet it is dominating the world of retail with a world-class supply chain operation that seamlessly links manufacturers to customers. For a company such as Wal Mart, their SCM strategy is their overall business strategy. In a profit driven world, SCM has unquestionable prominence at the strategic level.

The second SCM discipline is the development of and end-to-end process architecture centered on the customer. Unfortunately, as referenced with Porter's value chain, a company's core supply chain process isn't always readily obvious to the naked eye and often, considerable time and effort must be invested to arrive at a learned understanding of the end-to-end process.[44]

> "Supply chain architecture details the process, applications and information needed to improve and evolve your supply chain. It integrates rules about the process relationships between business entities and ensures alignment between process and supply chain infrastructure. Companies with supply chain architectures in

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[42] *Ibid*., xvi.

[43] *Ibid*., 20.

[44] Daft, *Organizational Theory…*, 113.

> synchronization with their business goals have better overall business performance."[45]

This may very well be the most difficult part of the journey. The ability to effectively link the process to the organizational structure to the infrastructure to the information requirements is a formidable challenge but the most important underlying theme is the ability to make the links between the supply chain and the customer. Importantly, industry has discovered that the value chain isn't necessarily restricted to a single customer value proposition such as effectiveness or efficiency; instead, today's SCM practices can in fact leverage supply chain performance and efficiency simultaneously.[46] The key is an understanding of the process. The absence of a well-defined organizational value chain will lead to incongruent activities and initiatives that may have little or even negative effect on the overall supply chain such as the procurement example presented earlier. Michael Hammer said it best when he wrote, "Without a focus on process, business improvement efforts amount to rearranging deck chairs on the Titanic."[47]

The third core SCM discipline is the designing of the organization for performance. Once the strategic link is determined and the process formally defined, the next major effort involves fitting organizational form to process function. A fully integrated supply chain attempts to break down the functional barriers by establishing horizontal process strategy and objectives. It ensures that each essential role is defined

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[45] Cohen and Roussel, *Strategic SCM…*, 49.

[46] It was once thought that supply chain effectiveness came at the expense of efficiency and that an efficient supply chain could not deliver on high performance. This paradigm has been all but erased by SCM. J. Dumond, M.K. Brauner, R. Eden, J.R. Folkeson, K.J. Girardini, D. Keyser, E.M. Pint, M.Y.D Wang, *Velocity Management: The Business Paradigm that has Transformed U.S. Army Logistics* (RAND Corporation, 2001), iii

[47] Hammer and Champy, *Reengineering the Corporation*, 203.

and that responsibility for executing each role is unambiguous. Responsibility for these roles must also include authority to make decisions.[48] In his book Moving Mountains, Lt. General Pagonis writes of the importance of not allowing organizational rules and structures from getting in the way of performance.[49] Reinforcing Porter's point, he goes on to suggest that one of the only ways to achieve pan-organizational synergy is through the introduction of a senior supply chain executive with the requisite authority to cross functional boundaries. As will be demonstrated, it is this third core discipline that is a severe shortcoming of the current DSC and must be the focus of considerable SCM transformation effort.

The forth discipline espoused by Cohen and Russell is the building of the right collaborative model. In a general sense, this has significantly greater application in a corporate setting than that of the military but it is not to be dismissed entirely. From a company perspective, the construction of the right collaborative model speaks to establishing shared relationships with the suppliers and the supplier's suppliers of your company. Again, Wal Mart sets the trend in this field. Essentially, Wal Mart has opened its corporate kimono to its suppliers. Proctor and Gamble (P&G), for instance, has real-time access to the Point-of-Sale (POS) information within Wal Mart in order to track inventory consumption in real time across all 7200 Wal Mart facilities around the world.[50] Through a collaborative sharing of system information, P & G can monitor its

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[48] Henry E. Eccles, *Logistics in the National Defense* (Harrisburg: The Stackpole Company, 1959), 252.

[49] Pagonis and Cruikshank, *Moving Mountains*, 223.

[50] Wal Mart corporate website; http://walmartstores.com/FactsNews/FactSheets/; Internet; accessed 7 March, 2009.

own inventory levels and shares in the responsibility for overall Wal Mart performance. Essentially, this core discipline attempts to extend the limits of a company's traditional internal value-chain to encompass the entire Mother Earth to consumer value-chain. Other companies are following in pursuit of the Wal Mart model and the Internet along with an emerging product family of collaborative IT systems is extending the traditional ERP foundation beyond traditional organizational boundaries. Obviously, trust is a key to success along with the ability to successfully identify the appropriate supplier(s) to properly fit with the collaborating company's vision and culture. Collaboration in the context of government procurement is a formidable challenge but as will be demonstrated, there is ample opportunity for the DSC to become better engaged.

The fifth and final core discipline is the use of metrics to drive business success. Supply chain metrics must align to the overall objective trying to be achieved. Remember the three customer values of cost, quality and service; it is vitally important that what is being measured actually aligns to what the customer values. Measurement without attention to this premise is a waste of time. If service is deemed the ultimate driver of value, then metrics that measure the Customer Wait Time (CWT) as the time between a part being ordered and the part being delivered to the customer is instrumental in assessing the ultimate effectiveness of the supply chain process. Furthermore, metrics that span organizational boundaries work as value chain linkages and contribute to a horizontal supply chain focus. The challenge is administering them in such a way that collective responsibility for the metric and overall process accountability is ultimately established. A metric without performance accountability is of little value. Therefore, metrics may be excellent linkage mechanisms but without an appropriately structured

supply chain organization, performance improvements will not occur to the extent possible.

These five disciplines combine to deliver much of the tangible philosophy behind SCM. With these in mind, it is time to shift focus to the Department of National Defence (DND) and a presentation of the Defence Supply Chain (DSC). As previously mentioned, the identification of a company's core supply chain process can be a difficult challenge and the same holds true for DND. At its roots, it is important to address the first SCM discipline to understand whether the DSC has strategic relevance to DND such that a departmental SCM program is in fact worth the investment of time and resources. From there, the remaining analysis can focus on the remaining four disciplines. As will be seen, there is considerable confusion over supply chain definitions, responsibilities and even strategic focus. Problems with performance of the DSC at the tactical level seem almost insurmountable but an analysis of the strategic situation will identify a number of fundamental SCM design flaws that if transformed could immediately transition the DSC into an effective force multiplier and provide a valuable CF strategic core competency.

In the absence of a profit motive, the DSC would appear to be at odds with industry of having important strategic relevance in a military environment. Interesting enough, it is much to the contrary. Rather than generating a profit, the CF exists to deliver military capability on behalf of the government, whether it is a domestic civil emergency or an international conflict. The risk of failure is enormous with national sovereignty, the defence of North America and the lives of Canadian citizens at stake. In order to deliver military capability as the raison d'etre of the CF, the CF requires two

fundamental inputs; trained personnel and serviceable weapons and equipment (see Figure 1.2). It is in this latter capacity that the DSC plays a prominent strategic role and it is this role that is perhaps not well understood or communicated by departmental leadership.

"For want of a nail, the campaign was lost."[51] Once acquired, serviceable weapons and equipment are a direct product of two important inputs, trained and qualified maintenance personnel and spare parts (see Figure 1.2).[52] Spare parts are delivered via the supply chain and therefore, the effective management and execution of the DSC has direct bearing on weapon and equipment serviceability and ultimately, the military capability of the CF.

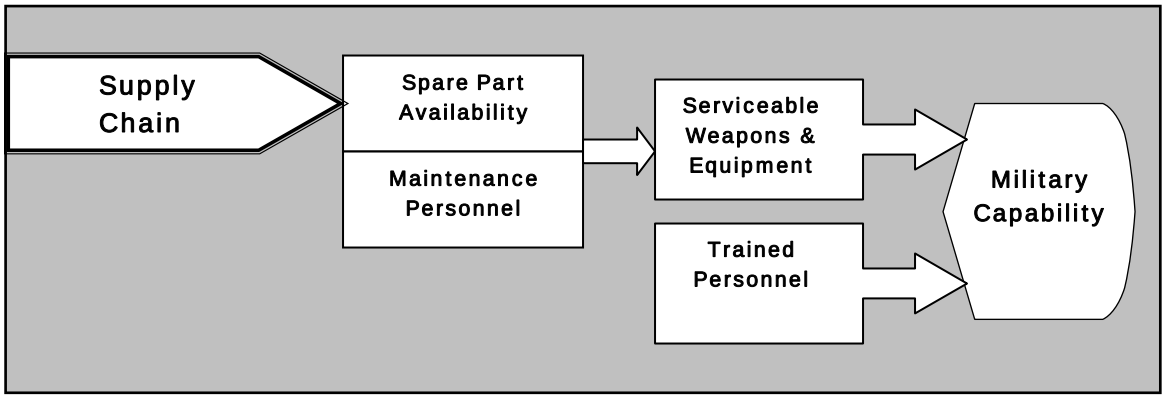

Figure 1.2 – CF Force Employment

Speaking to the Standing Senate Committee on National Security and Defence on 9 March, 2009, Lieutenant General Leslie highlighted the importance of serviceable military equipment to the war fighter, "Those Leopard tanks are lifesavers," he said.

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[51] William G.J. Tuttle, *Defense Logistics for the 21st Century* (Annapolis: Naval Institute Press, 2005), 7.

[52] Consider 'spare parts' as an all-encompassing term describing all those materiel requirements necessary to make serviceable a particular weapon system.

"They are game changers and we want to get those tanks where they can be used to save lives and to further the aims of the mission."[53] The Auditor General reported in its 2008 Audit of Support for Overseas Deployments that, "for the main combat equipment awaiting repair [such as the Leopard tank], 65 percent of the time, on average, they were waiting for parts to be delivered from either outside theatre, such as the main depot in Canada, or within theatre, such as between a warehouse at Kandahar Airfield and a forward-operating base."[54] The situation at home doesn't bode any better. In the same speech, Lieutenant General Leslie went on to report that only thirty percent of equipment used on military bases in Canada is in service at any time.[55] Failure on the part of the DSC has a direct impact on the success of the mission and ultimately, the strategic objectives of the nation.

The strategic relevance of the DSC extends beyond the simple availability of spare parts. While an insufficient and poorly managed DSC can result in a shortage of spares being available, at the other extreme, excess and surplus inventory can be equally as detrimental. Excess inventory results in excess consumption of very limited Capital and National Procurement (NP) funds, the need for excessive warehousing and the need for additional management attention by those charged with controlling the CF's inventory.[56] DND holds approximately $11.8 billion dollars worth of inventory that

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[53] CTV.ca, "Top Soldier Says Afghan Action Wearing Out Equipment," (10 March, 2009); http://www.ctv.ca; Internet, accessed 27 March, 2009.

[54] Auditor General, *Support for Overseas Deployments…*, 15.

[55] In the same speech to the Senate Committee, Lieutenant General Leslie said 33 per cent of light-armoured vehicles (LAVs) are out of service, 76 per cent of Coyotes, 100 per cent of its tracked light-armoured vehicles (TLAVs), 73 per cent of its Bisons and 71 per cent of its Leopard tanks. CTV.ca; "Top Soldier…"; http://www.ctv.ca; Internet, accessed 27 March, 2009.

represents 85% of the Government of Canada's inventory holdings and a sizeable investment of public monies that warrants strategic focus and oversight.[57] Even subtle efficiencies gained through capable DSC management can result in millions of dollars of opportunity cost savings that could be reinvested or reapplied to other CF resource priorities.[58] Moreover, the demonstrated mismanagement of 85% of the government's publicly funded inventory could have dire consequences for the credibility of DND public resource stewardship and the future of Canadian government budget allocations to the department.[59]

Finally, the strategic relevance of the DSC is demonstrated in its force projection role and the effectiveness of mobilizing the materiel and equipment requirements of a deploying task force and then projecting this materiel and equipment out onto the far reaches of the globe. A slow and cumbersome DSC reduces the ability to expediently mobilize, project and sustain forces, thus impacting the execution of CF strategy, the reputation of the military and ultimately, the nation.[60] Here again, the DSC has demonstrated significant performance failings that directly impact on the mission. A

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[56] Holding inventory can cost upwards of between 14 and 50 per cent of the total value of inventory. Douglas M. Lambert, James R. Stock and Lisa M. Ellram, *Fundamentals of Logistics Management* (Boston: Irwin McGraw-Hill, 1998), 17.

[57] Canada, Department of National Defence, *Audit Readiness Assessment*, Report prepared by PricewaterhouseCoopers LLP (March, 2007), 19.

[58] Canada, Auditor General, *Materiel Management in the Federal Government*, Report of the Auditor General of Canada to the House of Commons (Ottawa: Minister of Public Works and Government Services Canada, November, 1996), 16.

[59] The Standing Committee on Public Accounts (SCOPA) held a public inquiry into the reported $15M of materiel deficiencies in Afghanistan on June 17, 2008. The DM, VCDS (current CDS), CANOSCOM, CEFCOM and ADM(Mat) were all present and testified at the inquiry; http://cmte.parl.gc.ca; Internet, accessed 13 March, 2009.

[60] Tuttle, *Defense Logistics*…, 6.

report of the Joint Task Force Afghanistan Rotation 5/6 Rotation Staff Assistance Team observed that "101 seacans [sea containers] are in theatre and not accounted for in Canadian Forces Supply System."[61] From an approximate total of 1400 total sea containers in Kandahar, 101 sea containers equates to the loss of visibility on a significant amount of critical operational spares and equipment.[62] The loss of visibility translates into difficulties in sourcing the spares and ultimately, spares availability is jeopardized (see Figure 1.2) to the detriment of having serviceable weapons and equipment available for combat. The unaccounted for sea containers would have come as a direct result of a poorly executed mission mounting process and in effect, a failure of the DSC. In this manner, it is clear that force projection is a critical element of CF capability employment and the performance of the DSC is a vital force projection enabler.

It is a culmination of the ability to put weapons into service, the ability to demonstrate sound stewardship of a major government resource portfolio and the ability to mobilize and deliver a military force abroad in response to a government calling that elevates the DSC to strategic prominence within the CF context (see table 1.2). Unfortunately, just because the DSC has demonstrated strategic relevance does not automatically mean that it is perceived as being strategically relevant by departmental leadership. Despite all the facts and figures, and numerous related reports and audits on the failings of the DSC, the subject of a DSC transformation cannot be found on the

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[61] Lt(N) Jeff Watkins, Rotation Staff Assistance Team (RSA) JTF-AFG Roto 5/6, Presentation of findings for Rotational Staff Assistance Visit (9 August to 27 September, 2008), slide 5

[62] Total number of sea containers contained in the RSAT Roto 5/6 presentation. *Ibid*, slide 5

priority list of any senior leadership agenda.[63] This point will be tackled in greater detail during the SCM transformation challenges section of the paper. At this point, it is time to return to the four remaining SCM disciplines and begin a closer examination of the DSC; how it measures up and what needs to be done.

Table 1.2 – First SCM Core Discipline

SCM Core Disciplines	DND Analysis
1. View supply chain as a strategic asset	• DSC is vital to CF strategic objectives • Strategic relevance of DSC not formally recognized by existing CF leadership

After strategic relevance, the second SCM discipline is the development of an end-to-end process architecture centered on the customer. Unfortunately, as observed by the Office of the Auditor General, the performance of the current supply chain process, "…is often achieved more by military personnel's concerted efforts than by the system's design."[64] The design is complicated, lacking accountability and due to its present status, without proper focus on the customer.[65] The supply chain of the Canadian Forces is extremely complicated and not unlike most commercial supply chains, it spans a number of organizations and departments (see Figure 1.3) with a depth and breadth of inventory rivaling the largest of industry. The supply chain process of the Canadian Forces is far from intuitive and in light of the number of organizations and stakeholders directly involved, it can be a challenge to slice through to the underlying core process. M.

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[63] The CF Transformation reports encapsulate much of the strategic organizational emphasis required within the department and yet nothing is mentioned of the supply chain. Canada, CDS, CDS Action Team 4, *Enabling Transformation,*CDS Action Team 4 Report – Canadian Forces Transformation: Institutional Alignment (6 July, 2005).

[64] Auditor General, *Support for Overseas Deployments…*, 8.

[65] The Auditor General reports list these as well as many other significant shortfalls in the DSC design. *Ibid.*, 4-12.

Edwards Denning, a continuous improvement management guru once stated, "If you can not describe what you are doing as a process, you do not know what you are doing."[66]

Referring to Figure 1.3, the DSC can best be described as the sequence of activities that connects and transforms the raw materials of Mother Earth into manufactured weapon systems for the CF war fighter operating across the fighting units of DND. Working from left to right, the Defence Industry Suppliers are responsible for the transformation part of the process as they manufacture raw materials into finished goods. The resultant finished goods are then delivered to one of the two national depots that either hold the goods in inventory or distribute them out to the various Base Supply organizations across the CF as well as the forces deployed abroad. Once the goods arrive at Base Supply, they are either held in inventory or distributed out to the maintenance organizations or delivered directly to the war fighting units. Owing to its size and complexity, the DSC is big business within DND and the government as a whole. As a process, it crosses multiple Level 1 organizations, geographically spans the globe and is a major consumer of resources. According to the Chief or Review Services, DND currently manages 340 million pieces of inventory worth approximately $11.8B and an annual National Procurement (NP) program pours approximately $2B worth of new inventory into the DSC each year.[67]

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[66] W. Edwards Deming, 1900-1993, American continuous improvement management guru; http://www.12manage.com/quotes_sq.html; Internet, accessed 28 Feb, 2009.

[67] Canada, Department of National Defence, Chief of Review Services, *Inventory Management: Stocktaking, Adjustments & Write-offs* (Audit: July, 2008), ii.

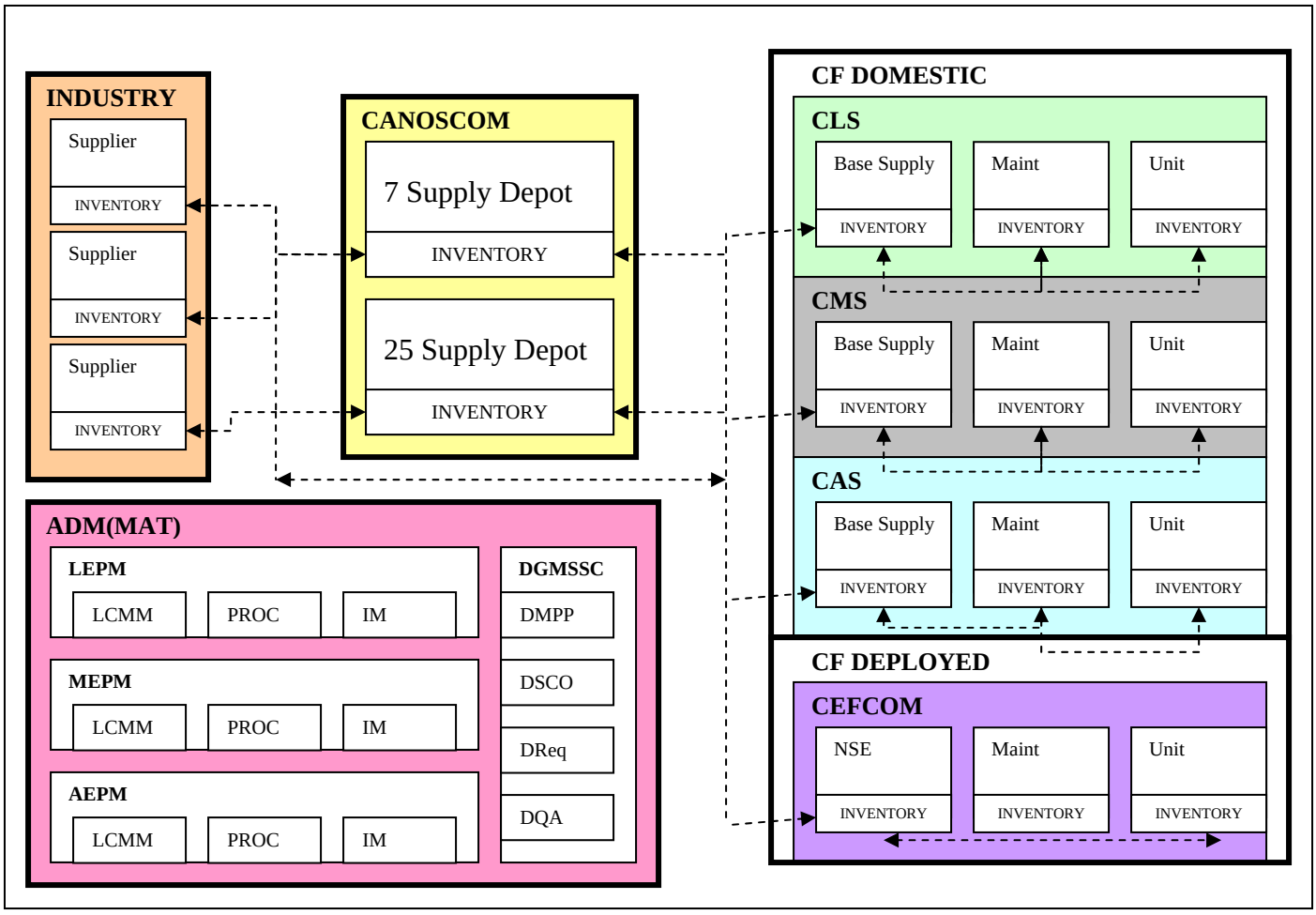

Figure 1.3 – Defence Supply Chain

As a process, the DSC spans numerous vertical organizations and with such a heavy investment of DND resources and owing to its critical role in CF capability, the cost of process sub optimization can be very costly and particular prone to performance shortcomings.[68] A strong SCM program would bridge the vertical stovepipes, establish a seamless horizontal strategy and ultimately lead to a robust and dynamic supply chain that is operationally relevant and cost effective. Unfortunately, it is a double-edge sword. The size and complexity of the DSC offers significant SCM potential but by the same

[68] Logistics and SCM are particularly prone to suboptimization. Pagonis and Cruikshank, *Moving Mountains*…, 215.

measure, size and complexity in the absence of directed transformation leadership will be a major change management obstacle.

One of the first challenges as it relates to developing an end-to-end process architecture is the ability to define the DSC customer. Supply chain and value chain theory are almost fanatical about the role of the customer and yet, the previous overview of the DSC process failed to even mention a customer. In fact, the notion of a DSC customer is worthy of a brief analysis and serious consideration for the future SCM transformation. In short, the DSC has never given much serious thought to the concept of a customer driven supply chain.[69] This does not mean that there aren't DSC customers, in fact, quite the opposite is true. Various classes of customers depend on the DSC for various commodities and services including fuel, ammunition and procurement services. One reason for the lack of customer focus stems from a major flaw in the organizational design, the other stems from the broad range of customers being served by the DSC. In this context, the DSC is actually a culmination of multiple sub-supply chains and technically, every member of the CF is a customer of the DSC, including those employees charged with managing and controlling the DSC itself. For example, clothing stores is a sub-process of the DSC that provides military clothing to every single member of the CF including the employees that work there. It is this ubiquitous nature of the DSC customer along with the collation of multiple sub-supply chains that presents many SCM challenges, not the least of which is the ability to discern what value needs to be designed into the DSC.

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[69] The three Auditor General reports span 20+ years of observing sub-standard supply chain service delivery. Auditor General, *Support for Overseas Deployments*…(2008), 10; Auditor General, *Materiel Management*…(1996), 16; and Auditor General, *DND – Materiel Support* (1987), 19.

The current process design flaw of the DSC is that it is structured and managed as a one-size fit all process with very little customer emphasis.[70] While this may prove to be a very efficient concept, the performance failings reported by the OAG would suggest this approach is failing to meet the value propositions of the war fighter who is far more concerned with performance effectiveness. The result is a DSC that is increasingly distancing itself from its operational relevancy to the CF.[71]

In accordance with the first core SCM discipline, the DSC must start its SCM journey with a soul-searching exercise of determining the strategic relevancy of the DSC to the CF. Since the DSC is comprised of multiple sub-processes, it would stand to reason that certain sub-processes might be more relevant to the strategic agenda than others. From a CF perspective, the relevancy of the DSC hinges heavily on its ability to contribute to the fighting force capability of the CF (see Figure 1.2) and it is here that the DSC needs to focus its process design efforts. On the surface, owing to the nature of military operations, speed and reliability would be the foremost DSC design considerations and run consistent to the current objectives of US military SCM initiatives.[72]

It therefore follows that the DSC must derive its value from the requirements of the war fighter and for the purpose of continued relevance and credibility; the DSC must invest the time and effort necessary to understand the current and ongoing needs of its

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[70] The three Auditor General reports cited in this paper consistently report dismal levels of supply chain service. *Ibid*.

[71] Henry E. Eccles discusses the risk of logistics losing its relevancy to the military imperative under civilian run control. He also addresses the risk of the other extreme of having too much operational focus. Striking a balance is key. Eccles, *Logistics in the National Defense*, ???

[72] For examply, the US Army envisions a "…leaner, faster, reliable, accurate and affordable" supply chain. J. Dumond, M.K. Brauner et al., *Velocity Management*…, 3

principle customer base if in keeping with the core philosophy of SCM.[73] Repeated Auditor General (AG) observations cite numerous examples where the DSC is failing to deliver to the set service standard and specifically with respect to the delivery of high priority requirements, both the 1987 AG report and the 2008 AG report demonstrate a longstanding period of consistent appalling performance.[74] This translates into a period of more than twenty years where the DSC has failed to meet the fundamental requirements of its only customer. Imagine putting this into a corporate context. "In today's world there are two kinds of companies: the quick and the dead."[75] Working in the highly fractionalized structure of the DSC, it is all too common for aggregate requirements such as end-to-end service delivery to fall through the cracks.[76] SCM transformation must, at the very least, put a renewed emphasis on the end-to-end service delivery and overall effectiveness as a matter of critical operational revival.

The next major shortfall of the DSC process is the ability to find it defined or described anywhere within the department. The second core discipline requires a comprehensive process architecture that links customer, value-chain and process enablers towards the effective delivery of supply chain service. A search on the Departmental Wide Area Network (DWAN), DND's intranet, produces a discouraging return when 'supply chain' is entered into the search field. In fact, you will be hard pressed to find

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[73] Satisfying the customer is the overriding process that directs all activities. P.P. Dornier, R. Ernst, M. Fender and P. Kouvelis, *Global Operations and Logistics* (Hoboken: John Wiley and Sons, Inc., 1998), 12.

[74] Auditor General, *DND – Materiel Support*, 19; and Auditor General, *Support for Overseas Deployments*…, 10.

[75] Stated by L. Dunlop, Turnaround Specialist and CEO of Sunbeam Corp. Beamish and Woodcock, *Strategic Management*, 5th ed, McGraw-Hill Ryerson Limited, 1999, 105

[76] Hammer and Champy, *Reengineering the Corporation*, 64

any departmental document or policy that clearly articulates or defines the overall DSC process as described in Figure 1.3 or even at all.[77] Furthermore, it is a major challenge to attempt to navigate the various terms and definitions that DND employs to describe the DSC process and its component sub-processes. As already mentioned, the confusion begins with the repeated and continual interchange of logistics and supply chain.[78]

Unfortunately, the confusion doesn't end here. DND employs a variety of supply chain related terms that overlap, attempt to envelop, amplify and even mean the same thing. It is difficult enough to understand the whole of DND's value chain and the wide variety of SCM related terms makes for a confusing understanding of the process architecture. The list of terms commonly used looks something like this: supply, supply chain, big 'L' logistics, little 'l' logistics, integrated logistics support, materiel management, inventory management, materiel acquisition and support, sustainment, support and replenishment to name just a few.[79] Adding further fuel to the confusing process architecture is the mix of a military Logistics Branch comprised of several formal sub-occupations including the Supply Technician and the Supply Officer who can work in or out of the DSC process. Other trades such as the Traffic Technician and the Mobile Support Equipment Operator are heavily employed in the DSC process but by virtue of

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[77] The Canadian Forces Supply Manual describes bits and pieces of the functioning of the DSC but fails to meet the process architecture criteria specified in the second core discipline. *Canadian Forces Supply Manual.*

[78] See Dr. Stephen Hays article for an attempt to dissect the difference between logistics and supply chain. Unfortunately, there are as many examples of complete overlap of terms as there are attempts to distinguish. An older textbook on the fundamentals of Logistics Management will look almost identical to any modern day textbook on Supply Chain Management. See Lambert, Stock and Ellran on the topic of logistics and then compare with Chopra and Meindl on SCM for an almost identical comparison of the two concepts.

[79] Pulled from a variety of policy and procedure documents found on the DND Departmental Wide Area Network (DWAN), accessed 14 March, 2009.

their occupational title, are more closely tied to their sub-culture such that any attempt to subsume these occupations into a 'supply' process would meet with deep seeded resistance.[80] Logistics, as a possible alternate term of choice, is too closely tied to the branch name and encompasses other occupations such as Finance Clerks and Cooks that fall outside the traditional purview of a supply chain.[81] It is not the intent of this paper to filter through this long list of terms and offer a solution of definitions, suffice to suggest that a major hurdle in the path to SCM enlightenment is arriving at a common understanding of the process architecture and the proliferation of DND employed terms is dizzying to even the most informed SCM practitioner. This needs to be a major point of initial SCM focus. "Most controversies would soon be ended, if those engaged in them would first accurately define their terms, and then adhere to their definitions."[82]

A final hurdle in the quest to define the end-to-end process architecture is the ability to avoid the all too common management practice of mistakenly allowing the capabilities and limitations of technology to shape the underlying process rather than allowing the process to lead technology.[83] The Canadian Forces Supply Manual (CFSM) is the "definitive source for Canadian Forces materiel management policy and procedures," and perhaps the closest resemblance to the presence of an existing DSC

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[80] The concept of service rivalry impeding logistics cooperation is discussed by Eccles, *Logistics in the National Defense*, 259.

[81] Finance and Resource Management are not typically contained within any of the textbook definitions of logistics or supply chain. See Chopra and Meindl, *SCM*…, 6.

[82] Quoted from renown theologian, Tryon Edwards, http://www.brainyquote.com/quotes; Internet; accessed 13 March, 2009.

[83] Cohen and Roussel, *Stategic SCM*…, 49

process architecture.[84] Unfortunately, the prominence of the process is quickly discarded in the opening paragraphs where the formal objective of the CFSM is stated as being twofold:

> a. to promulgate the policies, procedures and guidelines required to direct the operation of the CFSS,
> b. to provide detailed instructions for the use of the CFSS and MIMS applications.[85]

The CFSS is the Canadian Forces Supply System and the backbone information system of the DSC. The purpose of the CFSM as a general supply policy manual as compared with the formally stated objectives of being a CFSS user-manual is an immediate indication that the supply chain process has been overtaken by its supporting technology.[86] In effect, technology is supposed to be an enabler of the process (refer to Porter's Value Chain, Figure 1.1) and not the process itself. The CFSM is entirely system-centric, much akin to a 'CFSS for Dummies,' and as a result, there is little delineation between the all-important process and the enabling system. This is a rather common pitfall that befalls many in the commercial sector who allow technology to lead their process rather than the process leading the technology.[87] The DSC has all but forgotten its foundational process and as a result, management has fallen into the costly trap of trying to chase down purely technological solutions for what are inherently

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[84] Quote pulled directly from the cover of the manual. *Canadian Forces Supply Manual.*

[85] *Canadian Forces Supply Manual*, 1-1A-002.

[86] The 1987 Auditor General report identified the fact that technology was driving doctrine rather than doctrine driving technology. In 2009 parlance, doctrine and process could be interchanged. Auditor General, *OAG Report – Materiel Support*, 9.

[87] Cohen and Roussel, *Strategic SCM*…, 126

process problems.[88] In fact, "layering new sophisticated information systems on top of weak processes is likely to make things worse."[89] This common pitfall will require a critical first phase of defining the end-to-end process architecture including the painful separation of materiel policy from supply chain process from CFSS procedure.

As demonstrated, the ability to generate an end-to-end process architecture will be met with significant challenges (see table 1.3). The proliferation of supply chain and process terms can largely be attributed to a DSC attempting to impose its process design atop an organization largely segregated by its sub-cultures. The result is that organizations and departments subtly avoid the use of certain words and conveniently adopt others as the collision of politics and cultures prevent fundamental definitions from becoming mainstream. Confusion of value-chain responsibilities and the lack of a unifying focus is the result and a major obstacle in the SCM journey becomes the ability to integrate these competing forces into a cohesive single-process focus.[90] In the absence of a customer focus and without a clearly defined process architecture, SCM transformation will require the vital step of properly defining the customer and then working backwards to determine how the current process is measuring up to the DSC requirements. The journey begins with a clear understanding of the terms being used and

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[88] Recent IT initiatives impacting the DSC include: Distibuted Resource Planning (DRP), Personal Data Entry Terminals (PDET), Radio Frequency Identification (RFID), Materiel Acquisition and Support Information System (MASIS), Defence Total Asset Visibility (DTAV), the Information Exchange Initiative (IEI) and a next generation supply system. Information accessed from various DWAN sources on 13 March, 2009.

[89] Cohen and Roussel, *Strategic SCM*…, 238

[90] Integrating mechanisms is the term used by Porter to describe the various ways and means of bridging the functions and sub-cultures that comprise a horizontal value-chain. Porter, *Competitive Advantage*…, 49.

significant effort will have to be invested in breaking down some of the existing occupational and organizational barriers.

Table 1.3 – Second SCM Core Discipline

SCM Core Discipline	DND Analysis
2. Construct end-to-end process architecture	• No customer focus • Extremely complex • No defined process • Confusion of processes and terms • Presence of strong sub-DSC cultures • Supply system has replaced the process

The third core SCM discipline is focused on designing the organization for performance. This is perhaps the single greatest shortfall of the existing DSC with spillover effect onto each of the other disciplines. Arguably, it is the root cause behind the longstanding failings in DSC performance. It will be the focus of considerable analysis and must take center stage in the SCM transformation effort. Porter stated that a company's "value chain and the way it performs individual activities are a reflection of its history…"[91] Therefore, to understand DSC's value chain is to understand the evolution of the present day form of the DSC.

Prior to the unification of the CF, each of the army, navy and air force owned some form of a materiel command responsible for what would today be considered a supply chain. In those days, each commander owned their logistics and according to Henry E. Eccles in *Logistics in the National Defense*,

> "The commander must control his own logistics, it is a matter of critical importance. The commander has the task of fighting. He, therefore, has the right to say what logistics resources he needs to fight – requirements – and how he will allocate and distribute to his subordinates the resources his superiors give him to fight –

[91] Michael Porter, *Competitive Advantage*…, 36.

> distribution. By his control of distribution he exercises his responsibility to see that these resources are actually delivered at the right time and place to the subordinates who will use them in the accomplishment of the tasks he has assigned." [92]

In today's parlance, Henry would have said that the commander must control his supply chain and his rationale premised on the importance of controlling requirements and the emphasis of mission focus would continue through to today. The supply chain is a critical strategic enabler of military forces and as such, its principle design objective must be the delivery of effective, mission-focused support to the war fighter.

Unification of the services resulted in a centralization of the materiel support system into a single supply system and importantly, control of support operations shifted from the operational commanders into the hands of National HQ and civilian officials.[93] The change was effected in an effort to achieve efficiencies through the collapse of individual materiel commands and the centralization of ownership.[94] Efficiencies came as expected but it also came at a price.[95] The OAG observed in 1987 that the centralization of materiel services had lead to an erosion of support doctrine and systems that lacked the flexibility of field operations.[96] The OAG further reported that complete centralization was not practical and that the transition of strategic support to the operational commands was not clear.[97] Despite a long history of logistics being

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[92] Eccles, *Logistics in the National Defense*, 208.

[93] OAG Report, *DND – Materiel Support*, 6

[94] The concept of centralization leading to increased efficiencies has long been a central tenet of logistics and supply chain strategies. P.P. Dornier et al., *Global Operations and Logistics*, 425.

[95] Canada, Department of National Defence, Minister of National Defence, *Task Force Report on Review of Unification of the Canadian Armed Forces* (15 March, 1980), 42.

[96] Auditor General, *DND – Materiel Support*, 6

inextricably linked to the successes of commanders in battle, unification and the separation of logistics from the commander would subtly, over time, shift the emphasis away from the effective support of combat operations to increasing the efficiency of the supply chain under peacetime conditions. Observations from several OAG audits over the years would continue to report on the operational shortcomings of the DSC and attributed much of the cause to a polarization of support in NDHQ such that it "inhibited the integration of logistics with operations throughout the chain of command."[98]

In 1987, the OAG reported that as a result of the unification the CF, there has been a drastic decline in support doctrine, the materiel systems are centered on peacetime requirements to the neglect of operational requirements, DSC performance is unsatisfactory for times of conflict, operational stock visibility is non-existent, and there is little to no attempt to measure either the effectiveness or the efficiency of the DSC. Furthermore, it highlighted the unclear lines of responsibility and a notable absence of total DSC ownership and therefore, a resulting lack of strategic direction.[99] The 1990's brought delegations and downsizing to DND and the DSC became the brunt of a number of cost-saving initiatives.[100] The noted absence of clear lines of DSC responsibility in the 1987 OAG audit would pale in comparison to the subsequent audit of Materiel Management in 1996. On the heels of a number of devolution initiatives, the OAG reported in 1996 that the "essential elements of an accountability framework are

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[97] *Ibid*., 6

[98] *Ibid*., 7.

[99] *Ibid*., 7.

[100] A long list of the 1990's downsizing initiatives is recapped by Vice-Admiral Gary L. Garnett in "The Flag and General Officer as a Resource Manager," in *Generalship and the Art of the Admiral*, Edited by Bernd Horn and Stephen J. Harris (St. Catherines: Vanwell Publishing Ltd, 2001), 470.

missing," as a result of a policy and management framework with out-of-date or not clearly articulated roles and responsibilities. [101] Furthermore, the audit again recommended the use of performance measures to increase accountability and most notably, the audit stated that many of the reported deficiencies had been in existence since at least 1980 when the first audit of this area was conducted.[102] Fragmentation of the DSC had reached its pinnacle and in the absence of clear lines of responsibility, ownership of the problem was fragmented across the department such that no one organization or individual had the requisite authority to take the reigns and mount an offensive management cleansing to right-size the DSC.

Further departmental initiatives aimed at achieving efficiencies continued to chip away at the DSC and the Environmental Chiefs of Staff (ECS), the commanders who had been separated from their logistics at unification, were helpless in their individual ability to counter any of these attacks. The introduction of a Supply Chain Project (SCP) in 1997 marked the start of a decade of darkness for the DSC and represented just how far the peacetime mindset had permeated the DSC.

The SCP was an initiative generated from the Defence Management Committee (DMC) in October 1997 to contract out the whole of the DSC to industry in an effort to achieve annual recurring savings of $71M.[103] The ECSs rallied and the union rallied to defeat the initiative and after completing phase I of the initial SCP contract, on the 7th of

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[101] *Ibid*., 470. DELEGAAT was a major 1990 departmental initiative that devolved responsibilities down through the levels of command.

[102] OAG, *Materiel Management*…,16.

[103] Canada, Department of National Defence, *Request For Proposal – Supply Chain Project*, 700ZZ.W0159-0-AA01/D (2000), 19.

November, 2002, the department chose not to proceed with phase II.[104] In its place, the department turned to ADM(Mat) and accepted an in-house counter-proposal that would allow the DSC an opportunity to achieve similar savings in-house. An initial planning session was organized in Cornwall, Ontario where, on the heels of a perceived SCP victory, rejuvenated DSC members from around the CF descended for a 3-day crash working group to brainstorm a collective solution. The fear of a contracted solution had motivated DSC members to, at least initially, ignore the organizational and cultural barriers that had previously paralyzed the DSC and now hope overcame frustration as members seized a long awaited opportunity to right size the DSC. Optimization, "an act, process or methodology of making something as fully perfect, functional, or effective as possible," became the word of focus as members rolled up their sleeves in an effort to improve the DSC while at the same time seek to achieve targeted savings.[105] A general plan-of-attack was struck in Cornwall and members retreated to their organizations for the eagerly anticipated transformation to follow.

Hope of DSC transformation soon clashed with a fiscal reality. The project had been given a three year mandate to achieve the efficiency target of $45M in recurring annual savings.[106] Despite the 'optimization' emphasis in the project title, the articulated aim of the project quickly dispelled any misconceptions of the ultimate raison d'etre, to

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[104] The ECS fought collectively based on civilianizing the DSC and the perceived risk to operations. The unions fought against the inevitable loss of jobs to achieve the savings target. Source is the author's personal experience on working with the project while posted to 1 Canadian Air Division.

[105] Definition taken from the online Merriam-Webster Dictionary; http://www.merriam-webster.com/dictionary/optimization; Internet, accessed 15 March, 2009.

[106] Canada. Department of National Defence. *Synopsis Sheet – Effective Project Approval* (Materiel Acquisition and Support Optimization Project, ADM(Mat), March, 2003), 4.

achieve a "cost effective and efficient Materiel Acquisition and Support (MA&S) process that supports force generation and sustainment."[107] Note the very clear emphasis on cost effectiveness and efficiency. The project staff struggled to fit optimization efforts inside of savings initiatives but with a limited three-year window, MASOP had little choice but to focus on pure dollars and cents. MASOP went on to achieve respectable efficiencies but at project termination, most of the optimization work went unfinished.[108] In the end, the DSC was still lacking a suitable, or arguably any accountability framework and all of the OAG observations, including a number of major performance shortfalls, would continue to haunt the DSC.[109]

MASOP highlighted one very vital lesson for any future DSC design transformation aspirations. The separation of the functional DSC process authority from the DSC resource authority would forever render the DSC into a permanent state of management paralysis unless the strategic objectives of both authorities were better aligned. The DSC process authority vested in ADM(Mat) was of little significance when the DSC resource authority was predominantly dispersed across the ECS' (see Figure 1.3). MASOP would visibly demonstrate what years of Auditor General observations supported; the ECS' as end customers of the DSC were starved for a process optimization transformation while the process authority was focused on peacetime efficiencies. As a

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[107] Ibid., 4.

[108] The MASOP recurring annual savings target was $47.3M, upon project close-out, MASOP had achieved $39.2M in recurring DSC savings. Article sourced from the Canadian Institute for Procurement and Materiel Management website, Canadian Institute for Procurement and Materiel Management; Internet, accessed 28 March, 2009.

[109] The 2008 Auditor General report of Support for Overseas Deployments observed that less than 10 per cent of op critical items were received in Kandahar by the required due date. The 1987 Auditor General report of Materiel Support cited eerily similar performance shortcomings. In the end, it is questionable just how much 'optimization' had been acheived.

result, performance of the DSC had stagnated for almost thirty years. [110] Understanding the nature of this stagnation is the key to unearthing a design solution to the third core SCM discipline of designing the organization for performance.

The nature of the dueling cross-purposes working against the DSC is a direct product of the existing strategic organization design. Currently, all of the policy and process making authority resides with the ADM(Mat) who works for the Deputy Minister. On the other side of the fence, a majority of the DSC resources fall under the ECS' and Canadian Operational Support Command (CANOSCOM) who both work for the Chief of Defence Staff (CDS). At the highest level, the DM holds DSC authority but it is the CDS who owns the DSC resources. It is here that the fundamental clash between DSC effectiveness and DSC efficiency takes its root.

First, it is important to present the distinction that DND and the CF are two separate entities in law and that the DM is the public servant head of DND while responsibility for the control and administration of the CF belongs to the CDS.[111] While many of the duties and responsibilities between the CDS and DM are not clearly delineated, the DM has responsibility for the audit and accounting of departmental resources while the CDS is solely responsible for the missions and members of the CF.[112] Therefore, mission effectiveness is naturally a paramount concern for the CDS while stewardship and efficiency of publicly allocated resources are the principle objectives of

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[110] The major shortcomings of the DSC can be traced back to a 1980 OAG audit referenced in the 1996 OAG audit. In all likelihood, the shortcomings existed prior to the 1980 audit but sticking to the facts, 1980 marks the first traceable account of the major DSC problems.

[111] Douglas L. Bland, *Chiefs of Defense: Government and the Unified Command of the Canadian Armed Forces* (Canadian Institute of Strategic Studies, Brown Book Ltd, 1995), 154.

[112] *Ibid*., 155.

the DM. The fact that DSC authority resides under the DM while DSC execution occurs under the CDS results in the competing DSC process objectives evidently demonstrated during MASOP.[113]

The victims in this clash of objectives are the men and women charged with executing the DSC process who, as members of the CF, are motivated by mission focus and effectiveness but subject to the process authority of the DM, find themselves bound by a DSC designed on a premise of peacetime efficiency and resource stewardship.[114] This clash of objectives was witnessed first hand by the OAG who reported in its 2008 audit of *Support for Overseas Deployments* that effective supply chain performance is "often achieved more by military personnel's concerted efforts than by the system's design."[115] Frustrated by the ineffectiveness of the process, DSC practitioners are forced to improvise and 'cut corners' as they struggle to keep pace with a CF focused primarily on effective mission support. Such employee frustration does not translate well into a positive retention strategy. Interestingly, the US DoD has recognized the frustration brewing within its version of the DSC and cites employee retention as a major risk of not moving quicker on their logistics transformation efforts.[116] Arguably, frustrated by thirty years of neglected DSC performance and in light of current CF retention struggles, a major overhaul of the DSC might renew a lost sense of operational relevancy and purpose

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[113] *Ibid.*, 156

[114] SCM theory has long held true to the belief of efficiency or effectiveness but not both. Only more recently has industry awakened to the lesson that the two can, in fact, occur simultaneously. Russell, *SCM*…, 60.

[115] Auditor General, *Support for Overseas Deployments*…, 8.

[116] US DoD, *Logistics Transformation – Phase II*, 16.

in DSC members. Increasing DSC job satisfaction translates into a positive personnel retention strategy and as such, the need for SCM transformation is further amplified.

Understanding how a DM controlled DSC can lead to ineffective support lends further credence to the original assertions of Henry E. Eccles that "economy (efficiency) should not prevail in logistics planning," and that "a commander must control his logistics."[117] A DSC with such vital ties to the war effort and the national strategy cannot afford the performance paralysis of the current design; it clearly requires a stronger mission-focus in order to maintain relevancy, effectiveness and assured CF success.

Before moving on from the third core SCM discipline, there is another critical component of organizational design that needs to be considered as it pertains to the DSC. The concept of a DSC has been utilized throughout this paper but the term implies the existence of a formal organization that is resourced, managed and operated as a single organizational entity. As a single entity, it would further be implied that there is an element of strategic management as well as many of the other essential elements that accompany a well-managed supply chain such as a continuous improvement capability, a performance measurement framework (PMF) and a customer relations cell.[118] Most important of all, it would imply that there is a process owner at the helm of the DSC. In fact, the DSC is formally comprised of none of these fundamental SCM elements. The DSC is merely a governance structure comprised of most of the organizational stakeholders found in Figure 1.3. It is principally governed via committee management with DGMSSC sitting as the chairperson. Even the DGMSSC position itself is not

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[117] Eccles, *Logistics in the National Defense*, 261.

[118] OAG reported that no one group is responsible for providing strategic direction for the total system. Auditor General, *Materiel Support*…, 18.

principally focused on the leadership or management of the supply chain. In fact, nestled in ADM(Mat), DGMSSC is bound to the higher priorities and responsibilities of ADM(Mat) and in order to understand the complexity of a DGMSSC chaired DSC, it is important to understand the ADM(Mat) organization as the dominant DND entity housing most of the DSC authority.

Referred to as the Materiel Group, the ADM(Mat) organization is the "single, central service provider and program authority for materiel for the CF and the Department. ADM(Mat) is accountable to the DM for materiel's full life cycle – from acquisition, through maintenance and support, to disposal."[119] Arguably, the materiel life cycle is a process much like a supply chain but importantly, it does not have a customer focus. Instead, the focus of a materiel life cycle is the intrinsic ability of the department to manage and account for a piece of materiel during its existence in an organization.[120] Meanwhile, the main focus of a supply chain is to meet or exceed the materiel requirements of its customers.[121]

The distinction of processes is extremely important for the whole of ADM(Mat) is centered on this concept of the materiel life cycle. For example, efforts to improve the departmental materiel life cycle are not the same in focus as efforts to improve the effectiveness of the DSC. The materiel life cycle speaks to accountability and is more closely associated with the role of the DM as the departmental resource steward while the

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[119] ADM(Mat) intranet home page, http://admmat.ottawa-hull.mil.ca/en/index_e.asp; DWAN, accessed 13 February, 2009.

[120] From the point of acquisition to the point of disposal. Blanchard, *Logistics Engineering and Management*, 15.

[121] Cohen and Roussel, *Strategic SCM*…, 20.

DSC speaks to operational effectiveness and is more closely associated with the role of the CDS and the primacy of mission focus. The use of materiel life cycle management by the ADM(Mat) is merely a reflection of his place within DND and his corresponding accountabilities to the DM. The major deduction to be made is that immediately, without delving into the specifics of individual directorates or policies, the focus of effort from above DGMSSC is clearly articulated towards the life cycle of materiel versus effective supply chain support to the CF. In this regard, a DGMSSC chaired DSC demonstrates another example of how the supply chain is poorly designed for performance.

Secondly, ADM(Mat) is the principle organization responsible for the acquisition and introduction of major capital equipment into the CF. This is the critical first sub-process of the DSC where many supply chain decisions are made that will have far-reaching impact on the subsequent stages of the supply chain. Unfortunately, within the life cycle process, acquisition takes centre stage as the main and often only focus of senior Materiel Group attention.[122] However, the ability to reap the benefits of SCM requires a strict adherence to the SCM philosophy of an end-to-end process view. The major point is that senior Materiel Group perception is bound by defence acquisition as the primary, and possibly for many, the sole purpose of the organization.[123] This limited perception both inside and outside of ADM(Mat) will prevent the overall effectiveness and efficiency of the entire DSC to ever be fully attained. The point is not to be lost, the culture of ADM(Mat) is centered on acquisition and life cycle management, not SCM.

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[122] A common pitfall of many companies is to emphasize procurement over end-to-end process. *Ibid*., 124.

[123] The CDS Action Team 4 observed that acquisition has been a top priority with ADM(Mat) for some time and a read through the team's recommendations makes it abundantly clear that the focus and perception of ADM(Mat) is acquisition not supply chain. *Enabling Transformation: CDS Action Team 4 Report.*

Designing the DSC for performance may be a challenging endeavour in light of the existing ADM(Mat) authority position and the lack of a broader supply chain focus. This will have to factor heavily in the SCM transformation program.

This higher level Materiel Group overview sets the stage for the role of the Director General Materiel Systems and Supply Chain (DGMSSC), previously introduced for its role in the MASOP project. Despite the presence of supply chain in the title, confusion immediately ensues with the stated purpose of the organization, "to manage the Materiel Acquisition and Support (MA&S) framework to optimize the delivery of materiel and operational support to CF operations and departmental activities."[124] Materiel Acquisition and Support (MA&S) is a term unique to DND, and more specifically ADM(Mat), that combines the acquisition sub-process with the life-cycle support process to arrive at distinct MA&S process. MA&S is defined in the Defence Administrative Orders and Directives as the acquisition, support and disposal of the materiel component of a defence capability.[125] In a memorandum signed by the ADM(Mat) on 9 January, 2009, the description of the MA&S process is described as including the procurement of goods and services, materiel management and materiel related support.[126] There are subtle but tangible differences between the two descriptions and the different definitions merely demonstrate how the proliferation of terms is

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[124] ADM(Mat) website; http://admmat.ottawa-hull.mil.ca/en/index_e.asp; DWAN, accessed 13 March, 2009.

[125] Canada. Department of National Defence. Defence Administrative Orders and Directives 3000, MA&S, http://admfincs.mil.ca/admfincs/subjects/daod/3000/0_e.asp; DWAN, accessed 13 March, 2009.

[126] Dan Ross, FY *09/10 Materiel Acquisition and Support Functional Assessment* (Associate Deputy Minister – Materiel: file 1948-1, DMGSP 3-3, 9 January, 2009), 2.

impeding a common understanding of the process and moreover, presenting a formidable challenge when attempting to delineate respective organizational responsibilities and accountabilities.

Within DGMSSC, the Directorate of Materiel Policy and Procedures (DMPP) is the heart of DGMSSC as it pertains to the DSC (see Figure 1.3). DMPP, in accordance with its website, is the MA&S process custodian, ensures MA&S policies and procedures are maintained, is the developer of MA&S training, determines the IM requirements for MA&S, develops the MA&S governance structure, develops the MA&S accountability framework, acts as the focal point for MA&S strategic planning and develops and supports acquisition and procurement reforms.[127] There is a hefty amount of responsibility contained in these words and basically, it denotes the functional authority of ADM(Mat) as recognized in the functional accountabilities matrix of Defence Administrative Orders and Directives 1000-0.[128] Essentially, DMPP is the developer and maintainer of the policies, procedures, training and system requirements for the MA&S process.[129] DMPP is further sub-divided into functional sub-directorates, each with respective authority over their portion of the MA&S process.

Despite the term 'supply chain' in the title of DGMSSC, there is a noticeable absence of the term anywhere within the functional authorities of DMPP. Arguably,

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[127] ADM(Mat) website; http://admmat.ottawa-hull.mil.ca/en/index_e.asp; DWAN, accessed 13 March, 2009.

[128] Canada, Department of National Defence, Defence Administrative Orders and Direction 1000-0, http://admfincs.mil.ca/admfincs/subjects/daod/intro_e.asp; DWAN, accessed 13 March 2009.

[129] Responsibility for IM requirements has recently shifted to a separate directorate within DGMSSC but at the time of this writing, the responsibility was still reflected in DMPP. The DGMSSC website lists a Director Materiel Systems Plans and Requirements (DMSPR) but no link is yet provided. ADM(Mat) website, http://admmat.ottawa-hull.mil.ca/en/index_e.asp; DWAN, accessed 13 March, 2009.

much of DSC authority is diffused through each of the respective DMPP sub-directorates but the onus is clearly on the materiel life cycle vice an end-to-end supply chain. In a January, 2009, memorandum actioning all of DND, ADM(Mat) outlined his priorities and issues for the Horizon 1 planning period.[130] In this memorandum he states unequivocally the intent to tighten materiel management accountability throughout the department, where "Materiel Accountability is defined as the ability to demonstrate sound stewardship of the materiel resources entrusted to the DND/CF from acquisition, through in-service support, to disposal."[131] Referring to an earlier point, Materiel Group is clearly driven by an extremely important role within the DM organization as the departmental resource steward, a role that focuses on materiel accountability, materiel policy compliance and materiel resource efficiency. If there is to be a shift in the current DSC emphasis, the question of appropriate process ownership, a fundamental tenet of designing an organization for performance, will need to be addressed.

Moving away from the Materiel Group, there is one DSC stakeholder as a new DSC stakeholder that requires an important organizational design consideration before moving onto the forth SCM discipline. "With the goal of establishing a single focal point for all CF operational support at the national level," Canadian Operational Support Command (CANOSCOM) was created as the last jewel of the new organizational mix resulting from *CF Transformation.*[132] The CDS outlined the key tasks of CANOSCOM:

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[130] Ross, MA*&S Functional Assessment*, 1-3.

[131] *Ibid.*, 3.

[132] Canada, Department of National Defence. Lieutenant General R.R. Crabbe, Vice-Admiral L.G. Mason and Lieutenant General F.R. Sutherland, A Report on the Validation of the Transformed Canadian Forces Command Structure (31 January, 2007), 50.

> a. to coordinate the generation of task-tailored operational support organizations for employment in theatre activation and opening, operational sustainment and mission closeout.
>
> b. to support the operational commanders in planning and preparing for operations, including the execution of operational support at the national level.
>
> c. to reach back and coordinate the provision of national and strategic support.[133]

As it pertains to the DSC, the strategic service-delivery arm of the DSC formerly belonging to ADM(Mat) was formally transitioned to CANOSCOM and collectively organized under the Canadian Materiel Support Group (CMSG).[134] Predominantly an operations-focused command, the key task from the CDS of 'execution of operational support at the national level' leaves one very important foot in the front door of the DSC process. This explicit task refers to CANOSCOM's new ownership of the two national depots and strategic distribution operations that are now in the hands of CMSG as the heart and soul of the DSC process.

On the surface, it would appear as though the creation of CANOSCOM would be a major step towards the commander, in this case the CDS, having "control of his logistics." Unfortunately, upon closer inspection, the verbs used in the list of key responsibilities; coordinate, support and reach, do not invoke any real sense of DSC authority. In fact, ADM(Mat) still retains full functional authority for all MA&S policy, procedures, process and system requirements, and somewhere interwoven among the MA&S framework resides the implicit underlying DSC authority. So while the

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[133] Canada. Department of National Defence. CDS Organization Order – Canadian Operational Support Command (CANFORGEN 013/06 CDS 009/09 011330Z Feb 06), 1.

[134] *Ibid*., 2.

Commander, in this case the CDS, may now physically own his logistics, he possesses little of the functional authority to effectively control them. As a simple example, if either of the two national depots devised a new and improved process for performing the very onerous task of counting warehouse inventory, CMSG would be forced to funnel its requirements into DGMSSC for consideration, approval and implementation into formal procedure. If the Operational Support Logistics (OS Log) Cell within CANOSCOM devised a new and improved way to ship weapons into theatre, the revised process would have to be passed through DGMSSC as the MA&S process functional authority. The supply chain authority vacuum that exists in the CF lends directly to the Auditor General observation that support doctrine is eroding and that supporting information systems lack the flexibility of field operations.[135] Transformation of the DSC must address the current design of process authority.

The historical evolution of the DSC as a product of unification, devolution and downsizing has resulted in a critical force enabling supply chain to be split across a number of organizations and departments without any one person or organization at the strategic helm.[136] In the end, the current organizational design of the DSC is ill equipped to embark upon a major SCM transformation (see Table 1.3). DSC authority is diffused and poorly defined inside of a convoluted and confusing MA&S and LCMM organizational framework such that very little emphasis is placed on the overall end-to-end value chain. Furthermore, current DSC resources are separated from the DSC authority and a corresponding conflict in DSC purpose between effectiveness and

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[135] Auditor General, *Materiel Support*…, 6.

[136] The OAG reported the major absence of a single entity with responsibility for providing the strategic direction for the total system. *Ibid*., 18.

efficiency results in a process management paralysis. As a result, most DSC initiatives result in nothing more than the movement of deck chairs on a ship without a captain. The MASOP project summarized it succinctly; "MA&S activities are fragmented resulting in inefficiencies and ineffectiveness across National Defence."[137] Establishing a clearly defined process owner and matching DSC resources to DSC authority will be the essential and critical first step in the SCM journey.

Table 1.3 – Third SCM Core Discipline

SCM Core Disciplines	DND Analysis
3. Design organization for performance	• Focus exclusively on process efficiency • DSC authority and resources not aligned • DSC authority diffused across MA&S framework • No formal process ownership

The last two SCM disciplines deal with building the right collaborative model and the use of metrics to drive success. Both are extremely important horizontal strategies in the overall SCM concept but in the demonstrated absence of the first three disciplines, it hardly seems reasonable to expect much headway to be made on either of these last two fronts. However, the notable shortcomings with these remaining two disciplines will lend further credibility to the DSC design flaws and the need for a significant organizational redesign. Ultimately, all these major changes will culminate into the need for a complete DSC transformation.

The forth SCM discipline pertains to the construction of the right collaborative model. Similar to the Wal Mart relationship with Proctor and Gamble, this discipline requires that companies step beyond their traditional organizational construct in an

[137] Canada, Department of National Defence, *Project Management Plan – Implementation Phase* (Materiel Acquisition and Support Optimization Project, ADM(Mat), Version 5, July, 2004), 3.

attempt to define and then orchestrate the complete value chain starting from Mother Earth and flowing through to the end customer. For many companies, this value chain transcends their own organization and onto their suppliers and their suppliers' suppliers. As a result, companies are entering into inter-company partnerships in order to leverage process optimization opportunities across corporate portfolios. In essence, this concept merely takes the internal sub-optimization forces that exist within a company and attempts to extend this same concept across the mix of companies that form the whole of a value chain.

The challenge stems from managing the risk of multiple corporate cultures combining on a single process and importantly, attempting to apportion the total costs of a supply chain across the appropriate balance sheets of each participating company.[138] High-performing supply chains such as Dell's make-to-order concept would not be possible without embracing this collaborative approach to tackle the process delays that traditionally occur at the outer boundaries of an organization.[139] The collaborative model is predicated on a trusting relationship between the partnering organizations and a focus towards the longer-term strategic aims of each company. The concept is somewhat limited in practice inside of DND where government procurement regulations tend to frown upon the notion of long-term supplier relationships.

However, DND is making some collaboration headway with the ADM(Mat) introduced In-Service Support Contracting Framework (ISSCF) and Optimized Weapon

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[138] Supply chain costs are typically incurred all throughout the process while the revenue producing activity is not generated until the product is sold to the customer at the very end of the process. Chopra and Meindl, *SCM…*, 43.

[139] *Ibid*., 44.

System Management (OWSM) initiatives in an attempt to extend performance accountability for CF weapon systems out to the departmental suppliers.[140] There is little dispute over the fact that industry, in comparison to DND, is the front-runner in the field of supply chain management and that DND can potentially benefit from a collaborative supplier relationship. However, the ISSCF and OWSM initiatives are progressing independent of any strategic supply chain oversight and as a result, these initiatives will result in the potential outsourcing of the supply chains of several new major weapon system acquisitions including the new maritime helicopter and the new medium heavy lift helicopter plus existing weapon system capabilities such as the CF-18.[141] These initiatives have significant and longstanding DSC risks to the capabilities of future air power employment and yet, without strategic DSC presence, these initiatives surge unfettered from any form of major DSC accountability.

Not surprisingly, the ability to achieve any headway on this forth discipline is a direct consequence of not having the proper organizational design. If no one is at the strategic DSC helm then it stands to reason that any strategic collaborative SCM initiative will run the risk of not aligning to the strategic SCM requirements of the department (Table 1.4). No one is arguing that industry can't bring a significant amount of supply chain capability to the force employment capabilities of the CF, it is merely a question of ensuring that such initiatives do not compromise the longer-term core supply chain

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[140] ADM(Mat) website; http://admmat.ottawa-hull.mil.ca/en/index_e.asp; DWAN, accessed 13 March, 2009.

[141] For a full description of the OWSM SCM concept, see Andrew Genest, *CF-18 Supply Chain Management: Case for Action and Concept of Operations*, Report prepared by Harris Canada Inc. for Department of Public Works and Government Services Canada. Doc No CFA-TIES-6411, 30 March 2007.

competencies that were demonstrated to be so vital to the objectives of DND and the overarching national strategy.

Table 1.4 – Forth SCM Core Discipline

SCM Core Disciplines	DND Analysis
4. Build the right collaborative model	• DSC not strategically engaged in supplier collaboration arrangements

Establishing a strategic supply chain capability inside of a redesigned DSC would ensure that such initiatives were adequately scrutinized and more importantly, a strategic capability would be capable of exploring its own options of supplier collaboration to further leverage DSC performance. Ultimately, building the right collaborative model is directly linked to the presence of a forward leaning supply chain organization, already determined to be an existing and significant shortfall of the DSC.

The fifth and final discipline is one that is not particularly tied to SCM but applies in a more general context to all of industry. There is an old management adage that says, "you cannot manage that which you cannot measure," and this holds especially true for a boundary spanning supply chain. Porter predicates the success of his value chain theory on the ability of senior management to leverage interrelationship mechanisms for linking together all the functional pieces of an end-to-end value chain.[142] Properly applied, the use of metrics can serve as a very powerful linking mechanism to combat the sub optimization tendencies of most supply chains. Here again, the DSC falls short in its ability to deliver any form of tangible performance measures.

The Auditor General reported in 1987 and then again in its 1996 audit that the department had failed to institute any sort of broad performance measures in the

[142] Porter, *Competitive Advantage*…, 59

management of materiel and related support.[143] It further added that the establishment of performance measures would go a long way to increasing the degree of accountability currently lacking in these fields. Unfortunately, DND would not see the remnants of any performance measures until the arrival of MASOP and the crafting of a full Performance Measurement Framework (PMF) implementation plan.[144] PMF was clearly deemed to be an optimization component of MASOP and secondary to the cost saving considerations of the project. As a result, the final DSC PMF plan never saw the light of day and was eventually passed off to DGMSSC at project termination. Lacking the horsepower and suitable management prioritization, it wouldn't be until the summer of 2008 when the first stream, of a total of five, was finally rolled out as a pilot implementation.[145] The pilot was generally a step in the right direction but in many ways, without tangible and defined process authority, much of the benefit of introducing supply chain metrics will be slow to realize. Metrics were apportioned to each of the DSC stakeholders but in the absence of end-to-end process accountability, directed improvements across the stovepipes would be next to impossible to achieve (Table 1.5). Again, despite limited improvements that might be gained from a shotgun PMF implementation, full benefits will not be realized until the DSC is properly reorganized for performance in accordance with the third SCM discipline.

Table 1.5 – Fifth SCM Core Discipline

SCM Core Disciplines	DND Analysis
5. Use metrics to drive success	• Metrics limited: no end-to-end performance accountability.

[143] Auditor General, *Materiel Management*…, 5.

[144] MASOP, *Project Management Plan*, 6

[145] The author provided feedback on the initial stream of metrics being piloted.

The five core disciplines presented by Cohen and Russell serve as grounding upon which to assess the longstanding performance failings of the DSC and build the argument for the launch of a major SCM program (see Table 1.6). While the analysis flowed from the first core SCM discipline through to the fifth, certain of the core disciplines must logically precede others in an evolutionary SCM journey. Cohen and Russell offer little in the way of a step-by-step SCM implementation program but logically, organizational design is a critical enabler to the forth and fifth SCM discipline and logically, this must be the focus of considerable transformation attention. With that in mind, attention will now turn to the recommendations for a SCM transformation.

Table 1.6 – Summary of DND SCM Core Discipline Report Card

SCM Core Disciplines	DND Analysis
1. View supply chain as a strategic asset	• DSC is vital to CF strategic objectives • Strategic relevance of DSC not formally recognized by existing CF leadership
2. Construct end-to-end process architecture	• No customer focus • Extremely complex • No defined process • Confusion of processes and terms • Presence of strong sub-DSC cultures • Supply system has replaced the process
3. Design organization for performance	• Focus exclusively on process efficiency • DSC authority and resources not aligned • DSC authority diffused across MA&S framework • No formal process ownership
4. Build the right collaborative model	• DSC not strategically engaged in supplier collaboration arrangements
5. Use metrics to drive success	• Metrics limited: no end-to-end performance accountability.

The DSC is large and complex and while many of the transformation recommendations were hinted throughout the DSC analysis, it must be reemphasized that

SCM is as much a philosophy as it is a science. There is no one size fit all solution and importantly, "No military logistician believes that the Army's logistics system and process will ever be, or even should be, exactly like Wal Mart's." [146] SCM transformation cannot be a cut and paste exercise. While much of the commercial SCM components are directly applicable, there are distinct military requirements that prevent a blind adoption. Furthermore, while SCM transformation requires a fix of each of the core disciplines, the solution cannot ignore the fact that a DSC transformation is a major reengineering exercise that will require senior leadership engagement above the DSC. In addition, the fundamentals of any change management program must be a core consideration in the solution mix. Finally, there is much to be gained from the experience of other militaries that have already embarked upon the SCM journey, namely the US DoD. Therefore, lessons learned from the US DoD SCM experience will be introduced to highlight important considerations for the Canadian context.

The single greatest barrier to a departmental SCM transformation will be the ability to elevate the DSC to a point of strategic relevance within the department such that senior CF leadership is compelled to take action. In competition with other current CF priorities such as operations in Afghanistan, the upcoming Olympics, a force development review and ongoing CF recruitment and retention issues, it hardly seems reasonable that a commitment to DSC transformation would ever successfully hit senior management's radar.[147] The US military has wrestled with this very same issue and the lesson to be learned is that the need for senior leadership cannot be overstated.

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[146] Lieutenant Colonel Victor Maccagnan Jr., "Logistics Transformation – Restarting a Stalled Process," (US Army War College, January, 2005), 22.

The US DOD recognized that the inherent challenge of transforming a Cold War mindset of big infrastructure and predictable requirements coined by Lt. General Pagonis as the 'iron mountain' concept, would require nothing less than very senior leadership and a clear vision. In fact, it was recommended by the Under Secretary of Defense for Acquisition, Technology and Logistics (USD-ATL), the closest equivalency of the ADM(Mat) in Canada, that the "Secretary of Defense and the Chairman of the Joint Chiefs of Staff (CJCS) must personally lead the transformation effort for it to succeed."[148] In light of a very lofty vision statement that states that "DoD must have a logistics system that is equal to or better than the best-in-class global commercial logistics systems," and owing to the complicated boundary spanning process of the US supply chain, it is little wonder that senior leadership was deemed such a critical transformation requirement.[149]

The Canadian supply chain context is equally as complicated and despite being on a much smaller scale, it does not obviate the need for senior leadership to champion the cause. Reasonably, the case for action would likely have to unfold from the bottom-up as a convincing and SCM enlightened senior support officer to a well-positioned and influential senior commander with authority to drive the necessary change throughout the department. Interestingly, the US DoD SCM experience demonstrates how much of their SCM transformation efforts were driven from the bottom up as each of the services

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[147] The CF Transformation Review team highlighted that in face of current CF tempo, further transformation efforts should be delayed to the post-2010 Olympics Timeframe. Crabbe et al., *A Report on the Validation of the Transformed Canadian Forces Command Structure*, 60.

[148] US DoD, *Logistics Transformation – Phase II Report*, 7.

[149] *Ibid.*, 6

embarked upon their own supply chain initiatives.[150] Each service had their own distinct approach but in the end, they were all generally aimed at the same overriding goal of improving the performance effectiveness of the supply chain as a critical military capability.[151] Finally in 2003, the US DoD launched a high-profile overarching SCM program with the aim of synchronizing and leveraging the SCM successes of each of the services into a departmental wide SCM transformation.[152]

Departmental wide transformation would not have taken root without the concerted efforts of each of the individual services and, in turn, these services would not have sparked an SCM transformation without the presence of two principle igniters. The first is the fact that each of the service chiefs owned and controlled their logistics and the second stems from a relentless focus on mission effectiveness that generally prevails in any military organization. Each of the armed services had aptly recognized the critical role of the supply chain in effectively enabling its military capability and they eagerly embraced their SCM initiatives in an effort to greatly enhance the support to their war fighting capabilities.[153]

Unfortunately, from a DND perspective, there had long been a notable absence of a senior support officer ably positioned to influence senior CF leadership on support matters, let alone someone to speak to the specific need for DSC reform. This void of

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[150] Different from the CF, each of the US military services control their own logistics including much of what would traditionally comprise the ADM(Mat) responsibilities.

[151] The Army introduced High Velocity Logistics, the Marines called it Precision Logistics and the Air Force referred to their SCM program as Lean Logistics. See Maccagnan, "Logistics Transformation…," for a brief account of each initiative.

[152] The program was dubbed 'Sense and Respond' logistics. *Ibid*, 10

[153] Some of the more tangible objectives of logistics transformation amounted to the improvement of weapon systems availability by a target of twenty percent, reducing the commander's logistics footprint and at the same time, reducing overall support costs. Russell, "*SCM*…", 62

senior CF support leadership changed with CF Transformation and the introduction of Canadian Operational Support Command as the "…jewel in the Transformation crown."[154] The Commander of CANOSCOM reports directly to the CDS and while the organization's purpose isn't specifically centered on SCM, the transfer of the DSC's strategic supply chain infrastructure from ADM(Mat) to CANOSCOM presents an opportunity of having a convincing senior support officer in a position to influence a senior CF commander on matters of supply chain effectiveness. [155]

CANOSCOM is a relatively new organization and so it is still defining itself in terms of fit and form within the department. Aside from being suitably situated under the CDS, CANOSCOM presents a formidable and yet untapped supply chain opportunity. Unification brought the collapse of the individual support commands into a single supply system but importantly, the overriding change consideration at the time of unification was the concept of centralization and the resultant efficiencies that would derive from the economies of a single supply system. The fact that this authority was placed in the hands of 'National HQ' was a product of opportunity in the sense that National HQ was non-service affiliated and capable of providing a suitably neutral home for the tri-service supply system. The notion of dismantling the central supply system into tailored service-focused sub-systems at any time prior to CANOSCOM would have violated a principle SCM tenet of centralization.[156] However, the introduction of CANOSCOM as a non service affiliated support organization conceivably provides a new centralized home for

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[154] Crabbe et al., *A Report on*…, 50.

[155] The two national supply depots, 3rd line distribution and the ammunition depots fall under CANOSCOM. *CANFORGEN 013/06.*

[156] Centralization has long held as a tenet of SCM and Logistics Management. David Simchi-Levi et al., *Designing and Managing the Supply Chain*, 67.

the supply chain with one very important distinction from the current DSC design. The Commander of CANOSCOM, reporting directly to the CDS, is fundamentally focused on mission effectiveness and support to the war fighter versus a longstanding national HQ focused on peacetime efficiency and resource stewardship. According to Henry E. Eccles, this is fundamental flaw in the logistics objective, "…the objective of all logistic effort is the creation and continued effective support of the combat forces; while economy is essential to the attainment of that objective, economy, in itself, is not the objective."[157]

Transferring the reigns of the DSC to CANOSCOM would build on the American experience of having a focus on operational effectiveness and provide for one of the two necessary igniters for a bottom-up SCM transformation. The second igniter requires that the commander be able to control his logistics and from an SCM perspective, this means ownership and having the requisite authorities to improve upon the process.

In accordance with current DSC design, supply chain resources are owned by CANOSCOM and the ECS' while ADM(Mat) has retained functional authority over all MA&S policies, processes, procedures and requirements.[158] In short, process ownership is loosely housed in ADM(Mat) while the resources are dispersed across the ECS' and CANOSCOM. Bestowing DSC process ownership upon the Commander of CANOSCOM would require more than a change of nameplates; it would also necessitate the transfer of some of the existing MA&S functional authorities currently resident in DGMSSC. The separation of MA&S authorities out of ADM(Mat) and in particular,

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[157] Eccles, *Logistics in the National Defense*, 261.

[158] *CFAO 1000-1*

bestowing functional authorities onto CANOSCOM is not an entirely new idea. CF Transformation entertained four options in standing up CANOSCOM with option one taking the current form but option four took more of an extreme approach of establishing CANOSCOM as a new ECS with functional authorities and broader Force Development and Force Generation capabilities.[159] Option one was deemed to be a smart first step but without a better understanding of the CDS' intent for the longer-term purpose of CANOSCOM, more drastic option considerations were deemed to require further review.[160] The longstanding shortcomings of the supply chain are testimony of the existing DSC design shortcomings that warrant increasing CANOSCOM's authority beyond the first option to include at the very least, as it concerns the DSC, supply chain process authority.

This might very well be a welcomed proposal for the ADM(Mat) who could concentrate more fully on strengthening the MA&S policy portfolio as well as tightening up the materiel accountability program within the DND.[161] In many ways, it would alleviate ADM(Mat) of the process and procedure responsibilities that are entirely operational in nature and a distraction from ADM(Mat)'s primary role of materiel stewardship. The transfer of process and procedure authority to CANOSCOM would also contribute to rebuilding the longstanding erosion of supply chain doctrine and reestablishing the operational link between the DSC and the CF's war fighting

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[159] CDS Action Team 4, *Enabling Transformation*, 25.

[160] *Ibid.*, 25

[161] PWC Readiness Assessment, 9; and the 1996 Auditor General, Materiel Management report, 5; cites severe weaknesses in the MA&S policy framework along with major materiel accountability concerns.

capabilities.[162] Unification separated the commander from his logistics and by transferring supply chain process authority to CANOSCOM, logistics would be rightfully restored under the control of the commander.

Importantly, the transfer of DSC process authority would not in any way undermine ADM(Mat)'s MA&S policy authority. Materiel Group would still regulate and align the department's resource stewardship and accountability program with higher government policy-making authorities.[163] Teething pains would inevitably result with having to distinguish between process authority, procedure authority and policy authority. From a supply chain perspective, there can often be a very fine line between what constitutes a procedure and what constitutes a policy.[164] This would simply be an identifiable transformation risk and managed accordingly.

The notion of appointing a single supply chain process owner is not unique to the CF. There are key lessons from the US experience that can help shape success for a DND SCM transformation, most notably, the consistent and overriding theme of appointing a clear process owner, the notion of a 'kingpin' and one individual being responsible for the entire logistics process.[165] Ownership is often an overused and poorly understood term. It can take many forms but it needs to be properly defined with clear lines of responsibility and accountability. Lt. General Pagonis defines the concept of ownership when he states that a senior process owner "is required with authority to cross

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[162] The Auditor General reported on the lack of support doctrine as a result of the transfer of the supply system to civilian HQ. Auditor General, *Materiel Support*, 7.

[163] Most notably, the Treasury Board.

[164] The Canadian Forces Supply Manual is an example of the blurry lines between system procedures, process activities and policy direction.

[165] Maccagnan, "Logistics Transformation…," 23.

functional boundaries."[166] To this end, the US Secretary of Defense appointed US Transportation Command (USTRANSCOM) as the DoD process owner for distribution and in similar fashion, the Marine Corps blended the functions of distribution, transportation, materiel management and supply management under one umbrella.[167] The Army recognized the importance of a single process owner but also the importance of backing this individual with a strong organization fused with clear lines of command and control across the process.[168] True to form, this lesson is repeated in SCM theory and across industry as a lesson of critical importance. In fact, Porter deemed a single overriding executive with the authority to cross traditional functional boundaries as the most powerful of the available linking mechanisms.[169] He stressed this point when he wrote of the need to group business units under a single executive "who must have ultimate authority to modify business units strategy."[170] The overriding theme of a single process owner with the requisite authority is recounted through most SCM and logistics literature and as demonstrated with the US military, it will have to be a prominent initial consideration in DND's SCM transformation effort. Once the commander has reestablished control of his logistics, momentum can continue on the critical third core SCM discipline of designing the organization for performance by adding those

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[166] Pagonis and Cruikshank, *Moving Mountains*…, 215.

[167] Dennis M. Crimiel and Karen W. Currie, "Logistics Executive Agents: Enhancing Support to the Joint Warfighter," *Air Force Journal of Logistics* (Vol. 29, Iss. 3/4, Fall, 2005), 10.

[168] Dumond, *VM*…, 12.

[169] Porter, *Competitive Advantage*…, 398.

[170] *Ibid.*, 398.

organizational elements necessary to manage and execute upon the new and improved DSC.

Before any major headway can be made on a long term SCM transformation, the new DSC owner will have to concern himself with growing the department's awareness in the field of SCM, particularly as it concerns the internal DSC managers and practitioners. Cohen, Shoshanah and Russell recognized this as a major consideration in planning, developing and implementing a new organizational design and state that companies must, "organize around the skills you need, not the skills you have."[171]

Unfortunately, the field of SCM has received little training and management attention in DND. In fact, the Canadian Forces School of Administration and Logistics (CFSAL) has not even run a Supply Officer course since 2001.[172] Irrespective of this lack of Supply Officer training, there is also a notable absence of actual SCM content within the actual course itself. In fact, the focus of the existing Supply Officer course is "to train future Supply Officers in the functions associated with materiel management within the Canadian Forces Supply System."[173] Once again, the information system is front and centre with no mention of the departmental supply chain process or the rich field of SCM theory. Even the advanced SCM course designed for middle management logistics officers is desperately lacking any focus on SCM. Instead, "the course is designed to introduce candidates to strategic level materiel management issues within the

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[171] Cohen and Roussel, *Strategic SCM*…, 111.

[172] Major J.C. Collard, OC A Div Canadian Forces School of Administration and Logistics (Email 10 March, 2009). CFSAL is the DND school for the training of all DSC military personnel.

[173] Canada, Department of National Defence, Officer Commanding Standards North, *Logistics Officer 00328: Training Syllabus* (Canadian Forces Support Training Group: Spring, 2007), 5.

CF."[174] Again, the play on terms is confusing. SCM is the title of the course but the stated focus is instead materiel management. Furthermore, the listed training objectives centre on procurement and project management while the remaining objectives are only marginally tied to either the SCM course title or the stated materiel management focus.[175] Such a confusing use of terms by the very institution charged with leading the education and training of CF Logistics Officers is at least mildly concerning. As a result, logistics officers assigned to key DSC positions are ill prepared for their new roles and lack the process perspective necessary to effectively manage a supply chain as large and complicated as the supply chain of DND.

On the civilian side of the DND house, the training situation is even more dismal. DSC training is tailored to individual positions, it is entirely system-specific and nothing currently exists at the management level to educate senior DSC civilians in the field of SCM. Meanwhile, industry has embraced the need for higher education in the field of SCM and universities and professional institutions have responded accordingly with a range of degrees, designations, councils and memberships to educate and promote SCM.[176] A DND SCM transformation will require a major overhaul of the current supply chain training and education program in order to develop the modern supply chain skill sets necessary to navigate the challenges of implementing a major SCM program. This is not to say that a DND SCM transformation cannot begin without such an effort, it simply cannot afford to be overlooked in the longer term transformation effort of building

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[174] *Ibid.*, 12.

[175] The training objectives are: manage procurement and contracting, manage a project, plan materiel support to a National Level Deployment, Provide Materiel Support to a National Level Deployment, and manage materiel distribution including transportation aspects. *Ibid.*, 12.

[176] Russell, "SCM…", 58.

and maintaining the SCM momentum. As demonstrated with the kick-off session for MASOP, DSC practitioners are eager for SCM change, they are simply lacking a performance focused supply chain owner and an educated roadmap to demonstrate how to get there. Building the requisite knowledge base will ensure that SCM will thrive and flourish beyond the initial surge. In parallel to the longer-term training and education campaign, DND can immediately leverage from the SCM experience of its allies and of course, there is always the path of the SCM consultant to consider. The bottom line is that current DSC personnel lack the requisite SCM skill sets to lead a major departmental SCM transformation and at least initially, outside help will be a necessity.

The ability for DND to tackle its core SCM deficiencies will require nothing less than a major transformational effort. US experience has demonstrated that SCM transformation is a "Big deal…a very big deal," that calls for major organizational restructuring, realignments and improvements in logistics processes and procedures as well as possible technological change.[177] Cultural change, as in most change management programs, will be a fundamental challenge and although the journey will be difficult, "continuing to disregard logistics will have unacceptable consequences."[178]

Table 1.7 summarizes the principal transformation requirements discussed as being necessary to the department's SCM solution. Obviously, there may be other change management considerations but at the highest level, these will be the key enablers. The first requirement of establishing a senior SCM change management champion (see table 1.7) is still perhaps the single greatest challenge. Ideally, the CDS

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[177] US DoD, *Logistics Transformation*…, 2.

[178] *Ibid*, 2.

would lead the SCM charge but in light of current CF priorities, it is highly unlikely that such superior attention could ever be achieved. In reality, the transformation effort would require, at a minimum, his initial attention in order to champion the cause of CANOSCOM becoming the DSC process owner along with the transfer of the requisite process authorities necessary to manage and execute on the performance of the DSC. After that, the Commander CANOSCOM would be in a better position to lead the departmental SCM program and begin immediate actions against each of the core SCM disciplines. Not to be forgotten in the short list of major transformation enablers is the introduction of an SCM awareness campaign that will help alleviate the system-centric focus of current DSC stakeholders along with equipping DSC stakeholders with the underlying philosophical SCM mindset as an essential ingredient to better guide subsequent SCM efforts.

Table 1.7 – DND SCM Transformation Requirements

DND SCM Transformation Requirements
1. Establish senior SCM change management champion
2. Appoint CANOSCOM as supply chain process owner
3. Transfer of requisite MA&S process & procedure authority from ADM(Mat) to CANOSCOM
4. Launch major SCM awareness campaign

A final matter to consider in a departmental SCM transformation as it pertains to the need for senior leadership engagement, is a determination of how this would align within the overarching goals and objectives of the department. CF Transformation as a vision for the prevailing change agenda of the CF warrants a quick review to assess whether or not the launch of a major SCM program would ever have a glimmer of hope. The Chief of Defence Staff (CDS) articulated the following objective in his planning guidance for CF Transformation, “the creation of a CF that would be more strategically

relevant, operationally responsive and tactically decisive, supported by an effective, efficient and adaptable defence institution, capable of operating within a dynamic and evolving security spectrum."[179] While broad in nature, the CDS' objective speaks perfectly to most of the significant shortfalls that needed to be addressed in the DSC analysis. The DSC needed to be more strategically relevant, operationally responsive as well as being effective, efficient and adaptable. In fact, the aims of an SCM transformation would align almost perfectly to his high-level intent.

A further read of the CDS' six transformation principles translates on an almost line-by-line comparison with what might be the stated aims of an SCM program. For example, under his command centric imperative he states, "Effectively group capabilities under the appropriate command to best meet operational needs," and under operational focus he states, "must focus primarily on operational effectiveness."[180] DSC transformation as part of the SCM program would have fundamentally the same objectives. Perhaps rather than the grouping of capabilities, it might read the grouping of authorities and certainly as it pertains to operational effectiveness, this speaks to the underlying motive for most of the DSC transformation. There is no need to belabour the point suffice to suggest that a major SCM initiative would not be a radical departure from the current strategic change environment. Unfortunately, despite this close alignment of objectives, the current lack of SCM awareness within the department will preclude much hope for a major SCM initiative taking hold anytime soon. The need for an SCM change champion is dire.

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[179] Canada, Department of National Defence, *CDS Planning Guidance* (CF Transformation, 10 November, 2005), 4.

[180] Crabbe et al., *A Report on*…, Annex B.

There was once a time and place when militaries were at the leading edge of the logistics field. Today, companies such as National Semiconductor, Titeflex, Wal Mart and Dell have attained unparalleled new levels of operational performance as they strive to meet ever-rising consumer demands. At the heart of this modern day economic revolution is a management field called SCM. As a philosophical concept, SCM discards the vertical view of traditional organizations by seeking to establish a horizontal value-chain that links all the activities and organizations responsible in the process of transitioning the raw materials of Mother Earth into finished consumer products. The objective of SCM is to optimize the speed and quality of this process while also attempting to reduce the end-to-end costs. A growing wealth of industry SCM experience has demonstrated that it is the ability to link and leverage the horizontal activities of the supply chain across a vertically structured organization that is at the crux of the SCM challenge. Companies have embraced this challenge as the modern key to strategic competitive advantage and industry frontrunners are demonstrating that SCM transformation will in fact deliver unprecedented levels of operational performance and contribute mightily to the bottom line.[181]

The DND supply chain is somewhat unique from industry but it is equally as important to the strategic objectives of the organization. Industry and the US DoD have demonstrated that the adoption of a departmental SCM program would be capable of breaking down the current functional stovepipes of the DSC to transition the inventory 'iron mountain' mindset of the current Cold War posture into a modern day supply chain 'slingshot' capable of delivering world class supply chain service to wherever the CF is

[181] A consulting group, PMG, reports a 40% profitability advantage for companies with a high degree of SCM maturity. Cohen and Roussel, *Strategic SCM*…, 230.

operating. Such an SCM program would also contribute to the bottom line but much more importantly, it would also contribute mightily to the force capability of the CF. For this reason, it has been argued that DND is in dire need of a strategic SCM program and a major transformation of its current DSC. Initially, the case for SCM change was built by analyzing each of the five core SCM disciplines presented by Cohen, Shoshanah and Russell as they applied specifically to DND. It was demonstrated that the DSC is failing to meet even the most fundamental of requirements in each of the SCM core disciplines. At the heart of the issue is the fact that the CF has failed to view the departmental supply chain as a strategic asset and that the DSC is fundamentally not designed for performance. More specifically, DSC resources were separated from a highly dispersed DSC process authority and the resulting lack of process accountability has rendered the DSC into a permanent state of performance paralysis. The Auditor General has highlighted this fact in several of its DND audits, Lieutenant General Leslie, the Commander of the Army, has personally attested to the heavy toll of an ineffective supply chain and as a result of years of service level neglect, the maintenance-led OWSM and ISSCF initiatives are turning away from the DSC in an attempt to parcel the supply chain out to industry. The DSC is slowly sinking and without anyone at the process helm, the DSC is unable to alter course in order to capitalize on the tremendous performance potential of SCM enlightenment.

The last portion of the paper turned attention onto the immediate departmental changes that would be required as part of an SCM transformation effort. Based on US SCM experience and an extensive analysis of the design flaws of the DSC, it was determined that if the initial SCM transformation conditions were properly established,

the remaining SCM core discipline work would logically take care of itself. To this end, the initial transformation conditions called for the establishment of an SCM change champion, the immediate overhaul of the strategic organizational design of the DSC and the launch of an SCM awareness campaign. Most important of all initial efforts is the appointment of CANOSCOM as the undeniable process owner with the authority to execute the supply chain across all stakeholder organizations. "…the most wondrous process set in a perfect organization cannot produce worthwhile decisions in the absence of sound leadership and directed effort."[182] Moreover, appointing CANOSCOM as the rightful supply chain owner would result in a momentous and long overdue shift in process perspectives from a tiring pursuit of efficiency to a long overdue accent on effectiveness. "…the chief criteria by which we judge our logistics organizations should be: Are these so constituted that they contribute most to the development of sustained combat effectiveness in war?"[183]

A departmental SCM transformation will be a challenge but it is not insurmountable. In 2002, IBM established an integrated SCM program in a little over twelve months.[184] The transformation involved 19,000 employees spread across 100 locations in over 59 countries.[185] The key to success was the establishment of a strong management system with well-defined roles and responsibilities.[186] DND has a full plate of activities with which to occupy itself these days and arguably, a major SCM

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[182] Bland, *Chiefs of Defence*…, 212.

[183] Eccles, *Logistics in the National Defense*, 219.

[184] Cohen and Roussel, *Strategic SCM.*…, 111.

[185] *Ibid.*, 111.

[186] *Ibid.*, 113.

transformation could afford to wait another year or two in light of its longstanding record of neglect. Unfortunately, this neglect is translating into dire consequences for a resource-restrained department attempting to squeeze every ounce of force capability possible from a finite portfolio of resources. In light of the opportunities SCM enlightenment can bring to the table, perhaps the timing for a departmental SCM program is exactly right.[187] In the grand scheme of CF Transformation, the initial SCM efforts are relatively smaller in scale and provided ADM(Mat) is onside with the recommended changes, a simple CDS message on the heels of a few DSC working groups may be all that is required to implement the crucial first three SCM transformation initiatives (see Table 1.7). Unfortunately, without an initiating SCM spark there can be no fire and it would seem that in the current vacuum of senior departmental SCM awareness, aspirations for a much needed transformation will remain a distant but fading hope of current DSC personnel.

> "In the welter of controversy over high command organization and the allocation of the budget dollar, the vital factor of logistics has received inadequate analytical effort. And, yet, in the understanding of the relatively unknown subject lies the key to relating the creation of armed forces to the effectiveness of their employment."[188]

[187] US military supply chain initiatives are aiming to improve weapon system availability by 20% while at the same time reducing support costs. Russell, "SCM…," 62.

[188] Eccles, *Logistics in the National Defense*, ix.

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