

Strategic Supply

Abstract. Despite turbulent world and economic conditions, some companies continue to thrive in the global marketplace while others struggle to avoid or emerge from bankruptcy. We believe their secret to success is the successful application and integration of Supply Chain Management (SCM) principles throughout the entire enterprise. Industry leaders effortlessly balanced the iron triangle of SCM – the people, processes, and technology that are key to fueling a high velocity supply chain. The Department of Defense (DoD) lags behind industry in application of SCM principles. We recommend the DoD redefine its SCM enterprise at the DoD level and provide recommendations to guide the department as it transitions from a state of awareness about SCM to building an adaptive supply network in the future.

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INDUSTRY CONTACTS/PLACES VISITED

Domestic

Altorfer, East Peoria IL
American Honda Motor Company, Marysville OH
Caterpillar Logistics Technology Services LLC, Morton IL
Caterpillar, Inc., Peoria IL
CSC Defense Group, Falls Church VA
DHL Danzas Air and Ocean, Washington DC
Defense Logistics Agency, Ft. Belvoir VA
Dell Computer Corporation, Round Rock TX
Federal Express, Memphis TN
Ford Motor Company, Dearborn MI
IBM, Washington DC
International Paper, Covington KY
KPMG, San Francisco CA
Kraft Foods, Glenview IL
Limited Logistics Services, Inc., Columbus OH
Manugistics, Rockville MD
Office of the Assistant Deputy Under Secretary of Defense (Supply Chain Integration), Pentagon,
Washington DC
Pittigilio, Rabin, Todd & McGrath, Hartford CT
Robert Mondavi, Lodi CA
SAP, Washington DC
Sapient, Arlington VA
Sears Logistics Services, Naperville IL
The Ohio State University Fisher School of Business, Columbus OH
U.S. Army Materiel Command, Ft. Belvoir VA
U.S. Marine Corps Logistics Enterprise Transformation, Pentagon, Washington DC
Wal-Mart, Petersburg and Sutherland VA
XPEDX, Loveland OH

International

Sydney, New South Wales (Australia):

e2e Supply
KPMG
Lion Nathan
Linfox Logistics
Harper Collins Publishers ANZ
Qantas
Qantas Defense Services Ltd
Savi Technology
Sydney Airport Corporation

Melbourne, Victoria (Australia)

American Chamber of Commerce Australia
Melbourne, Victoria (Australia)--continued
Australia Club
Australian Defense Force
Australia Post
Australian Red Cross

Chartered Institute of Logistics & Transport
Council of Logistics Management
Coles-Myer Corporation
Forrester
Freight Logistics Action Agenda
KPMG
Lempriere
Richmond Tigers Australian Football League Club
SMS
Specialised Container Transport
Victoria State Government

“It is not the strongest species, nor the most intelligent that survive, but the ones that are the most adaptive to change.”

-- Charles Darwin

Introduction

Pick up a business magazine or watch any major network news program these days and you are likely to find at least one story concerning hard economic times and related business failures. The amount of ink and air time expended on events such as the “dot com” collapse, corporate governance scandals, and the impact of terrorism on the airline and other industries leaves the impression that all companies are struggling for their very survival. Yet, is this really the case? Wal-Mart plans to open an average of one new store a day in 2003 while competitor KMart emerges from bankruptcy and closes hundreds of stores.^[1] Dell Computer contributed 25.2% to the overall growth of the computer industry market in the fourth quarter of 2002 while its competitors combined to contribute only 0.5%.^[2] How are these companies and others like them able to overcome tough economic conditions and consistently outperform their competitors? The answer is not rocket science; it is efficient supply chain management (SCM).

Many of the same threats currently facing industry – accelerating changes in the strategic environment, war, terrorism, and consolidation/failure of firms that are key to the defense industrial base – are perhaps even more menacing and challenging for the Department of Defense (DoD). The irony is that the media routinely lauds the military for its performance and ability to overcome these types of threats. Newspapers and television stories are filled with accounts of military success – smart bombs hitting targets with pinpoint accuracy and ground forces giving embedded reporters the ride of their lives as they sprinted toward Baghdad to topple a corrupt regime. During recent military operations in Iraq, many commanders were quick to cite logistics as one of the keys to military success. At a makeshift Marine forward operating base in the southern Iraqi desert, 1Lt Andrew Shoemaker, the executive officer of one of 7th Marine Regiment’s infantry companies said, “It’s like a drive through Wal-Mart for all the essentials we need to fight. So far, things have worked incredibly well. We’ve had everything there when we need it.”^[3] Is there more to the lieutenant’s comments? Does our supply chain operate as effortlessly as Wal-Mart’s or is there a gap between the DoD’s application and execution of SCM principles and industry best practices?

From the boardroom to the battlefield, the key components of industry success are also applicable for the DoD – SCM is at the core of fundamental business success. Companies that improved business processes and strengthened relationships with their customers and suppliers have not only survived – they have thrived. Those lacking the agility and commitment to change did not – and they either have failed completely or fallen further behind industry leaders. The Strategic Supply industry study provided a unique opportunity to learn from many of the corporate champions of SCM – to examine how they think strategically, how they adapt and focus large organizations on SCM excellence, and how they shape their environment and build a culture to remain ahead of their competitors.

This paper begins by defining supply chain management and how its study contributes both to competitive advantage in industry and to the DoD’s ability to defend the nation. The focus then shifts to a discussion of the core components of SCM – people, process and technology – and how industry and the DoD are applying these principles in their SCM operations. It addresses the gap between industry and the DoD and what can and should the DoD do to transform its SCM operation. The remainder of the paper addresses why the DoD must change its approach to SCM implementation, articulates a new vision and end state for a DoD SCM enterprise, and concludes by proposing how to implement this new enterprise throughout the department.

“Tomorrow our heavy forces will be lighter, our light forces must be more lethal, and all must be easier to deploy. It will be a force that will not only be interoperable, but responsive, agile.”

SCM – what is it and why should we study it?

There is still much confusion in industry and the DoD about supply chain management. Supply chain management is more than logistics and more intricate than a single linear chain running from a supplier to an end user or customer. Rather, it is a network of multiple businesses and numerous, often complex relationships with suppliers and customers. SCM, as defined by the Global Supply Chain Forum, is “...the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders.”^[5]

SCM is central to operating profitably and, in many cases, to survival in the global marketplace. It crosses multiple functional silos and offers the flexibility and agility to cope with the ever-changing marketplace through new forms of relationships between business entities, focusing on collaboration rather than competition. Businesses essentially band together and divide tasks associated with the process of transforming raw materials into finished goods in a manner that provides a smooth and efficient product flow. “Firms considered best-in-class for SCM performance are able to operate their supply chains at 4 to 7 percent of revenue less than the average company in their industry. For a typical company earning \$500 million a year in annual sales, this difference results in a \$20–35 million cost advantage every year.”^[6] Thus, SCM offers a new business model – collaborative cooperation without the leveraged merger, the hostile takeover, or the antitrust objections of the government.

Why is it important for the DoD to study SCM? The geo-political landscape of the 21st century represents a challenging environment for US National Security. World peace is an illusion frequently interrupted by attacks against humanity, democracy, and individual freedom. As such, our National Security Strategy requires that the DoD constantly be postured at a high state of readiness. This responsibility is paramount to our national strategy. Moreover, it is consistent with the mission of our armed forces – to provide for the common defense of the nation. Central to this responsibility is a DoD enterprise architecture that provides sound information systems, processes, policies, and sustainment support to our warfighters across the full spectrum of military operations. SCM forms the cornerstone for this architecture. From a strategic perspective, SCM leverages our ability to procure strategic materials and weapons systems from the industrial base for mobilization and war. In short, *it* is not just a fad. No matter what you call it – effective SCM is an integrated network of logistics systems and a combat multiplier. It provides the ability to move armored divisions across the Iraqi desert. It provides the ability to sustain our joint armed forces anywhere in the world. It is essential to achieve success on tomorrow’s battlefield.

The rising threats of terrorism, weapons of mass destruction, and rogue nations require a lighter, more agile, and more lethal military force. We must transform our armed forces to counter these threats by improving internal processes, optimizing human capital, and leveraging emerging technologies and weapon systems provided by the industrial base. By applying industry best practices for SCM within the DoD, we will improve support to the warfighter and drive cost efficiencies throughout the DoD SCM enterprise. Imagine what the DoD or other federal agencies could do with resources freed up by lowering SCM operating costs 4 to 7 percent from current expenditure levels. With the DoD budget approaching \$400 billion, the potential savings are in the billions of dollars.

Perhaps more important than the link between DoD and the industrial base is a philosophical and cultural link between transformation and SCM. Both concepts focus on flexibility, agility, and adaptability and both “must permeate the organization from the CEO, through senior and middle management, and down to the people on the floor who are doing the work.”^[7] Thus, the roadmap for implementing SCM in DoD is built upon the study of those companies that have successfully evolved and capitalized on the SCM framework. The following section outlines the three principle components of SCM – people, process, and technology – and discusses how industry and the DoD are applying these lessons in their SCM operations.

Supply Chain Management Framework –People, Process, Technology

Successful SCM requires organizations to balance people, process, and technology. We consider these the three most important components of SCM and the direct determinants of an individual organization's success. They form the "iron triangle," symbolizing mutual support, stability, and productive internal communications. Although various authors and companies may use alternative names and slogans to describe their individual approach to supply chain management, we found various forms of this simple triad throughout our reviews of current literature, discussions with business process consultants, and visits to firms in the U.S. and Australia.

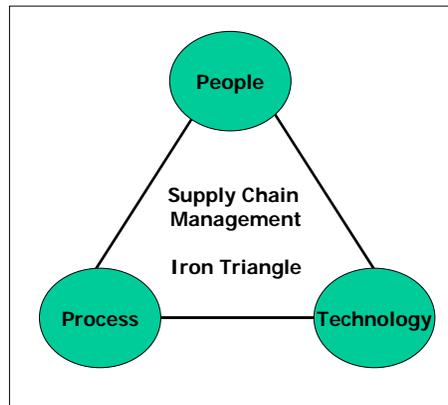


Figure 1: Supply Chain Management Iron Triangle

People. Supply chain management involves more than getting to know employees in your organization or in your supplier's organization – it requires committed *leadership*, an inspiring and clear *vision*, strong supporting *culture*, sound *organizational structure* and dedicated *change agents* to build and sustain a successful enterprise. It is also one of the more difficult areas to address when implementing SCM. When asked, "which one of the following has been the greatest challenge your company has faced managing its SCM project," 54 supply chain executives at \$500 million-plus companies cited culture clashes and business process changes as the two biggest problems. [8]

Leadership. Organizational leaders must fully understand SCM and the value it brings to the firm's overall bottom line. This understanding is critical to ensuring the SCM and overall corporate strategies are congruent and mutually reinforcing. Wal-Mart and Dell epitomize such synergy between SCM and corporate strategy. Both firms see successful management of the supply chain as their competitive advantage and CEOs like Michael Dell drive SCM excellence throughout the company. At Wal-Mart, senior executives, distribution center employees, and managers at all levels reinforce supply chain excellence. Individual store managers understand that the key to success lies in daily deliveries that keep products always available on the shelves and keep their promise of "always low prices."

In the DoD, most senior leaders charged with managing supply chain operations understand how SCM supports their overall organizational strategy. However, those outside of traditional logistics areas of responsibility still lack a fundamental appreciation for SCM and how it transcends the logistics business and influences the entire enterprise. Most leaders have yet to develop an appreciation for the principles of SCM in support of the entire DoD enterprise and still see the issue from an individual service or agency perspective – this is the leadership challenge...and the opportunity.

Vision. SCM leaders do not necessarily have to be cheerleaders; however, their vision for SCM must speak to each member of the organization and set standards and stretch goals that inspire him or her to perform like champions. A senior official in the Australian Defense Force said the senior leader's two most important roles are setting the vision and removing barriers. [9] He advocated creating a fuzzy

vision, not a finely crafted document built after hours of painstaking wordsmithing but rather one that portrays a future state that every employee can internalize and call his or her own. This fuzzy vision often requires senior leaders to reframe or refocus their understanding of the firm's value proposition. HarperCollins Publishers ANZ realized the true value of their operation was not in providing books and magazines to their readers; rather, it was about owning the content of the publications and determining how to distribute information in the most efficient and cost effective manner. Nick LaHowchic, President & CEO of Limited Logistics Services (LLS), set the tone for his organization. He understood the vital supporting role LLS plays in making Limited Brands an industry leader. He clearly communicated his vision and his infectious enthusiasm motivated the entire organization.

Within the DoD, each service and agency developed its own vision and mission to support the overall DoD strategy for defending the nation. However, there is no single vision for DoD SCM, nothing to unify the services or agencies in their SCM activities. In fact, there are often multiple competing visions within the services and supporting logistics agencies.

Culture. The interconnected nature of supply chain operations – core firms linked with multiple suppliers and customers – demands a strong culture both within the organization and between the organization and its key partners. Cultures that foster innovation, risk taking and collaboration are critical if SCM is to succeed. Building and maintaining trust is essential!

In our industry visits, the influence of an enterprise-oriented culture was the first thing we noticed as we walked in the door. You could see it – in the uniforms worn by all employees at American Honda, in the “core values” proudly displayed on walls throughout Caterpillar facilities, and in the ballet performed each night at the FedEx hub in Memphis. You could hear it – in the energy, enthusiasm and passion of leaders at Dell, LLS, HarperCollins Publishers ANZ, Australia Post and others. You could taste it – in the range of quality beers brewed by Lion Nathan, whose goal is to be the 21st Century's best drinks company, and in the Woodbridge family of wines produced by Robert Mondavi. You could smell it – in the aromatherapy line of bath and body products effortlessly managed by Nick LaHowchic and his LLS team. But, most of all, you could feel it – those organizations with a strong, energetic culture were alive and focused on the future while those struggling with cultural transformation focused more on obstacles in the near term rather than a better end state in the future.

There was no common denominator to predict whether a firm would have a strong culture. Many might believe organizations with union employees have an impenetrable culture and would be more resistant to change. However, we found this was not always true. Firms such as Caterpillar and Australia Post are thriving with union employees. After a debilitating strike, Caterpillar instituted its core values program – all of the employees bought into the program and now live by these values every day on the job. Australia Post adopted General Electric's fast track process to drive change, giving employees an opportunity to make suggested improvements on Monday and have a decision from management by Friday about whether to implement it. While some organizations lamented roadblocks, others saw them as opportunities.

Within the DoD, culture is an even bigger challenge. Each service and agency has a legacy – a history – that in itself creates a culture completely different from its sister services and agencies. Within these organizations are units that have their own cultures. For example, the Air Force culture is clearly different from the Marines. While all airmen are taught and expected to support the Air Force core values, various subcultures have their own norms and culture. Fighter pilots are “different” than those who fly transport or bomber aircraft. It is the same with supply chain management support personnel. The Air Force had logistics support personnel, transportation personnel, and supply managers, just to name a few – each in different organizations with their own cultures. While it just recently combined these specialties into a single logistics readiness career field, it remains to be seen whether long standing cultural barriers can be overcome. To be able to energize supply chain management within the Air Force, senior leadership has to first challenge – and change – the cultures within the SCM support organizations. Considering the Air Force is but one portion of the DoD, it is easy to see the magnitude of the cultural challenge facing the DoD.

Organization. The need to create links with suppliers and customers drives organization

structures that facilitate collaboration across the entire supply chain and encourage the free flow of information and ideas to achieve greater efficiency and effectiveness. Another critical component of sound organization is determining where the authority to make substantial decisions lies across the breadth of the entire supply chain. SCM operations span the entire organization, crossing all functional stovepipes. While the supply chain manager may not be the CEO, he or she requires full organizational support and must be included in strategic discussions.

Both Dell and Honda created organization structures to facilitate customer and supplier support. Dell places service and support personnel on site for its largest customers and Honda brings guest engineers from suppliers to Honda facilities to facilitate sharing information and ideas during the design and manufacturing process. Several companies created separate organizations even separate corporate entities, to manage their SCM operations. Ford created a Material Planning and Logistics (MP&L) organization to manage all aspects of its SCM and logistics operations with the exception of transportation. Both Sears and Limited Brands created separate business units, Sears Logistics Services (SLS) and LLS, to manage and run their SCM activities. A surprising observation was that despite the dynamic leadership of Ford's MP&L director and the fact his organization remained an internal part of Ford (rather than a separate entity), the CEOs for SLS and LLS actually had more power, influence, and voice in the overall direction of the parent firms' operations.

Organizational structures and stovepipes within the DoD make such collaboration difficult at best. Coordination within a service between operational and support personnel does not happen easily and collaboration between logistics and support personnel in each of the services happens even less frequently. In addition, organizational structures in the DoD make it difficult for SCM professionals to have a voice in key strategic decisions. Within the services, SCM activities are often buried within a logistics organization and pieces of SCM responsibility may be scattered throughout various organizations within the service. Functional stovepipes can be equally difficult to penetrate and often create an "us versus them" mentality. For example, a senior DoD official speaking to over 300 ICAF students argued the biggest roadblock to transformation is the acquisition community. A better approach, rather than trying to find a scapegoat – it's them, not us – is to foster collaboration and become an agent for change.

Change agents. Finally, supply chain management requires a break with the past, moving beyond functional stovepipes to an integrated process perspective for managing activities within and outside of the organization. This change – which can sometimes require dramatic restructuring – demands dogged determination from change agents to first gain acceptance of SCM principles among top leaders and then drive the change throughout the organization. Clearly articulating the benefits of SCM and its potential to dramatically improve the bottom line is essential to win the hearts and minds of all in the organization. At SLS,

LTG (ret) Gus Pagonis argued for and won the authority to make sweeping changes within a struggling company. He quickly turned the organization around and made SLS a key part of Sears' competitive advantage. He created "ghost busters" – licensed change agents – who were on call to managers throughout the company whenever they needed to solve problems and drive permanent change. At HarperCollins Publishers ANZ, an outsider was brought in to lead change and given total authority over processes and people. When the board of directors found the CEO balking at the changes, it had the foresight to remove him. The result is an enormous success.

In the DoD, there are many change agents, most notably Secretary of Defense Donald Rumsfeld. However, what is lacking are change agents at senior levels within the department and the services who understand SCM, its potential to dramatically reshape support to the warfighter, and to free scarce resources for other critical national security needs.

Leadership, vision, culture, organization and change agents – these elements are all critical to mastering the first leg of the iron triangle. The second leg, process, is equally important and in some ways more difficult to influence because of the diverse nature of the processes and an inherent resistance to change.

“Most management processes are controlled by the defenders of the past.”^[10]

Process. Successful management of the entire supply chain requires a process perspective that fosters the streamlined movement, analysis, and continuous improvement of product flow between the various links in the supply chain. PRTM, in working with hundreds of firms, found those who succeeded in improving their supply chains were those that focused first on process and then on selecting the right technology to leverage those processes. In other words, process pull versus technology push. What key processes are involved in SCM? The Global Supply Chain Forum identified eight key processes that drive supply chain efficiencies: (1) customer relationship management, (2) customer service management, (3) demand management, (4) order fulfillment, (5) manufacturing flow management, (6) supplier relationship management, (7) product development and commercialization, and (8) returns management.^[11] The following section addresses key considerations in each of these processes and illustrates how industry and the DoD are applying these principles.

Customer relationship management (CRM) is a company-wide business strategy designed to reduce costs and increase profitability by solidifying customer loyalty.^[12] Firms identify key customer segments and build tailored support and service agreements that specify performance expectations and ways to measure and reward that performance. The objective is to streamline processes in supporting customer desires and reduce variability in customer demand signals. Not all customers are the same – each has different needs and expectations – and the organization’s CRM strategy must properly manage them. Analytic software packages are available to help firms collect data from their customers and use that data to manage key relationships, improve the services they deliver, and products they provide.

Dell created Platinum Councils to integrate corporate customers into its long-range planning and product development efforts.^[13] These councils provide an invaluable source of information about future business trends and requirements. This allows Dell to not only provide focused, personalized service to its larger customers but also transmit this forecast throughout the supply chain to its suppliers. FedEx now operates a growing family of businesses that offer focused transportation, e-commerce and supply chain solutions for its customers. Companies such as Dell, HP and Volvo rely on FedEx to deliver key components within very tight time parameters. FedEx understands the value it provides to customers is “synchronized reliability,” a consistent level of performance that its customers both rely upon and demand. As a FedEx manager commented, “Information about the package is often more important to our customers than the package itself.”

In the DoD, the customer is most commonly defined as the warfighter and the cultural focus of the entire DoD support structure is “support to the warfighter.” Providers to the warfighter go to great lengths to satisfy their needs. Upstream from the warfighter, the DoD and the services themselves are customers to a variety of large and small firms in the industrial base. There is, however, a critical distinction between the “last mile” of support provided to the warfighter and the support structure and processes needed to bring the support to the last mile. This industry study focused on how to streamline activities and processes needed to bring critical support up to the last mile. As we partner with industry and address issues associated with contractors on the battlefield, this support will increasingly include the last mile. In the interim, SCM processes must resolve current visibility challenges as material responsibility is passed to combatant commanders in theater.

Customer service management (CSM) requires firms to manage “moments of truth” with customers before, during, and after the sale. Sound customer service management provides a single source of customer information and allows the firm to effectively manage partnerships with critical customers.^[14]

Dell provides its large customers with visibility into its production process, providing up-to-date information about each order through its Premier Dell.com web pages.^[15] In addition, Dell does not

simply listen to customer inputs and complaints – it acts upon them, often within minutes of taking the phone call. “Using data from customers who call Dell’s tech support staff – complaining of a faulty hinge or malfunctioning hard drive – the factory can almost instantaneously shift to a different supplier without disrupting production, said Tim Mattox, Dell’s vice president of marketing for its client product group.”^[16] Caterpillar is world-renowned for the quality of their customer service. Caterpillar dealers build, maintain, and encourage close customer relationships through trust and loyalty. Case in point – early each morning Altorfer, Caterpillar’s dealer in East Peoria, Illinois, delivers parts for several customers to a single, centralized location – the side of the road by a wheat field or a storage building at a construction site. Altorfer “keeps ‘em running” by timing its deliveries such that the right part is at the right location when the farmer or construction crews arrive at work in the morning and are ready to repair their equipment. Such exceptional service keeps customers committed to Caterpillar.

Customer service management in the DoD is fragmented – there are CSM efforts in the services, DLA, among the various weapons systems program offices and the commodity-centric inventory item managers. There is a common protocol (e.g. MILSTRIP) thread of information across multiple systems that provide feedback to customers on certain supply chain CSM functions. Even product life cycle support is provided by various independent program management activities that provide our warfighter with multiple faces, agencies and contractors – all presenting their version of truth regarding customer service. Duplication, redundancy and inaccuracy only weaken our customer’s trust in our ability to provide accurate and timely customer service management.

Successful *demand management* seeks to balance variability in customer requirements with inventory management, supplier capacity, production planning, and marketing. Reducing inventory costs and increasing inventory turns are two key inventory management issues facing firms today. Collaboration with suppliers allows firms not only to shift the burden of owning and managing inventory but also to move from a “push” to “pull” orientation in managing customer demand.

Inventory investment can run between 10-20 percent for a manufacturing company, and between 20-50 percent for wholesalers and retailers.^[17] Therefore any reduction in inventory holding and carrying costs can result in significant savings across the supply chain. Management of inventory is a trade off between the level of inventory held to achieve high customer satisfaction and the cost of inventory, which can often exceed 50 percent of the cash value of inventory on an annual basis.^[18]

Management of demand and inventory varied widely among the companies we visited. American Honda’s lean manufacturing processes allowed it to minimize work-in-progress inventory while the nature of the global apparel industry and the long lead times associated with production of various staple garments led Limited Logistics Services to have much higher inventory levels. For CAT Logistics, their value proposition requires that they support equipment that can be over 60 years old. The capability to ship 98% of parts the same day a customer orders them means keeping many slow moving parts in inventory. “Just in time” is not always the right answer for every part. For DoD, our value proposition demands that in time of war, our tanks keep running, aircraft keep flying, and ships keep steaming. Critical components, particularly those that are obsolete or with long lead times, should be kept in inventory. Thus, the lesson learned is that firms should focus on inventory and demand management approaches that maximize throughput and minimize cost given the unique characteristics of their market.

DoD influences demand by attempting to design reliability and maintainability into its weapons and support systems. This ability to respond to demand is based on historical data on failure rates, repair times, and consumption. Historically, in order to optimize demand, we placed repair capabilities and inventories as close to the warfighter as practical or feasible. Success was a measure of availability – the percentage of time we could issue a part from the inventory. Our legacy systems supported this approach and did not have the ability to factor in today’s just-in-time inventories and overnight delivery.

Order Fulfillment activities ensure firms are able to meet or exceed customer need dates. Warehousing and distribution activities, once viewed as a cost center and drag on the firm’s

profitability, can actually become value-added activities key to competitive advantage when managed using SCM principles. Firms must decide whether to manage and maintain these activities in-house or outsource them to third party logistics (3PL) providers. There is no single right answer – each firm must decide whether keeping these activities in-house supports its value proposition and enhances its ability to reduce costs and satisfy customers. Wal-Mart, for example, operates the fifth largest vehicle fleet in the US – a total of 837 million miles per year. It views control of its transportation network as a core competency key to supporting its value proposition and overall SCM strategy.^[19] Wal-Mart is also expanding its use of direct vendor deliveries, allowing vendors to deliver products directly to the store and bypassing the distribution center.

Innovative warehousing techniques such as cross docking allow companies to increase the velocity of their supply chains. Cross docking refers to receiving goods into a distribution facility and moving them out the same day, i.e. they move across the facility from the receiving dock to the outbound dock. The success that can be achieved using cross docking is demonstrated by Wal-Mart, which attempts to move all but what it characterizes as “staple goods” through its distribution centers and out to stores all in the same day. This use of cross-docking helps Wal-Mart maintain low inventory levels in its distribution channel – a key to its “always low prices” strategy – yet also maintain very high customer service standards by keeping stock on store shelves. Caterpillar’s agility allows them to ship 99.8% of customer orders the same day from its distribution centers.^[20] In addition, Caterpillar’s value proposition demands they have the right part when a customer calls. This often requires Caterpillar to quickly query its dealer network to determine availability of parts for earthmovers and tractors that may be three or four *decades* old. Once the part is located, Caterpillar quickly arranges to ship the part from one dealer to another and deliver it to the customer.

Increased visibility is a key enabler to maintain low levels of inventory without degrading customer service. In order to provide this visibility, distributors use two primary tools, warehouse management software and bar coding. Warehouse management software provides for the efficient movement and tracking of goods within the warehouse operation. Some distributors have increased productivity by as much as 25% by adopting warehouse management software.^[21]

Distribution within the DoD is largely structured to support a “push to stock” order fulfillment philosophy. Stratified inventory systems (retail, wholesale, etc.) provide quick response to customers – typically viewed as front line warfighters – who cannot afford to wait for parts. However, like Wal-Mart, the DoD is also expanding the use of direct vendor deliveries, particularly in cases where next day delivery is available and reliable enough to meet the needs of the warfighter. The challenge lies in balancing the ability to provide the right part to the right the location at the right time, every time through direct, just-in-time delivery versus pre-positioning large amounts of inventory at both stateside and overseas locations.

Manufacturing flow management seeks to match demand with production capacity. These processes, like order fulfillment, can either energize a firm or inhibit its ability to fully implement SCM principles and philosophies. Manufacturing and assembly facilities are significant capital investments and as such, firms may find it difficult or cost prohibitive to expand or modify these facilities to support leaner manufacturing processes. New facilities constructed with SCM principles in mind allow firms to integrate, on site, all key components in a manufacturing process and thus eliminate costs associated with component transport and storage.

Firms that consider SCM a strategic priority are moving from a traditional business model of build-to-stock (push systems) to build-to-order (agile pull systems) systems that support mass customization and responsiveness. The foundation underlying this movement is the lean manufacturing philosophy that originated in the Toyota Production System. Its tenants are “demand pull” production and material scheduling flows, just-in-time deliveries at each link in the chain, and process mapping to focus on value-added steps (and eliminate non-value adding steps which are classified as “waste”). American Honda’s new manufacturing system, Ultimate Flex, provides the automaker with a significant

competitive advantage. Honda retrofitted its plants so that each one could build nearly every car in its lineup, a move that provides tremendous agility and allows Honda to respond quickly to changes in demand. “Instead of installing new tools and jigs, it simply reprograms them with the touch of a button. When Honda starts production of 2003 Accords later this summer in Marysville, Ohio, it expects to lose only about 3 1/2 days of production, or 6,900 cars – 56% fewer than it lost during the previous changeover in 1998.”^[22] The central aim of this effort is that Honda’s flexible and agile lean manufacturing is now better able to respond to a demand pull concept, not only for material flows internal to manufacturing (parts reside in the production plant for a mere six hours) but also to better respond to demand direct from customer orders.

Quality control measures such as TQM, ISO 9000, and Six Sigma help companies set and achieve standards of excellence in their production processes. Organizations that successfully implemented such programs are also moving these practices off the factory floor and deploying them throughout the company to improve quality and reduce waste. As a result, many organizations are reducing costs, increasing profits and/or revenues, and meeting customer expectations. Caterpillar considers its Six Sigma process to be its number one critical success factor – and it is easy to see why. In one year, Six Sigma returned \$40M to the company’s bottom line – a substantial return on investment.^[23]

For the DoD, manufacturing activities primarily involve the repair of components for return to useable and serviceable condition. Repairs are performed at organizational or intermediate sites (located near warfighters) or overhauled at industrial/commercial depots. The concept is a “repair to stock,” the stock being set up to satisfy the expected future demand based on component failure rate historical data (mean time between failures). The depths of the stock layers are largely determined by the repair cycle times (mean time to repair) which vary greatly and are in many cases unreliable. This makes it difficult to adequately estimate and manage repair part cycle times. As DoD program managers oversee the complete life cycle management of major end items, manufacturing flow management becomes increasingly important.

Supplier Relationship Management (SRM) provides a structured way for organizations and suppliers to enhance their relationships, increase profitability, and ultimately provide improved products and services to the end users (customers). SRM is a dramatic change in perspective for many firms, as it requires a “new way of thinking about collaboration with suppliers, demanding greater transparency and trust than many companies have so far been comfortable with.”^[24] Two notable SCM leaders and authors, Stock and Lambert, identified four types of supplier relationships, ranging from arms length through partnerships, joint ventures and vertical integration. While most relationships are arms length, with suppliers offering standard products or services to a wide range of customers, there are times when it is appropriate for firms to pursue partnerships with suppliers. The depth of the partnership must consider the drivers (reasons to partner), facilitators (supportiveness of the environment), and components (methods to manage partnership) that lead to successful partnership outcomes. Mould and Starr examined partnership relationships from the perspective of operational complexity and market sophistication. Operational complexity addresses the intricacy of components in the supply chain while market sophistication addresses factors that influence how components are bought and sold.^[25] They argue firms and suppliers can successfully collaborate under certain conditions but trying to do so in the absence of these conditions is inappropriate and possibly counterproductive. Regardless of the model used to manage supplier relationships, firms must avoid the rush to establish partnerships with all suppliers and carefully analyze the need for partnerships and whether it is conducive to both firms.

Lion Nathan, one of the two major brewers and distributors of beer in Australia, carefully analyzed its strategic sourcing needs with all of its suppliers and broke them into four different classes: long term partnerships, risk management and leverage strategies, aggregated purchasing, and transactional focus. It only established long term partnerships (7-10 years) with critical suppliers who

were their only source for certain commodities such as glass.^[26] They also employed an “entrepreneurial” model of building partnerships by creating small firms who could supply key products and ingredients needed in their beverage businesses. Once the firms matured, Lion Nathan spun them off into a separate company – giving them a dedicated source now able to win business from other companies, thereby driving down costs and increasing efficiency. They used this approach to create Cyberlynx, a company that aggregates orders from several firms to purchase commodities companies typically buy in small quantities such as computers and office products. By partnering with other regional firms to increase the volume being purchased, they were able to drive down costs.^[27]

American Honda created close partnerships with its suppliers during development of its latest vehicle, the Element. Suppliers sent guest engineers to Honda facilities to help drive cost out of the design and manufacturing processes. As a result, Honda was able to avoid adding any new suppliers to its supply chain despite adding several new and unique components to the vehicle. By carefully analyzing its entire supply chain and the processes that support it, International Paper was able to significantly reduce the number of suppliers (less than 3% of its suppliers accounted for 80% of its business) and to reframe its supplier relationship from “3 bids and a cloud of dust” to a streamlined network that adds value to the overall supply chain.^[28]

The DoD must also consider the context in which it deals with suppliers. Which industries are critical for maintaining the DoD industrial complex? Should the DoD pursue a hybrid supplier relationship model to address peacetime and wartime support? The challenge for us is that one size does not fit all. DoD procurement needs span a wide range – from beans and bullets to bombs and aircraft – and the firms supplying those products run the gamut from small businesses to the world’s largest companies. Identifying key firms with whom to establish in-depth partnerships is by no means easy; however, it is vital to successful SCM in the DoD.

Product development and commercialization requires firms to integrate suppliers and customers in product development efforts to reduce costs and shorten the time to bring new products to market. Many firms encourage personnel from their key suppliers to participate in design and development activities before manufacturing new products. They also use customer focus groups to learn how to enhance existing products or develop a new product to satisfy an unmet consumer need.

American Honda provides a great example of how to involve suppliers and customers in developing new products. Before launching the Element, Honda engineers and designers talked to focus groups in the target market segment to understand the features most important to them. As mentioned previously, suppliers sent guest engineers to Honda’s plant to assist with final stages of design. The result is an innovative new vehicle that not only exceeds sales expectations in the target market segment but also appeals to a much broader customer base. Ford’s MP&L organization is also starting to integrate representatives from its organization into the product development process for new vehicles. Publishers such as HarperCollins Australia ANZ face significant challenges with product development as they introduce as many as 250 new products per month, each with a separate channel strategy based on anticipated demand. They developed a three-pronged strategy to better align their supply chain activities: use collaborative planning to reduce lead-time gaps, gain access to and use real-time demand information, and automate forecasting and replenishment activities.^[29]

Product development and commercialization within the DoD involves our weapons systems acquisition and contracting systems. These systems provide a common set of business rules for all DoD agencies and the Services. The problem is that these common rules are cumbersome, complex, and the systems requirement-definition processes are owned by the Services, which can lead to sub-optimal service-centric (and potentially redundant) acquisition outcomes.

The growth of direct-to-consumer channels such as catalogs and the Internet have led to returns to U.S. retailers that are worth over \$100 billion per year.^[30] With this much at stake, there is growing recognition that *Returns Management* or “reverse logistics” is an area that demands attention separate

and distinct from forward logistics processes. Indeed, while forward logistics is about efficiency and cost reduction, reverse logistics differs in that it focuses on prevention of monetary loss. Both disciplines, however, share the need to focus on customer service and are a tool to enhance a company's comparative advantage. "Reverse logistics includes product returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal, and refurbishing, repair and remanufacturing."^[31] At every link in the supply chain, companies must answer the basic questions of reverse logistics – whether to repair, remanufacture, recycle, resell, or dispose of an item.

Sears Logistics Services recognizes the opportunities inherent in successfully managing product returns. "Satisfaction guaranteed" is central to Sears' value proposition – their returns management process must efficiently process items ranging from a new appliance to a Craftsman tool purchased a decade ago. They carefully analyze return data to do a root cause analysis and determine whether there is a process or product problem. HarperCollins Publishers ANZ is leading an industry initiative to improve the handling of returns. Their goal is to collaborate with publishers and retailers to set standard industry policies, automate the return process to streamline handling, and consolidate processing of returns in a few centralized centers rather than with each publisher.^[32] Victoria's Secret, one the Limited Brands serviced by LLS, is at the other end of the returns spectrum. It does not return apparel to the LLS distribution system – stores mark down items until they sell. Items that do not sell are disposed of rather than forwarded to an outlet store. For LLS, this is the most cost efficient model since the cost to return the items outweighs the revenue generated by their sale at a significantly reduced price.

"Returns" is a common business activity in the DoD system and is often described as retrograde. Reusable repairable components and sensitive items/hazardous materials are tracked and traced throughout the return cycle. In some cases, a "two-price" reimbursement system places burden on the customer (price penalty) or encourages customers (price credit) to push the return of the unserviceable items into the repair pipeline. There currently is no integrated system within the DoD to monitor the movement of retrograde.

Successfully managing these eight SCM processes is difficult and time consuming; but it is absolutely vital to SCM excellence. This difficulty can drive supply chain managers and senior leaders to look for a quick fix – a piece of software or new technology that eliminates the need to spend time improving the underlying business processes. Unfortunately, "software on its own can't fix basic shortcomings in supply chain management; in fact, it can make things worse. The real benefit comes from repairing broken business processes, and companies that tackle them before turning to technology can reduce inventory levels and predict demand more accurately. This effort alone can increase revenues. Add the software, and the improvements are accelerated and sustained."^[33] Thus, technology is the final addition rather than the starting point for SCM implementation. The following section addresses key technology considerations and looks at where industry and the DoD are in the use of SCM technology.

*"If...analysis wasn't carried out before the software was installed,
weaknesses in the process tended to be magnified,
because when bad information is flowing software only helps it flow faster."^[34]*

Technology. Technology considerations such as information exchange, in-transit visibility, automation, and security are key to implementing and sustaining SCM. In the information age, most companies rely on information technology (IT) to share information internally and with their key suppliers and customers.

The main objective of technology in SCM is to create supply chain networks (SCN) that will improve enterprise integration initiatives. Chandra and his SCM research team argued creating SCNs requires an introduction of IT tools such as Enterprise Resource Planning (ERP), Distribution Requirements Planning, E-Commerce, Virtual Enterprises Management, Product Data and Knowledge

Management, Collaborative Engineering, and Multi-Agent Technology. Effective SCNs provide increased connectivity between units in the network, alignment of inter-organization support systems, and sharing of information resources among units in the network.^[35] Developing and implementing an effective SCN requires e-management technology that facilitates problem solving and information support across the network.

Barry Shore, another notable SCM author, identified four stages of IT in supply chains. In the first stage, hard copy dominates and IT and telecommunications play minor roles. Electronic Data Interchange in the second stage permits the electronic exchange of routine business transactions. The third stage is marked by enterprise-wide systems that integrate and coordinate operations using a centralized database. The final stage involves strategic alliances, extensive information flows, and decision support systems.^[36] Firms do not need to pursue stage four IT if their market, products or suppliers do not require that level of sophistication or cannot support it. Robert Mondavi operates its Lodi Wine Distribution Center without a warehouse management system – they do not need one due to the nature of the operation. Statistics from their last inventory prove this point – their variance amounted to just \$20,000 out of over \$100M in inventory.^[37]

There is no one size fits all technology solution – firms can rely on commercial, off-the-shelf software solutions provided by firms such as SAP, PeopleSoft, or Manugistics or they can develop their own proprietary software solution. Wal-Mart considers its SCM software to be critical to its competitive advantage and as such, it developed its own proprietary solution. Kraft built its own “eSync” program to provide collaborative planning, forecasting, and replenishment. Caterpillar uses a single database called ATARES to provide worldwide visibility on parts in their inventory as well as that of their partners.^[38] Like Wal-Mart, Caterpillar sees this program as a key part of their competitive advantage. The key lesson is that firms must understand their SCM processes and what technology can do for them and then resist the temptation to “over engineer” the technology solution. The return on investment can be substantial. For instance, before October 2002, Danzas/DHL had 18 regional data centers and a huge number of servers. They consolidated all data into one center in Tempe, Arizona for their North, Central, and South American operations. Hans Toggweiler, President and CEO for the North America region, estimated this consolidation would result in savings “in the low 9 figures.”^[39]

In today’s global economy, in-transit visibility is vital. Just-in-time manufacturing and assembly operations require firms to know – sometimes to the minute – when a key part or component will arrive from a supplier. Technology such as radio frequency identification (RFID) tags and automated identification technology (AIT) can provide this information to all firms in the supply chain. Customers increasingly demand the capability to use the Internet to track their package from the time it is shipped to the time it arrives at their home or office. FedEx provides world-class tracking capabilities for items shipped through its network of airborne and ground-based transportation channels. Wal-Mart’s move to implement passive RFID tags may accelerate the spread of this technology throughout the retail sector given the huge volume of goods moved through Wal-Mart distribution channels. The payback from implementing such programs can be substantial. For example, Savi Technology’s implementation of DoD’s Ammunition AIT project produced a 98% cost avoidance in the inventory/reconciliation of category I ammunition. Scanning labels and reconciling inventories used to take 40 man-hours per building. It now takes 30 minutes per building, yielding a cost avoidance of over \$860,000.^[40]

Automation technology such as robotics continues to provide substantial cost savings and flexibility in the manufacturing sector. American Honda implemented robotics throughout its Marysville, Ohio plant and achieved significant increases in both productivity and flexibility. As mentioned previously, its Ultimate Flex manufacturing system allows it to quickly shift production from one model to another. Extensive use of robotics speeds this transition and allows Honda to reduce the downtime associated with a model change. The payback for a DoD investment in such sophisticated

robotic systems is very low. Rather, the DoD should leverage industry capabilities and focus instead on things which industry is no longer willing to do because it is not cost effective. As technology becomes obsolete in industry and industry is no longer willing to perform certain functions still critical to national defense, the DoD should consider bringing those functions in house. This will affect the core restrictions currently mandated by Congress. The DoD needs to ensure critical functions are covered regardless of an arbitrary figure dictating the percentage of repair allocated to industry and DoD activities.

Finally, security of the supply chain involves both hard and soft components. Physical security entails not only protecting critical infrastructure such as facilities and IT assets but also components and finished goods in transit throughout the globe. Increasing reliance on computerized databases and record keeping drives many companies to establish backup locations for critical control centers and repositories for data archives. Much of the collaboration in supply chain activities takes place over the Internet. Information assurance is vital to insure transactions are secure and not vulnerable to attack by hackers or malicious viruses.

The terrorist attacks on September 11th focused a laser beam on vulnerabilities in the vast transportation network moving component parts and finished goods throughout the global supply system. Several initiatives have significantly changed not only the relationship between companies, suppliers, and customers but also the way in which goods are moved between them. First, the Customs-Trade Partnership Against Terrorism (C-TPAT) initiative drove a significant increase in cooperation between the government and industry.^[41] Some organizations, like IBM, worked with their suppliers to ensure compliance with C-TPAT requirements by assessing and enhancing their security processes in the areas of physical security, personnel security, education, and awareness training.^[42] A second program, the Container Security Initiative, uses a small number of customs agents working directly with host nation counterparts to inspect cargo containers before their departure. This allows containers to be immediately released upon arrival in the US. To date, 18 of the 20 largest ports have initiated action to participate, accounting for two thirds of the containers that arrive in the U.S.^[43] Thirdly, Free and Secure Trade (FAST) is a US/Canadian initiative to enhance the security and safety of the shared border by allowing importers to obtain expedited release for qualifying commercial shipments. The program began in December 2002, and is available to qualifying carriers in six US/Canadian ports. To qualify, importers must participate in C-TPAT, be driven by FAST approved drivers and utilize FAST cargo release methods.^[44] Finally, technology such as satellite tracking and Auto ID can provide visibility to the SKU level, giving companies the ability to expedite critical stock in times of crisis. This technology is available today from companies such as Savi Technology – but its greatest limitation is the lack of an international standard. Industry will play a key role in developing an international standard to provide seamless visibility of material moving through ports worldwide.

Although DoD's *Focused Logistics Information Fusion* four-part strategy remains viable (Capture Source Data, Modernize Logistics Systems, Improve Joint Decision-Making, Improve Data Integrity) – it does not push the services towards a common DoD SCM architecture. The Army is currently developing and expanding two high-level business architectures (the Logistics Modernization Program and Global Combat Support System-Army/Tactical) that target wholesale and tactical levels using SAP ERP solutions. Neither system, however, is totally integrated with the other. The Navy started with four separate ERP pilot programs, each sponsored by a different organization and all working toward a single, converged solution. The Marines are focused on network ERP structures that target their ground logistics support programs. Marine aviation will operate within the Naval aviation ERP solution. The Air Force developed a SCM Master Plan and Supply Chain Management Plan but, as of yet, has not implemented network architectures that address the consolidation of its current 94 stand-alone systems. The DLA has made the most progress with partial implementation of its BSM program (supported by Manugistics, SAP, and i2). DLA plans to deploy BSM by 2004, eventually replacing 120 legacy systems. Although the Services and DoD organizations are striving for network efficiencies and

effectiveness, the majority of the SCM IT solutions reinforces service stove pipes, rely on legacy systems that support service-unique business rules, and limit interface with other service and agency systems.

People, process and technology – they are the dancers, choreography and music that make up the supply chain management ballet. In our domestic and international travels, we saw firms that were ready for Broadway – they performed beautiful ballets, executing every aspect of their SCM operation in perfect harmony with suppliers and customers. We also saw firms better suited for off-Broadway venues – they may have a great musical score but lack the dancers and choreography to compete with the best-in-class companies. Success in SCM requires excellence in all three areas – people, process, and technology. It also requires senior leaders who are able to create, ignite, and sustain a burning platform – a compelling reason to change – in order to drive transformation throughout the organization. The remainder of the paper outlines our vision of the burning platform needed to drive development of a single DoD SCM enterprise and presents a road map the DoD can use to develop the mature SCM processes needed in the future.

*The world we have created is a product of our thinking;
it cannot be changed without changing our thinking.
-- Albert Einstein*

A New Approach to DoD SCM – The Journey Toward an Adaptive Supply Network

The Burning Platform – Igniting the Fires of Change. New and emerging threats continue to challenge our nation and demand a military with the speed, agility and flexibility to quickly respond to and defeat any adversary, anywhere. The DoD supply chain infrastructure must be able to support this speed and precision. As we saw throughout our industry travel, companies that were best able to sense and respond to rapid change in the business environment were those where the corporate and SCM strategy were one and the same. They were organizations whose supply chain activities spanned the entire enterprise so that when the organization made a quick change in direction to thwart a competitor or take advantage of a new opportunity, the supply chain operation turned at the same time, instead of continuing to move in the old direction.

While the front-line success enjoyed by the military in recent conflicts in Afghanistan and Iraq was conspicuous and rightly praised, military professionals intimately understand the true story “behind the scenes” – legacy systems, thinking, and infrastructure persist throughout the DoD and are highly resistant to change. The logistics and SCM networks achieve responsiveness through sheer push of volume. The department relies more on technology dominance rather than process simplification. Finally, service cultures continue to drive service-centric fragmentation and redundancy that inhibit a singular enterprise view.

As we learned on September 11th, the strategic environment is changing and our military posture and processes must change with it. It is naïve to think processes developed and honed during the Cold War or first Gulf War are efficient and effective enough to support today's – and tomorrow's – military environment. Instability and uncertainty have become the status quo. Simply employing new technology is not enough to solve problems and address challenges that span across all elements of the national security structure. We must apply the lessons learned from industry leaders in SCM to our operations in the DoD. Seeing the whole rather than individual parts is the essence of SCM and is the fundamental reason why adopting this process perspective is so critical to success in the future.

Resources are limited. We must drive efficiency and effectiveness into our SCM operations to get the most bang for our buck. We cannot assume defense budgets will continue to grow or support functions such as SCM will receive an adequate piece of the overall pie. Our aging workforce will put more demands on our social programs, increasing competition for the same resources the DoD needs to operate. In addition, the younger population is declining. Fewer people will be available for the DoD workforce – we must be lean and lethal. The imperative to change is clear; the challenge for senior leaders is to ignite and fuel this change throughout the entire DoD. This effort begins by defining the

enterprise.

Defining the DoD SCM Enterprise. The DoD currently has functional enterprises (the DoD Financial Management Enterprise Architecture, Future Logistics Enterprise) and service enterprises but no overarching DoD SCM enterprise. The existing DoD infrastructure does not readily support enterprise level management. We allocate resources at the Service level, and we task and reward our leadership at the command level. The DoD's complex supply chain is largely managed in a decentralized manner – often at the service or individual command level. Opportunities to exploit a supply chain operated in this manner are significant, but dwarf those possible if approached from a holistic DoD perspective.

Time and again, we heard successful companies stress the need to understand and define the enterprise prior to implementing SCM. They recognized the need to step away from an internal departmental focus and address decisions from the perspective of the overall good of the organization, the overall good of the enterprise. On the other hand, when the enterprise definition is piecemeal and not integrated across the organization, supply chains remain fragmented and sub-optimal. Companies continuing to struggle are those that failed to define and describe their enterprise from a strategic perspective and clearly articulate how each of the various sub-elements fit into the whole. As a result, they are plagued by internally competing profit centers and activities, disconnects and misalignments in metrics and behaviors, carry waste and redundancy, and demonstrate poor coordination and timing.

To optimize the supply chain for DoD, the enterprise must be defined at the DoD level. This does not mandate that all management take place in a centralized manner; it merely mandates that focus of the supply chain exist at the DoD level so that decisions optimize the supply chain for the entire enterprise. A DoD-level approach also ensures that actions taken at one command do not have a negative impact on another command or service — ultimately sub-optimizing support to the warfighter.

Having a defined SCM enterprise at the DoD level, we can now confidently describe a DoD SCM vision, which is the next step in building a single SCM culture. Properly done, the enterprise drives the SCM vision while the vision, in turn, energizes and focuses the enterprise.

A New Vision for the DoD SCM Enterprise. Modern warfighters need and expect a supply chain that delivers without regard to channel ownership or vertical integration. They measure success by the performance of the process – its ability to deliver the right part and/or equipment at the right time to the right location. The two primary building blocks in the DoD's Focused Logistics Campaign Plan – Logistics Transformation and Future Logistics Enterprise (FLE) – provide great clarity and guidance on developing a leaner, more agile, distribution-based logistics system. However, when the enterprise is defined at the DoD level, the FLE vision of “End-to-End” distribution is not sufficient to drive the change needed to create a single DoD supply chain. As such, we recommend a new vision for DoD SCM:

“A seamless integrated, adaptable, Department of Defense Supply Chain enterprise from the warfighter to the supply base, which leverages common core business processes, a shared network, and a unified culture that maximizes value to our most important customer – the joint warfighter.”

This vision is specific enough to provide clear intent while broad enough to provide room for creative and continued “out of the box” thinking and action. We also keep it simple – a complex and lengthy vision is counterproductive and more likely to stifle creativity and create confusion rather than shine a clear and bright light on the path ahead. How can the DoD achieve this vision? The following road map and implementation proposals provide one way to move the DoD toward an adaptive supply network.

The SCM Journey – a Road Map to Guide the Way Ahead. The transformation from service-centric logistics to an integrated, DoD adaptive supply network requires progression along a maturity continuum, beginning with an internal focus in the early stages (see Figure 2). This early internal focus (awareness stage) is characterized by reducing internal sub-optimizations, integrating and

synchronizing internal operating centers, balancing internal trade-offs, and creating enterprise goals and objectives that align the enterprise as a value chain. The second phase (enterprise operational excellence) further defines DoD SCM business rules and integrates processes across the Services and support agencies. In stage 3 (influence beyond enterprise), successes are leveraged where DoD SCM organizations begin to gain advantages in a strategic environment through collaboration, partnerships, and long-standing agreements that go beyond the boundaries of the “enterprise” itself. This phase is characterized by outsourcing, third party logistics providers (3PLs), public-private partnership, and pooling and sharing of resources industry wide (to include with competitors). The aims are transparency, information sharing, risk sharing and trust. Full integration of the supply chain can continue to evolve and mature to what might be described as the final stage, the “adaptive supply network” model.

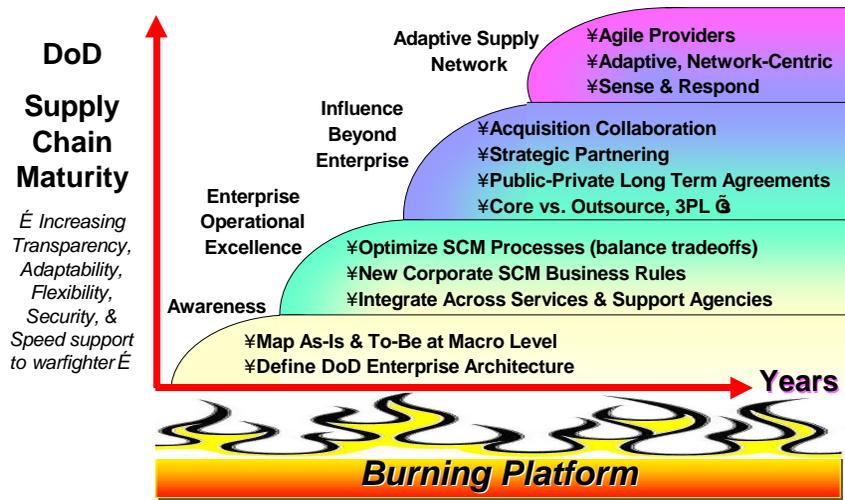


Figure 2: DoD Supply Chain Transformation Roadmap [45]

While it is difficult today to accurately describe the specific features of a final state – the adaptive supply network – the DoD must continue the journey toward an adaptive supply network model. In our vision, “maturity” for the DoD rests at Stage III of the roadmap – where the DoD is postured to learn and move to the next level of SCM, an *adaptive network system*. In other words, to move from a symphony orchestra able to play beautiful music from a set script to an adaptive jazz band, able to improvise and create harmony on the fly. A few of the highly successful organizations we visited are operating at Stage 4, utilizing single adaptive networks. Corporations such as Dell, Wal-Mart, and Honda continue to perfect integrated networks – centered on people, processes, and technology – to drive efficiency and effectiveness throughout the supply chain. The adaptive supply networks of these successful firms all share three “key” attributes which foster efficiency and effectiveness – they all thrive on real-world situational awareness, are event-driven, and tend to be self-regulating.

Making progress on our DoD SCM journey will be nearly impossible without a clear roadmap and accurate compass. Assisting with the navigation are the “pathfinders,” those professionals who have been down similar paths and can anticipate obstacles in the road, know which forks to take, and can see what lies around the bend. These are the PRTMs and the KPMGs of industry, without whom the journey could be long and treacherous.

Recommendations for Implementation. The actual implementation of a single, integrated DoD adaptive supply network is unquestionably our most difficult challenge. The DoD is not unlike many of the commercial industry organizations we visited. It is large, bureaucratic, and organizationally complex by design, consisting of many sub-organizations each with their own individual culture and

defined business processes. The transformation we propose requires a long-term view, not just another program. Second, we view this transformation road map as a growth process, not an event driven plan of action and milestones. Maturity is gained not by simply completing one stage, but rather by continuing to build upon this foundation as we transition into the future. The following discussion uses the iron triangle concept of people, process, and technology to outline our recommended glide path to implement this SCM transformation roadmap.

People. The most fundamental activities in the awareness phase are defining the DoD enterprise and mapping processes. The highest levels of leadership must drive and reinforce this effort, transcending service specific interests. We recommend the Secretary of Defense serve as the enterprise architect and establish a Joint SCM Steering Council composed of the Vice Chiefs, Assistant Commandant of the Marine Corps, and key senior leaders from within the department and defense agencies such as the DLA. The Joint Steering Council provides shared ownership of the enterprise “should-be” process definition. Mapping the enterprise architecture may require a shift to a joint culture and may include bringing in key military and civilians into the joint arena at a much earlier point in their career. This may also entail relooking how we train, develop, and promote our future SCM leaders. We believe these changes are required to institutionalize a process perspective and facilitate the deployment of supply chain management across the enterprise.

Leadership must reward support for the DoD enterprise. The road ahead is long – short-term victories are necessary on the path to creating the DoD SCM enterprise. In addition, previous and pending decisions to outsource activities should be revisited. In industry, the decision to outsource an activity is driven by whether the activity is a core competency and the outsourcing of it will increase value and profitability for the organization. The DoD view of outsourcing is simply to reduce cost or meet an arbitrary manpower reduction figure, not whether it is the proper business decision. We must be willing to revisit, and overturn if necessary, previous decisions to outsource activities critical to the DoD’s national defense role.

To truly implement SCM as we envision it may require new organizations, roles, and even changes to existing laws and regulations. The intent is to provide the department with the flexibility it needs to manage and develop its personnel. Or, as Jim Collins says in his book, “Good to Great,” it is all about making sure the right people are in the right seats on the bus to effect change. Achieving operational excellence in the DoD enterprise will require a dedicated champion at the OSD level. SCM is larger than logistics, acquisition, or other functional areas and as such, we propose establishing a new OSD Business Executive who reports directly to the Secretary of Defense. This provides an enterprise view and a seat at the “strategic table.” The Joint Steering Council will focus on SCM issues and be linked with other joint organizations such as the JROC to ensure SCM issues are integrated into the overall corporate defense strategy. We base this recommendation upon the best-in-class companies we saw in industry – where the CEO is directly involved in SCM strategy, relied on a SCM champion for execution, and ensured the SCM and corporate strategies mutually reinforced each other. We believe the DoD must make this change now.

Service roles mandated by Title 10 and legacy infrastructure can be barriers to SCM implementation. We anticipate Congressional action will be required to authorize new roles and possibly new organizational structures with the DoD and Services – only the last mile of the supply chain may be truly service unique. Finally, achieving influence beyond the enterprise and moving toward an adaptive supply network will require new levels of trust so that trust in the DoD enterprise and public-private partnerships is as great as the trust we have in individual services or agencies. Such trust is built by proven performance in times of crisis as well as peacetime operations.

Process. Active, engaged leaders are key to driving process changes needed for a successful SCM implementation. In the awareness phase, the “should-be” enterprise architecture forms the Master Business Plan for process implementation. This business blueprint applies the eight core SCM processes and lays them across the entire DoD enterprise, transcending all service and agency architectures and focusing instead on incorporating the processes at the enterprise, or DoD level. We envision the Joint Logistics Board as the body that sets recommendations and drives the architecture

while the Joint Steering Council provides the approval and allocation of resources. Similar to the Special Operations Command process for creating a “joint” POM, creation of a Joint Support Command may be required to facilitate building a joint POM and allocating resources for those SCM programs that support and enhance the DoD enterprise. In addition, this “should-be” architecture will drive commonality down to the lowest practical level – consolidating processes where it makes good business sense and separating those service unique processes that should remain within a particular service.

By establishing core DoD SCM business processes, we want to lock in boundaries which can enhance the overall enterprise. Services can still operate within this framework as long as the overall DoD SCM process is not sub-optimized. Our earlier discussion of the eight SCM processes and where the DoD stood relative to some of the best in the industry exposed a gap between the two – a gap that provides an opportunity for growth. Closing these gaps moves us toward the second phase, enterprise operational excellence. For example, in each of the eight process areas we must streamline and optimize the processes from a joint/DoD process perspective. The focus should be on performance metrics and supporting the warfighter, not which service owns the input.

SCM transformation requires expanding into new areas such as linking, aligning, and synchronizing production schedules of second tier suppliers to warfighter success. This also entails including suppliers as part of the enterprise. As we mature into the adaptive supply network, we understand this is a journey, not a destination. Although we cannot concretely define what the adaptive network will look like, we must begin today to prepare for it and anticipate what it may require. We ultimately envision a supply network that can anticipate and respond to the warfighters’ needs before they even know what they are. While we cannot read their mind, we are talking about the use of future technology and processes that properly balances push and pull aspects of demand.

Technology. We must stress again – defining enterprise-wide processes must happen before IT solutions are developed and implemented. The next step is to define a single enterprise architecture for the DoD that includes the fundamental elements of an enterprise architecture – data sets, frameworks, protocols, etc. A single enterprise architecture is critical to our ability to successfully optimize the DoD supply chain. It also instills the necessary discipline across the services and will lay the foundation for systems interoperability and allow us to use technology as an enabler for our new SCM business plan.

We recognize that we must rewire the house with the electricity still on – we cannot stop our operations or take a break from defending the nation. Where we have different SCM systems being implemented within the DoD we must ensure both they and existing legacy systems evolve to the single DoD enterprise architecture once it is defined. Regardless, technology must only be used where it adds value to the overarching DoD SCM enterprise.

Creating operational excellence within the enterprise demands an enterprise solution. We expect, as technology matures, to develop a COTS-based enterprise solution, tailored as appropriate, to accommodate unique needs where that makes sense. In the end, we will achieve a logical, fully integrated architecture that optimizes the eight core SCM business processes across DoD. We also envision leveraging existing ERP systems, integrating or eliminating legacy systems as needed, and capitalizing on current efforts and knowledge. Finally, in order to achieve the levels of collaboration discussed earlier, any technology solution must drive information transparency across the enterprise.

We anticipate the future will be upon us sooner than we think, even though our roadmap provides a long-term vision. Therefore, we must start now to anticipate what is required to implement the sense and respond network concept. Such a technology-enabled business model will add value to and significantly enhance our warfighting capability by increasing speed and agility and reducing the footprint of forward-based logistics support structures.

Radical? Perhaps. Out of the box? Absolutely! Nevertheless, we believe this implementation strategy is the type of thinking required to make real transformational changes to DoD supply chain management.

“Good is the enemy of great.”^[46]

Summary

There is little doubt, given the success of Operation Iraqi Freedom, that the DoD is perhaps the world's premier military force. However, does this status retard progress toward the goal of being “great” from a supply chain perspective? Are we, as a Defense Department, despite our public pursuit of transformation, stuck in this “good” status and thus satisfied with the slow pace of evolutionary change? As we have shown, the successful corporations – Dell, Wal-Mart, Honda and many others – have already learned this invaluable lesson. Change involves both risk and time – it will be a marathon, a journey of discovery rather than a sprint. It will take a transformational approach to get the DoD SCM process moving in the right direction. The DoD, supported by industry, must embrace this goal with zeal! The time is now; fresh after magnificent victories in Afghanistan and Iraq – while the impetus to change is still prevalent across the current administration and political body governing our land. This will take *people* across a DoD enterprise, empowered with a DoD SCM vision, supported by a strong culture, and staffed with change agents. It will take common core business *processes*, interconnected through a seamless, real-time *technology* network. Forged together, this iron triangle provides the solid foundation needed to provide the right support at the right time and place for the joint warfighter. Our lessons learned from industry formed the foundation for our proposed SCM transformation vision and roadmap, helping to guide us on the difficult road lying before us – it is now up to the leaders across DoD, industry, and Congress to make it a reality!

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