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Logistics evolution: a comparison of military and commercial logistics thought

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Abstract

Purpose - This paper aims to look at the relative position of thought leadership between the areas of military and civilian logisticians. Design/methodology/approach - The paper provides a theoretical framework in an exploratory study using the literature to evaluate the constraints on the military side of logistics thought. Findings - The discussion identifies challenges that may preclude military logistics thought from becoming the leaders for the foreseeable future. Originality/value - The paper provides an examination of the changing role between military and civilian logistics that has not been carefully examined since just after the Gulf War in 1991.

Full Text

My logisticians are a humorless lot [...] they know if my campaign fails, they are the first ones I will slay (Alexander the Great).

Introduction

In the last 20 years, both the military and civilian logistics environment have changed dramatically. In the business world, the rise of the mass retailer, technological innovation, effects of deregulation, the concepts of supply chain are just few examples of the challenges of the business logistics environment. At the same time, military logisticians have faced shifts from Cold War strategies, a different type of adversary, sustained combat operations in Third-World environments and a changing military work force. Each group has been challenged with difficult choices and has been forced to reevaluate and improve their processes. However, this leads to the question of are both groups progressing at a similar pace.

The military side of logistics may have had a head start in that process. The widespread use of the term "logistics" arose in the military. It is often argued that the study of logistics was born out of the necessities of war and the need to move troops, equipment and supplies to the battlefield. In the military literature, logistics emerged as a specific term by the time of the American Civil War ([39] McGinnis, 1992). Following Second World War, researchers began to characterize logistics into two sectors: business and military ([31] Kent and Flint, 1997). [25] Hauk (1964) went so far to specifically recognize the growing use of the term "business logistics." Therefore, military professionals and thought leaders may have begun the discourses of logistics, but it clearly migrated into the business environment.

Therefore, a comparison of the state of the military and business supply chains implies a significant advantage on the military side due to the much earlier adoption of research and practice of various processes, tools and technology. However, the truth is that civilian logistics and supply chain management surpassed military logistics at some point after the end of the Second World War. The question becomes how these "competing" supply chains reversed rolls. The paper will use the Theory of Reasoned Action (TRA) and Theory of Organizational Design (TOD) to evaluate the behaviors that have driven this exchange of positions.

After this introduction, the paper will evaluate the literature and use a modified existing classification framework to highlight the shift of military logistics from the role of supply chain leadership to a position of followership with respect to the civilian sector. Next, the two primary theories will be used to develop a model that will present possible explanations for the change in the rate of development for the two bodies of logistics thought. The paper achieves this through the use of the theoretical model and propositions. Finally, "Managerial implications" and "Conclusions and future opportunities" from this examination are discussed.

Literature review

As identified in the "Introduction," the concept and earliest works concerning logistics originated in military writings. [64] Tzu (1983) specifically identifies various types of supply and/or logistics depending on specific translation in approximately 500 BC. Even Alexander the Great included the study of logistics in campaign planning as highlighted by his famous quote about his "humorless lot of logisticians" at the beginning of this paper ([66] Wallis, 2008). Throughout history, various military leaders and thought leaders discussed and published numerous studies of logistics and what would be described as modern supply chain management as part of the formal study of warfare. In fact one

interesting quote from General of the Army, Omar Bradley was that "Amateurs study strategy, professionals study logistics" ([30] Kane, 2001). This highlights the basic importance of logistics on the military sides.

Perhaps two of the greatest military theoreticians were Carl von Clausewitz and Antoine Henri Jomini. These two were considered the premier military writers of the 1800s. Each wrote extensively about warfare including not only strategy and tactics, but also the importance of logistics and supply. Clausewitz's greatest work was *On War* that was published as a series of volumes beginning in 1832. The first translations from German were introduced to the British and US armies around 1874. In his work, [10] von Clausewitz (1832/1976) dedicated a number of chapters to "Billets, maintenance and supply, base of operations, and lines of communication." Each of these areas dealt directly with logistics in warfare from the strategic down to the tactical level. Furthermore, Clausewitz spoke of the "Holy trinity," which related the relationship between the military, people and government. His discussion mirrored much of the relationship management research contained in modern supply chain literature.

Jomini took a slightly different approach, but his works also highlight the early studies of military logistics. As a French General with Napoleon, Jomini had vast experience of all types of military challenges and opportunities. After retiring from active military service, he wrote a number of works that viewed military warfare more as a science rather than an art as defined by other authors of his period. With his view of scientific study, he articulated a clear and pragmatic view on the importance of logistics. In his book, *The Art of War* first published in 1838, he dedicated a chapter on "Logistics, or the practical art of moving armies" (1865). In this section he highlighted that logistics is the method used to implement strategy and tactics. At other points of his work, he discussed that a goal of strategy is to gain advantage over an adversary. Therefore, Jomini identified that logistics was a method to gain competitive advantage nearly 200 years before the business sector began to reach the same conclusion.

These early authors illustrate the early studies of logistics as part of the military science. To contrast this with business logistics studies is an exhausting and detailed task. To help with this process, [31] Kent and Flint's (1997) paper in *Journal of Business Logistics* provides an excellent framework to compare the two bodies of knowledge. Kent and Flint presented a meticulous examination of the civilian literature dating back to 1901 and the *Report of the Industrial Commission on the Distribution of Farm Products*. Furthermore, they used the literature to identify six specific eras of logistics thought evolution: farm to market, segmented functions, integrated functions, customer focus, logistics as a differentiator and behavior and boundary spanning. As an additional step, they identified the major influences on each of the eras. This is particularly important since military logistics was considered the major influencer on Era 2: segmented functions (1940-early 1960s). Finally, they identified the major characteristics of this era as the independent functional areas of in-bound, out-bound transportation, wholesaling, inventory, physical distribution and internal combustion.

This paper has two significant roles in continuing to analyze the relationship between military and civilian logistics. First, as identified previously, it presents a clear snapshot of where military logistics was the major influence on civilian logistics and placed that into a timeline. Second, it provides a framework to evaluate the current state of military logistics thought. By using the framework, this paper will examine the current military literature against the civilian eras to determine if military logistics thought has kept pace with its civilian counterpart.

Table I [Figure omitted. See Article Image.] uses the Kent and Flint framework to track evolution of military logistics literature and contrast it to the business logistics eras. It provides a reasonable method of examining whether military logistics thought has kept pace with its civilian counterpart.

The overall result of Table I [Figure omitted. See Article Image.] is to highlight the various leading authors and thoughts throughout a very wide period of time. Furthermore, when contrasted to the Kent and Flint equivalent table, it is apparent that there was a period of dramatic writing and growth in the civilian side of logistics during the 1970-1990 period that is not replicated in the military logistics literature. This period of significant growth in the business logistics community may be the time that the civilian sector became the thought leaders in this discipline.

Figure 1 [Figure omitted. See Article Image.] presents a graphical depiction of the growth of knowledge between the two areas of logistics. While it is not intended to be a complete listing of every key paper, it does highlight many of the critical authors and points across time. Furthermore, the timeline is a logarithmic like scale that clearly depicts the many centuries of where military logistics thought dominate the research, writings and understanding. Also, it shows the rapid growth of business logistics beginning in the 1970s.

The literature raises a number of important questions. Did something occur in military logistics that made them slow their research? If business logistics now provides the thought leaders can military logistics "catch up" to the civilian side? Should civilian logisticians continue to study military logistics? To answer some of these questions, the next section presents a conceptual framework to first evaluate the possible causes to the changing roles of the two logistics areas.

Conceptual framework

As demonstrated in the "Literature review," logistics evolution is a gradual process in which something changes into a different and usually more complex or better form by recognizing shortfalls and evolving to overcome them ([74] Anderson and Farrand, 2007). Modern logistics came of age during Second World War with ability of the military to establish stand-alone facilities near the front lines, easily reachable by truck from larger sources of supply. This was the precursor to the modern distribution center now routinely established by the world's largest companies ([8] Brewster, 2008). Understanding that the military once drove improvements in civilian logistics, a basis for the comparison into the role reversal has been identified as an opportunity for study.

To develop a conceptual framework, two theories were used: TRA and TOD. The TOD is a macro-examination of organizations used to explain what happened in the past, as well as, what may happen in the future. The TOD describes organizations patterns and regularities, and provides insights about the changes over time ([11] Daft, 2009). The TRA focusses on a person's intention to behave a certain way under specific situations recognizing that those situations might limit the influence on behavior. Culture and attitudes are some of the factors that influence the intention of decision makers to behave in certain ways within organizations ([2] Fishbein and Ajzen, 1975). The model presented in Figure 2 [Figure omitted. See Article Image.] provides a framework to evaluate the current state of military logistics thought and will be utilized as the basis for comparison between civilian logistics and military logistics.

To study the relationship between military and business logistics, the following discussion examines each of the key attributes in the model. Also, the propositions in the model are considered and provide an avenue to evaluate the relationship between civilian and military logistics. The overall discourse provides some insight into the differing rates at the creation of logistics thought in the two areas.

Vision

Researchers have seen vision as important element of leadership, strategy implementations and setting the direction an organization will follow ([89] Hunt, 1991; [98] Robbins and Duncan, 1988). A successful vision paints a vivid picture for the organization. Even though typically discussed in terms of the future, vision is stated in the present tense as if it were being currently realized. One purpose of a vision is to help employees understand what an organization stands for, what is expected of them and what are the goals for the organization ([107] Lipton, 1996). Strong links with company vision and strategy emphasize the explicit role of top management in the formulation of corporate identity ([73] Abratt, 1989; [80] Dowling, 1993).

Understanding that a different vision (organizational goals) will guide the evolution of an organization and lead to a complimentary organizational strategy ([48] Rao and Young, 1994), an initial comparison of organizational goals between the civilian sector and the military in a logistics context may best be viewed by first examining the mission statements of exemplar logistics organizations in both the civilian sector and the military. Two exemplar organizations for this initial comparison are Federal Express (FedEx) and The United States Transportation Command (USTRANSCOM). FedEx is a third-party logistics service provider specializing in time sensitive transportation services. They provide customers and businesses worldwide with a broad portfolio of transportation, e-commerce and business logistics services. USTRANSCOM is one of the nine unified commands of the US Department of Defense (DoD). The mission of USTRANSCOM is to provide air, land and sea transportation for the DoD, both in time of peace and time of war. The mission statements of each organization are shown in Figure 3 [Figure omitted. See Article Image.].

A comparison of these mission statements outlines distinct differences that may provide some initial insight as to why civilian logistics has surpassed military logistics. First, the FedEx mission statement immediately identifies one of the distinct differences between the civilian sector and the military. As a publicly traded company, FedEx is responsible to shareholders requiring financial returns. Competitive pressures in the private sector push companies like FedEx to improve performance and maintain focus on the vision (organizational goals) set forth by top management. In contrast, the USTRANSCOM mission statement, though it does mention "responsive support" to the different stakeholders, is not constrained by providing financial returns, and may not be driven by the same competitive pressure. Realizing there is the strong link between the vision of an organization and the strategy of an organization ([73] Abratt, 1989; [80] Dowling, 1993), our first proposition is as follows:

P1. Organizational vision (goals) is positively linked to the organizational strategy implemented.

The example with FedEx and USTRANSCOM highlights the different orientation of the two organizations based on the competitive pressures. Both organizations operate worldwide in a dynamic environment. However, FedEx has the additional challenge of meeting shareholder expectations for profitability and competitors willing to compete on price. Therefore, each has developed a differing vision and mission statement. Once that vision is established, a strategy must be formulated to carry out the vision. A vision provides the basis for a strategic plan ([107] Lipton, 1996). The next section details strategy and its importance to organizational evolution and further highlights the growing differences between military and civilian logistics organizations.

Strategy

We fully recognize that it is not possible to develop a true strategic plan more than a few years out and that business plans should have an even shorter horizon. But we are convinced that it is possible and wise, indeed necessary, to develop a set of very long-range scenarios that can form the foundation of our future strategic plans (Michael J. Eskew, Former chairman and chief executive officer, United Parcel Service (UPS)).

The need for a concept of strategy related to business became greater after Second World War, as business moved from a relatively stable environment to a more rapidly changing competitive environment ([76] Bracker, 1980). Mr Eskew recognized that strategic planning in business today meant being able to rapidly adapt to the changing needs of the organization.

The corporate strategy planning process typically starts with a vision, a mission statement and a set of objectives that the firm wants to achieve to satisfy its stakeholders customers, suppliers, employees and shareholders ([48] Rao and Young, 1994). The role of logistics is helping to bridge new strategies with organizational structures in response to new, continued competitive pressures. Logistics can interact with strategy and structure to provide a firm with a competitive advantage in today's demanding market environment ([61] Stock *et al.*, 1999). Logistics strategy is a set of guiding principles, driving forces and ingrained attitudes that help coordinate goals, plans and policies, and which are reinforced through conscious and subconscious behavior within and between partners across a network ([24] Hayes and Wheelwright, 1984).

The strategy-structure-performance (SSP) paradigm provides the basis for view a portion of the model presented. The premise of the SSP is that a firm's strategy, created in consideration of external factors, drives the development of organizational structure and processes ([83] Galbraith and Nathanson, 1978; [90] Miles and Snow, 1978). Enterprise-wide logistics integration will provide the bridge that is necessary to maintain a proper fit between strategy and structure in the competitive environment ([61] Stock *et al.*, 1999). Firms that have aligned strategy with structure are expected to perform better than competitors that lack the same degree of strategic fit ([84] Galbraith and Kazanjain, 1986; [88] Hoskisson, 1987; [106] Wolf and Egeloff, 2002).

Strategic logistics planning at UPS, for example, is designed to enable their stated purpose; "We enable global commerce." UPS, like FedEx, is a third-party logistics service provider. Their strategy to accomplish the stated goal is detailed in a recent UPS Plan of Action ([18] Garven and Levesque, 2006):

- We will continue to expand our distribution and supply chain solutions to synchronize the world of commerce.
- We will expand our position as a trusted broker between buyers and sellers worldwide.
- We will harness the appropriate technology to create new services and to strengthen our operations network.
- We will attract and develop the most talented people whose initiative, good judgment and loyalty will help realize our company's mission.
- We will continually study customers' behavior, anticipate their needs and design our products and services to exceed their expectations.
- We will create a practice of innovation that leads to sustainable growth.
- We maintain an environment that enables us to treat every customer as if they are our only one.
- We will leverage the UPS brand to maximize brand loyalty among all constituencies (UPS web site, 2005).

The stated plan of action is a proxy for the strategy of UPS, and details how UPS can adjust to rapid changes in the competitive environment. This is in stark contrast to the governmental bureaucracy and difficulties in strategy facing the military. An example of the difficulties facing military logistics is USTRANSCOM.

USTRANSCOM came into being on April 15, 1987 at Scott Air Force Base, Illinois. Its mission was to "provide global air, sea and land transportation to meet national security needs." It had three transportation component commands; the Air Force's Military Airlift Command, which was replaced by Air Mobility Command in 1992, the Navy's Military Sealift Command, and the Army's Military Traffic Management Command, renamed Military Surface Deployment and Distribution Command in 2004 ([82] Engstrom, 1991).

Initially, USTRANSCOM appeared to be the long sought after solution for DoD's fragmented and often criticized transportation system. The establishment of USTRANSCOM provided a unified combatant commander to serve as single-point-of-contact for Defense Transportation System (DTS) customers and to act as advocate for the DTS within the DoD. As with many newly developed organizations, it soon became apparent that the nation's newest unified command was experiencing some difficulty ([100] Smith and Nigra, 2008).

The initial proposal for the command allowed the services to retain their single-manager charters for their respective transportation modes. Even more restrictive, the document limited USTRANSCOM's authorities primarily to wartime. As a result, during peacetime, USTRANSCOM's component commands continued to operate day-to-day much as they did in the past. Each commander had their own vision for their command rather than the unified vision intended for USTRANSCOM. Each command controlled their industrial funds and maintained responsibility for service-unique missions, service-oriented procurement and maintenance scheduling, and DoD charters during peacetime single-manager transportation operations. Each commander also continued to have operational control of forces.

It appears as though the military realized the shortcomings of USTRANSCOM in 2000. Then Deputy Secretary of Defense, John J. Hamre, issued Department of Defense Reform Initiative Directive #54 - Logistics Transformation Plans. Within this directive, Secretary Hamre (1997-2000) outlines the following:

Logistics transformation must be rapid. The goals and objectives of the Logistics Strategic Plan must urgently become today's capability instead of tomorrow's vision. We must drive down our cost (e.g. pipeline, maintenance, and logistics footprint costs) as we leverage emerging technology to increase the visibility, accuracy, and speed of logistics operations without compromising our effectiveness. World-class war-fighting logistics is our challenge, and we must work together to provide it (Former Deputy Secretary of Defense, John J. Hamre).

This further supports the lagging nature of the DoD logistics thought since this occurred in 2000.

There is additional evidence of the role reversal between the civilian logistics sector and the military logistics complex relating to strategy. This is exemplified by the military's current reliance on private sector for logistics solutions as a part of their overall logistics strategy. In the early 1990s, the military changed the way in which the four branches of the military were supplied with parts and equipment. "Mission creep," or the many non-combat roles now undertaken by the military, is now creating a tremendous logistical strain on the armed forces. That, combined with private sector breakthroughs optimizing global supply chains, has inverted the old relationship of the military driving civilian logistics. Today's military relies heavily on civilian contractors for thousands of different logistics tasks ([8] Brewster, 2008):

P2. Organizational strategy is positively linked to logistics structure.

The recognition of the shortcomings of USTRANSCOM as the key component of the DoD's logistics system was a positive step in the implementing an organization strategy to improve performance. However, the growing strains on the system as part of the Global War on Terrorism highlight the challenges facing the military in the current environment. The overall strategies of the previous decades did not create a structure capable of meeting the DoD's needs supporting to major campaigns in the Middle East while providing traditional support to the other combatant commanders across the globe.

The conclusion of the USTRANSCOM example is that strategy, in consideration of external factors, drives the development of organizational structure and processes ([83] Galbraith and Nathanson, 1978; [90] Miles and Snow, 1978). One of the external factors potentially affecting strategy is regulation. The next section will continue with the example to a discussion of impact of deregulation of the civilian transportation and logistics industry. This will be compared to the constraints on the military side of logistics due to regulations created by the government structure.

Regulation

Organizations in both the private sector and the military are subject to different types of regulation. The assumption is that greater regulation exists within military organizations than does organizations in the private sector, placing additional constraints on the military and thus preventing them from making dramatic changes in their logistics structure and logistics practices. Deregulation in the private sector enabled entrepreneurial creativity and success in the development and operation of new transport services and provided for the rehabilitation of essential transport infrastructure. It also enabled increases in productivity and provided freight shippers and passengers with lower cost and in some instances higher-quality service ([101] Spychalski, 2011).

The deregulation of several key sectors of the economy, most related to the transportation industry, occurred in the 1970s, 1980s and 1990s. The transportation deregulation had a tremendous impact on the evolution of logistics in the civilian sector and was instrumental in the development of the modern supply chain. Key changes included passage of the Airline Deregulation Act in 1978 followed shortly by the Staggers Rail Act of 1980 and the Motor Carrier Act of 1980. These laws eliminated virtually all of the regulation of the railroads, airlines and motor carrier industries. Finally, the ICC Termination Act of 1995 eliminated the Interstate Commerce Commission, further reducing regulation of surface carriers. The effect of deregulation was that it was now possible for transportation services to be purchased and sold in a much more competitive environment ([77] Coyle *et al.*, 2009).

The government benefited from these acts with the ability to purchase additional transportation services for lower prices. However, the government, and specifically the DoD, also faces additional regulation not typically faced in the civilian sector. Regulations on government purchasing and contracting are potential "hidden" regulations restricting how the military executes its logistics strategy and develops its structure. A review of the government web site acquisition.gov provides some insight into federal purchasing requirements. The governing set of regulations provides a specific example in the Federal Acquisition Regulation (FAR). The FAR comprises the body of rules regulating the federal government's purchasing process and intended to ensure government buying and contracting is conducted in a consistent, fair and impartial manner. It is a massive set of rules which provide artificial barriers to the governments' ability to do business. These additional constraints reduce flexibility and create a bureaucratic mindset to implementing internal and external logistics strategies and operational efficiencies. To highlight one example, an academic study of the cost of regulation identified that Harvard University spent over 60,000 faculty hours, approximately US\$8.3 million in 1974 dollars and 4 percent of its total budget to comply with Federal Regulations ([54] Scott, 1978). Imagine the impact to an organization that is easy a thousand times larger and the impact of just 4 percent of the DoD budget to implement various regulations not required of civilian logistics organizations:

P3. Greater regulation is negatively linked to an efficient logistics structure.

While the current FAR is just over 2,000 pages is combined with the non-rational buying behavior/funding process of the Congress, it is safe to assume a greater level of regulation constraints exists within the military. These additional requirements and complexities place additional constraints on the military preventing them from making dramatic changes in their logistics structure or processes. Furthermore, it creates a bureaucratic mindset that lacks creativity and limits options to create an efficient logistics structure.

Organizational structure

One goal of an organization is to create an efficient logistics structure. [61] Stock *et al.* (1999) state that an organizational structure provides the framework in which to implement strategy. Organizational structure is defined as "the formal allocation of work roles and the administrative mechanisms to control and integrate work activities including those which cross formal organizational boundaries" ([9] Child, 1972). Another key point is that organizational structure differentiates organizations in term of how tasks are allocated among various units and how decision-making authority is specified ([61] Stock *et al.*, 1999). Therefore, organizational structure influences the behavior of its members ([78] Dalton *et al.*, 1980). So a DoD logistics organization will have its leadership and boundaries defined by its structure and controlling mechanisms.

This further constrains the DoD logistics organization in other areas. As identified previously, the bureaucratic mentality may actually be due to the organizational structure. [49] Rodrigues *et al.* (2004) demonstrated that the awareness of opportunities and needs that create administrative challenges might necessitate refashioned structure to operate the firm efficiently. Also, if the functional structure determines how resources are allocated to create capabilities and how sets of capabilities are coordinated and organized ([59] Stank *et al.*, 2005), then the DoD logistics organization may be creating systemic obstacles to improvement. Furthermore, the intense competitive pressures cause in civilian firms forces them to identify new ways to improve previously considered standard logistics practices ([12] Daugherty *et al.*, 2011). Without that set of similar pressures on the DoD side, there may not be any need to identify new and creative solutions or improvements to their logistics structure.

Based on these research findings, structure can be considered a prerequisite for success. Thus designing an effective logistics structure provides competitive advantages for organizations. Firms make decisions to select or shift their structures as deemed appropriate considering internal resources and environmental conditions ([12] Daugherty *et al.*, 2011). Since the 1980s many American firms went through a series of buy-outs and mergers, reorganizations and downsizing, combinations that have been proven successful ([33] La Londe and Masters, 1994). Only recently, the military has been forced to reevaluate its tasks and responsibilities of military organizations which prompted the changes described about USTRANSCOM in the previous sections. The goal of these changes was to create a new DoD organizational structure and processes (i.e. flattening structure, decentralizing processes, aligning structure and processes and increasing flexibility). The perceptions of flatter structure and decentralized processes should predict organizational effectiveness ([7] Bjornstad, 2011). Also, decentralization has been shown to increase an organization's flexibility and ability to adapt to continually changing environment ([93] Mintzberg, 1979). Typical hierarchical structures are decreasing in civilian organizations because of their many disadvantages to include some types of risk ([102] Sutton and D'Ambo, 1989; [94] Mulder, 1960). The net result is that the logistics structure must have the ability to adapt to different levels of formalization and integration. Finally, the decision maker must make organizational choices and strategic decisions according to an organization's structure and the employee's skill sets ([21] Halley and Guilhon, 1997):

P4. The firm's logistic structure shapes and constrains the decision maker's intentions.

Recently, many centralized organizations are seeking to restructure to become decentralized, flexible and adaptive to the changing environmental conditions ([16] Ferrell *et al.*, 2009). However, even if a military logistician has an intention to reshape the DoD's logistics structure and process, the organization's structure may limit both his intentions or options. In addition to organizational structure, [5] Baligh (1994) argued that another factor that affects the connection between the organization structure and its performance is the cultural setting of the structure or the culture in which the structure is embedded. As a result, culture should be considered as an additional factor that influences logistics intentions and performance.

Culture

A number of studies have determined that organizational culture concerns the system of shared values, beliefs, behavioral norms and assumptions that help individuals and groups to function within organizations ([13] Denison, 1996; [95] Ott, 1989; [52] Schein, 1996). Furthermore, organizational culture shapes how managers and employees sense and behave with respect to the environment ([13] Denison, 1996). The organization's founders and leaders are combined with the social interaction to develop the culture of the organization ([52] Schein, 1996; [95] Ott, 1989). Therefore, organizations attract, select and retain people who possess characteristics that are congruent to the organizational goals and overall culture ([85] Gailbreath *et al.*, 1997). These are critical factors in shaping the intentions of the logistics decision makers.

[26] Hillen (1999) defined military culture as a combination of "values, behavior and beliefs" shaped by external functional needs (such as the external threat, resources and force composition), legal needs (laws and regulations) and by social needs (civilian culture in general). Another definition of military culture includes "the beliefs and norms about the optimal means to fight wars" ([36] Legro, 1994). For [43] Murray (1999), military culture is the "intellectual and spiritual capacity" of the forces "to come to grips with the business of preparing for and executing war." [43] Murray (1999) further discusses how national historical experience and societal factors have shaped national military cultures. In an army organization, during peace time: linear organization and formalistic hierarchical authority, rigorous physical training, obsession on details and containment of individuality are common; but during war decisions and actions become a mix of deliberate thought and reflex mixed with a certain form of creativity and instinct ([70] Winslow, 2000). For instance, only after Operation Allied Force in Kosovo revealed shortcomings in the Air Force's asset-tracking capabilities, the force began making changes to improve visibility into the supply chain ([87] Herbert, 2003). This highlights the impacts of an organizational culture that is reluctant to change, until stressed, and an organization that trends toward similar thought processes and solutions.

An outcome of this type of culture is [14] Edwards and Eden's (1999) findings that "(In the military) dramatic improvement is not possible." They identify three distinct groups that all support the concept of little or no change although they have different motivations. The first group believes that "The current processes are performing about as well as one can expect and that there simply is no room for dramatic improvement." The second group "Acknowledges that dramatic improvement may be possible, but believes that it can occur only through a major infusion of resources, such as more money and more people, which will not be forthcoming in the foreseeable future." Finally, a third group states that "Dramatic improvement may be technically feasible, deep-rooted organizational and cultural barriers to change inevitably prevent the Army from achieving it" ([14] Edwards and Eden, 1999). All of these limit the decision makers' intention to improve. Culture becomes a critical influence and impacts the preferences, actions and intentions of the military logistician.

[99] Schneider (1987) further strengthens the relationship between attraction, selection and attrition model and culture. His work explained the homogeneity in behavioral preference among US Army Leaders. First, individuals are attracted to organizations whose structure, culture and processes are congruent with their personalities; as a result, individuals that remain in the organization are likely to have fundamental similarities ([85] Gailbreath *et al.*, 1997). In fact, research studies show that top leadership of the army is very homogeneous ([86] Gough, 1984; [85] Gailbreath *et al.*, 1997). Another indicator of similar culture is from the Meyers and Briggs personality indicators which identified most military leaders fall into four of the 16 MBTI groups ([105] Williams, 1999). These scales represent the individuals' sources of energy, preferences assessing information and making decisions and their lifestyle and work orientations ([85] Gailbreath *et al.*, 1997). Therefore, uniform behavior leads to similar actions ([36] Legro, 1994), but too much homogeneity can be negative to the effectiveness of an organization (i.e. narrow-minded decisions, complacency and lack of innovation) ([85] Gailbreath *et al.*, 1997). In contrast, heterogeneity of functional backgrounds allows differentiation, competitiveness, long-term viability and great organizational performance by helping the organization to deal with environmental changes ([92] Miller, 1991). Therefore, the similarity of military leaders' personality characteristics may lack intuition and reduce creativity. [85] Gailbreath *et al.* (1997) identified intuition was associated with creativity and stated that "Individuals with a preference for intuition are more future-oriented than sensing types and more likely to activate change and improve vision."

Organization theory posits that organizational culture is a pervasive social system phenomenon that impacts managers' choices of desired outcomes ([47] Quinn, 1988). It impacts decisions about the way to achieve those outcomes ([68] Wilkins and Dyer, 1988). Organization culture creates a set of behavioral norms for individuals and groups within organizations ([52] Schein, 1996). In a military where the operations are completed with a "mission-first" attitude, which requires tough-minded people oriented to the here-and-now ([79] Department of the Army, 1990), the culture shapes the intent of the logistics decision maker:

P5. Culture strengthens the decision maker's intention.

A sub-component of culture is the set of decision rules that people use in choosing actions to be taken and in taking actions ([5] Baligh, 1994). In addition to culture, the decision maker's attitude toward implementing certain logistics strategies impacts the intention to adopt new ones. For instance, an innovation assimilation study showed that very good decision-making predictors were the innate attributes of innovations ([45] Papadakis *et al.*, 1998). Therefore, the attitude, as well as culture, will impact the decision makers' intentions.

Attitude

A decision maker's attitude toward implementing a logistic strategy is defined as "the degree to which he or she has a favorable or unfavorable predisposition toward implementing the logistic strategy" ([1] Ajzen, 1991). The key is not measuring the decision maker's attitude toward the logistics strategy but rather the decision maker's attitude toward implementing the logistics strategy. A person develops positive attitudes when he or she positively evaluates salient attributes related to the subject in question ([1] Ajzen, 1991). More specifically, in assessing the decision maker's attitude toward implementing a logistic strategy, is a personal evaluation of the expected enjoyment of the related strategy implementation task. A decision-making study showed that both generic, as well as specific strategic decision characteristics, impact decision-making intentions. These decision-specific characteristics considered factors such as perceived magnitude of impact, frequency/familiarity, its uncertainty, its threat/crisis component and whether it emerges through discipline of the planning system of the firm in determining decision processes ([45] Papadakis *et al.*, 1998).

Several improvement initiatives are implemented in logistics management, which have significant implications for people and improve logistics and business performance ([35] Larson and Kulchitsky, 1999). Decisions are evaluated within the context of creating or destroying value ([67] Walters, 1999). For example, the decision maker's attitude toward logistics outsourcing is strengthened if he believes that key factors such as centrality of the logistics functions to the firms' core competences, risk liability and control, cost/service tradeoffs in operations, information and communications systems and market relationships create favorable climates for the logistics outsourcing. On the other hand, the decision maker's attitude toward implementing logistics outsourcing can be weakened if those key factors create unfavorable climates for the logistics outsourcing ([48] Rao and Young, 1994). The challenge is to apply attitude to the military logisticians' intentions. The same "can do - mission-first" attitudes of the DoD logistics professionals impact the intentions to complete the logistics task and/or implement the logistics strategy to support the warfighter. Clearly, the military logisticians' attitudes impact intentions in a number of ways:

P6. Attitude strengthens decision maker's intention.

TRA specifies that attitude is the person's evaluation of a specific behavior. The decision maker's attitude in this model examines the benefits of implementing improved logistics practices. As demonstrated in Figure 2 [Figure omitted. See Article Image.], attitude is combined structure and culture to help shape the logistics decision makers' intent.

Intent

According to [2] Fishbein and Ajzen (1975; see also [3], [75] Ajzen and Fishbein 1977, 1980), a behavioral intention predicts the performance of any voluntary act, unless intent changes prior to performance. Intention is defined as the individual's decision to engage or not to engage in performing the action. Decision maker's intentions are strengthened when they have all of the necessary information to form a completely confident intention. A firm that exhibits a fit between its strategy and structure can be expected to perform better than a firm that does not exhibit a strategy-structure fit ([91] Miles and Snow, 1984).

The key for DoD logistics decision makers is the interaction between the culture, attitude and logistics organizational structure with the intent which drives the logistics practices and outcomes. Clearly, the intent is for the military logistician to complete the mission and support the warfighter. However, the constraints placed upon that decision maker to this point will limit the choices and will impact the logistics practice:

P7. Intention drives logistics practice.

For most individuals, the organizational structure, culture and positive expectations about the benefits of logistics practices will lead to the implementation of new and improved logistics practices which result in differential supply chain performance. The question becomes does the DoD system differ so greatly from its civilian counterparts. The explosive growth of thought on the civilian side suggests there is a strong relationship between the propositions and the lack of creativity and similar growth on the military side of logistics thought.

Managerial implications

First, it should be noted that the US military logistics system is excellent. The US military has executed two wars literally on the other side of the world without any major logistics failures. They have been able to supply forces simultaneously in land locked Afghanistan, Iraq and simultaneously maintained support the rest of the military system that stretches from the Korean peninsula to Europe/Africa. The DoD logistics process continues to provide a logistics structure that is not matched by any other military. Therefore, the discussion is not meant to imply the lack of success of the DoD.

Rather, the question is can military logisticians benefit from the tremendous growth on the civilian side. Furthermore, the other key point is whether the DoD should invest the time, effort and resources to try and recapture a thought leadership position in the field. With the coming likely reduction in military funding, the DoD will be challenged to do more with less which implies a need to identify and execute creative solutions. This becomes almost a make or buy decision as whether should the military logistics thought leaders devote themselves to internal solutions or look to industry. Clearly, this is not a zero sum game and the DoD can choose to adopt internal solutions while simultaneously looking to the civilian logistics sector.

Conclusions and future opportunities

In this study, a combination of the TOD and the TRA are used to examine managements' motivations for implementing logistics practices. The TOD establishes the basic framework or foundation for the TRA. The combination presents the structure that is used to conduct a literature examination of the changing role between civilian and military logistics thought and output. A number of key points are identified to highlight the likely causes of this changing relationship.

The DoD continues to provide excellent worldwide service. However, there are a number of critical factors that may constrain future innovation and logistics theory growth. The logistics structure is clearly impacted by the regulation and somewhat unique mission of USTRANSCOM. These impacts create a logistics structure that further limits the intentions of the intentions of the logistics decision makers. Additional constraints to intent occur due to the culture and attitudes of the organization. The overall impact is an outcome driven system with a static process. As identified by [14] Edwards and Eden (1999), there are three diverse groups that will not support changing the process. Therefore, the likely outcome is a DoD that continues to rest on its laurels and falls further and further behind its civilian logistics counterparts.

However, the outlook should not be completely pessimistic. As identified previously, the US military's logistics system is without equal. Therefore, if the basis of competition is other militaries, the DoD is well ahead. Furthermore, the recent conflicts in Iraq and Afghanistan have demonstrated a growing willingness of the DoD to contract with civilian logistics providers. Even if the military does not take a thought leadership role, they can benefit from a knowledge diffusion due to these relationships. Finally, the system may not promote a climate that is conducive to change; however, usually a single leader or event could provide that transformative spark. Just as changes in the competitive environment have forced changes in the strategy and structure of manufacturing firms ([61] Stock *et al.*, 1999) the military situation may force change. [43] Murray (1999) may have military organizations that can never completely evaluate peacetime innovations and preparation until the audit of war itself, in which fear, chaos, ambiguity and uncertainty dominate.

This highlights the future opportunities for both the DoD and additional research. The DoD can clearly identify a need to improve logistics services while reducing budget. The opportunities for additional research are equally challenging. It would difficult at best to do a specific and an all-encompassing examination of the DoD logistics system in one study. Furthermore, there are numerous pitfalls in trying to negotiate the same Byzantine regulatory system to receive permission to interview or survey DoD personnel. This leads to a challenge to conduct a quantitative study of the propositions set forth in this exploratory work. Regardless of the difficulties, there is an opportunity to better understand the role of the DoD in future logistics thought.

In closing, the authors would very much like to thank all the US Military logisticians that operate under some of the most difficult circumstances worldwide to ensure our freedoms are protected.

Forbes

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Further reading

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Illustration

Figure 1: Comparison of military and civilian logistics thought

Figure 2: Conceptual framework of military logistics development

Figure 3:

Table I: Selected contributions to the development of military logistics knowledge

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Details

Subject	Studies; Supply chains; Leadership; Logistics; Supply chain management	
Business indexing term	Subject:	Supply chains; Leadership; Logistics; Supply chain management
People	Alexander the Great (356-323 BC)	
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