

The Art And Science Of Defense Logistics

CSC 1995

SUBJECT AREA - Logistics

THE ART AND SCIENCE OF  
DEFENSE LOGISTICS

By

S. I. Schuler  
Major, USMC

Paper submitted to the Faculty of the  
United States Marine Corps Command and Staff College  
in partial fulfillment of the requirements for the degree of  
Master of Military Studies

April 1995

The views expressed in this paper are those of the author and  
do not reflect the official policy or position of the  
Department of Defense of the U.S. Government

EXECUTIVE SUMMARY

Title: The Art and Science of Defense Logistics

Author: Major S. I. Schuler, USMC

Research Questions:

- 1) Demonstrate that DoD's 1994 Logistics Strategic Plan (STRATPLAN) is a bridge between the sciences of military and business logistics;
- 2) Demonstrate that the military services can execute the tangible requirements of the STRATPLAN; and

# Report Documentation Page

*Form Approved  
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>1995</b>	2. REPORT TYPE	3. DATES COVERED <b>00-00-1995 to 00-00-1995</b>			
4. TITLE AND SUBTITLE <b>The Art And Science Of Defense Logistics</b>		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>United States Marine Corps, Command Staff College, Marine Corps University, 2076 South Street, Marine Corps Combat Development Command, Quantico, VA, 22134-5068</b>		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>71</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

3) Assert that military logistics must be viewed as an art, rather than a science, due to its reliance on such intangibles as intuition, morale, and innovation.

Discussion:

When DoD published its Department of Defense 1994 Logistics Strategic Plan, it brought together the two diverse worlds of military and business logistics. The former has a long and well-documented history. Though first portrayed as an art, it is now acknowledged as a science due to the nature of its processes and execution. Business logistics, however, has always been considered a science due to its relatively recent conception and reliance on analysis and data. The STRATPLAN completes the evolution of military logistics to scientific status through advocacy of the smart business practices of corporate logistics.

The paper comprises five areas: 1) historical overview of military logistics; 2) synopsis of the STRATPLAN; 3) discussion of selected smart business methods advocated by the STRATPLAN; 4) Services' implementation of the STRATPLAN; and 5) STRATPLAN inadequacies based on failure to acknowledge the intangibles which make military logistics an art, rather than a science.

Conclusion:

- 1) The STRATPLAN is a potentially dangerous document if it is considered definitive logistics theory or strategy;
- 2) Military and business logistics are not the same despite sharing many common processes and systems;
- 3) Military logisticians must acknowledge their role in meeting intangible requirements in their management of risk;
- 4) Business logistics might be a science due to its methods for managing risk, but military logistics must remain within the realm of art in order to minimize risk.

CONTENTS

Chapter		Page
1. THE BASIS FOR RESEARCH AND ANALYSIS		1
2. HISTORICAL OVERVIEW	9	
3. THE DEPARTMENT OF DEFENSE LOGISTICS STRATEGIC PLAN		23
4. THE BUSINESS REVOLUTION OF THE 1980s		33
5. SERVICES' COMPLIANCE WITH THE STRATPLAN	42	
6. CONCLUSION	56	

THE ART AND SCIENCE OF  
DEFENSE LOGISTICS

THE BASIS FOR RESEARCH AND ANALYSIS

Between Past and Future

Since the break up of the Soviet Union, the world has truly been turned upside down. The fifty-year old bogey-man who peopled Americans' nightmares is gone. He was replaced with less evident, though potentially as threatening, proxies, in the form of Eastern European instability, turmoil within the former Soviet state, and Western insecurity as to the impacts of the dissolution on the region's commerce and economy.

This development had equally profound effects upon United States foreign policy, political platforms, and, most specifically, defense issues. With its old adversary out of the picture, the American people could not help but question the existence of a large and expensive standing military. Logic would dictate a considerably diminished force reflecting a considerably diminished mission. Never mind that the demise of the USSR created volatile situations (in addition to the already acknowledged hot-spots of the Middle East, North Korea, and Southwest Asia). The time for down-sizing the Department of Defense was here. The billions of dollars saved could be applied to domestic programs and strengthening the American economy. Saddam Hussein temporarily delayed implementation of the process, but with him soundly defeated

and safely immured back in Iraq, the cut-backs began.

The challenge facing the Department of Defense was, and is, formidable. Diminished defense budgets have precipitated countless discussions on end-strengths, missions, potential threats. "Doing more with less" has become the litany of the day as services tighten their belts. While the more glamorous issues of reduced troop strengths and terminated weapons systems receive the attention, however, DoD is just as carefully scrubbing the logistics structure which supports the operational framework. The effects on support are just as profound, perhaps even more so.

Concurrent with the streamlining of today runs the planning for tomorrow. Present and anticipated geo-political uncertainties only complicate the process. The twenty-first century is only five years away, but assessing, let alone acting, on a future threat can be little more than tentative. This in turn impacts logistics planners who must attempt to meet the needs of proposed strategies now to effect development within the next six years.

In its endeavors to make logistics cuts and streamline processes, DoD is looking more than ever to the civilian business sector for role models. The 1980s witnessed a revolution of the business world as American industries finally recognized, and resolved to retake, their share of shrinking national and international markets. Much of the success initiated during this time is attributable to streamlined and more cost-effective logistics practices. While DoD warehouses were stuffed at peak capacity (unequaled except during full mobilization), American industry was cutting its standing stocks and implementing data systems to augment re-order and distribution. The

benefits of these measures started producing results in the early 1990s, and many DoD agencies have already adopted many of the civilian sector's smart moves in order to mitigate fiscal restraints.

The Department of Defense 1994 Logistics Strategic Plan (hereafter referred to as the STRATPLAN) is an attempt to adopt, across the board, an even broader range of these business reforms and cost-saving systems.<sup>1</sup> A secondary goal is to lay the groundwork for logistics networks of the twenty-first century with the improved data and information systems provided by the business reforms.

## Thesis

In the STRATPLAN's advocacy of business practices, the separate paths of military and business logistics theory converge. Military logistics, once perceived as an art by theoreticians, has gradually evolved into a science.<sup>2</sup> On the other hand,

---

<sup>1</sup>The Department of Defense 1994 Logistics Strategic Plan is a roadmap to improve logistics performance and reduce infrastructure within the Department. It was formulated under the auspices of the Deputy Under Secretary of Defense (Logistics) by a Steering Group of senior DoD logisticians.

<sup>2</sup> Logistics was originally acknowledged as an art, almost in the pejorative sense, and hence secondary in importance to the sciences of tactics and strategy. The art label does have a certain logic to it if one considers logistics "a specific skill in adept performance, conceived as requiring the exercise of intuitive faculties that cannot be learned solely through study." However, modern theory harkens back to the etymology of the word logistics which is derived from the Greek *logistikos* (skilled in

business logistics, conceived and developed within an analytical and profit-oriented framework, has never been considered anything but a science. The STRATPLAN is

not properly theory, it is more the synthesis of evolved logistics theory and strategic focus. However, the approach is probably the blueprint for subsequent literature.

Though the STRATPLAN's purpose is not to argue the nature of military logistics, it reflects a scientific perspective by its stress on analysis, process, data, and system.

The STRATPLAN makes some excellent recommendations which can, and should, be implemented within the Department of Defense. It is, however, a potentially dangerous document. In both the business and military arena, logistics deals in the minimization of risk. Corporate logistics risk entails inventory versus stock-out and the correlating impact on profit. Risk can be minimized by accurate data, analysis, and market projection - that is, primarily scientific processes. Military logistics employs many of these same methods, but with a significant, subtle distinction. In war, scientific method and logic don't always meet the requirement because the requirement isn't always logical. To the military logistician, minimizing risk doesn't necessarily mean the satisfaction of a tangible requirement through employment of a tangible method.

This is where the STRATPLAN fails the military logistician and the nature of his profession. It acknowledges only the tangible, and ignores the intangible, aspects

---

calculation) and the French *logistique* (of reason). Using these roots, logistics has evolved into a science for it is a "methodological activity, discipline, or study [which] appears to require study and method." Definitions taken from The American Heritage Dictionary of the English Language, New College Edition, under the words art, logistics, and science.

which distinguish military from business logistics. Unlike his business counterpart, it is the military logistician's acquired experience with, and intuitive use of these

intangibles which both broaden and narrow his courses of action.<sup>3</sup> The purpose of this paper is, therefore, threefold:

- 1) Orient the STRATPLAN in the past and present to establish its role as bridge between the sciences of military and business logistics;
- 2) Demonstrate that the Services' can execute the tangible requirements of the STRATPLAN; and
- 3) Assert that military logistics must be viewed as an art, rather than a science, due to its reliance on such intangibles as intuition, morale, and innovation.

#### Condition

Logistics theory can take many forms. Some theories may address all areas of support from acquisition of weapons systems to facilities. Others may stress one particular aspect such as supply, maintenance, or transportation. In order to address the thesis questions, it became necessary to sometimes focus on one area,

---

<sup>3</sup>Though intangible is an adjective, this paper will utilize the word as a noun meaning something "incapable of being perceived, precisely defined, or identified; elusive." Definition taken from The American Heritage Dictionary of the English Language, under the word intangible.

<sup>4</sup> Services refers to the uniformed services of the Department of Defense and not components such as the Defense Logistics Agency. Moreover, the military logisticians referred to in this paper are the uniformed logisticians of the Army, Navy, Marine Corps, and Air Force. This is not intended to denigrate or ignore the role of civilian logisticians within the Department. Uniformed, military logisticians are addressed due to their employment within the operational forces.

sometimes on the entire spectrum. The resulting paper, therefore, deals with both

purely theoretical concepts and the practical aspects or implications. At no time, however, could the paper have anything but a firm grounding in reality.

#### Research Materials/Method

Research materials comprised two groups - primary sources such as directives and manuals, and secondary accounts. Current and near-current (1980-1994) journal articles provided information on both military perspectives and industry documentation/analysis of modernization programs. Both the Defense Logistics Systems Information Exchange (DLSIE) and the Defense Technical Information Center (DTIC) proved valuable for internal-DoD studies of adopted processes.

#### Format

The paper reflects the method of research and is divided into five main areas:

Historical Overview. This section provides historical perspective on the development of modern military logistics theory. It has two purposes. First, it seeks to orient the reader to the evolution of military logistics as an entity (with emphasis on the late eighteenth century to the present), and the increasingly important role of logistics in warfare. Secondly, it documents the subtle evolution of logistics from art to science. Rather than a recitation of battles, wars, and commanders, this is accomplished through a brief introduction to the theories of General Carl von Clausewitz, Baron Henri de Jomini, Lieutenant Colonel George Thorpe, Rear Admiral Henry Eccles, and Dr. Martin Van Creveld. Hopefully, this historical orientation will provide a framework for the twenty-first century concepts advocated by the STRATPLAN.

The Department of Defense 1994 Logistics Strategic Plan. This chapter provides a synopsis of the STRATPLAN.

The Business Revolution of the 1980s. Business logistics, though similar in many ways to its military cousin, serves an entirely different purpose in the profit-oriented world. The revolutionary systems of Just-In-Time (JIT), Theory of Constraints (TOC), and Manufacturing Resource Planning 11 (MRP 11) are covered to acquaint the reader with concepts addressed by the STRATPLAN.<sup>5</sup>

Services' Compliance with the STRATPLAN. This chapter provides a brief overview of the progress the Services have made toward implementation of the STRATPLAN.

Conclusion. This section focuses on the folly of accepting the STRATPLAN as a complete blueprint for logistics success in this and the next century. This is accomplished through discussion of: 1) the differences between military and business logistics, i.e. goals, intangibles; and 2) advocacy of the notion that military logistics remains within the category of art rather than science.

---

TOC, and MRP 11 be covered in "Business Revolution of the 1980s."

#### Justification for Research

This paper deals with timely issues which affect all members of the armed forces. The Marine logistician may utilize the body of information for current information within a theoretical and historical framework. More importantly, the thoughts/rationales advocated by the author may help verbalize givens which are seldom expressed but always considered when planning and supporting operational

forces.

## HISTORICAL OVERVIEW

### Introduction

The purpose of the following chapter is to provide an overview of the development of modern logistics theory. One might wonder why this examination begins with General Carl von Clausewitz's theory on war since his work is virtually silent regarding anything other than its operational conduct. He did, however, wrestle with the question of whether war was an art or science (though he determined it as neither). More importantly for this paper, he acknowledged and brilliantly examined the importance of intangibles in the military realm.

Most logisticians begin their histories with Baron Henri de Jomini (the next theoretician) due to his chapter on "Logistics; Or, the Practical Art of Moving Armies." Jomini does have some thought provoking things to say on the subject. Moreover, his espousal of an analytic approach to logistics helps it assume a more scientific flavor. Sadly, at least from the logistics perspective, Jomini no longer holds the interest for the operational historian that he (Jomini) wielded when Joshua Chamberlain avidly perused *The Art of War* in 1862.

With the shift to preponderance of equipment, weaponry, and transportation during World War I, logistics assumed more the shape and form we know today. Though *Pure Logistics* was penned in 1917, Lieutenant Colonel George Thorpe anticipated the new order and developed the first modern, scientific approach to logistics. The treatise continues to be relevant in many respects, though its

recommended organizational structures have become somewhat dated.

Rear Admiral Henry Eccles serves to flesh out Thorpe and transform theory into a concept more familiar to this decade's logistician. His *Logistics in the National Defense* is particularly pertinent to this paper due to its discussion of strategic logistics and the industrial base. Under Eccles, logistics becomes a discipline and enters the category of science.

Finally, Dr. Martin Van Creveld, though not properly termed a theoretician, concludes the overview with his thought provoking and often controversial observations. He serves as a catalyst to the formulation of theory, if for no better reason than to counter his arguments. Moreover, Van Creveld reflects more the attitude of many of our logistics strategists, thus providing insight into the authors of the STRATPLAN.

#### Clausewitz

That every theory of art may contain discrete sciences goes without saying, and need not worry us... creation and production lie in the realm of art; science will dominate where the object is inquiry and knowledge...<sup>1</sup>

Even Clausewitz found it difficult to categorize the nature of war, let alone a component of its conduct such as logistics.

---

<sup>1</sup>Carl von Clausewitz, *On War*, Michael Howard and Peter Paret, eds. (Princeton University Press, 1976), 148-49.

As previously noted, Clausewitz's concept of logistics is terse, almost offhand, in manner and regard. It has essentially one theme - supply. Many of the logistics

functions we typically consider as separate entities fall into this category. Weapons, ammunition, equipment, manpower, and subsistence are lumped together as justification for a viable base of operations. As the conduit to the homeland, the base provides the commodities not easily procured in enemy or neutral territory (i.e., all the aforementioned except foodstuffs). In this manner, Clausewitz ends his discussion of "maintenance and supply" by acknowledging the latter as the only logistics function.

If war is to be waged in accordance with its essential spirit - with the unbridled violence that lies at its core, the craving and need for battle and decision - then feeding the troops, though important, is a secondary matter...Moreover, privation in time of war may be compared to danger and physical exertion...Yet one can take it as a fundamental rule that hardship and privation, no matter how extreme, must always be treated as a temporary condition, which has to lead to a state of plenty - even at times luxury ... So if for the sake of great issues one imposes great privations on the troops, one must bear in mind, whether prompted by sympathy or by prudence, the regard owed them at a later time.<sup>2</sup>

There is more to this passage than reward for the privations of combat. It is an awareness of the role and impact of psychological factors in warfare. Nor is this passage the only one of its kind in the work. Clausewitz considered these intangibles integral to the prosecution of battle, to such an extent that the entire third book is dedicated to such topics as boldness, moral factors, and perseverance. For Clausewitz, victory belonged to those who exercised not only tactical and strategic excellence, but understanding of the warrior psyche.

---

<sup>2</sup>Clausewitz, 338-39.

Jomini

If Clausewitz's concept of logistics is unusually narrow, that of Baron Henri de Jomini seems unusually broad. To Jomini logistics encompasses the entire

spectrum of staff functioning, so many of his areas of responsibility include duties commonly attributed to the G1 through G-3. He painstakingly outlines eighteen "principal points that must be included if we wish to embrace... the movements of armies and the undertakings resulting from such movements"<sup>3</sup> Jomini continually stresses the role of such functions as medical, supply, transportation, maintenance, and embarkation in the conduct of the march and it is in this regard that he acknowledges logistics as "the practical art of moving armies." Many chroniclers of logistics theory use this description as the basis for a definition of logistics. It is not, however, the movement that our perspective conveys. The actual transportation of supplies inter, and intra-theater is not the issue to Jomini; it is the manner in which they fit into the broader scheme of the march (this being the actual entity, not the logistics in support thereof). While Jomini utilizes the term logistics, therefore, the actual concept bears little resemblance to our employment of the term.

Jomini expends considerable time and effort to further delineate staff responsibilities in march preparations. There is also an extensive description of espionage, reconnaissance, and signals and their function as logistics elements. It is

---

<sup>3</sup>Henri de Jomini, *The Art of War*, G. H. Mendell and W. P. Craighill, eds. (Westport, CT: Greenwood Press, 1971), 254.

<sup>4</sup>Jomini, 252.

the former discussion, however, which provides us the expanded activities that differentiate Jomini's perspective from that of Clausewitz. These include the material of war such as horses, carriages, caissons, teams, harness, and shoes; bridges and

engineer tools; artillery and its trappings; siege trains; and finally, ambulances.<sup>5</sup>

If there were a turning point where logistical theory seems to transition from art to science, Jomini's *The Art of War* would mark that point. There is no precise passage or chapter which supports this assertion; it is founded more on impression than overt statement. Jomini strives to present logistics in a straightforward, almost analytical style with detailed descriptions of formations, functions, and tasks. His approach is as scientific as possible considering the relative simplicity of the weapons systems and accoutrements with which he dealt. As if to underscore his dedication to process, there is little space dedicated to the psychological requirements and impacts of war.

Thorpe

Lieutenant Colonel George C. Thorpe, United States Marine Corps, serves as a first in addressing logistics for its own sake, and not as an aside to the more alluring topics of strategy and weaponry. His operational background, tempered by academic discipline, not only produced a thinker with a thorough grounding in the warfare of his

---

<sup>5</sup>Jomini, 255.

time, but also one with an eye to the matters of the future.<sup>6</sup> The work is also the first unabashedly scientific approach to logistics as testified to by its subtitle, *The Science of War Preparation*.

Like Jomini, Thorpe believed that logistics provided the means for strategy and tactics to conduct war. He considered logistics far broader than the areas of

transportation and supply (as suggested by Clausewitz), now broader even than the spectrum proposed by Jomini. For the first time, logistics was analyzed in its economic perspective as well as its affiliation to the civilian industrial base.

It is through historical examples (Napoleon's Russian campaign, Sherman's March to Atlanta, and the Franco-Prussian War) that Thorpe presents and supports his precepts for effective logistics. In the first instance, the lack of "one head as a branch of warfare for analysis of the requirements of the campaign" prohibited the effective organization and prosecution of logistics support. Furthermore, we are provided the first glimpse into modern logistics functions in the form of: supply (and its peculiar duties); transportation; medical services; engineering; civil affairs; military police; maps and information; communications; preparatory drills; maintenance; and clerical work.<sup>8</sup> Except for minor differences, these easily fall into our concepts of

---

<sup>6</sup> Thorpe's tours of duty included the Spanish American War, Addis Ababa, Cuba, and the Panama Canal Zone.

<sup>7</sup> George C. Thorpe, *Pure Logistics: The Science of War Preparation*, originally published in 1917 (Quantico, VA: Marine Corps Association, 1992), 19. Thorpe contends that, though Napoleon himself initiated most of the logistical planning for his operations, he had no central coordinator for logistics activities. Commissary, engineers, and transport were never consolidated into one main effort.

<sup>8</sup>Thorpe, 20.

supply, maintenance, engineering, transportation, medical services, and services.

Chapters IX ("Peace-Time Logistics") and X ("Factory Preparedness"), provide a deeper insight into Thorpe's concern with the industrial base and its relationship to military planning. Though much of the first section deals with the state-of-mind of

the industrial laborer, the preponderance of text produces five essential concepts for successful logistics planning:

- 1) Necessity for an even flow of military supplies even at the height of war;
- 2) Industry must be capable of surge capacity without undue initial stress;
- 3) Military logisticians must plan to the smallest detail during peace to augment transition to war;
- 4) Military departments, their organizations, and equipment should be oriented to war, not peace; and
- 5) Plans for, and selections of, logistics support should be based upon economy?

Unfortunately, Pure Logistics received little attention on either the Marine Corps or national levels. It might have helped phase the United States more easily into the mobilization of World War 11 or at least have conditioned planners into thinking along strategic logistics planes. Instead, the work (and its author) passed into obscurity for almost thirty years.

---

<sup>9</sup>Thorpe, 68-73.

#### Eccles

Rear Admiral Henry E. Eccles, United States Navy (Retired), first published Logistics in the National Defense in 1959, however the content is so timeless, and timely, the Marine Corps has adopted it as Fleet Marine Force Reference Publication (FMFRP) 12-14. It is interesting to note Eccles' comments on the provocation for some of his theory:

In 1917, Lt. Colonel Cyrus Thorpe, USMC, published an excellent little book, *Pure Logistics: The Science of War Preparation*. This attempt to develop theory and principle apparently attracted little or no attention until five copies were found in the Naval War College Library in 1945. Some students of war have wondered how many billions could have been saved had the significance of Colonel Thorpe's ideas been fully appreciated before 1941.<sup>10</sup>

*Logistics in the National Defense* is a long, highly detailed description, analysis, and synthesis of logistics thought which encompasses everything from basic concepts such as the strategic, tactical, and logistical relationship to operations, organization, and readiness. While it is not within the scope of this paper to recount the entire content of this work, a summary of its six major points give the reader an orientation to its place in the development of logistical theory.

Eccles' first theme is that modern war "covers an entire spectrum of human conflict."<sup>11</sup> This spectrum transitions from peaceful competition to subversive infiltration, riots to revolution, seizure of territory to use of nuclear weapons. Throughout it all runs the role of war with its limitation, objectives, and strategy.

---

<sup>10</sup>Henry E. Eccles, *Logistics in the National Defense* (Westport, CT: Greenwood Press Publishers, 1981), 44.

<sup>11</sup>Eccles, 10.

A second theme is the role of strategy as focus for conducting war and achieving objectives. Here, economic and logistic factors are introduced as they influence the strategy to be employed. Utilizing historical examples, Eccles illustrates that "the practical application of strategic concepts takes the form of tactical operations to establish control, preceded by an economic-logistics buildup."<sup>12</sup> The strategic-logistic-

command relationship is thereby determined.

Having brought logistics into the military fold, Eccles proceeds to his third theme of logistics: the bridge between the civilian economy and the operating forces.

Through a variety of definitions of logistics (general, international, national, civilian, and military), he emphasizes the difficulty of a finite description of its intangible nature. He does, however, recommend that military logistics, no matter how subtle, encompass the functions of men, materials, facilities, and services.<sup>13</sup>

Logistic installations and operations, unless controlled by wise and adequate planning, can expand far beyond the true needs of combat support. Eccles considers this fourth theme the heart of his thesis for "logistic activities naturally tend to 'snowball' or to grow out of all proportion to the tactical forces which they support and is perhaps the most important single thesis of this book." This "snowball" is attributable to three factors: the effects of the industrial revolution created a rapidly-increasing requirement for logistics support; the American standard of living, allied

---

<sup>12</sup> Eccles, 41.

<sup>13</sup> Eccles, 46.

<sup>14</sup> Eccles, 103.

with a general lack of logistics discipline, create a climate for consumer demand; and many commanders and staff planners fail to understand the tendency and fall, therefore, into the cycle.<sup>15</sup>

The fifth precept, the requirement that logistics forms the basis for strategic flexibility and mobility, relies upon the commander's control of his combat service

support. A well developed, flexible logistic plan facilitates "rapid and perhaps decisive movement in the early states of an emergency and...[is] essential to continued efficient logistics support."<sup>16</sup> Moreover, momentum, though usually a positive aspect of tactical operations, can create a "snowball" of support unless checked by an assertive system of logistic control. This leads into the sixth theme—"The understanding of the nature and degree of logistic control which command should exercise is essential to the attainment of combat effectiveness."<sup>17</sup>

Eccles concludes his treatise with an interesting thought for managers and commanders in regard to economizing logistics:

[T]he professional should not fall victim to the facile assumption that combat strength can be increased by the simple expedient of arbitrary reductions in logistic forces. There is an important distinction between the rigorous elimination of waste or unwarranted luxury, and the mirage of false economy. The first is merely the application of a strict logistic discipline. The second is a delusion based upon a failure to understand the nature and magnitude of the logistic base on which the combat forces must rest before they can begin to fight. High military

---

<sup>15</sup>Eccles, 103.

<sup>16</sup>Eccles, 129.

<sup>17</sup>Eccles, 10.

commanders may be called upon to accept many arbitrary and unsound political decisions but they themselves must not fall into the trap of self-deception.<sup>18</sup>

Van Creveld

Martin Van Creveld's *Supplying War* has been included in this overview of logistics theory development simply because it isn't (logistics theory, that is).

Unfortunately, many strategists, and many logisticians, fail to realize this fact and base their concepts on a history encompassing the Thirty Years' War to World War II.

Van Creveld's work carries two principle themes: 1) logistics development for the last three hundred years (the time span of this history), has not been a continuous process; and 2) the development logistics has made may be largely attributable to the requirements of transportation. True, the book is well-written and thoroughly researched, but its value to the present study is the often off-hand, general observations which support the primary work. Because these gems are generally unrelated and not considered in context, they are provided as follows:

1) Strategy, like politics, may be the art of the possible, but the possible is determined by more than tactics and doctrine. This is the realm of requirements, supplies, organization and administration, transportation, and communication. Perhaps these factors do not require strategic genius; maybe all they are is plain hard work and cold calculation. Because this deals in the realm of harsh reality, and

---

18Eccles, 321.

not imagination, it is probably ignored by military historians. The result is a distorted conception of history due to the inglorious restraints of logistics;<sup>19</sup>

2) Intense study of logistics can result in as distorted a viewpoint as the examination of pure strategy without its component restraints. "... It is essential not to lose a sense of perspective. Logistics form but one part of the art of war, and war itself is but one of the many forms that political relationships between human

societies may assume;"<sup>20</sup>

3) Weapons system design takes years; mass production of the same may require even more. Operational requirements - not to mention political ones - can change within a matter of days. Consequently, military planners must realize the limits to which planning must go in time and depth;"<sup>21</sup>

4) "The friction within any machine - human or mechanical increases in proportion to the number of its parts - a prime example of the law of diminishing returns;"<sup>22</sup>

5) The principle end of a military organization is not to structure down to the smallest number of supporting troops, but to achieve the greatest possible fighting potential;<sup>23</sup> and

---

<sup>19</sup>Martin Van Creveld, *Supplying War. Logistics from Wallenstein to Patton* (New York: Cambridge University Press, 1987), 1-2.

<sup>20</sup>Van Creveld, *Supplying War*, 180.

<sup>21</sup>Van Creveld, *Supplying War*, 203.

<sup>22</sup>Van Creveld, *Supplying War*, 235.

<sup>23</sup>Van Creveld, *Supplying War*, 235.

6) Intellect must play a central role in planning and execution, mainly because it is the only viable instrument we have at our disposal. To determine that war, like any other aspect of human behavior, can ever be totally comprehended by intellect alone, however, is foolhardy.<sup>24</sup>

Van Creveld seems uncertain as to the true nature of logistics. On one hand, he maintains that logistics is the product of cold, hard reality and intellect. Conversely,

he considers intellect as only one tool to comprehend the intricacies - perhaps the intangibles - of war. The architects of the STRATPLAN, however, do not seem to share this dilemma, however, in their advocacy of science (and intellect) to solve the logistics problems of this and the next centuries.

### Summary

The purpose of this historical narrative has been to demonstrate the evolution of logistics thought from its simplest recorded concepts to the sophisticated form we know today. Military logistics has greatly expanded in a relatively short time but the touchpoint of the past is still necessary:

The real purpose for recalling these "relics" is the essential, fundamental, mandatory need to make history a basic part of every management leader in industry, commerce, and the military. Especially is this appropriate to the military, for the cost of readiness and the cost of war - in lives and other resources - are simply too high. In this peacetime era of economic problems, we cannot afford to relearn the lessons of the past through the repetition of errors of commission or omission... nor should we reinvent a wheel that was in use in previous eras.<sup>25</sup>

---

<sup>24</sup>Van Creveld, *Supplying War*, 237.

<sup>25</sup>Joseph M. Heiser, Jr., "Past is Prologue," *Army Logistician* (Nov-Dec 1992), 39.

To trace the development of logistics theory is to study the development of societies and how they improve the manner of conducting war. As man's weapons have become more sophisticated and his ability to touch his enemy more easily achieved, so, too, have the demands on his capability to sustain them increased. Theory often follows an advancement already achieved; lessons learned, if they can

be ascertained, are not always enduring. Social attitude and intellectual climate have transformed the field of logistics from the realm of art to that of science with the blind confidence that anything approached scientifically has to produce a better product.

The preceding chapter has charted some of the theories which have brought us to the logistics concepts we utilize today. From the early, general term supply it has come to encompass everything from rations to development of major weapons systems. There is no doubt that modern military logistics is a big business with a startling price tag. Instead of being denigrated to an aside, logistics is now a major consideration in the development of grand strategy. Some would argue that it requires its own strategy in order to keep pace with diminishing budgets, advancing technology, and the global reach of United States military forces.

## THE DEPARTMENT OF DEFENSE LOGISTICS STRATEGIC PLAN

### Introduction

The purpose of the preceding chapter was to orient the reader to the evolution of logistics theory and its subsequent reflection not only of the development of warfare, but technological progress of a society as a whole. Support of sophisticated weapon systems, transportation of armies and material on a global scale, and mobile sustainment of the modern battlefield have all contributed to the derivation of logistics as a separate, highly technical entity. Logistics theory has become blurred with the necessity of developing logistics strategy - a fusion of the requirements of today with the perceived demands of the future. Though Martin Van Creveld, in his most recent book, has predicted that warfare and its sustainment will become less sophisticated in response to changing trends, United States military and political strategists anticipate,

and are planning for, just the opposite.<sup>1</sup>

What precipitated the drafting of the STRATPLAN?<sup>2</sup> If its purpose were nothing

---

<sup>1</sup>Martin Van Creveld, *The Transformation of War* (New York: The Free Press, 1991), 212.

<sup>2</sup>The purpose of the STRATPLAN is best presented in its foreword: "The Bottom up Review included the most comprehensive examination of the Department's infrastructure in years. From the BUR, the Deputy Secretary directed the development of a roadmap to improve logistics performance and reduce infrastructure at the same time." (STRATPLAN, "Foreword")

more than a statement of logistics strategy to facilitate Defense establishment

downsizing, it would probably not address the reforms that it does. It seeks,

however, not only to accommodate downsizing, but to remedy existing disfunctions.

This must start with not only military direction, but political leadership:

If sustainability is to achieve its rightful priority for resource allocation in the twenty-first century... a significant shift of attitude by both political and military regimes will be necessary. There must be a move away from shop-window displays towards a balanced, effective and enduring capability for the anticipated duration required to achieve success.<sup>3</sup>

This fat DoD inventory has many origins - some deliberate, others due to oversight and inaccurate planning data:

1) The major percentage of inapplicable assets is attributable to the initial provisioning process - or the retirement - of systems or equipment or to modifications/replacement of items thereby making a previous version obsolete;

2) Demand decline and invalid requirements contribute to volatile demand patterns, poor forecast accuracy over long procurement lead times, and use of externally generated requirements that receive little oversight or audit;

3) Inventory managers often buy too much material based on existing requirements and often increase the computed calculated procurement quantity; and

4) There is a noticeable inability to control data validity.<sup>4</sup> Though data retrieval systems have been employed for decades, the quality of data input is often suspect.

---

3R. I. Money, "Going the Distance: Sustaining Future Conflicts," RUSI Journal 136, no. 1 (Spring 1991), 32.

4 James H. Perry, "Growth in Unneeded Inventories: Contributing Factors," Logistics Spectrum 25, no. 2 (Summer, 1991), 23.

This is largely attributable fudge factors (adding on a percentage just-in-case); failure to register a requirement in the system (due to selective interchange or scrounging); and lost data as a result of human error or the systems themselves.

The Department of Defense 1994 Logistics Strategic Plan (STRATPLAN) is an attempt to blend the logistics theory of today with a strategy for the future. Since its content is integral to the concepts later discussed in this paper, it is introduced at this point to bridge the past with the present and future. It is not a long document (18 pages) and could probably have been included as an addendum to the paper. I have chosen to synopsise it, however, to highlight areas which are relevant to this study.<sup>5</sup>

#### Logistics Strategic Plan Guiding Principles

The STRATPLAN is predicated upon the following precepts:

- 1) Weapon system availability and material readiness at the unit level are of primary importance (this serves as a primary performance measure);
- 2) The cost and size/form (footprint) of logistics support must be reduced

substantially without diminishing readiness (a second performance indicator);

3) DoD must "define and act upon an understanding of its required logistics core competencies and prepare to source logistics from the most competent providers;"

4) DoD logistics capabilities must be considered as a segment of the national industrial base; and

---

5I have deliberately omitted documentation, as an attempt to do so complicated the notes disproportionate to the brevity of the document.

5) Military commanders need near real-time information concerning sustainment in order to plan, fight, and win.

#### Assumptions Concerning Future Logistics

In order to plan and execute a forward-thinking strategy, the STRATPLAN makes the following assumptions:

1) With the military focus shifted from global to diverse regional conflicts, logistics must become more flexible. This agility requires greater mobility, complete asset visibility, rapid response to demand, and improved management information to control logistics assets. The process from requirement to delivery must be streamlined;

2) Strategic air and sealift will continue as a constraint. Commercial air will become more necessary to augment military lift. As such, information on in-transit status of forces and sustainment will gain prominence;

3) As assets become more scarce and competing demands rise, the emphasis on logistics information will increase. Moreover, as reliance on information systems

increase (and as they become more integrated), these systems become a more lucrative target, and

4) Industrial base implications include:

- Continued shrinking source of supply and capability to surge
- Necessity of DoD supporting existing weapons systems as well as new ones

well into the next century

- Weapon system complexity will increase
- The United States will continue coalition warfare and with it support of its technologies held by friendly nations. Dependence on foreign technologies will also require off-shore support. Host Nation Support Agreements, joint ventures, and joint development/production will increase

- Conventional ammunition requirements will decrease due to diminished force structure and advocacy of smart munitions and less than lethal weapons systems.

This tendency is augmented by technologies which do not consume munitions in their employment.

#### Goals, Objectives, and Strategies

The STRATPLAN's goals, objectives, and strategies evolve from two perceived desirable outcomes: 1) better, faster, more precise, and highly reliable mobile response capability; and 2) a more streamlined structure that better balances and utilizes public/private capabilities (i.e., business practices). To convey these goals, the strategic planning group (framers of the STRATPLAN), chose to transmit these functions in measurable terms.

Goal #1: Reduce Logistics Response Times. Slow response times are symptomatic of processes that need to be streamlined and/or fail to challenge managers to achieve peak performance within realistic (vice padded) timeframes. Where the private sector has moved to reducing response times to accommodate customer desires or facilitate production, DoD response times are markedly longer. Improvement in response times is deemed essential for supporting a mobile force/response to multiple contingencies; minimizing investment, both in inventory and storage facilities; and responding "with the most current knowledge of operational requirements." The STRATPLAN continues with supply processing and transportation goals for the near and midterm.

In addressing the objectives and strategies to achieve the goal, Total Asset Visibility (TAV) is established as the vehicle of change. TAV is a capability to gather information about the quantity, location, and condition of any asset in the DoD logistics system. This information is then applied to improve logistics processes. As a management tool, TAV facilitates the movement/redirection of material rather than reliance on purchase or repair. OSD and Components (Services and agencies such as the Defense Logistics Agency) were directed to select standards for use of Automated Identification Technology (AIT) for maintenance and distribution of DoD material by June 1994. Furthermore, a compatible AIT tagging/documentation manifest system was to be in effect by October 1994.

Considerable emphasis is placed on the measure of responsiveness at the consumer level. If the consumer is satisfied that his requirements can be met in a

timely manner, he is less inclined to hoard stocks, and thus maintain the footprint already in effect (i.e., without expanding the assets deemed necessary to support the system).

Goal #2: Develop Seamless Logistics System. "One of the key impediments to improving logistics responsiveness is the mechanics of the system itself." Our present logistics system is horizontal as it involves the entire life cycle of an asset. The actual process itself is not simple, however, encompassing numerous levels of development, information systems, and control authorities. This goal seeks to streamline the process by stripping away steps and controls that fail to add value, hence slowing support to the consumer.

Revision begins with standardization, and utilization of Management Information Systems (MIS) to facilitate the decision process. This includes definition of requirements, standardization of logistics data elements, and establishment of a process and data baseline. Once requirements and processes are determined, Components are directed to implement the standardized systems and recommended business process and technical improvements.

The goal also requires the establishment of a comprehensive benchmarking program, improvement of the communication of logistics information, and development of flexible logistics support options. It is this last improvement which best reflects the seamless logistics system, for it seeks to "reduce organizational and functional barriers among strategic, operational and tactical logistics systems."

Goal #3: Streamline Logistics Infrastructure. This goal is the most pertinent to this paper as it addresses the utilization of business practices within the DoD logistics structure. For the strategic planners:

Reducing the cost and "footprint" of logistics is key to meeting the DoD's FYDP fiscal targets and providing an optimum "tooth to tail" profile. The DoD logistics infrastructure was built to provide for organic capability to sustain a large force committed to global conflict. With the reduction in force structure and peacetime logistics workload, it is essential that methods, procedures, and policies minimize the structural "overhead" of logistics... Measures of success: For purposes of national reporting, DoD will measure performance against this goal in terms of total cost to deliver required logistics support. Internally, DoD will measure changes in: (1) cost per output, (2) change in number of support facilities, (3) personnel trends, (4) inventories, and (5) other related indices.<sup>6</sup>

The objectives and strategies of this goal provide the focus for this paper as they include, first and foremost, the implementation of "most successful business practices." Functions to be accomplished under this requirement include:

- 1) Inventory reduction;
- 2) Elimination of excess organic depot maintenance not required to maintain core capabilities;
- 3) Plans for decentralizing order of commonly-used materials and items. This requirement is enhanced by implementing contracting techniques that facilitate local orders without extensive local purchase contracting. Additionally, establishment and use of Flexible Computer Integrated Manufacturing (FCIM) to facilitate stocking little-used, non-commercial parts is prescribed;
- 4) "Aggregate purchases from single sources across the broadest range of items, to include the distribution/delivery process in the purchase instrument, to reduce leadtimes, stockage, and contract administration;"

5) Improvement of data timeliness and integrity;

---

<sup>6</sup>Department of Defense, Logistics Strategic Plan/Edition 1994 (Washington, DC: GPO, 1994), 13.

6) Continued disposal of defunct/unnecessary stocks in the national stockpile to the extent permitted by law; and

7) Acquisition streamlining.

The second requirement (outsource of non-core logistics) provides the bridge for direct military access to the civilian industrial base. This will be accomplished first through use of commercial sources for dining facilities (by 1996), followed by direct vendor delivery of routine medical and clothing requirements by 1997. Furthermore, TRANSCOM is tasked with extending civil aircraft availability by providing incentives for participation in the Civil Reserve Air Fleet Program (CRAF).

The final objective, reduction of weapon system logistics support and sustainment requirements, is hardest to achieve because the best indicator of success - improved system availability, particularly in battle - precludes short term analysis. This will be accomplished through four principle avenues. First, Components are directed to support selective investments in Science and Technology (S&T) to reduce life cycle support costs when developing weapon systems. Secondly, data systems must be evaluated to ensure usage information is accurate. Third, developers are encouraged to finance reliability and maintainability factors up-front to cut maintenance costs further on in a system's life-cycle. Finally, education of "industry personnel" on field operation and maintenance environments for proposed equipment, is mandated.

## Summary

The 1994 STRATPLAN is an attempt to span the theory and realities of the present with the anticipated requirements of the future. Though it exhibits several commendable resolutions, it is most notable in its advocacy of adopting civilian business practices.

## THE BUSINESS REVOLUTION OF THE 1980s

### Introduction

When the STRATPLAN directs the use of "most successful business practices," it considers these measures in the context of essentially five areas: 1) inventory reduction; 2) decentralized order of commonly used materials and items; 3) single source, aggregate purchases; 4) improved/timely data; and 5) fiscally prudent disposal of dated/expired stocks.

American industry did not always employ these functions as ably (or tenaciously) as it now does. From the end of World War II until the mid 1970's, American industry dominated global economics. By the end of that decade, however, a not-so-subtle shift had occurred. The market share of many industries, previously enjoyed by the United States, was shifting toward the Japanese. American consumers were choosing Japanese products over tried-and-true American mainstays. Japanese productivity, quality, and inventiveness was rapidly outpacing and outclassing - that of the United States. Some analysts asserted that the Japanese improvement in quality was primarily a result of cultural, economic, and social characteristics of Japanese management. Others perceived the success of Japanese industry to be in

its manufacturing and production support techniques.<sup>1</sup> Whatever the reason, a major challenge to Yankee dominance was not only imminent, but a reality.

In an effort to regain their market shares, American businesses scrutinized the Japanese post-World War II recovery and economic boom and attributed its success largely to the adoption of two innovative philosophies: Total Quality Management (TQM) and Just-In-Time (JIT) scheduling. Successful American industry seemed to be weathering the storm through use of Theory of Constraints (TOC) scheduling and Manufacturing Resource Planning (MRP II). DoD has since become inundated with TQM (and its off-shoot, Total Quality Leadership (TQL)), and since it is so familiar to this paper's audience, will not be discussed.<sup>2</sup> A short description of the JIT, TOC, and MRP II methodologies will, however, orient the reader to a portion of DoD's approach to logistics downsizing.

## JIT

This philosophy traces its roots as much to Japan's previous reputation as the source of poor quality products, as the necessity of rebuilding Japan's industrial structure following World War II. While the development of JIT is usually attributed to

---

<sup>1</sup>Lance Heiko, "A Simple Framework for Understanding JIT," *Production and Inventory Management Journal* 22 (Fourth Quarter 1989), 61.

<sup>2</sup>Total Quality Management is the application of quality principles to all company endeavors, including the satisfaction of internal customers. Further information on the origins and principles of TQM can be found in W. Edwards Deming, *Out of the Crisis* (Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study, 1982).

Japanese industry, however, it should more accurately be credited to the philosophy of Dr. W. Edwards Deming. In 1950, Japanese leaders and businessmen invited Deming, a management and manufacturing consultant, to their country to educate industrialists on product improvement. It was his emphasis on quality, process control, and personal accountability which formed the basis for JIT.

JIT is not only a method of production and inventory, it is also a general approach for managing an organization. It focuses on producing small quantities of goods "just-in-time," whereas western industry focuses on production of large lots "just-in-case (JIC)."<sup>3</sup> The latter process is predicated upon: 1) full utilization of workers and machines, and 2) buffer stocks of raw materials and finished goods as a hedge against fluctuations in supply and/or demand, and machine breakdown. These buffer stocks result in the management albatross of inventory.<sup>4</sup>

JIT, however, advocates decreased lot size and the corollary work in progress, in-plant inventory, and buffer stocks. Less inventory means less idle capital investment. Further savings are realized in diminished warehousing requirements, insurance, taxes, and stock handlers.<sup>5</sup>

---

<sup>3</sup>Richard J. Schonberger and Abdulhussein Ansari, "Just-In-Time Purchasing Can Improve Quality," *Journal of Purchasing and Material Management* 20 (Spring 1984), 6.

<sup>4</sup> Richard J. Schonberger, *World Class Manufacturing* (New York: The Free Press, 1986), 2-3.

<sup>5</sup>T. Hillman Wilks, and William C. Suter, "The Choice Between JIT and JIC," *Production and Inventory Management Review* 9 (March 1989), 42.

The concept of JIT's demand-pull system holds particular interest to DoD in its

efforts to hone-down inventories. Under this concept, the manufacturing line pulls material into final assembly from feeding operations as required. Each operation pulls material from the previous one, back to the first station where raw materials are drawn, as needed.<sup>6</sup> Traditional manufacturing is based upon the push system whereby the process produces to fill inventory, vice demand. With JIT, the reason for production is actual market demand.<sup>7</sup>

It is the JIT philosophy, however, which saved many American businesses (Chrysler and Hewlett Packard, for example) and with which DoD logistics planners hope to streamline their system. JIT is predicated upon three principles:<sup>8</sup>

- 1) Streamline manufacturing operations;
- 2) Encourage and focus on worker creativity, for the worker is closest to the process; and
- 3) Utilization of control for total quality is paramount. This entails implementation of Deming's 14 points of total quality management, to include:
  - Unity of purpose of the organization
  - Adoption of the new philosophy means less toleration for old, continuing mistakes

---

<sup>6</sup>Richard J. Schonberger and Edward M. Knod, Jr., *Operations Management Improving Customer Service* (Homewood, IL: Richard D. Irwin, 1991), 332-34.

<sup>7</sup> Domenic J. Cirello, *Application of Just-in-Time Production Methods in the Defense Industrial Base*, MS Thesis (Dayton, OH: Air Force Institute of Technology, Sep 1991), 21.

<sup>8</sup> Robert W. Hall, *Zero Inventories* (Homewood, IL: Dow Jones-Irwin, 1983), 40.

- Discontinue the use of inspection to improve quality; emphasize, instead, improvement of the process

- Cease to award business based on the lowest bidder; seek to improve quality through long-term relationships with suppliers

- Effect constant and continuous improvement

Unlike the DoD imperative of more responsive and reliant data, however, JIT does not require extensive capital investment or use of computer systems.

JIT does have its limitations, and not all businesses can or will convert to JIT due to the trade-offs in supply and transportation. First:

[S]chedules [must] coincide with the delivery schedules generated by the assembly plant's just-in-time system. Otherwise, the result will simply be a transfer of inventory carrying costs from the firm's assembly plant to its part plants and its vendor; the [after will eventually recover these costs by increasing the price of their parts to the firm.<sup>9</sup>

Supply also impacts upon the transportation and costs of suppliers' materials due to increased numbers of small shipments to meet production schedules. More shipments usually mean more money, and many firms feel it is unnecessary to trade the costs saved in JIT's benefits to compensate for the expenses.

## TOC

The Theory of Constraints is based on the theory of Dr. Eliyahu Goldratt, who in turn derived his concepts from the Total Quality Management Theory of Deming and

---

<sup>9</sup>The 14 points of quality management are drawn from W. Edwards Deming, *Out of the Crisis*, 23-62.

the JIT inventory control procedure.<sup>10</sup> The premise is that the flow of materials through every system encounters constraints; the key to its success is the proper management of this constraint and its relationship to the rest of the system. The TOC focus is to balance flows of material, rather than capacity. Since maximization is based upon the constraint, this is the area upon which attention should be directed.<sup>11</sup>

Business uses a simple five-step approach to implement the system.

1) Identify the system constraint(s). The constraint may take a variety of forms and may not necessarily reside within the realm of logistics (i.e., procedural disconnection);

2) Determine how to exploit the system constraint(s). This entails ensuring it is actually working, especially on the right jobs;

3) Subordinate all other decisions to the effective use of the, constraint;

4) Elevate the system constraint(s). This means isolation, examination, and solution of the problem due to its impact on the system and not simply for its own effects; and

5) Once the process is flowing (less constrained), return to the first step and re-evaluate the system to determine where the new constraints are and continue the

---

<sup>10</sup>Raymond P. Mayer, "A Critical Look at Kanban, Japan's Just-in-Time Inventory System," *Management Review*, Dec 1984, 50.

<sup>11</sup>Eliyahu M. Goldratt, *The Haystack Syndrome* (Croton-on-Hudson, NY: North River Press, 1990), 109.

process of on-going improvement.<sup>12</sup>

TOC's principle advantage lies in its innovative approach to the organizational environment. Its focus is more strategic than tactical, i.e., considering the effects of the whole vice a focus on its parts. DoD's interest in such an approach focuses on the development of a process for fixing that part of the logistics system which is broken, and streamlining those functions which are impaired by the bottlenecks. Though JIT is commonly considered the philosophy of choice, TOC has the potential for fixing just as extensive a system since it is more a mindset than a manufacturing process. As a management technique which requires little hardware modification, it is certainly a viable process for DoD to consider.

## MRP II

Manufacturing resource planning is often confused with material requirements planning (MRP); the first represents a complete management system while the latter serves as a simple mathematical tool. MRP II was developed in 1978 by Oliver Wight because he felt a management program was necessary to make MRP more effective.<sup>13</sup> The name-of-the-game in MRP II is data - strictly disciplined, accurate, and current. This permits managers to calculate the requirements of every part or subassembly, week by week, and anticipate possible delays or stock-outs.

---

<sup>12</sup>Jacob U. Simons, Jr., and Richard I. Moore, Jr., "Improving Logistics Flow Using the Theory of Constraints," *Logistics Spectrum* 26, no. 3 (Fall 1992), 15.

<sup>13</sup>Simons, 17.

Every department, almost every employee, interacts with MRP II as it aids all aspects and levels of decision-making by providing data input from all aspects and

levels of the company.

MRP II attempts to achieve zero inventory, assumes uneven demand, and sets priorities ... During production, the system gathers the data necessary to evaluate the organization's performance. The data in turn is 'fed back' into the loop for future planning cycles.<sup>14</sup>

MRP II's reliance on accurate and timely data reflects DoD's stress on expansion, consolidation, and standardization of information systems. The purpose of these systems is to not only feed information to administer the process (be it manufacturing or sustainment), but improve it as well. Reliable information, therefore, provides not only a means of control, but a significant management tool:

The nature of logistics demands data - data of a varied character depending upon the specifics of the logistics function. Many logisticians have often said that those who do not know history are doomed to relive it. Data/information is a very real part of helping today's managers understand history and provide the sound basis necessary to invoke more informed decisions.<sup>15</sup>

### Summary

Generally, American business has managed to adopt the spirit and mechanics of fiscal reform through use of smart, scientific processes and systems. Though there are always uncontrollable forces such as markets and the whims of consumers, data

---

<sup>14</sup>Alicia Johnson, "MRP? MRP II? OPT? CIM? FMS? JIT? Is Any System Letter Perfect?" *Management Review*, (Sep 1986), 24.

<sup>15</sup>Dr. Bruce Christensen, "Problems with Logistics Data," *Air Force Journal of Logistics* 16, no. 1 (Winter 1992), 40.

and analysis greatly mitigate the impacts of risk. The contemporary corporate world is not the arena for exercising intuition or intangible instinct.

The revolution of the 1980s was not only a change in the way American industry did business, but a radical shift of paradigms and thought processes. It is no wonder DoD logistics planners are looking toward the business sector for answers. The Defense structure is the nation's biggest corporation. To continue to satisfy its customers in the style they have come to expect, but within radically reduced fiscal constraints, it must go beyond superficial reforms in order to respond quickly and efficiently.

The STRATPLAN was not, however, a complete surprise to DoD agencies and components. Many business practices have already been implemented within the Department with varying degrees of success. An overview of these already-accomplished innovations will be covered in the following chapter.

## SERVICES' COMPLIANCE WITH THE STRATPLAN

### Introduction

During the Gulf War build-up, over 400,000 anti-tank rounds were requested to ensure the destruction of 5,000 enemy tanks. In many cases, requirements for anti-tank and other preferred rounds exceeded world-wide stocks levels or requirements identified for a global scenario... We did not have a rationalized system which linked procurement calculations and projected CINC requirements. Only some 43,000 rounds were fired. A number of conditions contributed to the low expenditure rate... Without drawing an overly simplistic conclusion, it is safe to say that had a requirements determination process been in place, we would not have had to commit as many ships to moving ammunition to the Persian Gulf.<sup>1</sup>

If even private business, which predicates its existence upon profit, can manifest glaring inefficiency, it is also true that the federal government is host to a myriad of deliberate abuses and honest mistakes which can take years to detect or rectify.

Admittedly, the Department of the Defense hosts its share of these oversights which cost taxpayers literally billions of dollars each year. Overstock and standing stocks of munitions, repair parts, sustainable, and medical supplies cost money; this includes not only procurement and maintenance, but replacement when shelf life or obsolescence precludes their use. Much of this excess is based on faulty requirements data. Other reasons include initial procurement overstocks (i.e., introducing a new piece of equipment and its attendant repair parts without evaluating

---

<sup>1</sup>Gary H. Meals and Ted Kim, "Logistics: The Way Ahead," *Joint Forces Quarterly* (Spring 1994), 44.

what is already extent), inefficient accountability, and just-in-case items which swell warehouses and budgets.

Even before the STRATPLAN was published, the armed services had begun evaluating their various supply and requirements systems in an effort to streamline processes and cut costs. The purpose of this chapter is to provide a brief overview of the process the Services have initiated, whether in compliance with the STRATPLAN or through independent assessment, and examine their reforms with a reference to the better business practices of the 1980s.

### Theses and Studies

Military interest in revolutionary business practices was indicated as early as 1986 in the form of student master's papers at the Air Force Institute of Technology (AFIT) and Florida Institute of Technology (in conjunction with the Army); these in turn were

made available through the Defense Technical Information Center (DTIC) and the Defense Logistics Systems Information Exchange (DLSIE). There is little else available for the period 1986-1991 except these papers which indicate consideration of concepts. This is not to say, however, that these ideas were conceived without military oversight. Personal experience as a student at the Army's Logistics Executive Development Course at Fort Lee (then the Army's career level course for captains and majors) in 1987 first exposed me to the basics of TQL, JIT, and inventory control and management as part of the course curriculum. This reflected the Army's increased awareness of and interest in better business practices, though actual implementation was not really evident until 1990/91. Several of my fellow master's candidates researched and wrote papers on these concepts under the proctorship of senior Army officers, and though they were not official reports, they helped to answer questions and focus future research.

It is not within the scope of this paper to address this entire body of research nor every reform the military had implemented by the advent of the STRATPLAN. The papers encompass a vast spectrum of topics, from tire orders to algorithms. However, they all share two common characteristics - interest in logistics and acquisition reform; and fresh, innovative (often highly workable) methods to effect this process. Some of these recommendations include:

- 1) Advocacy of a Decision Support System (DSS) to determine medical facilities' potential for implementation of a stockless medical materials management system. The DSS is presented as a management tool vice determinant to ascertain the viability of JIT medical supply in Air Force hospitals and clinics. The Air Force, and

subsequently the other services, later implemented Class VIII (medical/dental supplies) stockage systems similar to the one advocated by this study;<sup>2</sup>

2) JIT adoption by defense contractors can, and should, be implemented. This can be achieved by fostering competition for defense contracts and encouraging contractor supplier alliance programs.<sup>3</sup> Current Defense contracting regulations often

---

<sup>2</sup>Thomas M. Harkenrider, Stockless Medical Materials Management. Applications for the United States Air Force Medical Service, MS Thesis (Dayton, OR Air Force Institute of Technology, Sep 1991), 84.

<sup>3</sup>Cirello,<sup>57</sup>.

preclude competition through intricate and sometimes almost unsurmountable requirements which frustrate and discourage potential contractors;

3) Recommendation to employ the Source-to-User concept of distribution management whereby purchased or repaired items are shipped to the ultimate user vice an intermediary warehouse for distribution. This method is a precursor of the seamless systems of the STRATPLAN;<sup>4</sup>

4) Defense contractors can implement JIT processes and pass the subsequent savings onto the government. Federal/DoD contracting regulations must be reviewed, however, to remove impediments to contractor implementation. The most serious problem in this regard concern government controls over product and process specification, quality, and subcontracting;<sup>5</sup> and

5) Time Based Competition<sup>6</sup> principles should be considered in formulating sustainment requirements for the Force Projection Army. These principles include (but are not limited to) flexibility; uninterrupted flow of supplies; utilization of pull

---

4 Dan E. King, The Source-to-User Concept - An Alternative Method for Distributing Aircraft Tires, MS Thesis (Dayton, OH: Air Force Institute of Technology, Sep 1986), 50.

5 Carl Ross Templin, The Effect of Defense Contracting Requirements on Just-In-Time Implementation, Ph.D Thesis (Dayton, OH: Air Force Institute of Technology, Dec 1988), 168.

6 Time Based Competition (TBC) is an industrial management technique whereby JIT production strategy is applied to the operations of an entire company. It stresses elimination of waste throughout the entire production operation, from development to distribution. Definition provided in Richard W. McArdie, Jr., Study to Determine the Feasibility of Applying the Principles of Time Based Competition to a Force Projection Army, MS Thesis (Fort Lee, VA: Florida Institute of Technology, Apr 1994), 5.

resupply; close cooperation with suppliers; and utilization of cross-training and multiple operators.<sup>7</sup>

These schoolhouse evaluations considerably differ from a 1989 study by the U. S. Army Logistics Evaluation Agency in New Cumberland, Pennsylvania. This agency was tasked to evaluate the Navy's JIT system already established at the Jacksonville Naval Supply Center (NSC), and determine its applicability to the Army's depot system. The conclusions were essentially negative due to several factors.

1) Navy customer support was considered to be on a larger scale than the Army's. "The Navy's brigade-size elements [not in reference to Marine Corps units] with their high demands with short time requirements versus the Army's unit-size elements requiring less frequent demands with fewer time constraints" was considered more difficult to support than the Army system;<sup>8</sup>

2) Though the system freed up storage space, it could require more maintenance of inventory on the part of the contractor, thus increasing costs to the government;

3) If the contractor didn't have a JIT system with his vendors, the primary contractor's costs for transportation, storage, and handling could increase the cost of supplies;

4) Should the Army adopt the system, Government Services Agency (GSA) might respond to reduced demand by diminishing its stocks. Lower stocks could jeopardize readiness if the vendor failed to deliver; and

---

7McArdie, 29-31.

8U. S. Army Logistics Evaluation Agency, Just-In-Time (J/7) Supply Evaluation (New Cumberland PA, 1989), 5.

5) Instead of the Army downsizing its stockage levels, encouragement of proper supply management would significantly lower stock.<sup>9</sup>

It is evident, therefore, that the military was at least examining the prospects of business practices as early as 1986. Unfortunately, the size and diversity of the military organization often precludes unified or timely implementation of new ideas. All the services have effected change, from simple tweaks to existing systems, to massive overhauls of programs and logistics frameworks. The Air Force seems to have had the least difficulty adapting to the changing climate due to its reliance on technology and subsequent close affiliation with defense contractors. The Navy began its streamlining during the mid-80s, but many of its requirements and limitations cannot be applied to the nature of land warfare and its sustainment. The Army has already implemented several programs to modernize its logistics

framework, and has produced an extensive body of literature outlining its plans for the "Army of 2010." Conversely, the Marine Corps, though smaller, faces the same situations as the Army, and has initiated sweeping reforms (but considerably less announcement of such). The following section will briefly address, therefore, the Army and the Marine Corps' logistics approaches to the reduced fiscal climate.

### The Army Strategic Logistics Program

Foreshadowings of the STRATPLAN are evident in Army literature (primarily Army

---

9U. S. Army Logistics Evaluation Agency, 5-7.

Logistician) starting in 1991 with the articulation of the Strategic Logistics Program.<sup>10</sup>

By this time, Army planners were already looking to two possible avenues to streamline logistics - data and stocks. This focus was later synthesized by Colonel Gilbert S. Harper when he wrote:

If we logisticians wait until all information is available, decisions will be made without our input. So we must anticipate requirements, establish essential logistics data bases, and automate to quickly process essential data into usable information so logistically sound operation plans and orders can be developed and issued... Sustainment will offer a tremendous opportunity to save or to waste. Huge inventories should be avoided in favor of improved industrial base surge capability in key areas.<sup>11</sup>

The Army's Strategic Logistics Agency was established in 1989 to formulate a program which would explore new concepts for supporting AirLand Battle-Future doctrine, integrate a seamless supply system, update technology, and modernize peace and wartime logistics processes. <sup>12</sup> The resulting strategic logistics program

would see the Army into the twenty-first century through reforms and streamlining in the present.

The program continues to be the Army's blueprint for its logistics future. Its goals continue to include plans for a seamless system and the achievement of sustainment imperatives for combat logistics; another major objective is the necessity to meet

---

<sup>10</sup>In 1991, General Jimmy D. Ross, Deputy Chief for Logistics (DCSLOG) of the Army, initiated a series of articles in *Army Logistician* outlining the nature and scope of the Strategic Logistics Program. Jimmy D. Ross, "The Strategic Logistics Program," *Army Logistician* (Mar-Apr 1991), 6.

<sup>11</sup>Gilbert S. Harper, "Army Logistics in 2010," *Army Logistician* (Sept-Oct 1991), 22.

<sup>12</sup>Deborah L. Pollard, "The Strategic Logistics Program: Roadmap For the Future," *Army Logistician* (Mar-Apr 1991), 7.

budgetary savings objectives resulting from Defense Management Review decisions.<sup>13</sup> Its focus is improvement/replacement of less optimal processes; use of the most current technology to achieve a "paperless" system; address of "core" logistics functions such as supply, maintenance, distribution, and transportation; and integrated development of major process improvements of these functions. TQM is a predominant management tool.<sup>14</sup>

Under the auspices of this logistics vision, the Army has introduced several systems to upgrade and integrate logistics performance. These include (but are not limited to):

1) Objective Supply Capability (OSC) - means for deployed user to electronically pass requirements to CONUS. Its purpose is to lessen the time required to register a part on the wholesale supply system;<sup>15</sup>

2) Total Distribution System (TDS) - a method for viewing and addressing the entire spectrum of distribution. This includes inventory control, automation, and communication links; capitalization and technology; and force structure and standardization;<sup>16</sup>

3) Logistics Automation Systems Support Office (LASSO) - remote area's center for effecting satellite link-ups (where possible) or despatching tapes (via Air Force

---

<sup>13</sup>Pollard, 8.

<sup>14</sup>Pollard, 6.

<sup>15</sup>Jimmy D. Ross, "Focusing Logistics for the Future," *Military Review* 72, no. 9 (Sept 1992), 52.

<sup>16</sup>Ross, "Focusing Logistics for the Future," 52.

flights) to register supply requirement in the CONUS system;<sup>17</sup> and

4) Supply Usage Requirements Estimator (SURE) - data base structured to each individual unit and corresponding equipment density which calculates requirements and usage rates.<sup>18</sup>

The Army would appear to be well focused on its logistics commitments for tomorrow within the constraints of today. With a permanent organization whose purpose it is to focus and direct efforts, the Army should achieve a proficiency level that not only meets, but exceeds, the expectations of the STRATPLAN. There is, however, potential for less than desirable results. First, the program should avoid locked-in-concrete plans which cannot (or will not) adapt to changing fiscal climates or strategic re-direction. It must remain flexible. Secondly, current and future

planners cannot become so enamored of their project that they ignore potential system fallacies or inadequacies. Finally, having published its intent and direction, the Army is obligated to financially support it., Sometimes, a little less publicity pertaining to an intended course of action is more prudent. Under these circumstances, less complete execution of a plan can attract undeserved criticism and scrutiny.

---

<sup>17</sup>Edward Augustus, "Logistics Automation Support," Army Logistician (Jul-Aug 1993), 36.

<sup>18</sup>Lawrence R. Mead, "SURE (Supply Usage Requirements Estimator) To Be A Hit," Army Logistician (Nov-Dec 1993), 30-32.

#### U. S. Marine Corps Logistics Vision

While the Army has expended considerable time, talent, and print expounding its strategic logistics vision, the Marine Corps has remained typically silent. That is not to say there is no strategic concept. On the contrary, top level Marine Corps logisticians have, for several years, anticipated the need for modernization of logistics computer software, verification of usage data, standardization of systems, and gradually laid the foundation for their development and employment. But one weakness exists. As far as a cohesive expression of this vision as a comprehensive plan - there is none.

Historically, the Marine Corps has been able to function without such written focus until, once established and functioning, articulated plans could be codified to doctrine. This manner of conducting business has become ineffective, however, and must be abandoned. Budget wars, roles and missions, and political pressures have forced the

Services to substantiate their expenditures within the broader framework of plans and policy. Programs which cannot be integrated into the larger picture should be (and usually are) destined for termination.

Despite its disinclination to proactively commit vision to paper, the Marine Corps has made substantial progress toward logistics support for the twenty-first century. The process includes an entire family of enhancements and replacements of existing supply and maintenance systems which set the stage for the following two systems.

#### Asset Tracking for Logistics and Supply System (ATLASS)<sup>19</sup>

ATLASS is a personal computer based supply and maintenance management system which enables the user to manage assets, interface with MAGTF Deployment Support System II (a previously deployed planning system for strategic lift), and track supply demands from introduction of requirement to delivery. It will be completely fielded in 1996 at which time it will provide maintenance, as well as supply personnel, a fully deployable, stand alone system that functions independently of mainframe support.

Phase I of ATLASS was fielded in 1994 and used by combat service support (CSS) personnel in Somalia, where it provided direct access to the stateside SASSY (Supply Automated Support System) Management Unit (SMU) and other sources of supply via satellite link. The next phase is scheduled for October 1995 and will entail the broadest and most difficult transition measures of ATLASS implementation. In addition to hardware and Database Management (DBM) software fielding, the Marine Corps Integrated Maintenance Management System (MIMMS) will be integrated into the system. At this point, the MIMMS and SASSY systems, which have shaped

Marine Corps supply and maintenance functions for almost twenty years, will finally be retired. The final phase of implementation is projected for 1996 when the last SMU programs will be absorbed by ATLASS and the framework to accommodate Total Asset Visibility (TAV) and In-Transit Visibility (ITAV) finally realized.

---

<sup>19</sup>Information on ATLASS is drawn from a HQMC (I&L) information sheet, undated and unpublished, titled "ATLASS Overview."

#### Advanced Expeditionary Combat Service Support (AECSS)<sup>20</sup>

In developing its concept of Operational Maneuver from the Sea (OMFTS), the Marine Corps has come to realize that it does not have a flexible and responsive sea-based support system. Sustaining operations ashore is presently based on establishing and building up combat service support in the theater of operations. Under AECSS, sustainment (particularly of supply classes I, [rations], III [petroleum, oils, and lubricants], and V [ammunition] are essentially stockpiled at sea, thus reducing the footprint which would be otherwise committed to the beach.

On 20 January 1995, the Marine Corps conducted an AECSS seminar in consonance with other services and civilian businesses which have experience in the support, or consumer, role. Several concerns were expressed. First, questions arose as to the type of sea base to be employed. Alternatives included the rental, modification and purchase of existing craft, or completely designing a new platform. The latter raises the issue of whether AECSS should be incorporated into Maritime Prepositioned Shipping (MPS) and, if so, if the MPF which supports OMFTS should be different than presently configured.

Secondly, AECSS requires a logistics system which provides accurate, current data on type, quantity, and location of asset. This issue can probably be resolved utilizing commercial systems and/or systems presently in use or under development by other services. This answer is in keeping with STRATPLAN objectives.

---

<sup>20</sup>United States Marine Corps Wargaming and Combat Simulation, "Sponsor's 'Quick-Look' Report," unpublished report, Jan 1995.

Third, the system will require the capability to respond to unanticipated demands, and be resistant to information warfare. Therefore, with its reliance on information systems, AECSS should employ both voice and data communications to ensure security and reliability.

Finally, movement of assets to the shore will require an adaptable or AECSS-peculiar means of transport. Method of demand on AECSS should combine both push and pull systems.<sup>21</sup> Once again, the STRATPLAN and its systems are evident.

ATLASS and AECSS are not the only concepts of the Marine Corps' logistics modernization process though they are crucial to its realization. Much of the thought, development, and money has already been dedicated to the program and ATLASS and AECSS represent the current stages which must be implemented or considered.

### Summary

It seems evident that many of the STRATPLAN's precepts and requirements have already been implemented or considered by the Services, the Marine Corps included. It is the more subtle aspects of the STRATPLAN however, which present the most

potential for nonconcurrency, even noncompliance. These factors are not as easily stated or addressed, dwelling as they do within the realm of the unquantifiable and intangible. The preponderance of this paper has, to this point, dealt with the tangible

---

21Push denotes proactive measures to push supplies to the user without request. Pull logistics is responsive to the demands of the user.

aspects of the STRATPLAN, its roots in the business world, and the Services' implementation of its mandates. The next, and concluding chapter, will address the more elusive aspects of military logistics, and the STRATPLAN's failure to acknowledge their role and importance in the conduct of war.

## CONCLUSION

### Introduction

The STRATPLAN is an attempt to bring the Department of Defense into the twenty-first century by utilizing, in large part, the successful business practices of the twentieth. Many of its mandates have already been implemented by the various services; others are still in the early stages of research and development. Whatever the status, the essential elements of the STRATPLAN are already in effect, and DoD components are well on their way to seeing the plan to fruition.

The STRATPLAN, though not a scientific document, advocates and requires the use of analytic processes to accomplish logistics missions. The desire to minimize risk is a major factor in the use of scientific method. Military logisticians wrestle with the amount of insurance they must buy to avoid stock-out and its possibly

catastrophic circumstances. So why shouldn't DoD view logistics from a purely scientific perspective?

The purpose of this chapter is to answer this question through examination of three factors: the nature of the STRATPLAN itself; a look at the essential differences between business and military logistics; and the intangible characteristics of the military logistician.

### STRATPLAN

Problems with the STRATPLAN generally fall into three categories - customer, response time/responsiveness, and process.

Customer. The STRATPLAN, by its form and content, seems to be modeled after a business, vice military, strategy. Using the business format, the resulting logistics strategy "is a key to satisfying customers, so the logistics process must be designed to meet the requirements and expectations of the customers it services."<sup>1</sup> It is uncertain as to who the customer is for the STRATPLAN, let alone what the plan endeavors to ultimately accomplish in regard to satisfaction of customer requirements. In this respect, it certainly bears little resemblance to a business logistics strategy, and even less to a military. The preeminence of the customer requires:

- 1) Updating and understanding his requirements and concerns;
- 2) Monitoring satisfaction of requirements; and
- 3) Recognizing different customers need different levels of service.<sup>2</sup>

These functions are laudable for either business or military logistics. If the customer

is not really identified, however, he can be neither surveyed nor supported. The STRATPLAN never really identifies its customer. One assumes that it is the soldier, sailor, airman, or marine. Emphasis on fiscal constraint and streamlining, however, convey the impression that financial managers, and not combatants, are its focus.

---

1P. M. Byrne and W. J. Markham, "Your Logistics Strategy is Obsolete," *Traffic World* 235 (Jul 26, 1993), 35.

2 Byrne, 35.

Response Times/Responsiveness. Responsiveness is seldom mentioned in the STRATPLAN as the process focuses more on response times to satisfy customer orders. The terms are not interchangeable, and it is alarming that our DoD logisticians cannot, or will not, differentiate between them. Response times deal more with the order and distribution process than a more encompassing, general method for doing business. Responsiveness, for the military logistician, represents a broader spectrum of thought and impact.

Responsiveness carries reaction beyond reflex counteraction; it connotes measured, positive activity, reflective of needs and stimuli... unanimity of purpose and especially the singleness of perception of purpose.<sup>3</sup>

As a theme, responsiveness deals with determining and serving real need; it is an ideal environment for synthesis of ideas and concepts. It is also a very unscientific term as it focuses on intangible indicators such as perception and satisfaction. When other themes, such as response times, are applied to a process, they tend to force analysis by dissection and examination of individual parts. The parts determine the maximum benefit. This is particularly true of cost-effectiveness rationales which deal

only superficially with human nature. Efficiency studies tend to ascertain high input-output ratios by optimization of each level of the process. These step-by-step approaches, with their emphasis on tangible outcomes, often forget the end product and the customer.<sup>4</sup>

---

<sup>3</sup>Kenneth N. Brown, *Strategics: The Logistics-Strategy Link* (Washington, D.C.: National Defense University Press, 1987), 69.

<sup>4</sup>Brown, 16.

James Huston best described this distinction when he wrote: "Because the Army logistics system is so big, it must be as efficient as possible as a matter of economy. However, economy must not take precedence over responsiveness and effectiveness because in the war the first 'runner-up' is the loser."<sup>5</sup> In a relatively closed system such as a production floor, there is little necessity to interact with the environment except as it effects supply of raw materials and storage of final product. Enhanced efficiency usually facilitates more economical use of resources. Corresponding risks also lowers due to increased accountability for time and materials. Should that system expand and become subject to unanticipated friction, the probability of risk increases. Unfortunately, war and its prosecution are illustrative of this latter open process.

Process. The STRATPLAN makes some commendable recommendations, goals, and objectives for a variety of processes, but never actually acknowledges or outlines a comprehensive (or even sketchy) program. The focus is on optimization of a number of discreet processes which are not incorporated into a concept of "the

whole." In military terms, the STRATPLAN emerges as a number of tactical entities without their incorporation into a strategic perspective. Instead, the document's approach potentially suboptimizes the logistics system by attempting to optimize specific processes.

---

<sup>5</sup>James A. Huston, *The Sinews of War. Army Logistics, 1775-1953* (Washington, D.C.: Center of Military History (U.S. Army), 1988), 693.

The concept of JIT is a good example where the STRATPLAN espouses a smart business system but ignores the process which must be implemented in order to make the concept successful. JIT relies on short lead times, small lot sizes, and a robust, responsive transportation system. How is the military to totally embrace JIT if transportation assets are already in short supply? Schedules are imperative, but what major Defense program has never encountered major changes and delays? Other integral facets of JIT - geographic concentration and vendor relationships - all run in the face of how DoD must conduct business rather than how it would care to operate.<sup>6</sup>

#### Business and Military Logistics

Even as late as the 1950s, logistics referred only to the military science of supply, transportation, and support services. Military logistics probably dates back to tribal feuds, while an equivalent function in the business world is a relatively new development.<sup>7</sup> Following the Korean War, however, business began to embrace the concept of logistics based upon utilization of military quantitative methods. Today, it is a formal discipline whose purpose is the efficient management of materials and

products into, through, and out of a firm in support of customer requirements.<sup>8</sup>

---

<sup>6</sup>Michael L. McGee, "Just-In-Time, or Just-Too-Late," *Army Logistician* (Nov-Dec 1994), 16-17.

<sup>7</sup>Joseph F. O'Brien, "Logistics Roots," *Logistics Spectrum* 24, no.2 (Summer, 1990), 33.

<sup>8</sup>O'Brien, 33.

Despite disparate identities and objectives, business and military logistics share many common aspects. Business is now addressing the importance of life cycle study and management of products to avoid large investments in support that might be too easily overcome by technology. Reverse logistics (recycle, reuse) is based upon the military model of retrieval and redeployment.<sup>9</sup> Databases are becoming the mainstay of proactive production. Each community has borrowed from the other the benefits of contractor, vice organic, support. Military reliance on demand forecasts is now an established function of smart businesses.<sup>10</sup>

It is with objectives, however, that similarities end. Military logistics must consider operational readiness in the support of troops and equipment. Business logisticians' purpose is the establishment and insurance of customer service through reliable, efficient distribution of a product.<sup>11</sup> General Pagonis draws a distinct demarcation between the two enterprises by equating military logistics with life and death and that of business with the pursuit of profits: "We in the military must sacrifice some measure of efficiency to maintain a higher margin of safety. We stockpile a little (or a lot) extra just in case."<sup>12</sup>

---

9William G. Pagonis with Jeffery L. Cruikshank, *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War* (Boston, MA: Harvard Business School Press, 1992), 150.

10O'Brien, 34.

11O'Brien, 32.

12pagonis, 210.

Risk is the name of the game, and it is the method of its minimization which distinguishes business from military logistics. The corporate logistician cannot operate within a completely closed system. The friction he encounters is usually tangible (slow suppliers and breakdowns, for example) but sometimes intangible (employees in the grip of a bad hair day). The first instance can be rectified by adjustment to the process. The second is less easily resolved but usually not as potentially damaging as it can be absorbed into the ebbs and flows of production. Though the human element has an impact, scientific method is the principle means of minimizing risk.

In the military arena, analytic processes can certainly augment the situation, but the human element (and thus the impact of intangibles) is considerably higher. The conduct of war itself is a complicated business considering just the scope, diversity, and effect of weapons and their support. Introduce the human element - both friendly and enemy, and any concept of tight control is a memory. Minimizing risk in this environment entails a myriad of forms and rationales. Utilization tables cannot convince the commander that what he wants isn't necessarily what he needs. Innovation has no formula. There is no scientific equation which can replicate the gut

instinct of an experienced logistician. For the military logistician, therefore, science is just another tool in his inventory.

### Intangible Characteristics of the Military Logistician

Logisticians, by their very nature, are an ill-defined breed composed of laborers, craftsmen, clerks, and technicians, as well as engineers, philosophers, statesmen, business managers, and a host of other individuals in trade specialties and academic disciplines too numerous to list.<sup>13</sup>

Despite the myriad of specialties, however, all logisticians (and particularly logistics officers), should demonstrate above average levels of innovation, flexibility, and responsiveness.

Innovation is an attribute frequently preached to junior military officers though seldom acknowledged or rewarded when exercised. True, weapons systems and doctrinal concepts of employment dictate a certain thought process. If he is to supply support on the constantly changing battlefield, though, the logistics officer must be facile enough to think out-of-the-box. Operational complexity over considerably longer distances, and in an increasingly lethal battlefield, will force conscientious logisticians to innovation to effect continuous support despite periodic logistics shortfall.<sup>14</sup>

The ability to adapt will continue to be critical in the event planning models are inaccurate, communications fail, and/or operations do not progress as anticipated. Innovation cannot help but augment the sustainment imperatives of anticipation, integration, continuity, responsiveness, and improvisation.

Responsiveness, reinforced by flexibility, rounds out the benefits of innovative thinking. The logistics officer must thoroughly understand the commander's intent

---

13 Kenneth M. Gladstone, "Logistics Management: White-Collar Cloak - Black Magic Artistry," *Air Force Journal of Logistics* 16, no. 4 (Fall 1992), 2.

14 "Anticipation is the Key to Future 'Logistics in Motion,'" *Army* 41, no. 2 (Feb 1991), 35.

and concept of operations to formulate his (the logistician's) initial support plan. Moreover, he must have a thorough knowledge of tactical or operational doctrine, and how the operator thinks - factors which do not always maximize the potential for logistical efficiency.<sup>15</sup> Knowledge of the plan and commander's intent facilitate anticipation of requirements, and tactical familiarity disposes the logistician to the possibilities of what might happen on the fluid battlefield. "The logistics officer needs to position himself far enough forward to stay abreast of the tactical situation and react quickly to changing operational demands as he sees them developing. Being an efficient order-taker is not enough."<sup>16</sup> To be responsive, logistics must be flexible enough to accommodate the ebb and flow of war while realizing its ultimate limitations to accomplish operations as planned.

A previously discussed, intangibles exist in a shadowy world which defy identification or definition. They convey pleasure, comfort, or security, but also discontent, frustration, or discomfort. Intangibles are not emotions but their presence or absence can provoke emotional reaction. Part of our unexplainable, instinctive selves, they are usually ignored by our no-nonsense, palpably-oriented society.

Just as the impact of intangibles has become less evident, the nature of war has transformed. Modern technology and tactics have removed much of the toe-to-toe,

look-him-in-the-eye warfare of yesterday. We have depersonalized war to such an

---

15H. T. Hayden and G. 1. Wilson, "The Tail That Wags the Dog," Naval Institute Proceedings 116, no. 10 (Oct 1990), 52.

16Hayden, 52.

extent that we attrite our enemy instead of kill him; we inflict collateral damage rather than destroy civilian property and lives. The impact of war is no less horrible - we've just managed to sanitize its description.

Ironically, the conduct of war has not evolved as much as we might hope. The very contemplation of war still conjures up images of patriotism counterbalanced by needless destruction; cowardice, as opposed to bravery; senseless sacrifice mitigated by enlightened and conscientious leadership. War still stirs the primal psyche in unexplainable, indescribable ways. Many aspects of war still remain within the realm of the intangible.

As previously discussed, Clausewitz had little to offer as to the conduct and application of logistics in the actual waging of war. He did, however, recognize, and attempt to address, the role of intangibles better than any later logistics theorist.

"One can take it as a fundamental rule that hardship and privation, no matter how extreme, must always be treated as a temporary condition, which has to lead to a state of plenty even at times luxury."<sup>17</sup>

War stimulates requirements which cannot be transmitted to usage rates or maintenance readiness. This is most evident in the operational sector where successful command lies in acknowledgement of, and responsiveness to, the

existential realities of war. It is here that the real alliance between logistics and the trigger pullers is either made or dissolved. Not only is the logistician responsible for identifying and providing the tangible, quantifiable elements of making war, he is

---

17Clausewitz, 338-39.

expected to anticipate and provide the unexplainable aspects of reassurance and peace-of-mind. In the 1990s and the future:

The change of dimension between what is 'economical' in a household or business or in civil government and what is needed in war leads to constant tension in the realm of defense economics. The need of armies in battle for redundancy, for spare parts, for morale-bolstering support services from hospitals to quartermaster shower units and for personal aides to keep commanders free of petty distractions have all, in various contexts from time to time, been seen as proof of military waste.<sup>18</sup>

It is true there is often a glaring disparity between the commander's "I want" and what is absolutely essential to the successful accomplishment of his mission. If the logistics officer is aware of the motivations behind these seemingly unreasonable demands, however, he can usually negotiate support predicated upon both physical and psychological necessity. The military logistician who automatically responds "I can't," without even trying, betrays not only his profession, but the forces he is pledged to support. Those who think, and react, in this manner, deserve the deprecatory epitaph "Sons/Daughters of Martha"<sup>19</sup> for military logistics is not only a profession of action and reaction; it is also one of watching and listening.

## Summary

The STRATPLAN has much to offer in the refining of requirements determination,

cutting response times, and smoothing the seam between strategic and operational

---

<sup>18</sup>Roger A. Beaumont, "Beyond Teeth and Tail: The Need for New Logistical Analogies," *Military Review* 65 (Mar 1985), 4.

<sup>19</sup>The Biblical Martha, sister of Mary and Lazarus, busied herself so much with domestic activity, she could (or would) not heed the teachings of Jesus. Beaumont, 10.

logistics. Unfortunately, however, its negative impacts are more pervasive than lack of a cohesive, integrated program. If it is to become the prototype for twenty-first century military logistics thought, the caliber of contemporary (and future) support is in jeopardy.

Logistics officers must understand that their profession far exceeds the realities of data systems, usage rates, and tangible support. Neither do they function in the same world as their business counterparts, nor is there a direct correlation between military and corporate logistics. We cannot afford to let the soothing, siren voice of pure logic lull us into believing the fallacy that all logistics requirements can be quantified, touched, or even coherently described. The preponderance of logistics is, in fact, apparent. There is an entirely less obvious strata, however, which lies in the psyche. Denial of intangible demands means denial of intangible motivations. Why expect courage and patriotism but ignore reassurance and peace-of-mind?

If war were more reliable in its conduct and outcome, science might be all the military logistician would need to accomplish his mission. Unfortunately, as long as mankind is sensate, war will continue to be complicated and cruel, unpredictable and unreasonable. Risk will continue to increase or decrease not only according to

situation and assets, but the manner in which these assets are innovatively and intuitively employed. The Marine Corps can certainly function with its tangible, STRATPLAN-mandated systems and processes. Unless it continues to recognize its intangible requirements and solutions, however, it cannot continue to win.

## BIBLIOGRAPHY

### Primary and Secondary Sources

Brown, Kenneth N. *Strategics: The Logistics-Strategy Link*. Washington, D.C: National Defense University Press, 1987.

Chase, Richard B. and Nicholas J. Aquilano. *Production and Operations Management* Irwin, ILL: Homewood Publishing, 1985.

Clausewitz, Carl von. *On War*. Ed. and Trans. by Michael Howard and Peter Paret. Princeton: Princeton U. Press, 1976.

Deming, W. Edwards. *Out of the Crisis*. Cambridge, MA: MIT School for Advanced Engineering Study, 1982.

Department of Defense (Deputy Under Secretary of Defense: Logistics). *DoD Logistics Strategic Plan*. Washington, D. C., 1994.

Eccles, Henry E. *Logistics in the National Defense*. Westport, CT: Greenwood Press Publishers, 1981.

Goldraft, Eliyahu M. *The Haystack Syndrome*. Croton-On-Hudson, NY: North River Press, 1992.

Greene, James H. *Operations Management Productivity and Profit*. Reston, VA: Reston Publishing Co., 1984.

Hall, Robert W. *Zero Inventories*. Homewood ILL: Dow Jones-Irwin, 1983.

Headquarters, United States Marine Corps (installations and Logistics). "ATLASS Overview.". Information sheet.

Huston, James A. *The Sinews of War.\* Army Logistics, 1775-1953*. Washington, D.C.: Center of Military History (US Army), 1988.

Jomini, Henri. *The Art of War*. Trans. G. H. Mendell and W. P. Craighill. Westport Conn: Greenwood Press, 1971.

Meredith, Jack R. *The Management of Operations*. New York: John Wiley and Sons, 1987.

Pagonis, William G. *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War*. Boston, MA: Harvard Business School Press, 1992.

Schonberger, Richard J. and Knod, Edward, M. *Operations Management Improving Customer Service*. Homewood, ILL: Richard D. Irwin, 1991.

\_\_\_\_\_. *World Class Manufacturing*. New York: The Free Press, 1986.

*The American Heritage Dictionary of the English Language*. New College Edition. Under the word "intangible."

Thorpe, George C. *Pure Logistics: The Science of War Preparation*. Originally published in 1917. Quantico, VA: Marine Corps Association, 1992.

United States Army Logistics Evaluation Agency. *Just-in-Time (JIT) Supply Evaluation*. New Cumberland, PA, 1989.

United States Marine Corps Wargaming and Combat Simulation. "Sponsor's 'Quick-Look' Report." Jan 1995.

Van Creveld, Martin. *Supplying War. Logistics from Wallenstein to Patton*. New York: Cambridge University Press, 1987.

\_\_\_\_\_. *The Transformation of War*. New York: The Free Press, 1991.

### Journals

Anderson, David L. and Quinn, Robert J. "The Role of Transportation in Long Supply Line Just-In-Time Logistics Channels." *Journal of Business Logistics* 7, no. 1 (1986): 6888.

Anderson, E. L. "What Makes Just-In-Time Theory So Familiar to Us?" *Purchasing* 91 (Jul 19, 1984): 51.

"Anticipation is the Key to Future 'Logistics in Motion.'" *Army* 41, no. 2 (Feb 1991): 34-35.

- Augustus, Edward. "Logistics Automation Support." *Army Logistician* (Jul-Aug 1993): 36-37.
- Beaumont, Roger A. "Beyond Teeth and Tail: The Need for New Logistical Analogies." *Military Review* 65 (Mar 1985): 2-11.
- Bingham, D. "Take a Fresh Look at Your Logistics Strategies." *Transportation and Distribution* 35 (Mar 1994): 58-60.
- Brabham, James A. "Operational Logistics: Defining the Art of the Possible." *Marine Corps Gazette* 78, no. 4 (Apr 1994): 26-31.
- Byrne, P. M. and Markham, W. J. "Your Logistics Strategy is Obsolete." *Traffic World* 235 (Jul 26, 1993): 35.
- Callahan, J. M. "Just-in-Time A Winner." *Automotive Industries* 165 (Mar 1985): 78.
- Cauchie, Marc A. "Military Logistics: From History to the Perspective of Its International Expansion." *Journal of Air Force Logistics* 13 (Winter 1989): 13-16.
- Christianson, Bruce P. "Problems With Logistics Data." *Air Force Journal of Logistics* 16, no. 1 (Winter 1992): 39-40.
- Conner, J.R. "Inventory Obsolescence: A Hidden Cost." *CPA Journal* 56 (Oct 1986): 111-112.
- Coogan, Charles O. "Logistics and Logisticians of the Future." *Logistics Spectrum* 20 (Summer 1986): 14-16.
- Copacino, W. C. "A New View of Logistics." *Traffic Management* 32 (Dec 1993): 31.
- Dawe, R. L. "Strategy First - Then Tactics." *Transportation and Distribution* 43 (Dec 1993): 62.
- Gladstone, Kenneth M. "Logistics Management: White-Collar Cloak - Black Magic Artistry." *Air Force Journal of Logistics* 16, no. 4 (Fall 1992): 5-7.
- Glaskowsky, Nicholas A. "Kanban/Just-in-Time: Panacea or Plague?" *Logistics Spectrum* 21, Part 1 (Winter 1987): 15-19; 22, Part 2 (Spring 1988): 19-21.
- Hammick, Murray. "Logistics Comes of Age." *International Defense Review* 25, no. 7 (Jul 1992): 665-673.
- Harper, Gilbert S. "Army Logistics in 2010." *Army Logistician* (Sept-Oct 1991): 18

22.

Hayden, H. T. and Wilson, G. 1. "The Tail That Wags the Dog." Naval Institute Proceedings 116, no. 10 (Oct 1990): 51-53.

Heiko, Lance. "A Simple Framework for Understanding JIT." Production and Inventory Management Journal 22 (Fourth Quarter 1989): 62-64.

Heiser, Joseph M. Jr. "Past is Prologue." Army Logistician (Nov-Dec 1992): 38-39.

"How MRP and JIT Do Work Together." Purchasing 97 (Nov 29, 1984): 43.

Johnson, Alicia. "MRP? MRPII? OPT? CIM? FMS? JIT? Is Any System Letter-Perfect?" Management Review (Sept 1986): 22-27.

Klima, Gerald G. "Just-In-Time: Mission Accomplished." Army Logistician (Mar-Apr 1993): 28-29.

Lane, Robert J. "Responsive Logistics." Army Logistician (Sept-Oct 1991): 30-32.

Mayer, Raymond R. "A Critical Look At Kanban, Japan's Just-In-Time Inventory System." Management Review (Dec 1984): 48-51.

Manoochchri, G. H. "Improving Productivity With the Just-In-Time System." Journal of Systems Management (Jan 1985): 23-26.

\_\_\_\_\_. "Suppliers and the Just-In-Time Concept." Journal of Purchasing and Materials Management 20 (Winter 1984): 16-21.

McGee, Michael L. "Just-In-Time, or Just-Too-Late." Army Logistician (Mar-Apr 1994): 15-17.

Mead, Lawrence R. "SURE (Supply Usage Requirements Estimator) To Be A Hit." Army Logistician (Nov-Dec 1993): 32-33.

Mears, Gary H. and Kim, Ted. "Logistics: The Way Ahead." Joint Forces Quarterly, no. 4 (Spring 1994): 38-44.

Money, R. I. "Going the Distance: Sustaining Future Conflicts." RUSI Journal 136, no. 1 (Spring 1991): 28-32.

Morgan, J. P. "Are Distributors Selling JIT or Just the Sizzle." Purchasing 100 (May 22, 1986): 73-76.

Moskal, B. S. "Manufacturing: Just-In-Time; Putting the Squeeze on Suppliers." Industry Week 222 (Jul 9, 1984): 59-60.

- \_\_\_\_\_. "Transportation: Delivering Just-In-Time." *Industry Week* 223 (Oct 1, 1984): 44-45.
- Muroff, C. "The Basics of Inventory Control." *Distribution* 92 (Nov 1993): 98-100.
- Novack, R. A. "Logistics Optimizing and Operational Plans and Systems and Their Role in the Achievement of Corporate Goals." *Transportation Journal* 32 (Summer 1993): 29-40.
- O'Brien, Joseph F. "Logistics Roots." *Logistics Spectrum* 24, no. 2 (Summer 1990): 7-12.
- Peppers, Jerome G. Jr. "Logistics and Strategy: An Inseparable Duo." *Logistics Spectrum* 20, no. 4 (Winter 1986): 13-17.
- Perry, James H. "Growth in Unneeded Inventories: Contributing Factors." *Logistics Spectrum* 25, no. 2 (Summer 1991): 19-25.
- \_\_\_\_\_. "Impact of Processing Times in Department of Defense Logistics Systems." *Logistics Spectrum* 25, no. 1 (Spring 1991): 15-20.
- \_\_\_\_\_. "Procurement Lead-Time: The Forgotten Factor." *National Contract Management Journal* 23, no. 2 (1990): 15-24.
- Plenert, Gerhard and Best, Thomas D. "MRP, JIT, and OPT: What's 'Best?'" *Production and Inventory Management* (Second Quarter 1986): 22-28.
- Pollard, Deborah L. "Strategic Logistics Program - Roadmap for the Future." *Army Logistician* (Mar-Apr 1991): 7-9.
- Quinn, F. J. "Just-in-Time: No Room for Error." *Traffic Management* 23 (Sept 1984): 28-30.
- \_\_\_\_\_. "How Airfreight Fits into the Just-In-Time Picture." *Traffic Management* 24 (Jun 1985): 76-79.
- Reed, John. "A Look At Current and Future Logistic Systems." *Armada International* 9 (Nov 1985): 38-40.
- Ross, Jimmy D. "Focusing Logistics for the Future." *Military Review* 72, no. 9 (Sept 1992): 48-55.
- \_\_\_\_\_. "The Strategic Logistics Program." *Army Logistician* (Mar-Apr 1991): 6.
- Russell, Steven H. "Military Logistics and Business Logistics: Re-examining the

- Dichotomy." Air Force Journal of Logistics 18, no. 1 (Winter 1994): 32-35.
- Schonberger, Richard J. and Ansari, Abdulhussein. "Just-in-Time Purchasing Can Improve Quality." Journal of Purchasing and Material Management 20 (Spring 1984): 2-7.
- Shelton, Keith and Davenport, David. "Agile Logistics: The Art of Logistics in the Twenty-First Century." Air Force Journal of Logistics 17, no. 4 (Fall 1993): 1-4.
- Simons, Jacob V. and Moore, Richard L. Jr. "Improving Logistics Flow Using the Theory of Constraints." Logistics Spectrum 26, no. 3 (Fall 1992): 14-18.
- Sullivan, B. Don. "Knowledge-Based Logistics Planning." Army Logistician (Nov-Dec 1991): 16-19.
- Trunick, P. A. "Logistics: An Agent for Change in the 90's." Transportation and Distribution 34 (Nov 1993): 36.
- Turse, E. James. "Some Logistical Realities." Marine Corps Gazette 74, no. 9 (Sept 1990): 24-25.
- Tusa, Francis. "Combat (Logistics Support) Prescription: More Tail, Less Tooth." Armed Forces Journal International 131, no. 7 (Feb 1994): 34.
- Vanairsdale, Michael J. "Just-In-Time Inventory: Trading Efficiency for Effectiveness." Army Logistician (Mar-Apr 1992): 8-10.

#### Unpublished Papers

- Cirello, Dominic J. Application of Just-In-Time Production Methods in the Defense Industrial Base. MS Thesis. Dayton, OH: Air Force Institute of Technology, Sep 1991.
- Harkenrider, Thomas M. Stockless Medical Materials Management Applications for the United States Air Force Medical Service. MS Thesis. Dayton, OH: Air Force Institute of Technology, Sep 1991.
- King, Dan E. The Source-to-User Concept - An Alternative Method for Distributing Aircraft Tires. MS Thesis. Dayton, OH: Air Force Institute of Technology, Sep 1986.
- McArdie, Richard W. Jr. Study to Determine the Feasibility of Applying the Principles of Time Based Competition to a Force Projection Army. MS Thesis. Fort Lee, VA: Florida Institute of Technology, Apr 1994.

Templin, Carl Ross. The Effect of Defense Contracting Requirements on Just-In-Time Implementation. Ph.D Thesis. Dayton, OH: Air Force Institute of Technology, Dec 1988).