



LOGISTICS MANAGEMENT DETERMINATIONS RELATED TO ECONOMIC CONSTRAINTS AND OPERATIONAL REQUIREMENTS

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Abstract: *Within the knowledge based society, the evolution of economic theory and practice in the logistic field, generally speaking, has a significant impact upon the domain of military logistics. The changes mentioned determine multiple and major mutations in military logistics due to its permanent connection to the economic logistic domain. The inter-conditioning of the management processes in the economic domain with those in military logistics generates a modern approach of logistic management, in the context of creating the necessary conditions for accomplishing the objectives of interoperability with western military structures. Given these assumptions, we are going to tackle the essential aspects characterizing logistics and logistic management in the economic and military domains in terms of effectiveness and efficiency.*

Keywords: *economic crisis; economic organizations; logistics; logistics management; military logistics; military logistics management; logistics efficiency.*

1. General Economic Aspects

Despite the still present effects of the recent economic crisis, developed economic organizations pay special attention to the principle of concentrating efforts in the sense of increasing economic efficiency. To this purpose, in order to apply the principle of permanently increasing the efficiency of logistic positions, the management of the respective departments is more often not given to the specialists trained in management and economics¹.

Given these circumstances, logistics and logistic management have been continuously growing and evolving. Ever since it acquired a scientific dimension responsible for the efficient functioning of any social system, logistics has also acquired global dimensions, propagating like a religion, undoubtedly serving political institutions.

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Raising awareness on the importance of logistics grows progressively with the development of management systems and marketing policies, from the status of activity destined to distribution to the status of system potentially incurring added value and elements of integration of the actors encountered on the route between suppliers and final consumers².

Under the circumstances of modern economy, logistic management is the specific process integrating the flux of goods and services in, through, and outside the organization, in order to ensure the necessary supply level at the appropriate time and in the appropriate place.

The logistic management mechanism is set into motion by several internal factors of the economic organization/firm among which we have to mention the following: the level of the tasks received and the possibilities of their technical accomplishment, logistic hardware (supply, transportation, packaging, storing, distribution, IT), logistic software (methods and techniques of planning, organizing, controlling, and evaluating), and also the inter-organization of the logistic process, the team workers' behavior and the level of logistics knowledge³.

Within the economic practice specific to the knowledge based society, integrating logistics and marketing has a double effect: marketing may ensure in a larger measure the role of integral part of the firm's global strategy and, at the same time, applying marketing concepts referring to the consumer/user's behavior facilitates the accomplishment of logistic strategy objectives.

In order to ensure its effective functioning, from the management perspective, at the level of each organization it is necessary to perform a permanent correlation of objectives, decisions and activities in the domains of logistics and marketing. Due to the input of logistics, marketing is able to offer the utilities of time, place, and ownership requested by customers. On the other hand, the marketing orientation allows logistics to acquire a competitive advantage in satisfying the customers' demands.

The efficiency of logistics is based on a correlation among supply, activities supporting production and physical distribution, the activities undertaken within the enterprise and on the interface with previous and subsequent segments within marketing channels. In order to acquire a competitive upper hand on the market, it is absolutely necessary to ensure the coordination of all three logistic components.

At the same time, efficiency has an unmediated connection to logistic costs which usually fall under three major categories: *transportation and handling*



costs – the most obvious and the best controlled costs for the firm, although their establishment on products and clients is performed starting from criteria devised by the company itself; *stock-related costs* – which are sometimes underestimated but may represent up to 1/3 from the merchandise value; and *costs incurred by the functioning of the logistic system* – those costs generated by predicting demand, planning production, material procurement, and orders processing. Specialists consider that, within production firms, logistic costs may represent 10-30% of the sales' value, which often means double of management estimates⁴.

Significant savings with respect to procurement, storage, packing and transportation are determined by the reduction of stocks. In the world there is an important trend, visible especially at the large commercial companies, to reduce stocks while developing databases with real-time information and accelerating transports for the timely satisfaction of beneficiaries' demands.

Large companies prefer to keep a significant part of own inventories in motion, within the supply flows, actually the so called "*inventory in motion*". In order to manage to deal with these flows in an adequate manner, companies resort to global communication systems that may offer exact and real-time data upon the movement of goods and the deliveries to consumers⁵.

2. Specific Approaches

The evolution of economic theory and practice in the logistic field, generally speaking, has a direct impact upon *military logistics* which is characterized as a systematic series of veridical knowledge upon a distinctive sphere of social activities, completely connected to national and global logistics. It studies the laws governing the endowment and procurement process in the military and starting from which scientific predictions regarding preparing and conducting military actions may be created.

In order to accomplish the evermore complex operational objectives, military logistics has to be able to ensure the delivery of any material goods, at any moment and whenever troops need them. To do so, there is a need of fulfilling three major requests: *an integrated logistic system, an efficient management of information and a focus upon the beneficiary's demands*.

Military and economic logistic demands may be regarded as a way of optimizing all available resources, so as they may operate efficiently in an unknown environment and in unpredictable situations. In this respect, logistics may be viewed



as a situational management of a certain event. Time, costs and quality are defining for measuring performances both in the civilian and the military environment.

The modernist tendencies in logistic management, in general, and especially in military logistics, challenge military specialists to identify new ways and manners of understanding and applying the theory of this science to the new demands dictated by the mutations occurring in the architecture of military logistic system, according to the exigencies of efficacy and efficiency imposed on the new national and global missions.

The current global economic and military challenges determine the necessity of transforming the management of military action and, consequently, of logistic management, according to the concept of the Alliance regarding the increase of rapid and adequate reaction capacity, the promotion of effects based operations, the implementation of pre-emptive strategies and highly efficient structures of forces adequate to these.

American military specialists consider that, under the current circumstances of logistic structures transformation, the main functions and demands in the domain of logistic management generally include the following: the management of launching orders, the management of stocks, the management of storage, the management of transportations, the evaluation/diagnosing of equipment, the monitoring of stocks, maintenance and repairs, extending the life duration of products/equipment, technical assistance, increasing the efficiency of functional processes, constituting the structures specialized in contracting goods in the theatre of operations, establishing the optimal IT architecture, accomplishing the integrated logistic support, the management of procurement programs, the digital data processing systems, ensuring and controlling the quality and training of personnel working in support services⁶.

The „*Smart Defense*” concept represents a new way of thinking regarding the generation of modern defense capabilities needed by the Alliance for the next decade and further on⁷. In this context, the current transformations in the military domain bring forth in the military new challenges and dilemmas, implying ensuring an optimal balance between the need to have well prepared and modern troops, the significant number of missions and the evermore limited resources. Thus, in the resulting situation, logistic stocks must be decreased, the quantities of materials to be transported must be reduced and the reaction time must also be shortened significantly. Consequently, the transformation of military logistic management is perceived not only as a central point in the future of logistic support, but also as



a lever for the effort of armed forces to ensure the necessary balance between the preparation state and the necessary modernization.

The reaction of logistic decision-making factors has to answer these challenges, which leads to the necessity of examining the way in which the transformation and the military logistic decision may give the most appropriate answer to the current circumstances and demands, dominated by the adaptation of capabilities to the modern sustainability demands.

In a similar manner to the great economic corporations, the army also has to deal with two obviously opposing demands: the need to ensure the optimal logistic support for combat forces at a costs level as low as possible and the need to reduce as much as possible the physical dimensions of logistic structures ensuring this support, given the current tendencies regarding the emergence of mobile and rapidly-deployable armed forces.

The future of logistics in the military field is evolving towards an integrated approach of supply, movement and transportation, maintenance, medical support and so on, which have certain similarities to those in the civilian domain. This will determine an improvement in the capacity of the logistic system to answer efficiently to the new requests, together with the significant reduction of the physical means necessary to forces support.

3. Chronological benchmarks and evolution trends

Operational logistics and its specific management have become more and more complex, together with the increase in the degree of endowment and technical equipping of military operational structures, phenomenon generating a larger and larger consumption of materials. We intend to present below some chronological information related to logistic events, having a strong impact upon the efficient and effective subsequent developments in the field.

It has been estimated that "if during the First World War the materials consumption for a combat soldier per one day was of 17 kilos and in the Second World War it was even bigger than 35-40 kilos, at present, this consumption is estimated to be around 80-100 kilos. In the First Gulf War, an American armored division, made up of approximately 10,000 soldiers, would use up every day 5,000 t of ammunition, that is 500 kilos for each fighter, and for the 350 tanks and 200 vehicles the necessary amount was 14,000 l of fuel..."⁸.

Experts have appreciated the mission of American logistic forces to provide



for the forces acting in Operation Iraq II, as „*being complex and difficult and, at the same time, full of challenges*”⁹. Moreover, Lieutenant General Thomas F. Metz, commandant of multinational troops in Iraq for one year, addressing the members of Senate subcommittee of management and training for combat, stated the obvious success of logisticians in supporting a structure of forces of approximately 160,000 infantry soldiers, sailors, pilots and civilians, who have taken part in military actions in a country as large as California. The General also said that the specialists in supplies within Operation Iraq II distributed daily an average of 1.2 million gallons of fuel, 55,000 bottles of bottled water, 13,000 boxes with tinned cooked food, 60 tons of ammunition and 200 pallets with spare parts during the period when he was in command. Although Metz remembered that at the beginning of his activity there, logistic channels did not function very well.

In April 2004, insurgents initiated attacks all over Iraq and attacked American supply centers and the truck convoys¹⁰. Supply specialists reacted then on the spot and „*passed from a centralized distribution to a des-centralized distribution, focused on regions*”, said Metz. This change increased the volume of supply, but also permitted a greater flexibility, thus helping to better protect civilian convoys going to the battle field, and leading to the avoidance of risk in the regions most prone to attacks. Another lesson learned, according to Metz, was that military logisticians who dealt with the convoys in Iraq had to be trained, trustful, and skilled with weapons in order to ensure the best conditions for accomplishing supply missions¹¹.

Lieutenant General (ret) William G. „Gus” Pagonis – the one who coordinated the supply process in the Gulf War, in 1991, in an interview regarding Operation *Desert Storm*, emphasized that the largest number of loses suffered by Americans in the first stage of war was not among the infantry troops in the first lines, but rather among those who preceded or succeeded them and who provided combat fighters with food, fuel, water, ammunition. „*Logistics has long stopped being an action behind the front*”, said the General who also stated that „*very few people know that at least 50% of the 390 soldiers killed during Operations Desert Shield and Desert Storm, during 1990-1991, were part of the logistics troops and died while dealing with troops supply*”¹². Most deaths were caused by accidents rather than by bullets. The same dangers caused by the haste to supply for the troops also appeared during the second intervention in Iraq.

In Operation Iraq II, the implementation of air supply in the regions with the highest risks reduced the number of trucks in convoys by a number of 40 and thus



at least 80 soldiers were no longer prone to daily attacks¹³.

We must underline the fact that the logistic effort in Operation Iraq II was huge with respect to supplying food, fuel and ammunition. Thus, the 15 fighting brigades that were in Iraq in 2005 were made up of 60,000 soldiers. The rest of American soldiers dealt with *supplies*, intelligence gathering, staff issues, piloting helicopters. Other few thousands of soldiers dealt with training and *supplying for Iraqi troops*, thus taking part in combat, as the conflict was unconventional in nature. Many times ***three or five soldiers were needed in order to support each soldier directly involved in combat*** and some of the support missions of the American army were in other regions of the Persian Gulf¹⁴. The record level of American troops in Iraq was reached in August 2007, that being of 162,000 militaries¹⁵.

In the operations in Afghanistan, the technology called „*weight-in-motion*” (*WIM*) was used for hastening the boarding of Apache helicopters in C5 transport airplanes. In the classical system, in order to do so, a soldier had to drive the vehicle on the access ramp and perform manually the whole boarding calculus.

WIM – which is an advanced combination of *sensors, micro technology and artificial intelligence* – performs automatically all these activities. “*You can drive a vehicle, including trailers for boarding at a speed of 5-15 miles per hour without stopping. Instead of taking 30 minutes for each boarding cycle with an error rate of 20%, the use of WIM allows performing the same operation in 30 seconds for each vehicle, with a zero error rate*”¹⁶.

By using WIM means, the technical assets of a maneuver brigade with over 1,100 vehicles may be boarded *in a few hours*, as compared to *a few days*, as it lasted before. To the rapid deployment in the theater of operations, the WIM system is a considerable advantage¹⁷.

According to the estimation of American logistics experts, using spare parts and high technology equipment will considerably reduce the notorious “print” of logistics upon operations and will contribute to decreasing the reaction time. The multipurpose containers, in which two or several products are packed, will reduce the need to use supplementary transportation capabilities.

In the same vein, *The Battlefield Delivery System - BDS*, which uses standard transportation containers, will lead to the emergence of a much more flexible transportation system, the products being delivered directly from the commercial agent to the theatre of operations¹⁸.

At the same time, the „*container plane*” concept will lead to the increasing



flexibility of BDS, thus ensuring the increase of possibilities of reaction of the logistics base, the cockpit of the plane becoming a center of command and control¹⁹.

A new concept, that is, pre-configuration goods containers for boarding, is a more efficient means of ensuring the distribution of materials towards the soldier. *"We can put materials into containers in such a manner so as to facilitate their expedition from strategic bases to the tactical level without necessitating their reconfiguration"*, said Dan LABIN, head of the Department of Pacific Northwest National Laboratory Center of Studies, dealing with the project of filling containers with materials²⁰.

Much more rapid and precise than the current methods, the system of pre-configuration containers is also interactive. A commandant in the theatre of operations may request re-supplying with various materials and may receive them in the exact configuration requested, on a platform which is compatible with the one planned to be used for downloading these materials²¹.

According to expert assertions, modern armies are now developing the so-called concept *"anticipatory logistics"* for petrol products, ammunitions and maintenance, which is actually logistics, based on the real consumption needs. This concept uses technologies, information systems and procedures meant to foresee and establish the priorities of the military consumer/user in order to be able to ensure adequate logistic support, function of real consumption. Although at a first sight the concept is somewhat simple, in the future modern technologies are bound to be used on a larger scale as instruments for monitoring the level of materiel stocks, as well as that of the technical state of major equipment²². Moreover, there will be a need of using IT systems for assisting decision in order to determine the best solution of using the support means available. This is the way in which logisticians will benefit from the most modern instruments of management of the supply-delivery chain.

Conclusions

Logistic management is a continuous, cyclical process which is performed from the moment when the mission is received to the moment when the decision is made and also, after that, during combat actions until ceasing all activities and even a period after they cease.

The characteristics of conflicts and situations of instability in the future



determine, function of the character of enemy actions, economic development, infrastructure of operation areas (theatres) and so on, the real necessities for accomplishing logistic support for the success of the operation. In this context, it is easy to explain why it is necessary to use specific logistic management for performing the optimal direction of the logistic resources necessary for obtaining the success of military actions.

In conclusion, logistics managers have extremely complex missions in preparing and conducting operations. In order to fulfill operative-tactical aims, they need solid training, competence, responsibility, a lot of initiative and perseverance.

Consequently, the current important mission is decreasing the „volume” of logistics in the economy of military actions and reducing the length of **provision** supply flow in the theatres of operations. This is relatively easy to define but far harder to accomplish. The greatest challenge for the logisticians of the future will be that of ensuring a versatile, interactive logistic system capable of supporting efficiently and effectively military operations.

To put things into perspective, following the reconfiguration of the logistic system through modernizing IT technology specific to networkcentric warfare, logistic management will be further developed due to creating flexible structures with a high reaction capacity, capable of acting in any circumstances, according to the missions received.

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