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Italian Defence Reform: Toward a New Logistics Support Model?

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ABSTRACT

Logistic support has often been considered an ancillary issue within the defence procurement strategies of many MoDs, with negative trickle-down effects both on the system's effectiveness and on process efficiency. Recently, a new trend has brought logistic support to become increasingly important in both operational and technological-industrial terms, with the progressive transition towards performance-based models. Indeed, these models revolutionized logistic support by committing the support supplier to the systems' achieving precise performance targets. During the last decades, the Italian Ministry of Defence has also been trying to open up to new methods of logistic support. In this field, the 2015 White Paper highlighted the need for a review of the management model for acquisition, logistics and general support, including existing procedures, structures and norms by drawing on patterns from private companies and being guided by the basic principles of efficiency and effectiveness.

keywords

Italy's military policy | *Procurement* | *Defence industry*

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by Alessandro R. Ungaro, Paola Sartori and Federico Palmieri*

1. Logistics support to the military: evolution and trends

According to a definition commonly accepted among NATO membership, logistics support is the "science of planning and carrying out the movement and maintenance of forces" and, in its most comprehensive sense, covers the following aspects of military operations: "(a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposal of materiel; (b) transport of personnel; (c) acquisition or construction, maintenance, operation, and disposition of facilities; (d) acquisition or furnishing of services; and (e) medical and health service support."[1]

This definition encompasses a wide array of responsibilities that include spare parts management, maintenance and repairs, as well as, and more in general, life-cycle support for weapons systems and support for combat forces. It appears to embrace the concept of logistics of the American armed forces to the extent that it includes the study, design and development of military materiel and the acquisition, construction and maintenance of infrastructure and medical support.

[1] The NATO definition is cited here, not only because of its particular relevance, but also because it tends to conform to definitions developed within the national framework. NATO Standardization Office, *NATO Glossary of Terms and Definitions (AAP-06)*, Edition 2016, https://nso.nato.int/nso/zzlinks/terminology_public__non-classified nato glossaries.html.

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Research conducted with the support of Boeing. Italian version of "Riformare la Difesa italiana: verso un nuovo modello di supporto logistico?", published in July 2017.

Although it is estimated that of the total cost of a complex weaponry system (such as a combat aircraft), 30 percent of allotted resources is earmarked for acquisition while the remaining 70 percent goes to logistics support,[2] this latter aspect has frequently been considered an ancillary issue within defence procurement strategies, triggering a negative chain reaction that impacts on both the effectiveness of the system as well as on the efficiency of the procurement process. The tendency has been to concentrate the majority of attention, experience and resources – both human and financial – on the acquisition of new systems, with a predilection for short-term objectives and at the expense of a long-range perspective, thus leaving one fundamental issue unaddressed: how to sustain a complex weapons system effectively over time.

The relevance of logistics support to the military has been gaining greater importance and weight. The changes in the international security outlook of recent decades and the consequent reorganization of the armed forces – especially those of Europe – have introduced gradual but significant changes in the context of logistics support as well. A new dimension in logistics has been defined and inserted into the larger framework of technological and military advances. Indeed, the growing complexity and sophistication of systems, their extended lifecycles, rapid technological innovation and the increased integration of civilian components have had, and continue to have, a strong impact on logistics support as well. The ever-increasing electronic content in the majority of the complex systems with which the armed forces are equipped, and the features that distinguish them – among which the need for constant and continual updating throughout the life-cycle –, generate issues both technical and cultural, i.e. associated with the formation and training of personnel. These new trends have triggered a search for new logistics support models capable of ensuring a high degree of flexibility and modularity, in addition to improving cost effectiveness in response to gradual reductions in the resources available for the national defence. From a business point of view also, that 70 percent of funding earmarked for logistics support has attracted the attention of the main aerospace, defence and security sector players. Indeed, it is no accident that these latter are displaying a growing interest in developing commercial services and products that reflect the current trends, thus additionally exploiting synergies between commercial and military spheres.

2. The traditional vs performance-based model

Of the existing models for the design and supply of logistics support, this document intends to compare the performance-based approach with the traditional – otherwise known as transactional – approach.

[2] David Berkowitzd et al., "Defining and Implementing Performance-Based Logistics in Government", in *Defense Acquisition Review Journal*, Vol. 11, No. 3 (December 2004-March 2005), p. 256.

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The traditional approach has the buyer signing a contract with the provider for logistics support in the form of targeted and specific interventions such as repairs, upgrades, the acquisition of spare parts and so forth. This approach is still widespread in the management of military logistics despite the above-mentioned trend,[3] and offers a linear solution to an immediate problem, and it is precisely that immediacy, along with its limited short-term costs, that are considered among the approach's principal advantages. Nevertheless, the problems that remain lie mainly in the existing disparities in the buyer-provider relationship in terms of both interests and the equal distribution of risks and costs. Indeed, traditional support system efficiency is measured in the light of ordinary industrial and quantitative data, such as number of repaired military systems; volume of materiel mobilized; hours worked and number of parts. This approach tends to discourage the industrial counterpart from seeking more innovative and efficient processes aimed at ensuring greater reliability and reducing stockpiles. In such a scenario, the client retains sole responsibility for the final performance of the weapons system, acquisition of materiel and necessary support services, as well as supply chain management, leaving the provider simply to supply the service within the contracted timeframe.

In alternative, Performance-Based Logistics (PBL) revolutionizes the supply of logistics support by obliging the provider to achieve certain levels of weapons systems performance, thanks not least to both incentives and penalties written into contracts. In other words, PBL models do not "sell" specific products or services (as in the case of the traditional model), but rather results, or better, operational outcomes, such as systems or materiel availability, training readiness, and so forth. In this way, logistics support shifts from reactive to proactive: instead of solving problems (breakdowns, malfunctions), the PBL approach seeks to prevent them, with the ultimate aim of ensuring adequate system performance.

A formal definition of PBL is offered by the US Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness contained in the 2013 *Performance Based Logistics Comprehensive Guidance*, according to which PBL is

> synonymous with performance-based life cycle product support, where outcomes are acquired through performance-based arrangements that deliver warfighter requirements and incentivize product support providers to reduce costs through innovation. These arrangements are contracts with industry or intragovernmental agreements.[4]

[3] For some of the most recent examples see: "Patria to Support Norwegian NH90s", in *Shephard News*, 27 April 2017, https://www.shephardmedia.com/news/rotorhub/patria-support-norwegian-nh90s; Safran, *Safran Signs Contract to Support German NH90 Engines*, 17 May 2017, https://www.safran-group.com/node/13196.

[4] US Department of Defense, *PBL Guidebook. A Guide to Developing Performance-Based Arrangements*, 2016, p. 10, http://bbp.dau.mil/docs/PBL_Guidebook_Release_March_2016_final.pdf.

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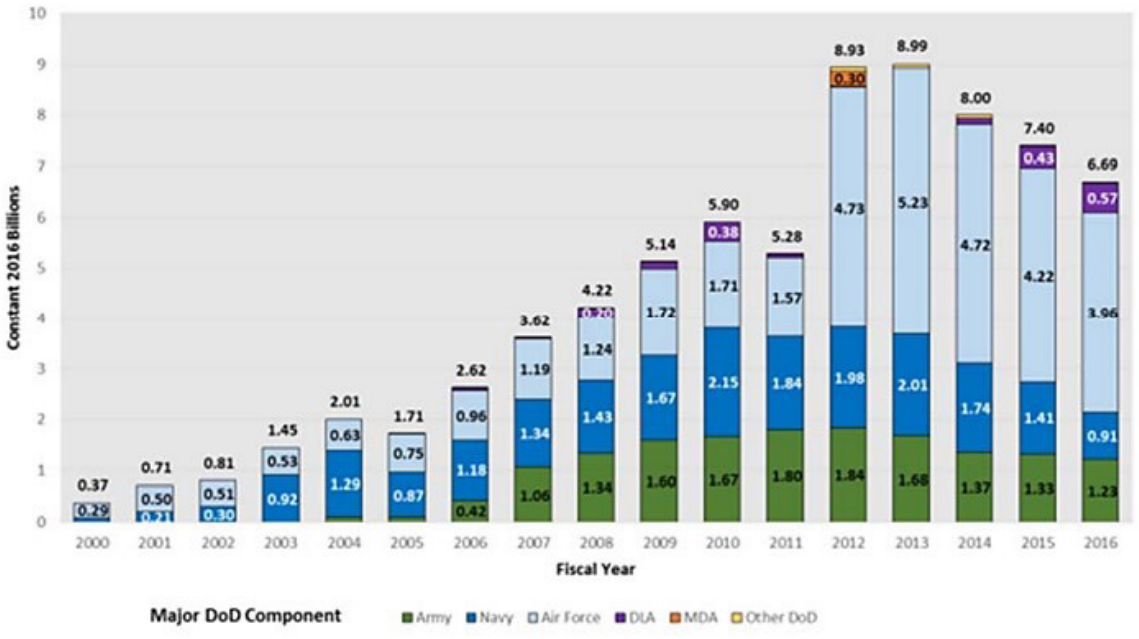
The concept of PBL came to the fore in the late-1990s when the US Air Force was trying to improve F-117 readiness.[5] Recent decades have witnessed a trend in the adoption of performance-based models aimed at effective and efficient system lifecycle support. Typical examples include UK contracts for CH-47 Chinook support[6] or the US Air Force contracts for C-17 GISP support.[7]

Figure 1 below shows how performance-based contract commitments have increased in the United States over the past 16 years from approximately 400 million dollars in 2000 to slightly under 6 billion dollars only ten years later, hitting peaks of nearly 9 and 8 billion respectively in 2013 and 2014.[8] The figure also reveals how the US Navy was years ahead in the use of PBL, its subsequent distribution more or less equally among the Army, Navy and Air Force only recently being surpassed by the Air Force.

Figure 1 | PBL contract commitments of the US Department of Defense (2000-2016)



Source: Andrew Hunter, Jesse Ellman, Andrew Howe, "Use of Incentives in Performance-Based Logistics", cit., p. 147.

[5] Ibid., p. 11.

[6] Brad Mudd, "TLC(S) for Helicopters", in *Boeing Frontiers*, Vol. 5, No. 3 (July 2006), p. 28, http://www.boeing.com/news/frontiers/archive/2006/july.

[7] Boeing, *Boeing Awarded Contract for PBL Sustainment of C-17 Globemaster III*, 7 October 2011, http://boeing.mediaroom.com/2011-10-07-Boeing-Awarded-Contract-for-PBL-Sustainment-of-C-17-Globemaster-III.

[8] Andrew Hunter, Jesse Ellman, Andrew Howe, "Use of Incentives in Performance-Based Logistics. Contracting: Initial Findings", in *Acquisition Research: Creating Synergy for Informed Change. Proceedings of the Fourteenth Annual Acquisition Research Symposium. Vol. 1*, Monterey, Naval Postgraduate School, 31 March 2017, p. 147, https://www.researchsymposium.com/conf/app/researchsymposium/unsecured/file/146/SYM-AM-17-052-005_Hunter.pdf.

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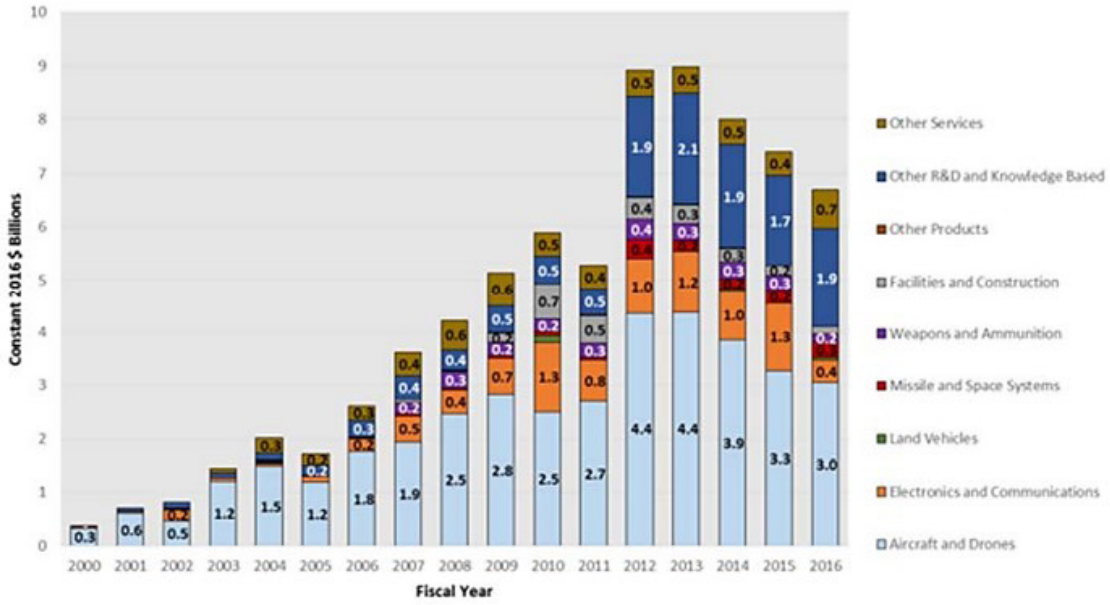
At system/platform level (Figure 2), manned aircraft and drones were the main drivers behind the increase in PBL contracts between 2000 and 2016, followed by electronics and communications. What is curious is the almost total absence of PBL contract commitments for the Ships & Submarines category, which is an indication of the special logistics, maintenance and updating needs of these systems.

Figure 2 | PBL contract commitments of the US Department of Defense by system/platform (2000-2016)



Source: Andrew Hunter, Jesse Ellman, Andrew Howe, "Use of Incentives in Performance-Based Logistics", cit., p. 149.

The increased application of PBL is an attempt to address the lack of alignment that has too often characterized client and provider interests in traditional logistics support contracts,[9] resulting in a vicious circle that penalises the purchaser both financially as well as in terms of system readiness and performance. On the contrary, with PBL contracts, the system's final performance is the responsibility of the provider, who must shoulder the eventual additional costs associated with breakdown or malfunction. Consequently, the provider has a greater incentive to reduce both the number of spare parts, along with their cost and that of maintenance-related labour, by improving the quality of logistic support and innovation.[10] A vicious circle thus becomes a virtuous one with advantages for both buyers and providers.

[9] US Department of Defense, *PBL Guidebook*, cit., p. 14.

[10] Ibid.

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From this perspective, a PBL contract usually includes the following elements:

- buyer and provider are bound by a long-term contract that specifies the desired system or component performance goals (measured on the basis of specific metrics defined by the purchaser) and a system of incentives/penalties designed to "steer" provider behaviour;
- the provider is responsible for system logistics support and has the spare parts and the equipment necessary to maintain the system under the conditions set by the contract;
- the provider is responsible for logistics support at organisational, intermediate and depot level.[11] Support while the system is in use remains the responsibility of the buyer.

In this regard, it has to be recalled that, PBL contracts can be tailored to specific needs. Based both on system requirements as well as on other factors, such as systems years of service, existence of support infrastructure, eventual civilian-military synergies and national legislative or regulatory limitations, clients can select the risk levels and results that define the parameters of the contract. The logistics support spectrum offers contracts that can be calibrated according to the following models:

1) *Traditional support*: In this case, the buyer is responsible for system performance, configuration, hardware as well as services acquisition, and also carries sole liability for the risks associated with logistics management. According to this model, the provider is obliged to comply with the minimum performance metrics.

2) *Contractor supply role*: As opposed to the traditional model, with this type of contract the provider is responsible at least partially for supply chain management, has a front-line role in system configuration and supplies logistics support at organizational, intermediate and depot levels. This formula places the provider in charge of warehouse management, while the buyer remains the owner of spare parts stock.

3) *PBL at subsystem level*: This type of contract is usually long-term and names the logistics support provider as having sole responsibility for the supply chain and system configuration. According to this model, spare parts are the joint property of buyer and provider, to whom intermediate and depot level maintenance are assigned, albeit to a limited extent.

4) *PBL at system level*: performance-based logistics support applied at system level places the majority of risk on the shoulders of the provider, who is responsible at all

[11] The organizational level involves maintenance activities possible with the use of available consumables and spare parts. The technical tools and documentation in possession of the end-user are sufficient and no basic assistance is required. The intermediate level involves dismantling, reconfiguration and calibration; spare parts and basic tools are used by basic maintenance personnel with the help of related technical manuals. The depot level is handled by industry builders and not covered by the supply contract.

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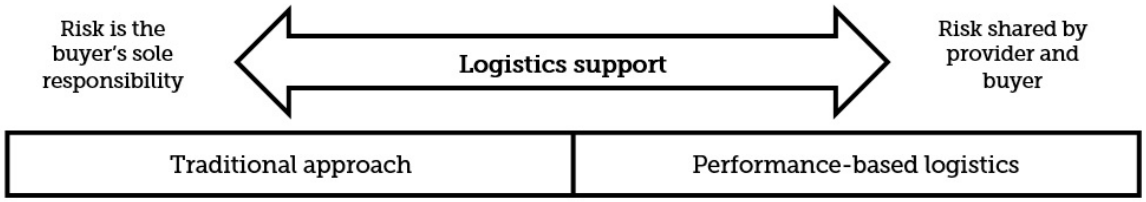
levels for system maintenance, spare parts and support equipment management, leaving the client with sole responsibility for deployment logistics. This type of contract also calls for the client to define the performance metrics.

Figure 3 | The logistics support spectrum



Traditional support	Performance-based
Acquisition of materiel and services (*Transaction-based*)	Acquisition of results (*Performance-based*)
Level of provider responsibility ⇩	Level of provider responsibility ⇧
Industry/government = provider/client relationship	Industry/government partnership
Reactive	Proactive
Broader requirements Higher costs over the long term Greater client risk	More specific requirements Reduced costs over the long term Shared risk
Upgrade requires substantial investments	Continuous upgrade ensured through incentives

3. Italian Defence reform and logistics support

The Italian context is no exception to the above considerations. Indeed, in recent decades the Italian MoD has been receptive to new methods of logistics support,[12] initiating a gradual shift in the early 2000s toward different models. A decision motivated by a series of noteworthy political, cultural and scientific changes that have also had an impact on military logistics.

Among the various drivers behind this decision, two factors – both with technological and organizational roots – deserve specific mention for their relevance to the current context.[13] First, the growing technological complexity of military systems comes with higher costs, not only in terms of acquisition but also of maintenance, both in monetary terms as well as personnel training, which is motivation for the MoD and the armed forces to cooperate more closely with their industrial counterparts.

[12] Interview, Rome, 9 May 2017.

[13] Giuseppe Genovese, "La nuova logistica delle Forze Armate", in *Informazioni della Difesa*, No. 6/2001, p. 35, http://www.difesa.it/InformazioniDellaDifesa/periodico/IlPeriodico_AnniPrecedenti/Documents/La_nuova_logistica_delle_Forze_Armate.pdf.

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In addition, gradual but steady defence budget cuts, which are affecting resources for Operations & Maintenance in particular,[14] have made the procedures and methods thus far applied to logistics unsustainable. The reduced availability of resources for this budget item, especially as compared with other European nations such as France and UK,[15] have prompted the need to rationalize investments and streamline structures and decision-making procedures.

These drivers of change have certainly led to substantial improvements in the field of logistics over in the last decade. Nonetheless, as the scarce availability of some equipment systems shows,[16] a more efficient logistics support model is still a long way off. This is mainly due to cultural, structural and regulatory constraints that hinder the definition of a performance-based model, which should be founded on three conditions.[17]

First, it is important there be a certain level of alignment between the contracting parties. From the standpoint of relations with industry, PBL contracts presuppose the development of a true client/provider partnership that acknowledges mutual interests. Essential, therefore, is the establishment of trust between the partners and a shared vision of logistics support as a "win-win" and not a "zero-sum" game. In this regard, the divergence between the armed forces and their industrial counterparts continues to be one of the main obstacles to redefining what has become an obsolete provider/client relationship. Moreover, the lack within the MoD itself of an adequate level of harmonization, in terms of both method as well as structures across the various branches of the armed forces, continues to produce negative externalities, such as duplications and the inefficient use of resources, that also hamper logistics.[18] Certainly, a "cultural" shift involving all the various players is no simple achievement and can take time, but it appears essential from the standpoint of a general change of mentality in the management of logistics support.[19]

Secondly, fundamental to implementing a new logistics support model is the stipulation of long-term agreements. In addition to budget limitations, the lack of multi-year financial plans is an undeniable obstacle to the adoption of performance-based models. These require a reasonably lengthy timeframe in order to bring benefits to both parties. On the one hand, the provider is required

[14] Paola Sartori, "Forze Armate, in Italia la musica non cambia" in *Affarinternazionali*, 5 August 2016, http://www.affarinternazionali.it/?p=35730.

[15] For a comparison of itemized defence expenditures, see: NATO Public Diplomacy Division, *Defence Expenditure of NATO Countries (2010-2017)*, 29 June 2017, p. 12, http://www.nato.int/cps/en/natohq/news_145409.htm.

[16] A good example is the Italian Air Force's C-130 fleet, which displays some gaps and problems in terms of logistics support. Interview, Rome, 9 May 2017.

[17] Andrew Hunter, Jesse Ellman, Andrew Howe, "Use of Incentives in Performance-Based Logistics. Contracting: Initial Findings", cit., p. 141.

[18] Interview, Rome, 9 May 2017.

[19] Interview, Rome, 27 June 2017.

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to amortize initial investments in order to provide efficient services; on the other, the buyer – faced with an initial outlay that may turn out to be more onerous than with traditional contracts – can reap the benefits of a learning curve in terms of increased efficiency, cost reductions and system readiness and availability.[20] An ulterior, and potentially problematic, element lies in the political perception of this aspect and of the theme of investments in defence in general. Greater initial financial investments unaccompanied by an adequate explanation of the long-term benefits of such an approach could generate criticism and/or hostility among public opinion.

Finally, the adoption of a performance-based logistics support model presupposes effective performance management. This aspect is an especially important one in that it involves fixing and defining desired results with the aim of adopting effective measures for monitoring and improving provider performance. In this sense, the identification of operational requirements must necessarily take into consideration both eventual budget constraints as well as technological changes, which may even involve prolonging the operational life of those more dated systems. Regarding these considerations, various stakeholders in Italian military spheres have indicated flexibility, readiness and full-mission capability as obligatory operational requirements for best sustaining Italian armed forces activities, and thus to be included in the stipulation of eventual logistics support contracts.[21]

Effective performance management also includes the possibility of incorporating both incentives and penalties into contracts, with a view to encouraging the industrial counterpart to improve the quality of the services it offers. In this regard, the existence has been noted at national level of specific legal constraints regarding contract features capable of providing incentives for better business performance. Indeed, current regulation on the matter allows the Ministry of Defence to sign short-term contracts only, and renders particularly complex, if not impossible, the insertion of incentives (both in terms of time as well as cost)[22] and of penalties. Italian regulation specifies, for example, that cumulative penalties cannot exceed 10 percent of the overall amount of the contract. As indicated by many interlocutors, this could serve to discourage companies from improving or correcting their performance, resulting in negative effects in terms of the quality of the services they provide.[23] Many agree that the possibility of introducing

[20] Interview, Rome, 9 May 2017.

[21] Interview, Rome, 27 June 2017.

[22] Time-based incentives have an effect on the initial duration of the contract, introducing the possibility of either extending or shortening the duration of contracts with a designated provider, while cost-based incentives concentrate on the provider's profits. Among the various types of contracts based on these types of incentives, the principal ones assign financial advantages or the payment of penalties in function of the level of performance achieved. For more on these aspects, see: Andrew Hunter, Jesse Ellman, Andrew Howe, "Use of Incentives in Performance-Based Logistics. Contracting: Initial Findings", cit.

[23] Interview, Rome, 12 May 2017.

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effective incentive and penalty systems into long-term contracts – along the lines of the British model, for example – is fundamental to making the transition from traditional to performance-based logistics support.[24]

Furthermore, the presence of what is known as Government Furnished Equipment (GFE)[25] within a complex military product could constitute an obstacle to an efficient PBL model. In fact, it adds an additional factor of complexity[26] since, in some cases, the responsibility to ensure both the supply and performance of some components is divided among several players, which leads to dysfunctional support management.

4. The White Paper and logistics reform

In recognition of the current limitations, the 2015 White Paper that set the guidelines for a comprehensive Italian Defence reform recognizes logistics as a top priority. In particular, the document states that: "acquiring specific assets and then not guaranteeing their operational capability through the appropriate training of staff and proper logistic[s] support, puts the investment[s] at risk and clearly damages the nation".[27]

Accordingly, the White Paper recommends that reform of the management model for acquisition, logistics and general support take its cue from the private sector and be guided by the basic principles of efficiency and effectiveness. This new model should be structured in three main steps:[28]

1) Closer collaboration between the Italian MoD and industry.[29] The document highlights the need to transform the relationship between industry and the Defence Ministry by shifting from a mere client-provider relationship to a real partnership.

2) In this sense, the White Paper suggests the adoption of a "broad definition" concerning the operational needs and technical/military requirements naturally associated with the missions assigned to the armed forces, but that also take other national needs, such as strategic/industrial ones, into consideration. It also points out how a closer and more continuous collaboration between industry and the MoD throughout the weapons system lifecycle becomes necessary also in consideration of a growing technological complexity that calls for highly skilled and specialized

[24] Interview, Rome, 27 June 2017.

[25] GFE refers to materiel owned/acquired directly by the government and subsequently consigned to or made available to the provider.

[26] Interview, Rome, 15 May 2017.

[27] Italian Ministry of Defence, *White Paper for International Security and Defence*, July 2015, art. 160, http://www.difesa.it/Content/Pagine/Libro_Bianco.aspx.

[28] Ibid., art. 159.

[29] Ibid., art. 277.

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personnel and resources.

3) Governance review, including the reorganization of the National Armaments and Logistics Directorate (DNAL),[30] which should centralize all aspects associated with "support to the forces" including acquisition, infrastructure and logistics (except for direct support to operational units).

4) At the moment, responsibility for this function is shared by the DNAL – as regards the first phase of logistics support covered by the acquisition contract – and the SMD as regards the later phases (excluded from the acquisition contract). The purpose of the reform is thus to ensure continuity in the management of logistics support over the entire lifecycle of the product. On the other hand, what is known as Combat Service Support – which, as a result of its specificity, remains the remit and responsibility of the Chief of Staff of each individual armed force branch – a clear definition is needed of which activities are included in this category and which belong under the heading of "general logistics support to the forces".

5) The introduction of a six-year investment law, to be updated every three years for defence expenditures,[31] with a view to generating the sufficient resource stability necessary to ensure longer term planning. Indeed, the introduction of a multi-year spending bill aims to guarantee management continuity across the life of a weapons system. Stability and timeframe certainty regarding the availability of resources are indispensable in major acquisitions programs to permit the adequate planning of activities with a duration longer than even a decade.

To be more specific, the White Paper goes even further by identifying some more detailed adjustments to existing procedures, structures and regulations that could pave the way to adopting a new logistics support model. One of these concerns the adaptation of existing technical and administrative regulations, which should have a twofold objective: to allow acquisition over long periods, on the one hand, and to ease contractual conditions on the other – both for the MoD and its industrial counterpart – with the aim of simplifying and speeding up procedures.[32]

This reflection should involve MoD modes of purchasing and testing materiel supplied. To that end, it could be useful to review the less binding regulations of other European countries and launch a constructive dialogue between government institutions and industrial players in the interests of proposing modifications to the current system that might allow for the introduction of more advantageous contractual terms for both parties.[33]

[30] Ibid,, art. 174.
[31] Ibid., art. 160.
[32] Ibid., art. 277.
[33] Interview, Rome, 27 June 2017.

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With a view to achieving greater efficiency, cost certainty and reasonable financial stability, the White Paper recommends revising the acquisition model by incorporating long-term logistics support into acquisition contracts and, if necessary, an initial training period.[34] Acknowledging the growing plurality of systems and technological complexity, the White Paper suggests balancing the skills to be retained by the armed forces with those to be managed by industry. It also suggests that industry might absorb some MoD technical/industrial facilities along with staff. Ad hoc regulations should be introduced in order to define the status of the personnel of those companies called upon to operate in theatre to ensure better logistics support to the equipment deployed in operations.[35] Finally, concentrating more specifically on resources, the White Paper recommends increasing participation in European multinational cooperation programs with a view to generating financial savings as well as scale economies.[36] Multinational programs offering the possibility of cooperation on logistics support, even at an initial bilateral level, could be identified.[37]

To conclude, in the light of the political, military and technological changes that have taken place, the logistics support of major weapons systems and the modes by which they are sustained over time are undergoing profound revision with a view to achieving high levels of effectiveness, efficiency and availability. This undertaking is proving increasingly complex, requiring specific skills, professional expertise and, above all, an in-depth change of mind-set regarding the Ministry of Defence/industry relationship.

Italy is no exception with respect to these considerations, and the greater operational needs associated with international missions, coupled with a highly unstable scenario, urge consideration of a new general system of logistics support management for all major defence systems. Furthermore, this stance seems to converge with the predictions of a 2015 White Paper that proposes various measures that, if promptly implemented, could guide the transition to a logistics support model more in line with European and international best practices and capable of responding more effectively to the needs of the Italian armed forces.

Updated 27 July 2017

[34] Italian Ministry of Defence, *White Paper for International Security and Defence*, cit., art. 278.
[35] Ibid., art. 280.
[36] Ibid., art. 277.
[37] Interview, Rome, 15 May 2017.

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