

Abstraction of the concept of military logistics

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Abstract

Purpose – Military logistics (MiL) encompasses a broad range of interdependent functions across organizational levels, geographic contexts and operational conditions, yet its conceptual boundaries remain fragmented. This study aims to conceptualize and visualize the core dimensions of MiL and their interdependencies across peacetime, mobilization and wartime operations.

Design/methodology/approach – The study adopts an exploratory approach. Empirical insights were generated through nine expert workshops involving MiL specialists and Swedish Armed Forces officers. Through an iterative abstraction process combining literature and empirical evidence, the study develops a conceptual framework that integrates functional, organizational, geographic and operational dimensions of MiL.

Findings – The findings conceptualize MiL as a multidimensional, adaptive system linking strategic, operational and tactical levels. Effective MiL requires scalability between peace and war, flexible boundaries between military and civilian systems, lifecycle management of materiel, civil–military integration and multinational interoperability. The analysis demonstrates that increasing operational distance, intensity and uncertainty substantially expand logistical complexity and requirements.

Originality/value – The study advances MiL theory by identifying 12 core dimensions and integrating them within an empirically informed conceptual framework. The framework extends existing definitions and functional classifications by clarifying the relational and context-dependent character of MiL and its role in military readiness and operational effectiveness.

Keywords Military logistics, Defence logistics, Scope of military logistics, Conceptual military logistics framework, Dual-mode operational capability

Paper type Research article

1. Introduction

For many observers, logistics is primarily associated with storage and transportation (e.g. Sarder, 2020), whereas specialists recognize it as a considerably broader field (e.g. Christopher, 2022; Nagy-Bota and Moldovan, 2022; Hugos, 2024). Military logistics (MiL) is broader still (Prebilič, 2006; Rutner *et al.*, 2012; Yoho *et al.*, 2013; Alexa, 2020; Aćimović *et al.*, 2021; Loska *et al.*, 2025). Thorpe's early definition illustrates this breadth, encompassing not only supply and transportation but also war finance, ship construction, munitions production and other elements of the war economy (Thorpe, 1917). Despite this long-standing recognition of its importance and breadth, the precise scope of MiL remains

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difficult to articulate (Eccles, 1954; Kane, 2012; Bury, 2021), including within the armed forces themselves (Neilson, 2012; Serrano *et al.*, 2023).

One reason for this conceptual ambiguity is that MiL is understood differently depending on professional and functional perspectives. Personnel with technical backgrounds may primarily associate logistics with the maintenance and upgrading of defence materiel, particularly vehicles and other military platforms (e.g. NRC, 2014; Smith, 2018). Others emphasize the movement of equipment and personnel (e.g. Henderson, 2008), while logistics may also be understood primarily as the provision of supplies and ammunition to combat units (e.g. Kress, 2002). In addition, MiL encompasses activities extending beyond the military organization itself, including civil–military cooperation and strategic partnerships (Anand, 2001; Glas *et al.*, 2013). MiL is therefore not a single function but an interconnected set of activities, resources, competencies and organizational interfaces.

Understanding this scope is important because logistics is a fundamental enabler of military capability and has frequently been decisive in determining the outcome of military campaigns (Ćimović *et al.*, 2021). MiL must support routine peacetime activities and training while simultaneously providing the capacity to transition to mobilization and wartime operations. It must also sustain forces operating beyond their home bases and, when required, beyond national borders. Theatre logistics, for example, involves both strategic and intra-theatre transportation and requires consideration of geographical and infrastructural conditions, including access and entry routes (O’Hanlon and Sherjan, 2010). These changing operational conditions place different demands on logistics resources, competencies, organizational responsibilities and decision-making (Pawelczyk, 2018).

Existing definitions capture important aspects of this domain but differ considerably in scope and emphasis. Ćimović *et al.* (2021) observe that definitions of defence logistics (DL) and MiL are commonly embedded in national defence strategies and military manuals, with individual military organizations determining which activities are classified as logistics. Van Fenema and van Kampen (2021) conceptualize logistics as processes that enable military organizations to develop capable and sustainable forces and, more generally, as the planning, implementation and control of efficient transportation and storage from origin to consumption. Historically, MiL has been characterized as the “practical art of moving armies” (Jomini *et al.*, 2007). Compared with civilian logistics, however, MiL encompasses additional responsibilities, including the management, maintenance and upgrading of materiel, commonly referred to as technical services. Consequently, existing definitions provide important but partly different perspectives on MiL rather than an integrated account of what the domain comprises and how its components interact.

The literature reflects similar fragmentation. One stream focuses on operational logistics and the consequences of inadequate logistical support (Lis, 2016; Rahman and Hamid, 2019; Loy *et al.*, 2019; Grigore, 2023). Another examines national capacities to sustain armed forces and the contribution of private-sector actors (Markowski *et al.*, 2010; Kane, 2012; Beaumont, 2015; Stanley-Lockman, 2020; van Fenema and van Kampen, 2021; Serrano *et al.*, 2023). A further stream addresses equipment maintenance, spare parts, upgrades and lifecycle management (Crow and Reichard, 2011; Tuunainen, 2016; Pawelczyk, 2018; Arts *et al.*, 2019). Integrated logistics support (ILS), for example, provides a systematic approach to optimizing in-service activities, reducing lifecycle costs and sustaining materiel availability over extended operational lifetimes (Tysseland, 2008; Vaskic and Paetzold, 2019).

Taken together, these studies demonstrate the breadth and importance of MiL but also reveal a conceptual knowledge gap. Existing research provides substantial knowledge about individual logistics functions and doctrinal definitions, but less attention has been devoted to how these elements relate to one another across changing geographical and operational conditions. In particular, the literature provides limited conceptual support for understanding the relationships among logistics functions, required equipment and competencies, organizational interfaces and the additional dependencies that emerge as operational demands increase.

A conceptual visualization is particularly valuable in addressing this gap because definitions and functional classifications alone cannot readily represent such relationships and dependencies. A visual framework can show how functions, resources, competencies, organizational actors and operational contexts are connected and how their relationships change as military activities expand geographically and increase in operational intensity. This provides a system-oriented representation of MiL that complements existing doctrinal definitions and functional classifications rather than seeking to replace them.

The need for such a representation is reinforced by the context-dependent nature of MiL. Logistics requirements change with geographical reach, operational intensity and reliance on external actors. Consequently, understanding MiL requires attention not only to the functions performed but also to the resources, competencies, organizational interfaces and dependencies required to sustain them under different operational conditions.

The visualization also has a practical motivation. Military commanders, logistics leaders and planners need to understand how changes in operational scale and geographical reach affect requirements elsewhere in the logistics system. Making these relationships visible can support the identification of capability requirements, dependencies and interfaces and help determine where responsibilities, resources, equipment and competencies need to be positioned or coordinated. The framework can thereby support logistics planning, organizational development and operational readiness.

Against this background, the purpose of this study is to conceptualize and visualize the core dimensions of MiL and their interdependencies across geographical and operational contexts. The Swedish Armed Forces (SwAF) provide the empirical setting through which this abstraction is developed, while the intended contribution is conceptual rather than a description or evaluation of the Swedish logistics organization itself.

The study addresses the following research question:

How can the core dimensions of military logistics be conceptualized and integrated into a framework that captures their interdependencies across geographical and operational contexts?

The study makes two related contributions. Conceptually, it identifies 12 core dimensions of MiL and develops an empirically informed framework for examining their interdependencies across changing operational conditions. In doing so, it extends existing definitions and functional classifications by providing a relational and system-oriented perspective on MiL. Practically, the framework provides military leaders and planners with a structured means of identifying logistics requirements, interfaces, dependencies and potential capability gaps, thereby supporting logistics planning and operational readiness.

The remainder of the article is structured as follows. The next section reviews the historical development and contemporary definitions of defence and military logistics, establishing the conceptual foundation for the study. This is followed by the research design and methods and the empirical presentation of the conceptual framework. The Discussion interprets the 12 core dimensions and their relationships in light of the existing literature. The article concludes by specifying the theoretical contribution, practical implications, limitations and directions for further research.

2. Conceptual foundations and definitions of military logistics

The term *logistics* likely derives from the Greek *logistikos*, meaning “*the art of practical calculation*” (Leighton and Coakley, 1955; Tepić *et al.*, 2011). Within the ancient Greek Army, it referred to the planning and calculation of the operations required to conduct military campaigns (Rouquet, 2024). The modern usage of the term emerged much later, in the nineteenth century, when Jomini formalized the concept based on the French military role *Maréchal Général des Logis* (Rouquet, 2021). Jomini *et al.* (2007) redefined logistics as a practical and general science concerned with organizing military operations. In the English-speaking world, the concept gained prominence only after First World War; Thorpe’s (1917)

Pure Logistics initially received limited attention until its rediscovery in 1945 at the US Naval War College Library (Eccles, 1954).

The formalization of logistics as a distinct military function began in 1942 with the establishment of specialized logistics organizations within the US Army (Rouquet, 2024). Second World War demonstrated the strategic importance of logistics, with operations such as Overlord illustrating its decisive role in mission success. Post-war developments institutionalized logistics in both military and commercial contexts, expanding research to include transportation optimization and management efficiency (Heskett, 1960). By the late twentieth century, logistics had evolved into a fully institutionalized function across sectors (Meyer and Rowan, 1977).

At a broader level, Eccles (1959) conceptualizes MiL as the critical linkage between military operations and a nation's economy, established through national resources, processes and systems that generate the necessary materiel and personnel. Perjés (1970) further describes logistics as encompassing the supply of materials and the quantitative calculations associated with movements, equipment, organization and combat operations. A key function of strategic MiL is maintaining control over the interface between military forces and the production of required materiel, including the setting of requirements and the planning of storage, distribution, maintenance and production (Pawelczyk, 2018).

According to Alexa (2020), logistics is inherently complex due to the breadth of tasks involved and the numerous internal and external influencing factors. This complexity applies equally to MiL, which must support basic peacetime operations while also enabling comprehensive supply chain networks for deployed forces. It must also account for external factors such as resource availability, multinational cooperation, strategic partnerships and diverse operational environments. The primary objective of MiL is to establish and maintain a specified level of combat readiness at the lowest possible overall cost (van Fenema et al., 2021). Furthermore, contemporary megatrends, including digitalization, automation and autonomy, as well as emerging microtrends such as additive manufacturing and bionic enhancement, increasingly shape logistics processes (Alexa, 2020).

NATO (2018) defines logistics as “the science of planning and carrying out the movement and maintenance of forces,” emphasizing its role as the vital link between deployed forces and the industrial base that produces essential materials and weapon systems. NATO (2018) identifies several core areas of logistics:

- (1) Design, development, acquisition, storage, transport, distribution, maintenance, evacuation and disposal of materiel.
- (2) Transport of personnel.
- (3) Acquisition, construction, maintenance, operation and disposition of facilities.
- (4) Provision of services.
- (5) Medical and health service support.

From a Swedish defence perspective, established SwAF doctrine identifies eight functional areas of MiL (Försvarsmakten, 2007, 2021, 2023). These eight areas constitute the doctrinal point of departure for the present study:

- (1) Supply of necessities (procurement, inventory management, maintenance, decommissioning).
- (2) Materiel supply (acquisition, storage, maintenance).
- (3) Technical service (equipment maintenance, system support).
- (4) Transport service (movement of personnel and equipment).
- (5) Infrastructure (logistics-related maintenance and operations).

- (6) Contracting (procurement of logistics-related services).
- (7) Health care (defence medicine).
- (8) Other logistics support (e.g. mail handling, travel arrangements, legal services, pastoral care).

Although this classification identifies the principal functional areas of MiL, it does not in itself explain how these functions interact, what resources and competencies they require, or how their scope and interdependencies change across geographical and operational contexts.

MiL and DL are often used interchangeably, yet they represent conceptually distinct constructs. MiL generally refers to the logistics required to support a military force, including the capacity to project personnel and materiel beyond national borders. DL, by contrast, focuses primarily on sustaining a defence force engaged in territorial defence. Although related, the two concepts differ in emphasis, scope and operational orientation. However, this distinction becomes increasingly blurred for nations prioritizing national defence while also participating in alliances such as NATO, which require member states to deploy units abroad. NATO defines collective logistics as “*the collective planning, generation, synchronization, and prioritization of national and NATO logistics capabilities to support missions, operations, and exercises through shared processes and organizational structures*” (NATO, 2018).

Contemporary military organizations seek to balance cost-efficient stability during peacetime with agility and flexibility during conflict (Kovács and Tatham, 2009; MoD, 2022; Loska *et al.*, 2024). The distinction between peacetime and wartime logistics reflects fundamental differences in priorities, procedures and resource management strategies (Mozharovskyi and Hodz, 2024). Peacetime logistics emphasizes cost-efficiency, long-term sustainability and predictable supply chains, often integrated with civilian suppliers. In contrast, wartime logistics prioritizes operational agility, resilience, rapid responsiveness, redundancy and survivability, frequently accepting higher costs and logistical risk to maintain operational tempo.

Because armed forces rarely possess sufficient resources independently, they often rely on civilian organizations, a concept central to civil–military cooperation (CIMIC). According to Loska *et al.* (2025), developing mutuality and trust among partners enhances operational effectiveness (Moccia *et al.*, 2020), both within military organizations and across external collaborations.

Technological advancements have significantly expanded the scope of logistics, which now comprises interdependent activities supporting both personnel and weapon systems. Hoffman (2014) defines logistics as including:

- (1) Acquiring and moving physical goods, weapon systems and personnel to and within operational theatres.
- (2) Providing facilities and services for global military operations.
- (3) Ensuring access to relevant commercial and military technologies, progressively more intelligent and networked, to enhance operational effectiveness.

Brick (2019) offers a conceptual framework for MiL that distinguishes three domains: Supplier logistics, operations logistics and the defence logistics base (DLB), see Figure 1. Supplier and operations logistics refers to the provision and management of resources necessary to build and sustain the armed forces across varying operational scenarios. The DLB includes personnel, equipment and technological infrastructure essential for developing and sustaining national military power. Supplier logistics additionally strengthens the industrial base and national competitiveness (Markowski *et al.*, 2010; Lee and Park, 2020; Pukhova *et al.*, 2021).

NATO (2021) defines HNS as the civil and military assistance provided, in peacetime, crisis or war, by a Host Nation (HN) to NATO and/or other forces and NATO organizations

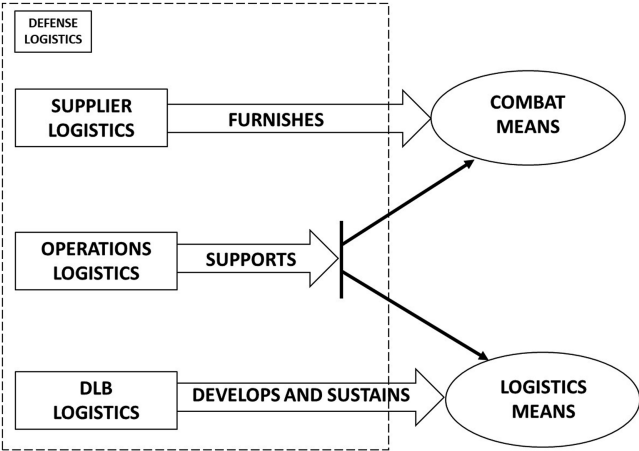


Figure 1. Military logistics taxonomy. Source: Brick (2019)

located in, operating on or from, or transiting through the territory of the HN. HNS is not limited to military assistance but may involve a broad range of civilian resources, services, infrastructure and administrative support. Consequently, the designated HN authority is responsible for coordinating relevant national actors and ensuring that Host Nation Support Arrangements are endorsed at the appropriate level (Otzulis and Ozoliņa, 2017; NATO, 2021). In this sense, HNS can be understood as a specific component of the broader MiL system. Effective HNS requires a high degree of interoperability among participating military and civilian actors (Larson, 2003; Paget, 2016). In this context, interoperability extends beyond technical compatibility to include communication, organizational procedures, cultural understanding and the interchangeability of equipment and other logistical resources.

In the twenty-first century, rapid advances in information technology and evolving concepts of materiel management, particularly in the context of modern information warfare, have reshaped the demands placed on military logistics. Modern MiL requires rapid response, flexibility, reliability, secure and efficient functioning, timely provisioning and full visibility of logistical assets (Lu and Ma, 2018). These developments aim to transform MiL from semi-mechanized and mechanized systems into fully digitized, precision-oriented supply support structures.

In sum, MiL has evolved from ancient military planning into a comprehensive, institutionalized function linking military operations with national economic and industrial capacities. It encompasses supply, transport, maintenance, infrastructure and health services, with distinct approaches in peacetime and wartime. Modern MiL emphasizes agility, technological integration and civil–military cooperation, increasingly blurring traditional boundaries between national defence and international operations. Whether MiL can be organized and assigned to clearly defined responsibilities, and whether any actor can possess the comprehensive oversight required, remains an open question. These characteristics provide the conceptual foundation for examining MiL as an interdependent system across different geographical and operational contexts.

3. Research design and methods

3.1 Research design and analytical approach

This study employed an exploratory qualitative research design based on a structured abstraction process informed by systems thinking (Hiver et al., 2022; Hanger-Kopp et al., 2024).

The objective was to develop a conceptual framework capturing the functional scope and interdependencies of MiL across different organizational, geographical and operational contexts. Systems thinking was considered particularly appropriate because MiL comprises multiple interdependent functions that cannot adequately be understood in isolation but must be examined as components of a broader system (Gammelgaard, 2004; Aastrup and Halldórsson, 2008; Nilsson and Gammelgaard, 2012).

The study followed an abductive research logic (Kovács and Spens, 2005), whereby empirical observations and existing theoretical and doctrinal understandings were compared throughout the research process. Rather than testing a predefined model, the analysis moved between the literature, established MiL classifications, expert knowledge and emerging conceptual representations. The purpose was not merely to describe existing logistics practices but to abstract from them a broader conceptualization of MiL.

The study did not follow a single established workshop or qualitative coding protocol. Instead, the methodological procedure combined abductive reasoning, systems thinking, and iterative conceptual framework development through expert engagement. The procedure comprised five interrelated stages: (1) establishing an initial analytical structure from the literature and military doctrine; (2) selecting participants with relevant MiL expertise; (3) conducting a series of expert workshops; (4) aggregating and analysing the knowledge generated through the workshops; and (5) developing and assessing the conceptual framework through expert evaluation and comparison with the literature. This approach is consistent with conceptual framework co-construction through expert engagement (Schiele *et al.*, 2022).

3.2 Empirical context and participant selection

Sweden and the SwAF were selected as a purposeful empirical setting. Sweden provides a particularly relevant context because its MiL system must simultaneously support peacetime activities, conscript training, force generation, mobilization, territorial defence and increasingly multinational operations following Sweden's integration into NATO. The Swedish Total Defence concept further requires extensive interaction between military organizations, public authorities, civilian infrastructure providers and private-sector actors.

The study considered all three branches of the SwAF, the Army, Air Force and Navy, although the empirical abstraction places greater emphasis on the Army because of its broader territorial presence and extensive logistical requirements. While the services operate according to common overarching logistics principles, their specific equipment, infrastructure, maintenance, transportation and supply requirements vary according to operational context. This variation was considered when examining whether the emerging conceptual framework could accommodate different logistics environments.

Participants were selected purposively based on their professional knowledge of MiL and their ability to assess MiL from organizational, operational and functional perspectives. Participants included both SwAF military personnel and military faculty logistics specialists at the Swedish Defence University, all holding officer ranks ranging from Major to Brigadier General. Their professional backgrounds encompassed strategic and staff-level logistics as well as operational and functional responsibilities.

Each workshop involved between three and five participants. The composition was not identical across workshops; participants were selected according to the geographical, operational and functional scope addressed in each workshop. Experts with relevant knowledge and experience were therefore included as the analytical scope expanded. This purposive and adaptive expert-sampling strategy ensured that the model development drew on expertise relevant to the context under examination while incorporating perspectives from different organizational levels and areas of military logistics.

3.3 Workshop design and data collection

The primary empirical material was generated through nine expert workshops conducted from late autumn 2024 to spring 2025. Each workshop lasted approximately 25–45 min and was designed as a focused expert discussion in which participants identified relevant MiL activities, assessed their relationships, challenged the boundaries of the emerging conceptualization and evaluated successive versions of the framework.

The starting point for the empirical analysis was the eight functional areas of MiL identified in Swedish Armed Forces doctrine ([Försvarsmakten, 2007, 2021, 2023](#)): (1) supply of necessities, (2) materiel supply, (3) technical services, (4) transport services, (5) infrastructure, (6) contracting, (7) healthcare and (8) other logistics support. These established doctrinal areas provided the initial functional boundaries of MiL and ensured that the workshop process was grounded in an existing MiL classification rather than in categories constructed solely by the researchers.

For analytical purposes, the eight areas were consolidated into four broader domains based on their functional relationships:

- (1) Storage and distribution of necessities – primarily incorporating supply of necessities and related logistics support.
- (2) Materiel needs and handling – incorporating materiel supply, technical services and infrastructure.
- (3) Transport services – incorporating transportation and associated contracting requirements.
- (4) Healthcare – encompassing defence medical support.

The consolidation did not redefine or replace the eight doctrinal areas but provided a more parsimonious analytical structure for the workshop process and subsequent visualizations. These four domains constituted the analytical starting point from which the empirical abstraction proceeded.

The operational contexts were used as progressively expanding analytical settings. Beginning with routine logistics within a military base, the analysis extended to exercise areas, operations farther from the home base, mobilization and wartime deployment, civil–military transition points, HNS and long-term materiel support. These contexts were selected because they represent interconnected settings in which the scope and complexity of MiL change with increasing geographical reach, operational intensity and dependence on external actors. They were not treated as independent or hypothetical scenarios, but as an analytical progression through which increasingly demanding logistics conditions could be examined.

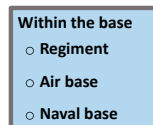
Each context built on the preceding one. During the workshops, participants assessed which previously identified logistics requirements remained applicable, and which additional functions, resources, competencies, organizational interfaces and interdependencies emerged as the analytical context expanded. The contexts served as an analytical device for identifying cumulative and changing MiL requirements and provided the empirical basis for [Figures 2–5](#). They were not intended to represent statistically generalizable cases; rather, they enabled the systematic examination of how the scope and interdependencies of MiL change across geographical and operational conditions.

The workshops were not audio-recorded. Instead, detailed contemporaneous notes were taken during each workshop, focusing on participants' observations, proposed modifications, areas of agreement or disagreement and explanations concerning the boundaries and relationships among MiL functions. The notes were reviewed and consolidated immediately after each workshop to preserve contextual information and identify issues requiring examination in subsequent workshops.

With logistics focus on a regiment / military base

- | | | |
|--|--|------------|
| 1. Storage and distribution of necessities | <i>prescribed personal equipment, warehouse, canteen, ammunition, etc.</i> | } Examples |
| 2. Material needs and handling | <i>materials handling equipment, bicycles, cars, etc.</i> | |
| a) Technical maintenance | <i>tools, maintenance knowledge, etc.</i> | |
| b) Infrastructure | <i>storage, garage, service halls, wash halls, dryers, etc.</i> | |
| 3. Transport service | ... | |
| a) Contracting | <i>if required - private companies</i> | |
| 4. Health care | <i>civilian health care</i> | |

*Conscripts training and
practice equipment*



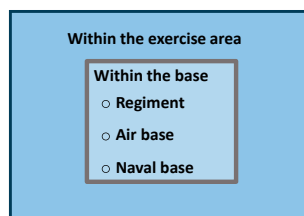
Assignment: Training of conscripts, e.g. 250 persons / year

Figure 2. Logistics needs within an army base. Source: Authors

With logistics focus on a regiment / military base

- | | | |
|--|---|------------|
| 1. Storage and distribution of necessities | <i>field lunch, replacement necessities, etc.</i> | } Examples |
| 2. Material needs and handling | <i>off-road vehicles, trucks, salvage vehicles, etc.</i> | |
| a) Technical maintenance | <i>repairs skills, military-civil service cooperation, etc.</i> | |
| b) Infrastructure | ... | |
| 3. Transport service | ... | |
| a) Contracting | ... | |
| 4. Health care | ... | |

*Conscripts training and
practice equipment*



Assignment: Training of conscripts, e.g. 250 persons / year

Figure 3. Logistical requirements within the exercise area for army activities. Source: Authors

3.4 Successive abstraction and analysis

Consistent with the abductive research design (Thompson, 2022; Timmermans and Tavory, 2022), data collection and analysis proceeded concurrently rather than through retrospective coding of a complete dataset. The analysis followed the operational progression described in Section 3.3, with the findings from each workshop informing the analytical focus of subsequent workshops.

The workshop material was analysed manually. Initial analysis focused on identifying logistics functions, activities, resources, competencies, responsibilities, interfaces and contextual conditions within the four analytical domains. These observations were then compared and grouped according to recurring relationships and patterns across the operational

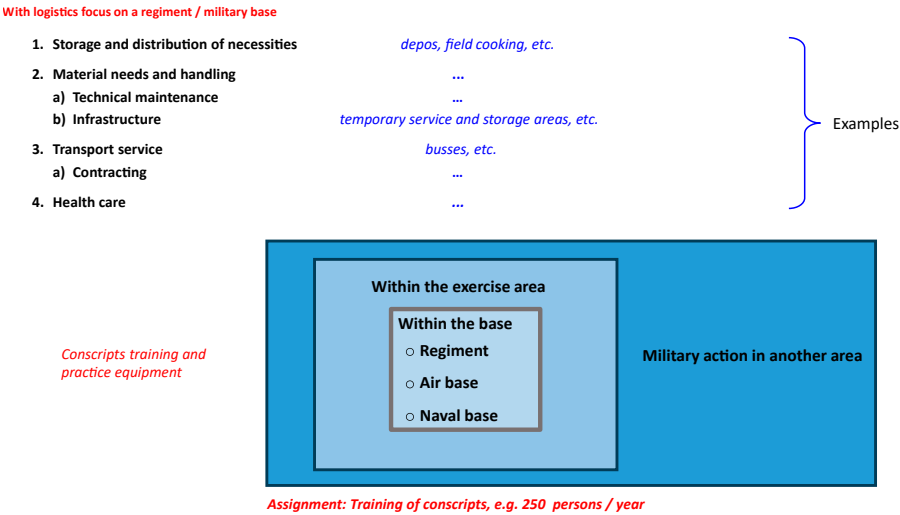


Figure 4. Logistical functions, equipment and supply requirements for operations farther from the base.
Source: Authors

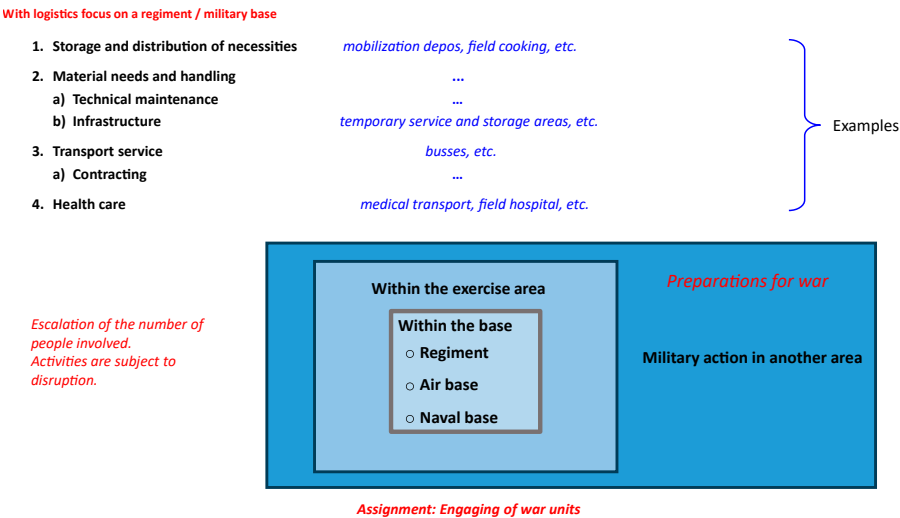


Figure 5. Logistical functions, equipment and supply needs when deploying combat units in outreach areas.
Source: Authors

contexts. Existing doctrine and literature served as sensitizing analytical categories, while additional requirements and relationships emerging from the workshops were incorporated inductively.

Workshop documentation and successive versions of the conceptual framework were maintained throughout the analysis, providing a traceable progression from doctrinal categories and workshop observations to analytical groupings and subsequent model revisions. Given the focused volume of material and the model-oriented analytical approach, dedicated qualitative data analysis software was not used.

3.5 Framework development and consensus process

Framework development was based on a repeated sequence of proposition, expert assessment, revision and reassessment. The initial representation drew on the literature, Swedish military doctrine and the four analytical domains described in [Section 3.3](#). Following each workshop, relevant observations and proposed modifications were incorporated into the existing representation, which then provided the basis for assessment in the subsequent workshop.

At each stage, participants assessed the relevance and completeness of the identified logistics functions, resources, competencies, responsibilities, interfaces and relationships. Consensus was achieved through discussion and refinement rather than formal voting. Participants were encouraged to identify missing elements, clarify ambiguities and challenge the emerging representation. Where differences in interpretation reflected organizational level, operational context or service-specific requirements, these differences were examined as potential contextual variation rather than automatically resolved into a single interpretation.

The final framework emerged from this repeated expert assessment and comparison with doctrine and literature. It therefore represents an analytically derived conceptualization of MiL rather than a detailed description of a particular organizational structure.

3.6 Methodological rigour and management of researcher bias

Methodological rigour was strengthened through triangulation, repeated expert assessment and transparency in framework development. Workshop observations were compared with established military doctrine and the MiL literature, while the series of workshops provided repeated opportunities to assess and challenge emerging interpretations. The inclusion of participants with different professional backgrounds and levels of responsibility reduced reliance on individual perspectives and helped identify variation across organizational, functional and operational contexts.

Potential researcher bias was further addressed through the abductive research design. The initial doctrinal categories served as an analytical starting point rather than predetermined conclusions, allowing workshop evidence to extend, modify or challenge the emerging framework. Detailed workshop notes and successive versions of the framework were retained, providing an audit trail from observations through analytical interpretation to framework development.

These procedures do not eliminate researcher interpretation, nor do they establish statistical generalizability. Rather, they enhance transparency by making the analytical process traceable and by subjecting emerging interpretations to repeated expert and documentary scrutiny. The resulting framework should therefore be understood as an empirically informed conceptual abstraction whose transferability to other national, service-specific and operational contexts requires further empirical examination.

4. Results: military logistics across expanding operational contexts

This section presents the empirical development of the conceptual framework across the operational contexts described in [Section 3.3](#). The results focus on how additional logistics requirements and interdependencies become visible as the analytical scope expands.

[Figures 2–5](#) use a common structure. The numbers 1–4 in the upper-left corner represent the four consolidated analytical domains: storage and distribution of necessities; materiel needs and handling; transport services; and healthcare. Blue text provides examples of logistics activities, equipment, infrastructure, resources and competencies associated with each context, while red text in the lower-left part of each figure and below the main geographical frame identifies the principal activities and missions performed by the military base. The rectangular boundaries represent geographical scope and expand across [Figures 2–5](#) to indicate increasing geographical reach and operational complexity.

During the workshops, participants also discussed differences in how MiL functions and responsibilities are organized under peacetime and wartime conditions. Because these organizational arrangements include sensitive information, they are not reported in detail or incorporated into the visualizations.

4.1 Military logistics within the base

[Figure 2](#) illustrates the logistical functions and equipment required within a regiment (military base) to support training exercises and conscript education. Equipment and infrastructure are naturally adapted to the activities conducted at the base and therefore vary between army, air force, naval and other operational environments.

As shown in [Figure 2](#), the logistical requirements comprise the resources necessary for daily garrison operations. These include storage facilities for personal equipment, weapons and ammunition, food and other essential supplies. Basic workshop services and garages are needed for the parking, maintenance, and repair of vehicles, bicycles and related equipment. Handling equipment, such as ground-based forklifts, is also required. Technical expertise is essential for maintaining and servicing the unit-specific equipment located at the base. When more technically advanced maintenance is needed, civilian operators are contracted. Supply needs primarily involve daily provisions such as water, food, hygiene items and other consumables used within the base.

4.2 Military logistics within the exercise area

[Figure 3](#) illustrates the expanded logistical requirements that arise in a regiment's exercise areas during training activities and conscript education. The figure should be interpreted as a complement to the requirements presented in [Figure 2](#). As before, equipment needs differ depending on whether the activities involve army, air force, naval or other operations.

From a logistical standpoint, requirements increase substantially when conscripts are deployed to training areas and firing ranges. Transport capacity is needed in the form of small buses, off-road vehicles and similar means of movement. Depending on unit type, various weapons systems and platforms, such as combat vehicles, naval vessels, helicopters, aircraft, mortars, howitzers or tanks, may be employed. To avoid the need for conscripts to return to the garrison during the day, on-site field lunches and sanitation facilities are required.

Following each exercise, weapons must be cleaned and stored, and vehicles must undergo cleaning and servicing. The greater the quantity and complexity of equipment used, the more access is needed to service stations, spare parts and technical expertise. Expertise or maintenance equipment unavailable at the home base must be transferred from other bases or procured from civilian providers.

4.3 Military logistics beyond the base

[Figure 4](#) illustrates additional logistical functions, supply needs and equipment requirements arising when training exercises and conscript education occur at locations sufficiently distant from the base that personnel cannot return for overnight stays and operations extend over multiple days.

As shown in [Figure 4](#), extended operations generate additional logistical demands. Longer movements of personnel and equipment necessitate different modes of transport compared with local operations. Public transportation is often used for moving personnel, while heavy transport vehicles or trains are employed for large weapons systems and combat vehicles. Overnight accommodation may include barracks near training areas, tents or privately rented facilities.

Arrangements for water, food, hygiene, storage of weapons and ammunition, fuel, equipment and vehicles depend on resources available at the training location. Supplies unavailable on-site must be transported from the home base or procured locally from civilian

suppliers. To maintain operational readiness, first-line technical expertise must be available. Equipment that cannot be repaired locally must be recovered and transported for maintenance elsewhere. All operations conducted beyond military premises require surveillance and security measures to protect personnel and materiel.

In addition to on-site first aid provided by military medical personnel, advanced medical needs rely on public healthcare services.

4.4 Mobilization and military operations in outreach areas

Figure 5 illustrates the additional logistical requirements arising during the mobilization phase when combat units are deployed in outreach areas.

According to the Swedish Defence Commission ([Departementsserien 2019:8, 2019](#)), readiness requirements for the SwAF include:

- (1) Certain wartime units must maintain high readiness and be immediately available.
- (2) Most wartime units must begin fulfilling their tasks within a few days of a readiness decision.
- (3) All wartime units must be capable of initiating their assigned missions within one week.
- (4) Home Guard units must operate with most of their forces within 24 h, and smaller elements within a few hours.

These requirements imply that the SwAF must be capable of transitioning to wartime organization within one week. Such rapid mobilization places significant demands on distributed mobilization storage and logistical equipment.

Experience from operations in Afghanistan and comparable environments indicates that extending operations to distant or austere locations, particularly during rapid mobilization, substantially increases logistical complexity. Extended transit times, limited access to established supply hubs, hostile and unpredictable environments and the need for real-time adaptability all challenge logistical planning and execution. Ensuring efficiency, resilience and security of logistics becomes critical for sustaining operational effectiveness.

Depending on the operational area and season, personnel require tailored equipment and weapon systems capable of functioning effectively across a wide range of environments, from sparsely populated Arctic conditions to densely built urban settings.

Figure 5 therefore depicts a shift from supporting conscript training to mobilizing combat units in an actual operational context. Rather than handling approximately 250 conscripts annually, logistics functions must scale up to support 5,000–10,000 personnel requiring equipment, accommodation, training, transport and supplies. This scale-up places substantial demands on logistics capacity, including prepositioned personal equipment, weapons, ammunition, combat vehicles and related materiel.

Even without active combat, injury rates, primarily due to accidents, must be anticipated and managed. Mobilized personnel may be unfamiliar with available equipment, necessitating weapons training and instruction in equipment maintenance and servicing.

4.5 Civil-military supply transition points

Regardless of whether replenishment involves supplies or materiel delivered to a regiment (military base), an exercise area or mobilized units, one or more transition points are always present. Deliveries may originate from military stockpiles or directly from civilian suppliers. Transport to these transition points can be conducted using either civilian or military vehicles; however, when there is a threat of attack, armoured military vehicles are typically employed to ensure secure delivery.

In addition to transition points, there are also “referral points,” where military units independently collect supplies such as fuel and food or are directed to public healthcare facilities.

Swedish MiL is generally divided into two resource levels (Figure 6):

4.5.1 Forward-level logistics. The forward level comprises unit-bound resources as well as operational logistics units. These resources are primarily driven by tactical and operational requirements and must therefore be designed and dimensioned accordingly. Forward-level logistics resources consist of the logistics units attached to task forces.

4.5.2 Rear-level logistics. The rear level encompasses the Armed Forces’ own resources, including the Armed Forces Logistics (FMLOG), as well as certain territorially bound resources and those provided by external civil, national or international partners. Rear-tier logistics activities are afforded a higher degree of peacetime rationality, employing standardized processes and operating with varying delivery times and capabilities relative to the forward level.

A key component of this logistics concept is the logistics unit (LogE), which ensures availability, serves as a buffer and acts as the handover point between rear- and forward-level logistics functions. In Figure 6, FMLOG is represented by the SwAF Central Warehouse and the logistics battalions that provide transport capacity.

An essential structural element of MiL is the system of mobilization depots. These specialized storage facilities, containing military or civil defence materiel, are designed to enable rapid mobilization in the event of crisis. Many depots are geographically dispersed, often located in remote areas, deep forests or underground mountain facilities.

Since the early 2000s, wartime materiel stored in mobilization depots has not been regularly maintained by the SwAF. For many years, the focus on international missions led to responsibility for depot-stored materiel being delegated to other actors. With the renewed emphasis on national defence, and the reassignment of materiel to specific units, operational formations must now reacquire the knowledge and routines required to properly maintain depot equipment. War unit courses focusing on technical services aim to re-establish these maintenance procedures and thereby enhance overall operational readiness.

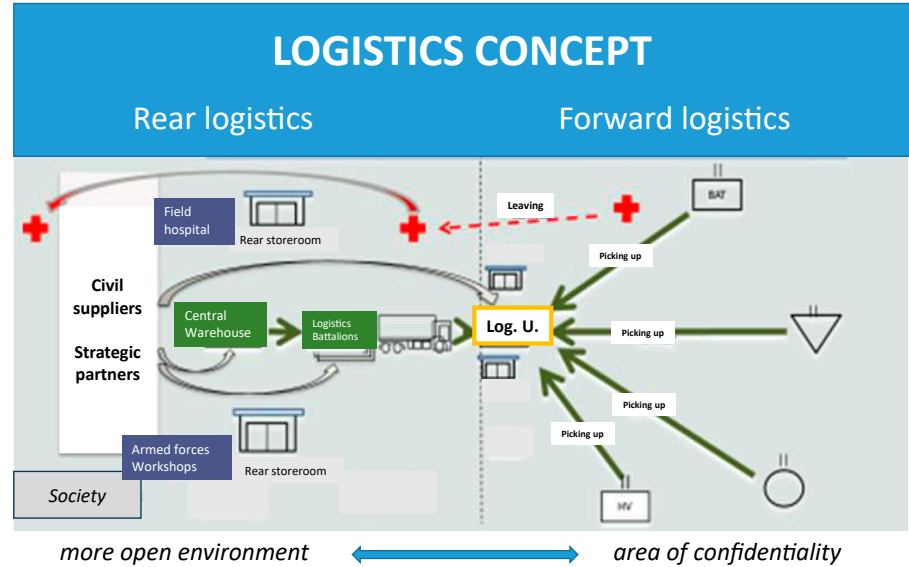


Figure 6. Typical Armed Forces logistics concept. Source: [Försvarsmakten \(2021\)](#); Authors’ translation

Figure 7 illustrates the hierarchical phases of transition points in alignment with NATO processes, commonly referred to as Lines 1–4. While NATO uses different terminology, its logistics structure is broadly like the Swedish model. In the Swedish framework, the division between rear and forward levels corresponds to a four-tier system encompassing Lines 1 through 4.

4.6 Host nation support

HNS solutions span diverse geographic regions, unit types and logistical capacities, and therefore require a distinct set of logistical capabilities and organizational structures. These requirements apply both to the host nation and to the incoming military units.

The arrival of foreign military units generally demands substantial staging areas, provisioning capacity and robust security measures. Incoming forces also require significant transport capacity, including access to rail networks, heavy transport vehicles, buses and coordinated transport management systems. Careful logistical planning is essential to ensure sufficient accommodation, fuel and food supplies. In addition, operational scenarios require recovery capabilities to retrieve, and transport disabled vehicles and equipment from road networks.

As illustrated in the figures, military operations conducted under HNS arrangements rely on extensive support from other public authorities (e.g. police, customs, healthcare services) as well as from civilian actors. This multi-actor environment underscores the importance of coordinated planning, clear division of responsibilities and interoperable logistical processes.

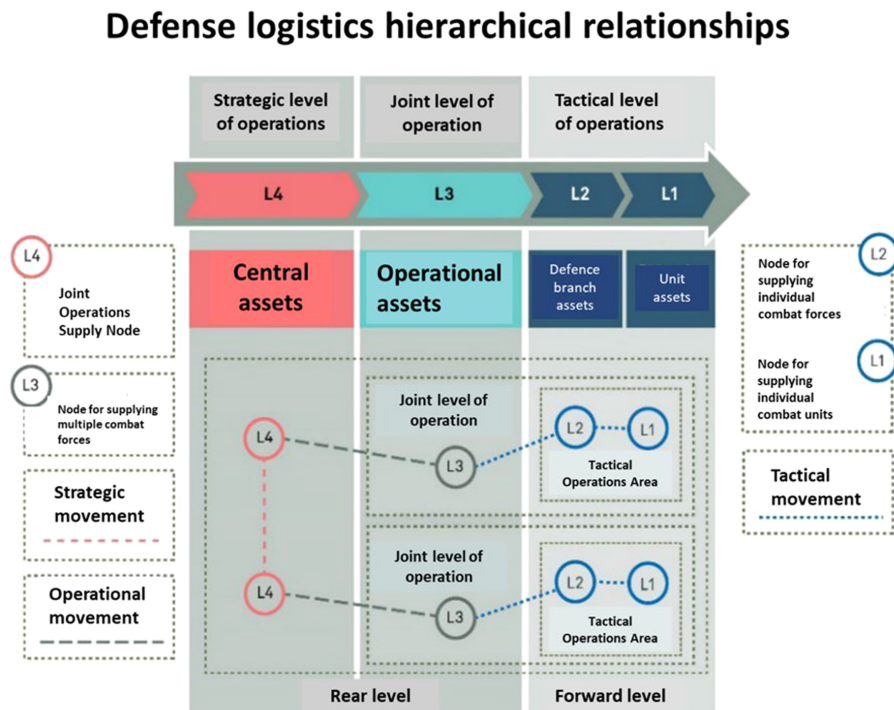


Figure 7. The Swedish Armed Forces hierarchical logistics concept. Source: [Försvarsmakten \(2023\)](#)

4.7 Lifecycle maintenance and upgrading of materiel systems

The responsibility for maintaining, upgrading and modifying existing materiel systems throughout their often decades-long life cycle, often extending beyond 30 years, falls within the broader logistics function commonly referred to as *technical services* and is closely linked to ILS, which ensures that these systems remain sustainable, supportable and operationally effective over time. A central challenge is determining where this work should be conducted and who should be responsible for it, while ensuring that the necessary technical expertise is available.

Several organizational arrangements are possible:

- (1) The Armed Forces may retain full responsibility and perform all work in-house.
- (2) The process may be delegated entirely to the original equipment manufacturer (OEM).
- (3) A hybrid approach may be adopted, in which civilian companies are contracted to perform part or all the work.

Regardless of the chosen model, the maintenance and upgrade process requires comprehensive planning. This includes procuring consumables and spare parts, testing and integrating modification equipment, and addressing issues related to obsolete components. Furthermore, materiel must be transported to appropriate facilities for maintenance, modification or upgrades, which introduces additional logistical considerations.

5. Discussion: core dimensions and the integrated framework of military logistics

The findings demonstrate that MiL is best understood not through an exhaustive inventory of functions or through a single encompassing definition, but through the relationships among a set of interdependent dimensions whose significance changes with operational conditions. The conceptual framework demonstrates how logistics requirements and interdependencies increase as geographical reach, operational intensity and organizational complexity expand. In this sense, the principal contribution of the study is the identification and integration of twelve core dimensions that connect the existing MiL literature with the empirically developed framework.

The dimensions build on established conceptualizations of MiL while extending them through a system-oriented perspective. [NATO \(2018\)](#) emphasizes the breadth of logistics functions associated with the movement and maintenance of forces; [Pawelczyk \(2018\)](#) highlights the strategic interface between military requirements and the production, storage, distribution and maintenance of materiel; [Hoffman \(2014\)](#) emphasizes the movement of goods, weapon systems, personnel, facilities, services and technologies; and [Brick \(2019\)](#) distinguishes among supplier logistics, operations logistics and the DL base. The present findings integrate these perspectives and demonstrate how their constituent elements interact across changing geographical, organizational and operational conditions. The resulting 12 dimensions should therefore be understood as interconnected properties of the conceptual framework rather than as an alternative functional taxonomy.

5.1 Core dimensions of military logistics

5.1.1 Strategic interface management. The first dimension concerns the interface between military requirements and the economic, industrial and organizational systems through which military capability is generated and sustained. [Eccles \(1959\)](#) conceptualizes logistics as a critical link between military operations and the national economy, while [Pawelczyk \(2018\)](#) emphasizes the strategic logistics responsibility for defining requirements and coordinating production, storage, distribution and maintenance. The empirical framework extends this perspective by demonstrating that these interfaces remain relevant throughout the operational continuum. Military requirements must be translated into the availability of materiel, services,

infrastructure, maintenance capacity and other resources, whether these are provided internally, by defence industry, or through civilian suppliers. Strategic interface management therefore connects long-term capability generation with operational logistics requirements.

5.1.2 Functional breadth and scope. The second dimension captures the breadth of MiL. NATO (2018) includes the design, development, acquisition, storage, transport, distribution, maintenance, evacuation and disposal of materiel, as well as personnel transport, facilities, services and medical support. Hoffman (2014) similarly emphasizes physical goods, weapon systems, personnel, facilities, services and technological capabilities. The empirical analysis confirms this breadth but also demonstrates why a functional inventory alone is insufficient. The four consolidated analytical domains used in Figures 2–5, storage and distribution of necessities, materiel needs and handling, transport services and healthcare, provide a parsimonious structure for visualizing how different logistics requirements interact. The contribution of the framework is therefore not to replace existing functional classifications, but to demonstrate how their requirements expand and become increasingly interdependent as operational conditions change.

5.1.3 Dual-mode operations across peace and war. A defining characteristic of MiL is its requirement to function across fundamentally different operating conditions. Peacetime logistics emphasizes cost-efficiency, sustainability and predictable supply arrangements, often involving substantial reliance on civilian systems, whereas wartime logistics places greater emphasis on responsiveness, redundancy, survivability and resilience (Kovács and Tatham, 2009; MoD, 2022; Mozharovskyi and Hodz, 2024; Loska et al., 2024). The empirical framework demonstrates that these are not isolated logistics systems but different operating modes within a broader logistics capability. As the analytical contexts progress from routine base activities towards mobilization and wartime operations, the required logistics capacity changes in scale, configuration and tolerance for disruption. The ability to transition between these modes is therefore central to operational continuity across the peace–war continuum.

5.1.4 Geographical and organizational variability. MiL requirements are inherently dependent on geographical and organizational context. Logistics within a military base can rely on established infrastructure, storage, workshops and relatively predictable supply arrangements. As activities extend into exercise areas and subsequently farther from the home base, these fixed resources become less accessible and must increasingly be supplemented by mobile capabilities, temporary infrastructure, external transport, civilian services and distributed support arrangements. This progression is captured in Figures 2–5 and is consistent with the importance of geographical and infrastructural conditions in military operations (O’Hanlon and Sherjan, 2010). The framework therefore demonstrates that geographical expansion does not merely increase transportation requirements; it changes the configuration and interdependence of the logistics system.

5.1.5 Scalability and readiness. Closely related to geographical variability is the requirement for rapid scalability. The empirical progression from supporting routine conscript training to mobilizing combat units illustrates a substantial increase in logistics requirements. Swedish readiness requirements stipulate compressed mobilization timelines (Departementsserien 2019:8, 2019), requiring logistics systems to make personnel, equipment, accommodation, transportation, supplies and supporting services available at considerably greater scale. Scalability is consequently not simply a question of increasing volumes. It requires appropriate stocks, infrastructure, transport capacity, organizational arrangements, competencies and coordination mechanisms to be available when required.

5.1.6 Civil–military integration and transition points. The empirical analysis shows that MiL cannot be conceptualized as a closed military system. Armed forces depend on civilian suppliers, infrastructure, transportation, healthcare, technical expertise and other external resources. This reflects the broader importance of civil–military cooperation and strategic partnerships identified in previous research (Anand, 2001; Glas et al., 2013; Moccia et al., 2020; Loska et al., 2025). Figures 6 and 7 further demonstrate that these relationships require identifiable transition and referral points through which resources move between rear and

forward logistics structures and between civilian and military systems. The conceptual implication is that effective MiL requires permeable system boundaries combined with clearly managed interfaces. Civil–military integration is therefore not peripheral to MiL but constitutes one of its core dimensions.

5.1.7 Host nation support and multinational interoperability. HNS extends the systems logic of MiL beyond national organizational boundaries (NATO, 2021). Collective logistics requires coordination among national and NATO capabilities through shared processes and organizational structures (NATO, 2018). The empirical analysis demonstrates that HNS creates requirements for staging areas, transport capacity, infrastructure, provisioning, security, healthcare, recovery capabilities and coordination with multiple civilian and public-sector actors. As emphasized by Otzulis and Ozoliņa (2017), these requirements extend beyond purely military structures and depend on effective coordination between military and civilian actors. Effective HNS consequently requires a high degree of interoperability (Larson, 2003; Paget, 2016), extending beyond technical compatibility to encompass communications, organizational procedures, cultural understanding and the interchangeability of equipment and other logistics resources. HNS thus illustrates particularly clearly how the boundaries and interdependencies of MiL expand as military activity becomes multinational.

5.1.8 Lifecycle management and technical services. The framework also extends beyond the immediate delivery of logistics support to encompass the long-term sustainment of military systems. ILS provides a systematic means of optimizing in-service activities, controlling lifecycle costs and maintaining materiel availability (Tysseland, 2008; Vaskic and Paetzold, 2019). Long-lived military systems create requirements for maintenance, spare parts, upgrades, obsolescence management, technical expertise and organizational decisions concerning whether support should be performed internally, by original equipment manufacturers or through hybrid arrangements. These requirements may persist for several decades. Lifecycle management therefore connects present operational readiness with long-term technical and industrial support capacity and demonstrates why MiL cannot be restricted conceptually to the immediate movement and supply of forces.

5.1.9 Operational versatility and resilience. MiL must continue to function when operating conditions become uncertain, degraded or hostile. The progression represented in the framework shows that increasing operational distance and intensity expose logistics systems to longer supply lines, reduced access to established infrastructure, changing demand and potential disruption. Resilience therefore involves more than maintaining additional stocks. It requires the capacity to adapt logistics configurations, relocate resources, employ alternative suppliers or routes, recover and repair equipment and sustain essential functions despite disruption. This reinforces the systems perspective adopted in the study: MiL requires sufficient structural flexibility to absorb stress while continuing to support military operations.

5.1.10 Human and organizational factors. The framework further demonstrates that logistics capability depends not only on materiel and infrastructure but also on competencies, responsibilities, organizational arrangements and coordination. As logistics requirements expand, specialized technical knowledge, contracting expertise, planning competence, maintenance skills and the capacity to coordinate across organizational boundaries become increasingly important. The breadth of MiL also means that no single organizational actor is likely to possess all necessary resources, competencies and authority. Logistics capabilities and expertise must therefore be distributed across operational units, specialized logistics organizations, defence authorities, civilian providers and other actors. This organizational dispersion reinforces the need for system-wide coordination rather than organizational centralization as an end.

5.1.11 Digitalization, automation and emerging technologies. Technological development increasingly affects both the performance and configuration of MiL. Digitalization, automation, autonomy, additive manufacturing and other emerging technologies can increase responsiveness and enable new forms of distributed logistics support (Alexa, 2020). At the same time, technological integration introduces new dependencies on

information systems, data quality, communications, energy supply and specialized competencies. Technology should therefore not be treated as an independent solution to logistics challenges but as an enabling dimension that interacts with organizational, operational and supply-chain requirements throughout the framework.

5.1.12 Supply chain precision and visibility. The final dimension concerns the increasing requirement for accurate, timely and secure logistics information. Modern information-intensive military operations require rapid response, reliability, flexibility and visibility of logistics assets (Lu and Ma, 2018). Such visibility becomes particularly important as logistics networks extend across geographical areas and involve military units, logistics organizations, civilian suppliers, infrastructure providers and allied forces. Supply chain precision and visibility consequently provide the informational basis for coordinating the other dimensions. Without reliable information concerning the location, condition, availability and movement of resources, the scalability, resilience and interoperability represented in the framework cannot be effectively achieved.

5.2 Relationships among the dimensions in the conceptual framework

The analytical significance of the twelve dimensions lies in their interdependence rather than in their treatment as separate categories of logistics activity. The empirical framework in Figures 2–7 shows that changes in operational conditions affect several dimensions simultaneously. The four consolidated functional domains establish the principal areas of logistics support, while the framework reveals how the relationships among these domains and the 12 dimensions change with geographical reach, operational intensity and organizational complexity.

This relational perspective is important because the effectiveness of individual logistics functions depends on conditions elsewhere in the system. For example, available supplies have limited operational value without sufficient transport capacity; maintenance depends on access to spare parts, technical competence and recovery capability; and multinational support depends on interoperable procedures, infrastructure, information and organizational interfaces. The framework therefore directs analytical attention towards dependencies and coordination requirements rather than towards individual logistics functions in isolation.

The progression across the empirical contexts further reveals that logistics complexity is cumulative but not uniform. Existing requirements may persist while additional dependencies emerge, and the relative importance of individual dimensions changes with the operational setting. Geographical expansion, for example, increases not only transportation requirements but also dependence on temporary infrastructure, technical support, external providers, information and resilient supply arrangements. The framework thus demonstrates that MiL should be understood as a context-dependent system in which operational changes can generate requirements across several interconnected dimensions.

These findings support a narrower conceptual conclusion than an attempt to formulate an exhaustive new definition of MiL. The 12 dimensions identify the principal characteristics through which contemporary MiL can be analysed, while the framework shows how those characteristics interact under changing operational conditions. The contribution relative to existing definitions and conceptual frameworks is considered further in Section 6.1.

5.3 Synthesized definition of military logistics

Based on the 12 core dimensions and their integration within the conceptual framework, the study proposes one concise synthesized definition:

Military logistics is a multidimensional and adaptive system that generates and sustains military readiness by coordinating the movement, supply, maintenance, and lifecycle support of personnel, materiel, infrastructure, and services across strategic, operational, and tactical levels. It integrates military, civilian, national, and multinational resources and must remain scalable, resilient, interoperable, and adaptable across changing geographical and operational conditions.

This definition is deliberately synthetic rather than exhaustive. Its purpose is not to replace established doctrinal definitions or to reproduce the full range of MiL functions. Instead, it captures the central properties revealed by the 12 dimensions and the conceptual framework. MiL is thus conceptualized not as a fixed collection of support activities, but as an integrated and adaptive system whose effectiveness depends on the coordination of interdependent capabilities across organizational, geographical, technological and operational boundaries.

6. Conclusions, contributions and implications

This study set out to conceptualize and visualize the core dimensions of MiL and their interdependencies across changing geographical and operational contexts. The findings demonstrate that MiL is best understood as a multidimensional and adaptive system in which logistics requirements become increasingly interdependent as operational scale, geographical reach and organizational complexity increase. The 12 core dimensions identified in the study provide the conceptual structure for understanding this complexity, while the framework demonstrates how these dimensions interact across different operational conditions. By linking functions, resources, competencies and organizational interfaces within a common analytical structure, the framework complements existing doctrinal and functional classifications and provides a basis for analysing MiL as an integrated system rather than as a collection of separate logistics activities.

These conclusions should be interpreted within the empirical and methodological boundaries of the study. The framework was developed through expert workshops in the Swedish defence context and represents a conceptual abstraction rather than a comprehensive representation of all national or service-specific logistics arrangements. Its broader applicability therefore requires further empirical assessment across other military, national and multinational settings.

6.1 Theoretical contributions

This study makes three related theoretical contributions to the conceptual development of MiL.

First, it advances a relational perspective on military logistics. Existing definitions and functional classifications establish the breadth of MiL and identify its principal activities (NATO, 2018; Pawelczyk, 2018; Brick, 2019), but provide more limited insight into how logistics functions, resources, competencies and organizational interfaces depend on one another. The framework extends these approaches by making such relationships analytically explicit and showing that changes in operational conditions can generate requirements across several parts of the logistics system simultaneously.

Second, the study conceptualizes MiL as a context-dependent and adaptive system. Building on systems perspectives in logistics research (Gammelgaard, 2004; Nilsson and Gammelgaard, 2012), the findings demonstrate that the configuration and boundaries of MiL vary with geographical reach, operational intensity and dependence on military, civilian and multinational actors. This extends functional and doctrinal conceptualizations by emphasizing adaptation and changing interdependencies as inherent characteristics of MiL rather than treating logistics requirements as fixed across operational settings.

Third, the study identifies 12 core dimensions that provide a theoretically grounded structure for analysing MiL. The dimensions develop established themes in the literature, including the functional breadth identified by NATO (2018), the strategic interface emphasized by Pawelczyk (2018) and the broader system perspective represented by Brick (2019) and van Fenema and van Kampen (2021). Their theoretical value lies not in providing another exhaustive classification, but in specifying the principal dimensions through which the relationships and contextual variation of MiL can be systematically examined.

Taken together, these contributions extend existing definitions and frameworks from primarily specifying the content of MiL toward explaining its relational and context-dependent character. The resulting framework therefore provides a conceptual basis for further theoretical and empirical investigation of how MiL systems are configured, coordinated and adapted under different operational conditions.

6.2 Practical implications for military leaders and planners

The framework provides military leaders and planners with a structured means of identifying logistics requirements, dependencies and potential capability gaps. By making relationships among logistics functions, equipment, infrastructure, competencies and organizational interfaces more visible, it can support assessments of whether the capabilities required for an intended military activity are available, appropriately positioned and sufficiently coordinated.

In practical planning, the framework can be used to assess which logistics capabilities are required for a particular operational setting and to identify additional resources, competencies, infrastructure, coordination mechanisms or external support that may be needed as operational demands increase. Such assessments can inform decisions concerning the positioning of logistics resources, allocation of responsibilities, preparedness requirements and coordination with civilian and allied actors.

The framework can also support organizational analysis. Rather than prescribing a particular organizational structure or implying that logistics activities should be centralized, it provides a basis for determining where responsibilities and capabilities should reside and where coordination across organizational boundaries is necessary. Its practical value therefore lies in helping planners identify dependencies, vulnerabilities, responsibility gaps and potential logistics shortfalls before they constrain operational readiness or mission execution.

6.3 Research limitations and transferability

Some limitations define the boundaries of the study. First, the framework was developed primarily from the Swedish defence context. Although many of the identified dimensions are grounded in the broader MiL literature and international doctrine, their relative importance and organizational manifestation may differ across countries, military services, alliance structures and operational environments. Comparative studies are therefore required before broader transferability can be established.

Second, the empirical foundation consists of nine expert workshops involving participants with extensive MiL knowledge. This provided access to specialized expertise but also means that the resulting framework reflects expert interpretation rather than systematic observation of logistics activities across multiple military organizations. The framework should consequently be regarded as an empirically informed conceptual abstraction rather than a validated universal model.

Third, the successive abstraction process was designed to reveal relationships and expanding requirements rather than to measure their relative importance or causal effects. The 12 dimensions should therefore not be interpreted as equally important under all conditions, nor does the framework specify thresholds at which particular logistics requirements become operationally critical. These issues remain open for empirical investigation.

6.4 Directions for further research

Future research should examine the framework across different national, service-specific and multinational settings to assess which dimensions remain stable and which are context-dependent. Comparative studies could establish whether the relationships identified in the Swedish setting are transferable to MiL systems characterized by different organizational structures, resource bases, doctrines and degrees of reliance on civilian actors.

A second research priority is to examine the relationships among the 12 dimensions more systematically. The present study identifies their interdependencies but does not determine

their relative importance, causal relationships or critical thresholds. Future research could investigate how changes in one dimension affect others and under what conditions particular combinations become decisive for logistics performance and operational readiness.

Further research is also required on dimensions undergoing rapid transformation. Emerging technologies, including artificial intelligence, predictive analytics, additive manufacturing and autonomous systems, may alter both logistics capabilities and dependencies. Related questions concern cybersecurity and the resilience of increasingly digitized logistics systems. Multinational interoperability also warrants further investigation as military cooperation requires coordination across different doctrines, organizational arrangements, technical standards and national support systems. Finally, increasing reliance on private-sector capabilities raises unresolved questions concerning how military organizations can balance access to civilian capacity and expertise with requirements for availability, security, resilience and operational control.

Addressing these issues would enable the conceptual framework developed here to be tested, refined and potentially extended while preserving its central analytical purpose: to understand how the core dimensions of MiL interact under different organizational and operational conditions.

Disclosure statement

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

Generative AI

The authors used ChatGPT (OpenAI, 2026) exclusively for language refinement and clarity improvements and take full responsibility for the content of the manuscript.

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