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Impact of new fire support capabilities from a joint functions perspective

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Abstract

The article highlights the usefulness of the operational framework described by the joint functions to understand the impact that an available capability has on the operation from an actional point of view. At the same time, this framework can also be exploited for the purpose of identifying a need for capabilities at the level of the current joint force in order to be able to accomplish the assigned missions. In order to argue the above, I have focused on a fire support capability that has recently become part of the national armed forces structures - the M142 HIMARS (High Mobility Artillery Rocket System). In the first part of the article I briefly detailed aspects of the operational framework described by the joint functions, in the second part I presented a reasoned perspective on the impact that the capabilities of HIMARS systems have on the way of conceptualizing operations. The article aims to argue, through a concrete example, the possibility of using the operational framework described by the joint functions to understand the full potential of an existing or prospective capability for national armed forces structures.

Keywords:

joint functions; HIMARS systems; fire support; operational framework; capability.

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The integration of new fire support capabilities under current or forward-looking equipping programs also requires, in my view, an understanding of how the military commander can exploit their full potential in operations. Warfighting functions provide a useful context for conceptualizing the way new capabilities can be exploited in a timely manner, according to the operational needs of the force structures that possess or will possess them at a given point in time. Through this article, I have aimed to highlight a useful way to understand the impact of new fire support capabilities of national armed force structures and how the commander and his staff can conceptualize the exploitation of the new capabilities they offer in planning and conducting the operations of their force structures.

For the completion of this paper, I considered the method of documentary analysis in order to systematically select, review and evaluate public (unclassified) sources of information. In this manner, I aimed to illustrate in a synthesized way a perspective on the potential implications of the integration of new military capabilities at the national level. I considered it sufficiently relevant to address the influence of a limited number of new or prospective military equipment capabilities using the framework in which combat functions manifest since, in my view, the way of constructing the perspective can be extrapolated to other types of equipment, capabilities or services available to national armed forces structures.

Joint functions are a tool, at the disposal of the commander and his staff, used in particular to ensure a holistic approach to all aspects of an operation and to visualize the specific activities of the force structures available in the operational framework created. Joint functions are basically a description of the capabilities available to the force structures. The concrete requirements of the joint force for the conduct of an operation are determined by the commander through the joint functions ([NATO 2022a](#), 105). From this point of view, the joint functions come to argue the current requirements of a joint force but also the need for armed force structures to have modern capabilities, adapted to the current confrontation environment.

The operational framework described by the joint functions

Within both NATO ([NATO 2022a](#), 105) and national perspective ([SMG 2011](#), 70) ([SMG 2014](#), 26) the joint functions are:

- fires and maneuver;
- command and control (C2);
- intelligence;
- force protection;
- information operations (INFO OPS);
- sustainment;
- civil-military cooperation (CIMIC).

It should be noted that, differently from NATO regulations, at the national level there are seven joint functions since manoeuvre is associated with fires in a single function. In the following lines, I will briefly present the main ideas of each of the joined functions in order to address them in the second part of this paper in interpreting the potential impact of new capabilities.

Fires and manoeuvre (manoeuvre and the application of firepower according to Romanian Army doctrine) integrate, from a national perspective as mentioned, two joint functions according to NATO doctrines. The main purpose of *manoeuvre* is to obtain an advantageous position in relation to the enemy that would allow the threat or application of force against him. At the operational level, manoeuvre is the process by which combat power is concentrated where it would have a decisive effect in preventing, disrupting or neutralizing enemy operations (NATO 2019, 1-21). Although usually manifested physically, the manoeuvre can affect the morale of enemy forces by creating uncertainty, confusion and paralysis. Fire, applied by structures of two or more categories of armed forces, has as its main purpose to influence the enemy's combat capability. The effects of fires are mainly physical, but they can also affect the psychological and morale components of combat power, thus having an impact on the enemy's will to fight.

Command and control (C2) as a joint function is the exercise of authority by the commander over available forces to accomplish the mission. Operations are characterized by centralized planning and direction to ensure unity of effort, and decentralized executive authority down to the lowest echelon capable of effectively employing force structures. A representative element is the command-and-control architecture which, in today's operating environment, is dependent on capabilities exploiting the increasingly congested and contested electromagnetic spectrum (NATO 2022b, 49).

The role of *intelligence* is to ensure a continuous and coordinated understanding of the confrontation environment, supporting the commander by identifying the conditions necessary to accomplish objectives, avoiding undesirable effects and assessing the impact of enemy action, own forces or other actors on the concept of operation. The *intelligence* joint function is an essential tool for the conduct of the decision-making process as it integrates the activities of the commander, staff and collection elements to generate the required intelligence products resulting from the information cycle (direction-collection-processing-dissemination).

Force protection is a function focused on eliminating or minimizing the vulnerability of personnel, equipment, facilities, operations and activities to potential threats or hazards, to ensure freedom of action and operational effectiveness in accomplishing the mission. Force protection is a responsibility of commanders at all hierarchical levels but also a fundamental ongoing responsibility of all personnel. Representative aspects of this function include air defence, CBRN

(Chemical, Biological, Radiological and Nuclear) defence, military engineering and operational security.

Information Operations (INFO OPS) as a joint function integrates those actions and activities that produce effects on the understanding and perception, the will to fight and the capabilities of target entities in order to assist in the accomplishment of the set objectives. Key enablers of this function include psychological operations, deception, electronic warfare and physical destruction (SMG 2014, 33).

Sustainment refers to the coherent provision of the necessary support for the conduct of the operation until mission accomplishment. This support mainly concerns the provision of resources (human and material), medical support and military engineering. Rehabilitation, resupply and regeneration of force elements are outcomes of sustainment and play an important role in maintaining the required level of combat capability. The degree of sustainment has an impact on the tempo, duration and intensity of all types of operations.

Civil-military cooperation (CIMIC) is the coordination and cooperation of military commanders with civilian actors in the area of operations to accomplish the force's objectives. Through this function, the commander can create and maintain conditions favourable to the accomplishment of his mission by exploiting moral, material or tactical advantages to the detriment of the enemy. Civil-military interactions are an important tool in achieving strategic and operational level objectives as civilian actors in the area of operations can have an impact on the outcome of the conflict situation or crisis.

Through the operational framework described by the joint functions, the commander combines the actions and activities of the force structures to generate effects aimed at influencing the enemy's ability to understand, the level of capabilities available to him and his will to fight. Similarly, the activities and actions of the available force structures produce effects with the potential to influence the enemy's ability to understand, the level of capabilities and the will to fight from the perspective of friendly forces or other actors in the area of responsibility.

The capabilities available at force structure level define each of the joint functions but, taken in isolation, these capabilities can be leveraged across multiple functions. The commander, in order to accomplish his mission, may choose from a multitude of available capabilities and combine or integrate them in a number of ways to accomplish the combined functions listed above. He will detail in the operation order the concrete way in which the available forces and assets are to be employed, but they are not exclusively associated with a single function. An action of an available force or capability can and will be exploited within more than one joint function.

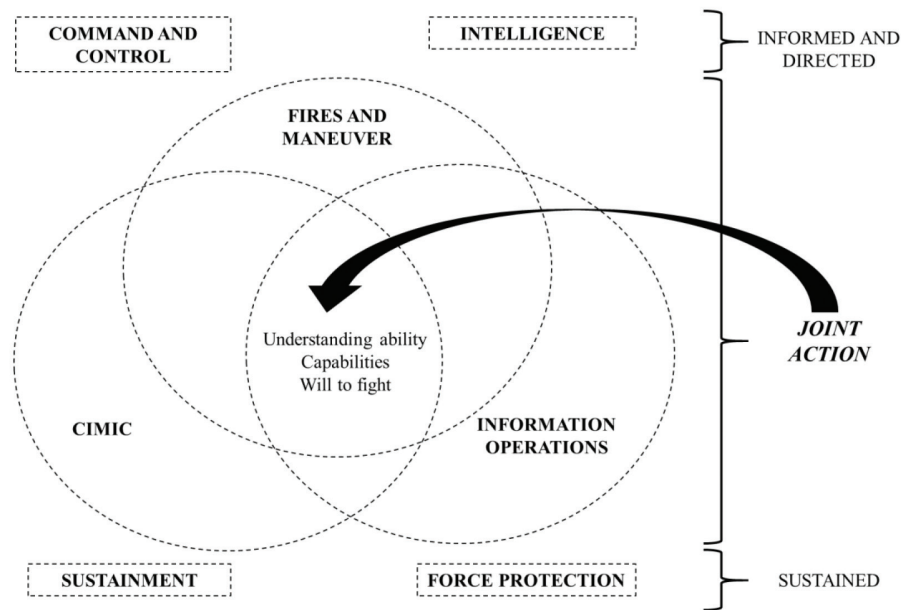


Figure 1 Actional framework described by the joint functions
Source: Adaptation from AJP-01 Allied Joint Publication, 2022, p. 106.

The impact of new fire support systems on performing joint functions

The practical conditions under which the combat power of a force can be effectively applied are related to an understanding of the conflict nature and the context in which it is manifested, the specific operating environment, the target entities with existing threats, and the capabilities available for friendly structures, the enemy or other actors present in the area of responsibility.

More often than not, the increased capabilities of modern fire support systems are visualized to have implications in a geographic framework of the action, through the increased maximum range at which they can strike targets - in the deep, close and rear area of operations. An example of this is the equipping of the Romanian Army's land force structures with M142 HIMARS (High Mobility Artillery Rocket System), which, at first sight, brings to mind the maximum range at which they can engage targets - 70 km (for GMLRS – Guided Multiple Launch Rocket System) and 300 km (for ATACMS – Army Tactical Missile System). An illustrative representation of the impact that the maximum range of fire support systems can have on the operational environment can be found in *Field Manual FM 3-0 Operations* from 2022.

This representation shows the influence of the maximum range of fire support systems (available to both sides) on an area of operations perspective at the operational and tactical level.

Given the full range of possibilities offered by HIMARS (increased range compared to the artillery systems they have replaced, improved accuracy, a greater variety of potential munitions, the advantage of minimizing possible collateral effects, etc.) we

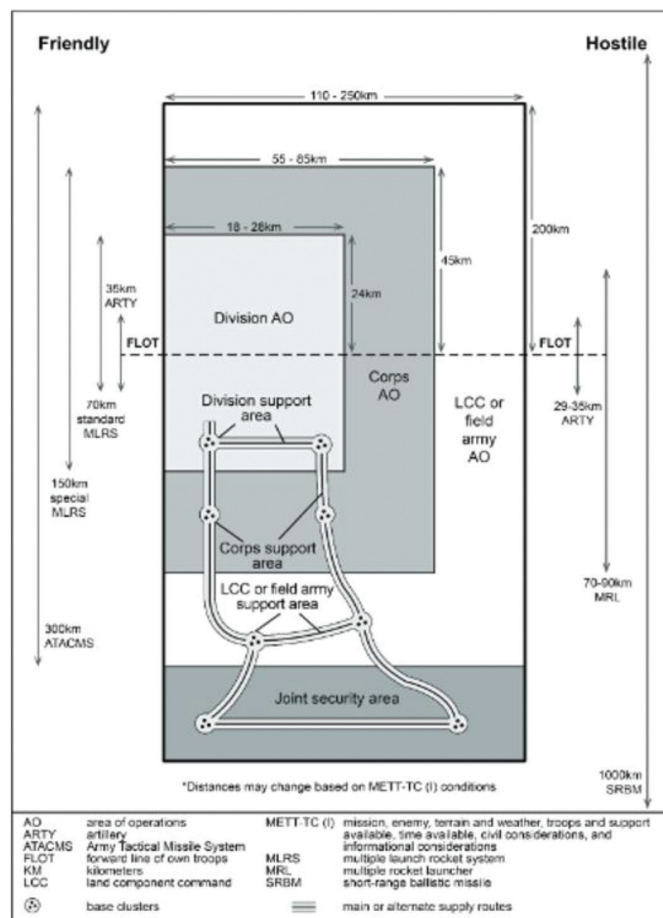


Figure 2 Doctrinal model of representing front and depth dimensions

Source: Field Manual FM 3-0 Operations, 2022, p. 6-8.

can consider multiple ways of exploiting these systems in the operational framework described by the joint functions.

I have presented below a personal perspective on equipping national land forces with HIMARS systems where I have integrated the main aspects in the form of a SWOT analysis.

Although only certain types of ammunition have been procured nationally ([Defence DataBase 2024](#)), this paper has considered HIMARS systems as platforms with the potential to utilize the full range of ammunition available to such systems. Another aspect worth mentioning is that in detailing the perspective of the contribution and integration of HIMARS systems into friendly forces' joint functions, I have also addressed some aspects regarding the potential for disrupting enemy joint functions.

Fires and manoeuvre

The main contribution of HIMARS systems in the joint function *fires and manoeuvre* is the potential to diminish the combat capability of enemy force structures, either directly by destroying various military equipment or indirectly by influencing the psychological and morale status of enemy troops. The accuracy of the munitions fired

TABLE NO. 1

SWOT analysis regarding equipping national land force structures with HIMARS

| | |
|---|---|
| <p style="text-align: center;">STRENGTHS</p> <ul style="list-style-type: none"> - HIMARS are validated systems as effective in recent conflicts (Iraq, Afghanistan, Ukraine) - Equipping with such systems helps deter armed aggression against Romania - They can provide fire support in both joint and multi-domain operations - They have a high degree of mobility, also being air mobile, offering increased flexibility - They ensure a high degree of technical interoperability with allies in terms of command-and-control systems - Capable of <i>shoot and scoot</i> fire missions, ensuring a high degree of survivability in today's confrontation environment - Can accurately engage targets at considerably longer ranges than existent conventional artillery systems - They use the advanced fire support command and control system - IFATDS (International Field Artillery Tactical Data System) which allows automated fire planning, coordination and execution - They have an integrated logistics system with containerized ammunition and the possibility of mechanized loading (Forțele Terestre Române 2024) - They can use a wide variety of ammunition with different payload types - Munitions are designed to minimize the risk of casualties or collateral damage - Launched munitions have high velocity and a low radar signature, which renders them difficult to detect and intercept as they are hard to distinguish from other conventional munitions | <p style="text-align: center;">WEAKNESSES</p> <ul style="list-style-type: none"> - The need for dedicated resources in order to ensure physical protection as well as anti-aircraft/anti-rocket protection of HIMARS systems, as they are high pay-off targets for a potential enemy in all types of operations - The need to associate electronic warfare platforms and high-performance radars with HIMARS systems in order to detect and combat drones, in particular reconnaissance drones, providing them with multispectral protection adapted to a modern conflict - In my view, multispectral protection also involves the implementation of effective modern measures suitable for protecting these systems, such as multispectral camouflage or the use of 'convincing' models or replicas of HIMARS platforms - Enemy jamming along the trajectory or in the target area can have effects on the accuracy of munitions (Marquardt, Bertrand and Cohen 2023) - The operation of HIMARS systems is dependent on the provision of foreign-sourced contingency materiel, in particular munitions. This can be problematic in crisis/conflict situations when demand may be high and resource allocation will be prioritized. |
| <p style="text-align: center;">OPPORTUNITIES</p> <ul style="list-style-type: none"> - The potential of locally supporting HIMARS systems operability through Aerostar S.A. Bacău (Lockheed Martin 2024) - Participation in multinational exercises exploiting Romania's membership in the ASCA community (Artillery System Cooperation Activities) (Orjanu 2023) - Enables access to emerging munitions for such systems (e.g.: Extended Range GMLRS with a maximum range of 150 km and Precision Strike Missiles with a maximum range of 499 km) including munitions with trajectory-correction systems, active immediately after launch, to make them harder to identify with counter-battery radars | <p style="text-align: center;">THREATS</p> <ul style="list-style-type: none"> - The risk of partially harnessing the potential of HIMARS systems due to the limitations of current national ISR (Intelligence, Surveillance and Reconnaissance) capabilities - Reduced operational effectiveness of HIMARS systems over time as a result of lessons identified in the Russian-Ukrainian conflict - The development of new capabilities or implementation of new tactics to counter the effects of HIMARS as a result of lessons identified (Newsweek 2024; Goldstein and Waechter 2023) - Reliance on satellite information for target acquisition but also for GPS guidance of munitions, while anti-satellite warfare capabilities exist worldwide (VPK News 2023) |

by HIMARS systems can be utilized primarily on fixed targets, such as infrastructure elements used by the enemy or concentrations of forces - in certain directions of effort, at objectives or located in various areas. Considering the variety of munitions (including submunitions) (Defence DataBase 2024) that can be launched by HIMARS systems, we can consider a wide range of effects on the enemy in direct support of friendly manoeuvre structures.

From the enemy's perspective, the manoeuvre and joint fire function are disrupted by the ability of HIMARS systems to rapidly execute accurate fire on high-value targets. Thus, by employing submunition strikes (including anti-armour mines) in certain areas or at certain times of the operation, various effects on the enemy's manoeuvre forces can be achieved such as disrupting offensive actions, and blocking or delaying the introduction of reserves into the battle. I mention here the direct contribution of HIMARS systems in Donbas to blocking the offensive of Russian forces in the

Bakhmut-Kramatorsk direction in July 2022 (Nistorescu 2024, 79). Another aspect of the deployment of HIMARS systems that may disrupt this joint enemy function is also, in my view, the polarizing effect of enemy fire support assets specifically intended for HIMARS detection and counteraction throughout the operation.

Another important contribution of HIMARS systems to the disruption of the enemy's joint function *fires and manoeuvre* is their high proficiency in executing counterbattery fires (Global Defense News 2023). The effectiveness of HIMARS systems in such situations is based on their high mobility, the availability of an automated fire control system, and the ability to execute *shoot-and-scoot* fire missions, all in conjunction with high accuracy and lethality on target. Another advantage in this area may also be the development and use of munitions with trajectory correction systems immediately after launch, to make it impossible to accurately detect firing positions with counter-battery radars (Kadam 2022).

Command and control

The joint function *command and control* is enhanced by equipping force structures with HIMARS systems in several ways. One of these is the prospect of effective command and control of fire support through the exploitation of IFATDS. The speed with which the automated planning and execution of fire missions is carried out has implications on the ability to react, in the form of counter-battery fire, against enemy fire support systems aimed at disrupting the exercise of command and control at the joint force level. The reaction capability can also be exploited against targets of opportunity arising in the dynamics of action, especially those classified as TST (Time Sensitive Target), where HIMARS may be the only effective capability available to the commander.

Given the *command-and-control* function from the enemy's perspective, HIMARS systems have proven to be particularly effective in hitting command post targets (BBC 2022), thereby disrupting the functionality of enemy command and control systems at different tactical echelons.

Intelligence

The capabilities of HIMARS systems are integrated and assist the joint function *intelligence* by contributing to the operational picture, capitalizing on the characteristics of the modern IFATDS fire command and control system and exploiting target acquisition data and information.

Disrupting the enemy's *intelligence* function with HIMARS systems can be achieved by physically destroying equipment intended for data transmission or data collection such as, for example, communications centres (Kadam 2022) or counter-battery radars (New Voice of Ukraine 2023). The exploitation of HIMARS systems as part of deception plans can contribute to degrading the enemy's ability to understand the real operational situation by stimulating sensors and deliberately providing certain information such as, for example, shifting the main effort of the force in a certain

direction by deploying and employing launch positions for this purpose. As an example, I would like to highlight the role of HIMARS systems from 2022 in the Russo-Ukrainian conflict, as they contributed to misleading the enemy and drawing attention to the province of Kherson, an action followed by the counter-offensive in Kharkov ([Toroi 2024](#), 34).

Force protection

The impact of equipping with HIMARS systems on the joint function *force protection* can be understood, in my view, in two aspects, one positive and one negative. The positive aspect is primarily the high capability of HIMARS systems to effectively combat enemy strike systems from a distance, particularly those that pose a high risk to friendly force structures - such as tactical assets with WMD capabilities.

The negative aspect would be, in my view, the need to allocate additional or dedicated resources for direct protection and close defence of HIMARS systems, as well as for their air and missile defence throughout the entire operation. This is also a consequence of the fact that, as stated earlier, the HIMARS systems available to a force are high pay-off targets for any potential enemy.

From the enemy's perspective, the *force protection* function is disrupted primarily by the constant need to mitigate the effects of a potential HIMARS attack, which may occur at considerable distances from the front line. Thus, in order to protect important enemy infrastructure elements, concentrations of forces or resources of any type, or to protect other various objectives in rear areas of operations, the enemy will have to take some specific measures and allocate additional resources (electronic warfare or air and missile defence) to mitigate the effects of HIMARS engagement.

Information Operations (INFO OPS)

The availability of HIMARS systems at the joint force level and their successful employment during operations can be exploited in information operations to boost the will to fight and the morale of friendly troops. An elementary example in this area can be the promotion of successful HIMARS actions among friendly forces. At the same time, equipping forces with HIMARS and the direct implications of this, such as pushing concentrations of enemy assets further away from the front line, can have demoralizing effects on enemy force structures in the close area of operations ([Kosoy 2024](#)).

Another aspect, also mentioned in the joint function *intelligence*, is to capitalize on the status of HIMARS systems as a high pay-off target for the enemy in plans to mislead them. The contribution of HIMARS to degrading the enemy's ability to understand the operational situation can be significant.

As a characteristic element of the joint function *information operations* from the enemy's perspective, I mention the enemy's focus on propaganda aspects, promoting the destruction of HIMARS systems ([Tass 2024](#)) or the unconventional manner of their use - against civilian population or objectives ([Avia.Pro 2022](#)). The disruption

of this joint function can be achieved, first of all, by becoming aware of these aspects and then implementing countermeasures or exploiting them in the framework of friendly information operations.

Sustainment

From a *sustainment* point of view, equipping forces with HIMARS systems have a major impact on the geometry of the operating environment. While from a friendly operations perspective, the main contribution to sustainability is, in my view, countering fire support systems that could disrupt the flow of resources. Regarding enemy operations, HIMARS systems have demonstrated a high potential to affect their sustainability. The maximum range at which HIMARS systems can accurately and effectively engage targets has been intensively leveraged (and publicized) in the Russo-Ukrainian conflict as they were used to strike infrastructure elements, force concentration areas, ammunition depots, or Russian soldier training bases (Kosoy 2024). Thus, we could observe that equipping friendly force structures with HIMARS systems may lead to a revision of the enemy's way of deploying resources at considerable distances from the front line in order to remove them from the HIMARS engagement range.

Civil-military cooperation (CIMIC)

The advantage of using munitions that are constructively aimed at reducing the risk of casualties or collateral damage can be exploited in this joint function to strengthen support for the cause from the civilian population existing in the area of operations. Moreover, the population in the territory occupied by the enemy can be an important source of information regarding his use of military equipment or the conduct of activities by his forces, information which can also be exploited in the planning and execution of fire missions with HIMARS systems.

Concerning the disruption of the enemy's *civil-military cooperation* joint function, special attention needs to be paid to the relationship of proportionality between these functions of the conflicting parties. Thus, the progress achieved by the actions of friendly forces in the functional area of civil-military cooperation strengthens this joint function while, obviously, securing enemy disadvantage.

Conclusions

Exploiting the operational framework described by the joint functions can be done beyond their basic role - the tool of the military commander and his staff to ensure a comprehensive approach to the aspects of an operation. Considering that the way joint functions are accomplished in an operation is also a description of the capabilities available to the force, it is possible to argue on their basis some new needs, by solving which mission fulfilment is facilitated in the current confrontation environment.

Joint functions can provide a framework for understanding and realizing the potential of available capabilities to the military commander, but at the same time,

these functions can also provide the requirements of national force structures given the missions they have or may have in a given context. Moreover, by conceptualizing the performance of these functions at the level of a potential adversary or other actor present in the area of operations, we can have a thorough understanding of the potential of the capabilities available to them, which can be exploited both in understanding the confrontation environment as a whole and in determining the centres of gravity for targeted entities.

Through the example used in this paper - the equipping of national land forces structures with HIMARS systems - I have argued a useful way, in my view, to substantiate how to capitalize on existing or prospective capabilities. At the same time, in writing this paper, I have presented and argued a perspective on the impact of equipping national armed forces structures with HIMARS systems by addressing their contribution or influence on the fulfilment of each joint function in particular with examples from the ongoing Russo-Ukrainian conflict.

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