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NEW CHALLENGES FOR THE MILITARY LOGISTIC LEADERS AND ORGANIZATIONS

ÚJ KIHÍVÁSOK ELŐTT A KATONAI LOGISZTIKAI VEZETŐK ÉS SZERVEZETEK

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Abstract

In the near future the military operations are expected to occur in different domains, in parallel with each other generating synergic effects. The multi-domain operations require significant changes in the capabilities, skills and structure of the organizations and personnel dealing with logistics support to operations. The swift decision making process, the allocentric management or establishment of the effective and close cooperation will be indispensable in the execution of the tasks which may be conducted in 5 domains simultaneously. These days, artificial intelligence (AI), cloud-based architectures or robotic and autonomous systems have already been used in the space-, cyber-, air-, land- and maritime warfare (e.g. in the USA, Russia and China), which presents new challenges to the military leaders, especially when determining and setting up the proper organizational structure. The authors introduce in this article - including but not limited to – the characteristics of the multi-domain operations, also examine the current logistic support system and structure of the Hungarian Defense Forces, in order to formulate suggestions for potential changes, improvements (especially, the structure of the logistic organisations and the management methodology of the logistic leaders).

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Absztrakt

A nem túl távoli jövőben a műveletek különböző dimenziókban, egymással párhuzamosan, szinergikus hatásokat kiváltva fognak zajlani. A multi-domain műveletek jelentős változtatásokat követelnek meg a logisztikai támogatást tervező, szervező személyek és szervezetek képességeiben, készségeiben és struktúrájában. Az egyszerre akár 5 dimenzióban folyó feladatok eredményes végrehajtásához elengedhetetlen a logisztikai oldaláról a gyors döntéshozatali eljárás megvalósítása, az allocentrikus vezetés kialakítása vagy a logisztikai szakterületek közötti hatékony és szoros együttműködés megteremtése. Az űr-, kiber-, légi-, szárazföldi-, tengeri hadviseléshez már napjainkban is alkalmaznak (például az Amerikai Egyesült Államok, Oroszország, Kína) mesterséges intelligenciát, felhő alapú architektúrákat vagy robot és autonóm rendszereket, amelyek új kihívások elé állítják a katonai vezetőket főként a megfelelő szervezeti struktúra meghatározásában, kialakításában. A tanulmányban a szerzők bemutatják – a teljesség igénye nélkül – a többdimenziós műveletek főbb jellemzőit és megvizsgálják a Magyar Honvédség jelenlegi logisztikai támogatási rendszerét, struktúráját, hogy javaslatot fogalmazzanak meg a lehetséges változtatásokra, fejlesztésekre (különös tekintettel a logisztikai szervezetek felépítésére, a logisztikai vezetők irányítási módszerére) vonatkozóan.

Kulcsszavak: *többdimenziós műveletek, megváltozott környezet, kihívások, logisztikai támogatás, logisztikai szervezeti struktúra, logisztikai vezetők*

INTRODUCTION

In the 20th – 21st century, the continuous development of the society and the technology had a significant effect on the military operations and the methods of warfare. With the development and apply of the AI, the cloud-based architectures, as well as, the robotic and autonomous systems, the range of military procedures has expanded. All this contributed to that the nations' defense forces can conduct operations for reaching the defined goals while operating in multi-domains synchronised, in parallel with each other. As per the vision of the US Training and Doctrinal Command, in the future theatre several types of

operations will be conducted simultaneously, in which the air-, land-, maritime warfare will be complemented by cyber operations and space warfare.³ The multi-domain operations require high degree of expertise, – from the managers operating the system –, properly built structure of the organisation and coordinated operation of the different disciplines. Although the digitalization is getting more and more emphasis in the maintenance and operation of systems, as well as, in applying technologies replacing the human labour, the human factor continues to play an important role in the planning, organization and execution of operations. The multi domain operations (MDO) generate new challenges for the logistic support too. The integrated support, upkeep and maintenance of the various complex weapon systems, support and service facilities, infrastructures also the info-communication tools can only be achieved by logistic professionals with an effective command and control structure and with specific knowledge. So, it is necessary to know and understand the characteristics of the operations in which we participate, also the tools which are at our disposal, in order to be able to determine the organizational structure and the requirement system for the logistic leaders which supports the execution of the operations in the most effective way. As per the article „Developing Logistics Leaders for the Multi-Domain Environment”, published in the Army Sustainment American journal (by Col. Eric McCoy), the logistic leaders must improve their competence and attitude for the success of the multi-domain operations.⁴ The egocentric management style should be replaced by allocentric management, where the logistics professionals have the right expertise and they can make the necessary decisions at different levels to which the proper logistics organizational structure matches. The logistics support system of the Hungarian Defense Forces (hereinafter (HDF) must also be prepared for the multi-domain operations so that the supply of forces and equipment meet the expected requirements. This is supported by the fact that the Hungarian Armed Forces announced a large-scale national defense and force development program, the implementation of which will expand the Hungarian army with new capabilities. This also has an impact on the military logistics support system, so it is necessary to optimize the command structure, prepare and train the logistic personnel, and it is worth reviewing and expanding the documents regulating logistics support,

³ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. Hadtudomány, 4. szám 2020. pp. 3-27. Online: https://www.mhht.eu/hadtudomany/2020/2020_2szam/003-027_Hegedus_Hennel.pdf

⁴ Eric A. McCoy: Developing Logistics Leaders for the Multi-Domain Environment. Army Sustainment, 2021. pp. 22-27. Online: <https://alu.army.mil/alog/ARCHIVE/PB7002101FULL.pdf>

so that the supply system of the new type of modern army meet the requirements.

In the article, we present the essence of the multi-domain operations, without the need to strive for completeness, also the types of warfare, then examine the management structure of the Hungarian logistics support system and those possibilities by which the logistics supply procedures can be more effective in such operations.

1. Multi-Domain Operations

The nature of the military operations and the types of warfare have changed a lot in recent centuries. Whereas in the past multi-service warfare took place on the battlefield, which was mainly confined to land and sea, the current operations extend to air, outer space and cyberspace. In the operations, the multi-dimensionality is such a medium in which the military force can manoeuvre and exert effect.⁵ The term „domain” thus encompasses all fields of warfare through which the enemy can be influenced. As the AJP-3.20 doctrine reads, the multi-domain operations are a space of defined military activity in which tactical operations help to achieve objectives. It provides space for the military operations and for a wide range of defense activities. Although the domains can be separate, there is no hierarchy between them. As long as the military activity is linked to a domain, its consequences and effects are cross-dimensional.⁶

Thus, there is no need any longer for corps-level organizations in these operations, a battalion battle group can also achieve success, properly led, divided its forces, spatially fragmented, in a joint environment. This is confirmed by the fact that the use of force is expected to take place simultaneously in air, land, sea, outer space and cyberspace, in all domains, from different positions, with sufficient support to gain supremacy over the enemy.⁷ The activities exerted by the forces “have an impact on other domains, thus improving the efficiency of the execution of joint tasks. New types of manoeuvres are also emerging

⁵ Readahead-Shaping NATO for Multi-Domain Operations of the Future. Joint Air & Space Power Conference JAPCC, Kalkar, Germany, 2019. p. 10.

⁶ AJP-3.20 Doctrine. Allied Joint Doctrine for Cyberspace operations.

⁷ David G. Perkins: The Future Army: Win in a complex world. Online: https://www.youtube.com/watch?v=9nWn2w2_q5k

in the multi-domain operations, ensuring that forces to be able to communicate information, to (fire) strike or to move in all domains.⁸ The United States Army developed concepts for this long time ago. One of these was the concept of air-ground operations, the essence of which was air force to support armored units, carrying out counterattacks on the ground, with aircraft and combat helicopters to develop success. The concept was developed by American experts as early as 1980-82 and has been used by the NATO too since 1984. The next step was creating the air – navy concept in 2009, in which closer cooperation between the U.S. Air Force and Navy was developed.⁹ Here, space has already emerged as a new domain, as the concept mentions, the Air Force and the Navy also support each other with space warfare tools in carrying out operations. Space and cyberspace have already risen to military branch level in the United States in 2016 and then in many countries around the world (e.g. Russia, China). With this, the operations can now be performed in 5 domains. Therefore, the different forces may be able to:¹⁰

- a) occupy large areas;
- b) coordinate operations and reconnaissance in order to ensure a more flexible response;
- c) integrate ground forces with other elements (special operations forces, helicopters, combat aircraft, etc.);
- d) integrate space, air, ground and surface weapons systems into a single computer network;
- e) process and transmit large amounts of real-time information in the electromagnetic field.

Of course, this requires each military arm to have basic abilities, such as:¹¹

- a) independent manoeuvrability in its own domain;
- b) firepower, if necessary, beyond its own military branch domain;
- c) advanced self-defense ability;

⁸ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. p. 8.

⁹ Kiss Roland: Air-Sea Battle – A globális közös terekhez való hozzáférés hadműveleti koncepciója. Nemzet és Biztonság, 4. szám 2015. p. 60.

¹⁰ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. p. 15.

¹¹ The U.S Army in Multi-Domain Operations 2028 concept. Trados Pamphlet 525-3-1. 2018. p. 19.

- d) means of low emission and visibility;
- e) advanced communication channels;
- f) network, air defense and reconnaissance capabilities;
- g) vertical airlift capability;
- h) autonomous, semi-autonomous systems;
- i) human resource exploitation with biosensors and human-machine interface application;
- j) flexible leadership skills, AI to support decision making.

These skills can only ensure the attainment of dominance over the opponent and the success of the operations together with an effective command and control (C2) system. The essence of MDO lies precisely in the fact that decision-making ability is based on a large amount of intelligence and high-speed data transfer, where powers are delegated to lower levels, resulting in faster decision-making. This will result in the timing and speed at which the opponent is unable to keep up when performing operations.¹² Thus, the success of interdimensional operations depends on the development of applied technology, organizational structure, effective command and control methods, and decision-making ability of the staff. Regarding the dimensions, it is expedient to briefly describe their characterization, as this is the only way to propose improvements to the command and control system of persons and organizations planning and organizing logistics support.

Examining the different domains, it can be said that space warfare capability is now a key factor when speaking about modern warfare. This is confirmed by the fact that GPS navigation, communication channels and each complex weapon system operate with satellites which provide accurate positioning, constant, available information communication, control of GPS-controlled weapon systems, or the collection of reconnaissance data such as the situation of the other party and its military equipment. It can be stated that, since the Second World War the leading commanders of almost every country have shared the view that a war cannot be won without the domination of the airspace.¹³ By now, this “perception” has extended to the space, as satellite-assisted systems increase the range of tools and procedures

¹² Kimber Nettis: Multi-Domain Operations: Bridging the Gaps for Dominance. Online: <https://www.16af.af.mil/News/Article/2112873/multi-domain-operations-bridging-the-gaps-for-dominance/>

¹³ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. p. 16.

that can be used to support operations which are essential to the success of a war. So, we can say that most wars cannot be won without the domination of the (outer) space. The extent to which the opposing parties will be able to destroy, manipulate each other's satellite systems and replace defective, destroyed assets will be crucial in carrying out the operations. In this context, MDO theory states that successful warfare requires a dominant position in space warfare, thus, like micro-satellites, high-altitude communications aircraft or UAVs (Unmanned Aerial Vehicle) will bear a bigger significance.¹⁴ And Air Force will support the space warfare in a variety of ways. Actually, the warfare linked to the air domain has been closely linked to the land and naval warfare since the beginning of World War II. The air dimension has previously been considered an important factor, which has also become an essential component of the 5-domain operational space with the development of the MDO concept. New types of military equipment (such as F-35 and F-22 fighter jets or convertible aircraft, with command and info communication devices) are already capable of transmitting and processing large amount of data, as well as, traveling long distances. The advanced sensor and electronic system of combat aircraft provides efficient detection capabilities and data transmission. For example, the convertible aircraft combines the features of helicopters and propeller-driven planes with the vertical displacement of engines at the wingtips, thus expanding the range of applications. These developments, and new types of 5th generation devices, have given the air domain an important bridging role between domains.¹⁵

This will also increase the operational capability of ground units, as effective airspace support will also allow combat to be fought more effectively.

According to the MDO operational concept, the domain will continue to play a key role in future warfare. The range and accuracy of weapon systems are constantly increasing, which, combined with reconnaissance capability, can increase the depth of operations. In these operations, special operation forces or mixed forces (elements consisting of special operation teams and traditional mechanized infantry elements) can operate with a high degree of support from the forces in the depths of the enemy. The U.S. began developing the digital soldier system as early as the 1990s.¹⁶ This is an individual tactical equipment

¹⁴ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. p. 16.

¹⁵ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. p. 17.

¹⁶ Army technology: Land Warrior Integrated Soldier System. Online:
https://www.army-technology.com/projects/land_warrior/

that ensures integration of soldiers into the command and control system with modern sensors and communication devices. This makes it possible for a soldier, integrated into the network, to effectively assist commanders in the decision-making process by sharing information quickly and efficiently. The tactical equipment includes the following: ¹⁷

- a) communication systems (verbal and data);
- b) command and control system;
- c) multipack vest and body armor;
- d) night vision device;
- e) weapon system;
- f) navigation and sensor system.

In MDO operations, the digital soldier is complemented by AI, so human-robot collaboration will be of paramount importance in performing the tasks. The equipment, enhanced with AI, will help process large amounts of data from reconnaissance, perform risk analysis of threats from the enemy, and consider possible responses, thus ensuring the soldier makes the right decision. Successful military operations in urban terrain will be key in future land operations, as envisioned by the MDO operational concept: one of the most important factors determining the strategic environment is the densely populated urban environment. As urbanization of the Earth's population has accelerated, in future conflicts, the enemy must be defeated in urban terrain as well. Physical contact will always be needed, and in addition to the special operation forces, land forces will play a role in this.¹⁸

Operations in urban terrain require a high level of cooperation from the military branches, which includes the continuous flow of information, operation of an integrated, efficient command and control system, long-range ground and air fire support, furthermore the possibility of combined take-off and landing by convertible aircraft. In support of land units, naval warfare continues to emerge markedly.

Regarding naval warfare, Navy was already engaged in multi-domain operations during World War II, coordinating combat activities at

¹⁷ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek p. 19.

¹⁸ Appendix D MDO in Dense Urban Terrain (DUT) In: The U.S. Army in Multi-Domain Operations 2028 concept. TRADOC Pamphlet 525-3-1 D-1.

surface, underwater, in the air, and on land. It is a characteristic of operations, carried out by the Navy, that the force is able to carry out ocean, naval, river, coastal and landing operations in cooperation with other forces or on its own. Navy is made up of various types of forces (surface ships, submarines, naval aircraft, coastal artillery, air defense units, Marines, special operation and combat support service units, etc.). Modern naval warfare has 5 domains. The first two are surface of the world's sea (sea surface and land – when marines land), the third is the airspace above it, the fourth is the depth of water and the fifth is the cyberspace.¹⁹

For modern defense forces, which have navy, it becomes important navy to have an increased range, thus ensuring the expeditional employment of the forces. With convertible aircraft, forces can be moved into operational zones in the depth, omitting the classic sea-land medium-change landing operations.²⁰ This type of operation requires advanced sensors, efficient cyber-, space- and electronic warfare, integrated use of UAV systems and joint subunits. This also confirms that in the near future the various operations will be carried out not only in two domains, but also in the space-, air-, land-, and sea domains integrated with cyber warfare.

In 2016, NATO raised cyber warfare to an independent military branch level. Cyberspace itself is a dynamically changing domain, in which data is collected, stored, processed and transmitted via interconnected info communication devices and systems that also use the electromagnetic spectrum, ensuring a continuous and global connection between people and devices. It is now inconceivable to fight a modern battle without using the electromagnetic spectrum, which is closely linked to cyber warfare, network-centricity, communication and command systems.²¹ Its significance is well illustrated by the fact that without effective cyber defense, not only an army can become inoperable, but an entire country can be “paralyzed” and suffer severe damage. Moreover, NATO considers cyber operations so important that it has declared cyberspace itself a separate area of operation. In the electromagnetic field, the superiority of information over the enemy, the reception, transmission, processing of encrypted information, the control

¹⁹ Krajnc Zoltán (szerk.): Hadtudományi lexikon: Új kötet. Budapest, Ludovika Egyetem Kiadó, 2019. p. 369.

²⁰ John Reed: The future of amphibious warfare is airborne. Foreign Policy 2013. Online: <https://foreignpolicy.com/2013/03/26/the-future-of-amphibious-warfare-is-airborne/>

²¹ Hegedűs Ernő-Hennel Sándor: Többdimenziós (multidomain) hadműveletek. p. 22.

of weapons systems, the control of autonomous, semi-autonomous systems and robots, which are closely linked to cyber warfare, are realized. It can be said that military branches can only perform their tasks securely with effective cyber defense. Overall, therefore, it can be stated that MDO will become increasingly important in the future, which the forces will carry out in parallel, in close cooperation in 5 domains.

The seriousness of the topic is shown by the fact that in 2017 U.S. set up its first Multi-Domain Operations Task Force with 2 200 personnel, to which reconnaissance, space warfare, electronic combat and cyber warfare elements were also added to increase the operational capability of the unit.²²

In the near future, similar units and subunits are expected to be set up in the militaries of other countries. The question may arise, how the Hungarian Defense Forces (HDF), and within that the logistics, can prepare to support these operations? In the next section, we will look for the answer to this and make a proposal for developing the logistics management/command and control method.

2. Logistics is ahead of new challenges

First, it is worth examining what kind of MDO operations the HDF can participate in and what capabilities are available to do so. Taking into account the MDO principles, the HDF currently has a land-, air force- and cyber defense force, which is undergoing continuous equipment and knowledge development, thanks to the Zrínyi Defense and Force Development Program. The Hungarian government is committed to the development of the HDF. This is also reflected in Hungary's National Security Strategy: *„The HDF must have well-equipped and well-trained forces, as well as efficiently applicable, deployable and sustainable, interoperable capabilities to the extent necessary, striving to improve quality indicators in addition to quantity.... The force must be developed in such a way so that it will be able to have an impact in all operational spaces relevant to Hungary: on land, in the air and in*

²² Sebastian Robin: The US Army's Experimental „Multi-domain” Units are practicing how to battle Chinese Warships. Online: <https://nationalinterest.org/blog/buzz/us-army%E2%80%99s-experimental-%E2%80%9Cmulti-domain%E2%80%9D-units-are-practicing-how-battle-chinese-warships>

cyberspace.²³ Equipment such as rotary wing-, passenger and multi-purpose light courier and delivery aircraft, Gydran armored combat vehicles, Leopard 2A7+ tanks, digital soldier tactical equipment, as well as, the establishment of the Cyber Training Center is just a few of the large-scale developments aimed at making the HDF modern with a force that meets new challenges. Accordingly, in the future, the HDF may be able to perform MDO operations in 3 domains²⁴ (land, air and cyber warfare), for which logistics professionals must also be prepared to support.

Expectations for the logistics profession are only increased by the fact that the requirements for the application of AI, for example in the operation of military equipment, are also emerging as a new trend. In this regard, the U.S. Department of Defense also identifies an area where AI technology can be utilized. Implementing predictive maintenance and care is based on using AI to predict the failure of critical components, automate diagnostics, and plan maintenance.²⁵ Implementation can be done by AI-based solutions that collect, analyze, and use data through the controller of individual devices to extend the life of the device and detect faults to prevent downtime. It can be seen that there are already challenges in logistics in several areas, which can be addressed by choosing and designing the right command and control structure and shortening the decision cycle.

In the American journal, mentioned in the introduction, the author also draws attention to the fact that logistics managers also need to adapt to future operations and, if necessary, change command and control methods, as well as organizational structures.²⁶

Figure 1 below illustrates the organizational structure and command and control system of the logistic organizations of the HDF.

²³ 1163/2020. (VI. 21.) Korm. határozat Magyarország Nemzeti Biztonsági Stratégiájáról. Online: <https://njt.hu/jogszabaly/2020-1163-30-22.2>

²⁴ Az űr és tengerihadviseléshez az MH jelenleg nem rendelkezik számottevő képességgel.

²⁵ Porkoláb Imre – Négyesi Imre: A mesterséges intelligencia alkalmazási lehetőségeinek kutatása a haderőben. Honvédségi Szemle, 5. szám, 2019. p. 9.

²⁶ Eric A. McCoy: Developing Logistics Leaders for the Multi-Domain Environment. p. 23.

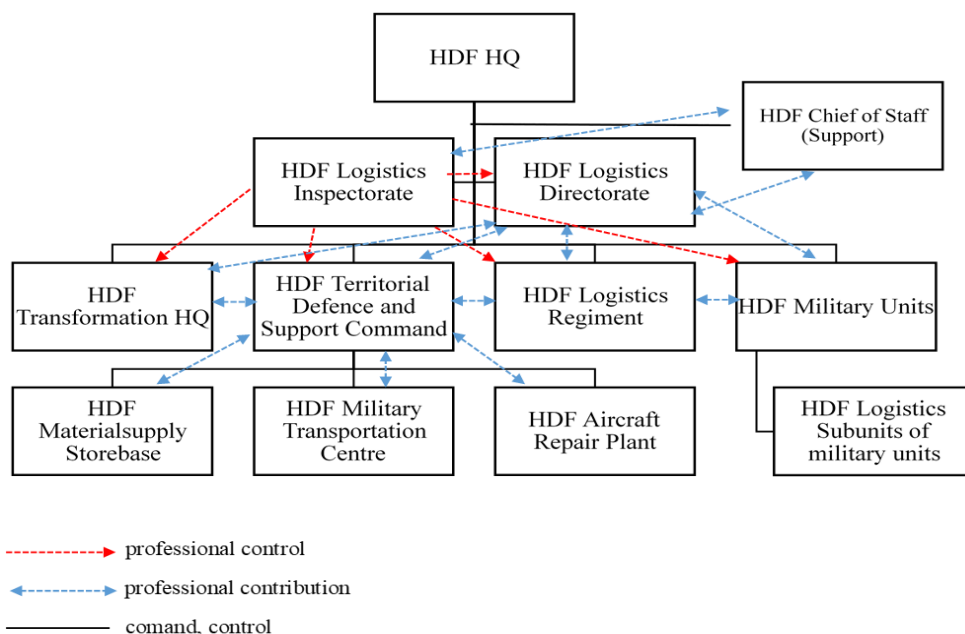


Figure 1. *Simplified C2 outline of the Logistics organizations of the Hungarian Armed Forces*²⁷

The development of the current organizational structure began in 2019 and was completed in 2020, integrating certain departments of the Ministry of Defense, Defense General Staff and Joint Forces Command. This also meant that strategic and operational levels were integrated in the command structure of the logistics support. With “blurring” the different command levels, there is no proper segregation of duties. While it was previously clear which activities, powers and responsibilities belonged to the strategic or operational level, in the new structure this is by no means so simple, which also affects the effectiveness of organizations providing logistic support. Nevertheless, further changes are expected in the future to develop the current structure to a more efficient one.

Among the military organizations the HDF Territorial Defence and Support Command (hereinafter HDF TDSC), HDF Transformation Headquarters (hereinafter: HDF TH) and HDF 64th Boconádi Szabó József Logistics Regiment (hereinafter HDF LR) belong to the direct subordination of the HDF Command. The subordinates of the HDF TDSC are the HDF Materialsupply Storebase (hereinafter HDF MSS),

²⁷ Forrás: Szajkó Gyula saját szerkesztése

HDF Military Transportation Center (hereinafter HDF MTC) and HDF Aircraft Repair Plant (hereinafter: HDF ARP). The logistics subunits of the combat and combat support military organizations (for example, the Logistics Command and Logistics Battalion of the HDF 5th Bocskai István Infantry Brigade) are subordinated to the Commander of the Brigade, whose superior is the HDF Command. The HDF Logistics Inspectorate is an independent organizational unit of the HDF Command, which manages and supervises the development and upkeep of logistics and combat support service forces of the HDF.²⁸ Thus, this inspectorate coordinates the development processes related to logistics and also performs control activities. Through its subordinate military organizations, the HDF TDSC (in terms of logistic support) performs the central logistic tasks of the fields of supply, military technology, transport and military billeting, while through the Military Center of Excellence, of the HDF TDSC contributes to the planning and organization process of logistic support for military organizations by developing training programs, textbooks and regulations. The HDF Command Logistics Directorate (HDFC LD) is an organizational unit performing logistics and management tasks at the strategic and operational level and is unanimously responsible for the preparation, elaboration and issuance of internal regulations governing the field of logistics.²⁹ The Deputy Chief of Staff (support) of HDF Command cooperates with the HDF Logistics Inspectorate and HDFC LD on strategic logistics issues. The subordinate military organizations of the HDF TDSC cooperate with the logistics subunits of the combat and combat support military organizations also with the HDF LR. The main tasks of the HDF LR, as a tactical-level logistics regiment, include the preparation and training, development and maintenance of the application capabilities of subunits designated on the basis of NATO Allied tasks and bi- or multilateral cooperation agreements. It is also responsible for the logistic support of joint-level military operations. Overall, it can be stated that HDFC LD performs strategic and operational level logistics tasks, the HDF TDSC – as an operational level military organization – also participates in operational level logistics processes, while the HDF TH prepares logistic standards and plays an important role in logistics research and development within the HDF. The central supply of military organizations is provided by the HDF MSS, the HDF MTC and the HDF ARP. The lo-

²⁸ Honvédelem.hu: MH parancsnoksága szervezeti felépítése. Online: <https://honvedelem.hu/a-magyar-honvedseg-parancsnoksaga.html>

²⁹ Honvédelem.hu: MH parancsnoksága szervezeti felépítése. Online: <https://honvedelem.hu/a-magyar-honvedseg-parancsnoksaga.html>

gistic elements of the military units are responsible for the logistic support of their own units and for those units which are ordered under their support. In this system, submission of logistics reports and performance of various logistics tasks are carried out in accordance with the chain of command. As an example, we can mention the support of the units' fuel needs. The logistics element of the military organizations prepares the fuel demand, which is submitted to the HDFC LD Supply Chief in the form of a case file. HDFC LD aggregates the fuel requirements and then sends them to the Supply Directorate of the HDF TDSC Logistics Directorate, who also aggregates them. Taking into account the stocks available in the central warehouse, the superior may decide to cover the demand from the central warehouse. In this case, the fuel demand is transferred to the HDF MSS Central Departments, where they arrange for the delivery of fuel. Another option is that a civilian company to deliver the fuel on the basis of a pre-concluded contract, which will also be implemented through HDF TDSC. For logistics tasks at the strategic and operational levels (such as procurement, regularization, training, strategic redeployment, etc.), the chain of command may change with reports or arrangements sent separately to the given military branch inspectorate, Deputy Chief of Staff (Support) or HDF TH.

Accordingly, it can be concluded that the command and control structure of the HDF logistics organizations mainly reflects the centralization, the linear organizational structure, in which the powers decrease vertically downwards. However, in the multi-domain operations, even at the "lowest" tactical level, the appropriate powers must be ensured so that logistic support of the operations can serve the successful execution of missions in the most effective way. When performing multi-domain operations, at the tactical level, logistics managers need to be provided with a high degree of autonomy and an appropriate organizational structure with which they can work effectively and perform the set tasks.³⁰ This requires, first and foremost, a reduction in bureaucracy at the tactical level and an increase in the power of logistics officers and non-commissioned officers. Of course, there are also requirements for logistics leaders too. Modern logistics officer, non-commissioned officer, must have the appropriate skills and personal attributes. The attributes define the leader's qualities, personal inner values, which will make a leader a "leader", while the right skills and competencies will be the characteristics with which a commander will be able

³⁰ Eric A. McCoy: Eric A. McCoy: Developing Logistics Leaders for the Multi-Domain Environment. p. 24.

to make appropriate decisions.³¹ In the U.S. Army Sustainment, Eric A. McCoy also points out that in the future, logistics forces need to fit MDO with the right structure, in which logistics leaders must use an allocentric leadership style instead of egocentric, when performing tasks. To do this, it is necessary to select the right soldiers, after joining the army, from whom to form excellent leaders in the changing environment of the future, where extremely little time will be available to make decisions. Taking these suggestions into account, it is worth the HDF to consider what changes are needed to prepare the logistics for participation in future MDO operations. In our opinion (considering the proposals formulated in the journal Army Sustainment) the following developments and changes could further increase the work efficiency of the HDF logistics organizations:

- a) to reduce bureaucracy and system of reports (at tactical level highly suggested);
- b) to provide more power to the logistics units and sub-units of military organizations at tactical level;
- c) to reduce the administrative staff at strategic and operational levels and increase the logistical staff of tactical level organizations;
- d) a high degree of professionalism should characterize the logistics professionals, for which appropriate training and re-training must be provided with the involvement of the industry and civilian education system as well.

With the reduction of the bureaucracy, the administrative burden on the logistics officers could be reduced. In this regard, HDF has already launched a project to make the recording process of materials and assets easier by digitization. As an example, we can mention the programs to develop digital journey log, electronic Detailed Equipment Book, and clothing webshop.³² In the reporting system, it would be necessary to simplify the procedure and the cooperation obligations. Extending the power would speed up the decision cycle at tactical level. We have already mentioned that in the future battlefields, operations can take place in several domains at the same time, in parallel and in coordination. In this type of operations, logistics leaders will need to

³¹ Eric A. McCoy: Developing Logistics Leaders for the Multi-Domain Environment. p. 24.

³² Ez is csapatmunka: Beszélgetés Schmidt Zoltán vezérőrnaggyal, logisztikai hadmérnemi szemléllővel.
Online: <https://honvedelem.hu/hirek/ez-is-csapatmunka.html>

make quick decisions even at tactical level (e.g. replacing used materials and equipment, providing equipment for the operations). An example is the procurement and provision of materials and equipment. Regarding the current HDF system, it can be said that in accordance with legal regulations, certain military equipment can be provided through centralized procurement. Changing the procurement system is not an easy task. But there are forward-looking suggestions that would be worth incorporating into the HDF system. These include the Dynamic Procurement System, Attila Derzsényi has written of its success. This system provides an opportunity to function as a pre-qualification system. Following pre-qualification, only companies who have already been qualified, e.g. have demonstrated their suitability at one stage of participation or that they are not subject to the exclusion criteria, will be invited to tender.³³ This would speed up the procurement procedures even at tactical level. The procurement process is just one example, but any action, decision, or command, in support of an operation, that can accelerate the availability of materials and equipment at tactical level, can lead to positive results. Logistics must adapt to the changed operational environment. In a three-domain operation, when a unit performs a task in cyberspace, in the air and land domains at the same time, the success of the mission cannot be influenced by the egocentric management of logistics support. Well-prepared logistics officers and non-commissioned officers are needed with appropriate authority and power at tactical level as well. Reducing the administrative staff at the strategic and operational levels and increasing the executive staff at tactical level are also among the objectives of the HDF Commander.³⁴ This may be necessary when thinking about new types of operations, where a battalion, company, platoon, or a squad will be able to carry out MDO operations. To this, it is justified to provide a sufficient number and prepared logistics staff in order to perform logistic support tasks. A high degree of professionalism is a prerequisite for a logistics officer or non-commissioned officer to be able to plan and organize the logistics support of a subunit performing an MDO operation. He/she must be familiar with the areas of expertise (food, fuel, clothing, armored and automotive technology, electronics, armaments, etc.) and have appropriate decision-making power. This may also require training and re-training, where at tactical level, logistics officers master the principles

³³ Derzsényi Attila: Képesség alapú beszerzés a katonai logisztikában. *Katonai logisztika*, 1-2 szám, 2021. Online:

https://drive.google.com/file/d/1IMP50c9QszsRaDue_qbKgG9IWvXselaX/view

³⁴ Ruszin-Szendi Romulusz az ütöképes és meghatározó magyar haderő fejlesztését ígérte. Online: <https://www.portfolio.hu/global/20210601/ruszin-szendi-romulusz-az-utokepes-es-meghatarozo-magyar-hadero-fejlesztetet-igerte-485994>

of each area related to management, stockpiling, stock replacement, etc. As nowadays the technology develops in a very swift pace, militaries can hardly follow this progress. Since the industry has the necessary know-how regarding these developments, the military needs their knowledge. For that reason, involving the industry in the trainings is important. In the future battlefields, the decision-making cycle will be shortened during the implementation of operations. This will also be true for the command and control activities of the personnel, planning and organizing the logistics support.

Overall, we can say that logistics must be adapted to the new types of operations in the future, with an appropriate command and control structure and a high level of training for professionals.

Summary

It can be highlighted, that MDO operations require an extremely high degree of flexibility, adequate expertise, technological background and an allocentric command and control style from the defense forces. Logistics must also adapt to this. Moreover, if we take into account that HDF will be able to perform 3-domain operations (land, air, cyber-domain) in the future due to the developments, it is worth the military logistics professionals to raise the question: how can logistics still contribute more effectively to the successful implementation of operations? In Army Sustainment periodical, Colonel Eric A. McCoy has a definite idea of how logistics can prepare to support MDO operations. These include allocentric management, the appropriate training and selection of logistics professionals. In the HDF, logistics experts should follow new trends, new achievements in civilian logistics, technological developments and, of course, procedures followed by other foreign defense forces. Regarding the command and control structure of the HDF current logistics organizations, it can be said that the tasks, authorities and powers at strategic and operational level are not always clearly separated from each other. However, at tactical level, it would be important to increase the “decision-making freedom” of logistics officers and non-commissioned officers, furthermore, to encourage them to use allocentric management methods. Great emphasis should also be placed on retraining and vocational training in the areas of logistics. In an MDO, with fast operational tempo, it is a clear requirement the logistics officers to be already well-prepared, including at the tactical level, and to know the sectoral areas of logistics support, the regulations, the tasks

related to management, sustainment and supply. In the future, it will not be enough for an officer to know only one sub-area in terms of sectoral areas of logistical support. Even at tactical level, it is necessary to expand logistic knowledge, taking into account military domain (air, ground, cyber defense) specifics (such as differences in supply methods) and sectoral areas (supply, military technology, transport, infrastructure, etc.) so that the logistics managers can meet the emerging challenges.

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