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CALL FOR PAPERS

The editorial board of *Hungarian Defence Review* invites authors to submit papers in 2019, based on new research results that deal with some aspect of the following topics:

1. Hybrid warfare – changes in the doctrine of leadership: decision-making and Mission Command in the 21st century
2. Automated systems: changes in the operational requirements of autonomous systems in light of recent technological developments
3. Warfare in non-conventional theatres: challenges and opportunities of the information battlespace, the role and significance of information warfare in contemporary conflicts
4. Built-in areas: the characteristics of urban combat and its digital military challenges in built-in areas
5. Cognitive development: Super-soldiers? Challenges and opportunities in the mental development of the digital soldier – human-machine teaming on the battlefield
6. Leadership aspects of technological changes and their impact on decision-making
7. The introduction of Mission Command into the Hungarian Defence Forces on the organizational level.

We request our authors to submit a max. 2000-character preliminary abstract of the planned paper, addressed to the responsible editor (gaspar.katalin@hmzrinyi.hu). The editorial board of the journal will evaluate the received abstracts and notify the submitter of the decision. At the same time, acceptance of a submitted abstract does not automatically entail the publication of the paper, as the decision on its publication will be based on the final text after a professional review.

The Editorial Board of Hungarian Defence Review

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FOREWORD

The 21st century operational environment provides significant challenges for future military leaders in their endeavour to maintain national and global security. Nations are faced with increased challenges related to an erosion of the traditional rule-based order previously subscribed to by nations, as well as a decline in their competitive technological advantage. Multiple nations in the Alliance are further presented with challenges across a wide spectrum of missions, including COVID-19 and future pandemics, climate change, mass migration, counterterrorism, cyber-attacks, information warfare, irregular warfare, and conventional warfare.

The Hungarian Defence Forces is in the middle of the most significant modernization effort of the past 50 years, and anticipates that global security challenges will continue to increase, and recognizes the need to prepare our military leaders to deal with these challenges. Our leadership emphasizes the impact of advanced technology as it changes the character of warfare and shapes the future battlespace. Indeed, our National Security Strategy highlights the importance of developing a long-term defence strategy, a solid defence industry, and an adaptive force to address future operational challenges, including exploiting advances in technologies such as Artificial Intelligence (AI) and autonomous, unmanned systems. This is especially important given that the integration of such technological advances will contribute to the complexity as well as the level of risk and uncertainty in the operational environment.

We realize that our leaders must be prepared to utilize advanced technologies in order to gain the competitive advantage over their adversaries, and at the same time have a cognitive advantage as well, to be able to handle wicked problems on the battlefield. So, technologies, such as Artificial Intelligence (AI), machine learning (ML), autonomous systems, and advanced quantum computing systems will reconfigure the future battlespace. But we also recognize that it is our human capital, which will be required to understand both the risks and benefits associated with the deployment of these advanced technologies.

As leaders develop a higher level of technological competency, and understand how they can utilize this technology more effectively on the battlefield, this will create a competitive advantage that strengthens our contribution to NATO, and enables us to defend our sovereignty against the exponentially increasing number of challenges.

This is why the Hungarian Defence Review will continue to focus on the importance of educating our future leaders and the wider public regarding the potential impact of emerging advanced technologies as well as the ethical, legal, and moral consequences of implementing advanced technologies in mission plans and mission execution. The integration of new and novel ways of solving operational challenges is as much an education as a technological endeavour, and our hope is that these articles will facilitate a leader's decision making and leadership effectiveness.

*Col. Imre Porkoláb, PhD
Head of the Editorial Board*

Viktor Huszár

DISTRIBUTED INTELLIGENCE: CYBER WARFARE APPLICATION POSSIBILITIES OF COMPUTER VISION AND ARTIFICIAL INTELLIGENCE¹

DOI: 10.35926/HDR.2021.1-2.1

ABSTRACT: *Artificial Intelligence (AI) and blockchain technology have significant transformative potential to create next level solutions in improving traditional systems within military and law enforcement. Despite initial scepticism in scaling blockchain technology beyond the boundaries of digital currencies and overcoming dependence on traditional legacy systems, it is evident that the technology, together with AI has the potential to become greater than the internet itself.² Countries like China and the United States have expressed interest in applying and combining the technologies for improvements and advancements in military and law enforcement areas, such as “cyber defence, secure messaging, resilient communications, logistics support and the networking of the defence Internet of Things (IoT)”³. As investors and innovators seek to cash in on the merging of two powerful technologies, we have reached the crossroads necessitating a comprehensive research effort to determine best-use cases and utilization practices for military and law enforcement purposes.*

KEYWORDS: *Artificial Intelligence, decentralized, blockchain, security, military, law enforcement, cyber security, machine learning*

INTRODUCTION

The past few decades have illustrated what is already known – information technology is not only evolving but disrupting numerous industries with the potential to offer scalability and advancements at an unprecedented rate. Next generational technologies, such as blockchain and Distributed Ledger Technology (DLT), augmented with machine learning and Artificial Intelligence, offer military and law enforcement the opportunity to transform and further safeguard their respective industries.

As early as the 1990s, the United States employed digital technologies, like *network-centric operations* that merged “tactics, techniques and procedures that a networked force

¹ A tanulmány a TKP2020-NKA-09 számú projekt részeként a Nemzeti Kutatási Fejlesztési és Innovációs Alapból biztosított támogatással, a Tématerületi Kiválósági Program 2020 pályázati program finanszírozásában valósult meg. / The study was implemented as part of the project TKP2020-NKA-09 with the support of the National Research Development and Innovation Fund, in the financing of the Thematic Excellence Program 2020 application program.

² Hashim, H. “Military Applications of Blockchain Technology.” *Fintech News*, 1 July 2020. <https://www.fintechnews.org/military-applications-of-blockchain-technology/>

³ Sanchez, S. L. “Blockchain Technology In Defence”. *European Defence Matters*, 14. 2017. 17. <https://www.eda.europa.eu/webzine/issue14/cover-story/blockchain-technology-in-defence>

can employ to create a decisive warfighting advantage”.⁴ In 1995, Bower and Christensen shone a spotlight on “disruptive” technologies that could keep competitors ahead of the competition. Their research illustrated that the majority of well-established companies strive to remain ahead of their respective industries when it comes to “developing and commercializing new technologies” that ranged from step-by-step improvements to unique progressive approaches that turned industries on its head – with the main aim being that such advancements “address the next-generation performance needs of their customers”.⁵

Around the same time, a ubiquitous information network appeared based on blockchain technology – a technology that had the potential to secure immutable records without a central authority at the helm.⁶ Fast forward decades later and blockchain’s DLT is set to impact multiple industries, influence economic systems, legal frameworks and information technologies at large.⁷ It must be noted that while commercial industries have rushed to get ahead with respect to blockchain technology, and faced a certain amount of scrutiny regarding the lack of regulations, far less attention has been fixed on the opportunities and vulnerabilities blockchain technology would bring to military intelligence and law enforcement.

The following subsections broadly define blockchain technology to project possible relationships between the technology with respect to implementation and utilization within the military intelligence and law enforcement sectors.

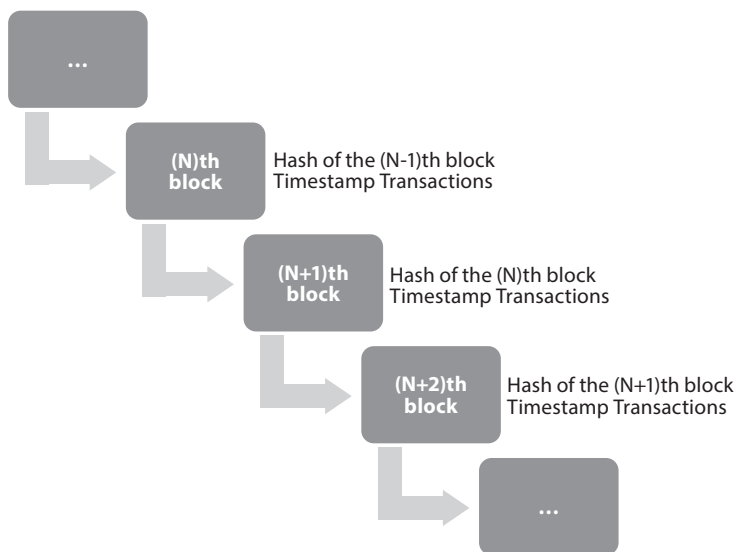


Figure 1 *Structure of Blockchain (Based on Pinna and Ruttenberg, 2016)*

⁴ Garstka, J. J. “Network-Centric Warfare Offers Warfighting Advantage.” *SIGNAL Magazine*, May 2003. <https://www.afcea.org/content/network-centric-warfare-offers-warfighting-advantage>, Accessed on 20 April 2020.

⁵ Bower, J. L. and Christensen, C. M. “Disruptive Technologies: Catching the Wave.” *Harvard Business Review* 73/1. 1995. 43–53. <https://hbr.org/1995/01/disruptive-technologies-catching-the-wave>

⁶ Haber, S. and Stornetta, W. S. “How to time-stamp a digital document.” *Journal of Cryptology* 3/2. 1991. 99–111. DOI: 10.1007/bf00196791

⁷ Andersen, C. “The Great Chain of Being Sure About Things.” *The Economist*, 31 Oct 2015. <https://www.economist.com/briefing/2015/10/31/the-great-chain-of-being-sure-about-things>, Accessed on 22 May 2020.

BLOCKCHAIN TECHNOLOGY DEFINED

Blockchain is a distributed data storage approach, where “blockchain” describes the list of data clusters (blocks) that are organized into a limitless chain creating a distributed database. Each block contains a link to the preceding block on each node (participant) that the blockchain stores. A basic feature of blockchain systems is the storage of blockchain nodes in sorted entries with unified agreement on the current state using a *consensus* approach. Though this approach to distributed storage has been popularized through Bitcoin’s distributed “cryptocurrency” framework, many alternative systems currently exist or are under development which follow the same principle but differ fundamentally in their purpose and key technology. As it stands, these systems are collectively and improperly referred to as “blockchain technology”.

It is blockchain’s capacity to decentralize transactions while increasing security that has tech entrepreneurs investing in what is most likely the next technological revolution that will greatly impact and transform society, economies, and the internet.⁸ The importance of blockchain’s distributed fault tolerance and seamless transaction has already been recognized by the military sector and research is under way to determine whether existing systems can be successfully migrated to blockchain, in whole or in part.

In the context of blockchain technologies, the ledger is an entry repository where entries can be stored without possibility of modification once they become part of the database – the ledger may also demonstrate narrow “ledger” semantics depending on the blockchain technologies applied but this is an irregularity. Blockchain technologies implement and expand a distributed ledger through continuous synchronization with nodes in the distributed network. The network can be geographically distant or owned by various companies, so each node has a copy of the ledger. Any additions to the ledger require an agreement by other nodes, followed by the verified block’s appearance within minutes or seconds on other nodes, depending on the solutions used. Any trusted central monitoring body can access the information stored in the entries, without involving said body’s internal processes and rules.⁹

The ledger is maintained by distributed network nodes based on a number of consensus algorithms employing cryptography to store and verify transactions. This allows the network to remain functional even with a large number of defective nodes, provided that the number of defective nodes is below the maximum allowed. IT applies the distributed consensus algorithm or, more generally, the distributed consensus protocol a great deal. In each application context, the selection of the consensus protocol is influenced by factors such as hypothesized failure modes, maximum system size, consensus response time, and synchronization requirements. Accordingly, it is not surprising that different blockchain technologies utilize several different consensus protocols. What is uniform in blockchain technologies is that the problem of distributed consensus is addressed by some protocol.

Blockchain has a common structure and can be viewed as a transaction log (journal) whose data clusters are stored in blocks in a strictly chronological order. As shown in *Figure 1*, these blocks are time-stamped and identified by selected cryptographic hash. Each block contains a reference to the block preceding it, and in this way, the blocks are

⁸ Tapscott, D. and Tapscott A. *Blockchain Revolution: How the Technology behind Bitcoin is Changing Money, Business, and the World*. London: Penguin, 2016.

⁹ Pinna, A. and Ruttenberg, W. *Distributed ledger technologies in securities post-trading: revolution or evolution?* Frankfurt: European Central Bank, 2016. DOI: 10.2866/270533

organized into a backward-chained list which, at its worst, can be processed from the first block to clearly determine the current state of the distributed database. Of course, this implies consensus between nodes on the blockchain. If inconsistent copies of a chain begin to spread within the network, the discrepancy is typically resolved through one of the following consensus protocols applied via mining nodes: proof-of-work (POW), proof-of-stake (POS), or round-robin (mining diversity).

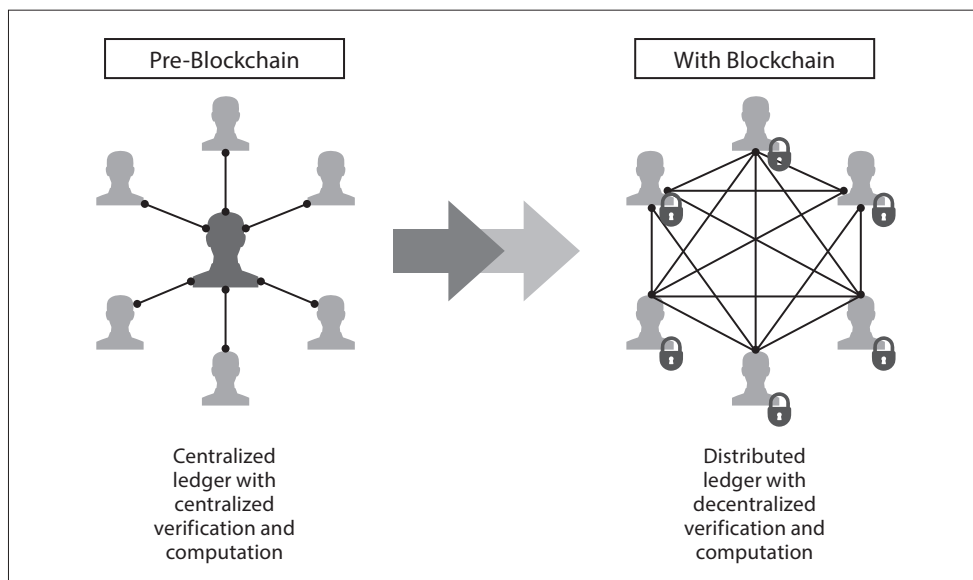


Figure 2 *Centralized v Decentralized Data Distribution*¹⁰

The decentralized nature of blockchain technology (*Figure 2*) removes the need for a central authority or checkpoint, which ultimately creates a fairer, more secure system. The way data is recorded on the blockchain reflects the value of decentralization.¹¹ Instead of relying on a central authority to secure transactions with other users, blockchain uses innovative consensus protocols on the node network to authenticate transactions and record data in an unbiased manner. Thus, the blockchain is not stored by a central data controller but numerous computers.

The unbiased manner of recording and distributing secure, immutable data makes blockchain an asset capable of limitless potential with regards to cyber security and other military applications. To understand the range of blockchain technologies for tactical sustainment challenges, László Kovács suggests the military examine the potential of blockchain solutions to challenges associated with in-transit visibility, data integrity, reporting, operational contracting, and logistic estimation.¹²

¹⁰ Perera, W. "Understanding Blockchain: How it works". *The Capital*, 13 May 2020. <https://medium.com/the-capital/understanding-blockchain-how-it-works-5772e29421b8>, Accessed on 28 May 2020.

¹¹ Dwyer, G. P. "The Economics of Bitcoin and Other Private Digital Currencies." *Journal of Financial Stability* 17. 2015. 81–91. DOI: 10.1016/j.jfs.2014.11.006

¹² Kovács, L. "National Cybersecurity Strategy Framework." *AARMS* 18/2. 2019. 65–76. DOI: 10.32565/aarms.2019.2.9

Qualities of the:				Problem			Transaction					Participant				Solution				External Factors		
Author	Sector	Type (C: Criteria, F: Flow Chart)	Year	Solvable without Blockchain	Intermediaries	Centralization	Rate	Size/Data Volume	Digital Nature	Privacy Expectations	Strict Immutability Required/Possible	Interdependency	Quantity	Shared Control	Integrity Motivations	Trust Level	System/Software Control	Stand-Alone System	Current Capability	Permission Type	Likelihood of Attack	Regulation Compliance
Greenspan (19)	Blockchain Development	C	15	×	×	×						×	×	×		×				×		
Birch, Brown, Parulava (20)	Finance	F	16										×	×	×					×		
Meunier (21)	Blockchain Development	C	16		×		×	×		×	×		×	×		×	×	×				
Lewis (22)	Blockchain Development	C	17		×	×						×		×								
Peck (23)	Electrical Engineering	F	17	×			×			×			×			×	×			×	×	
Wüst-Gervais (15)	Computer Science	F, C	17		×	×	×						×			×	×			×		
Mulligan (3)	Finance	F	18		×		×	×	×	×	×			×	×	×	×		×	×		×

Figure 3 Trends in specific consideration points regarding blockchain applicability, highlighted columns indicate those of particular interest in military intelligence applications¹³

Authors McAbee, Tummala and McEachen undertook the survey of several examples of “military intelligence-specific guidance” frameworks considering adoption of blockchain technology. The authors identified a key quality they deemed mandatory, that being the collaborative process in which several authors shared control. Peck’s model illustrated flexibility in “in potential employment, which suggests that even in the presence of other disagreeable factors blockchain technology may be worth considering in cases where the database is likely to be attacked.” Military intelligence would benefit keenly during periods of worst-case scenarios “when cyber, electromagnetic and physical attacks attempt to disrupt system operations [...] when they will be needed most”.

IDENTIFICATION OF VULNERABILITIES WITHIN MILITARY INTELLIGENCE SYSTEMS

Sam Mire, Market Research Analyst at Disruptor Daily, stated that there is belief the US military’s supply chains, cyber security and internal communications could benefit from implementing aspects of blockchain technology.

¹³ McAbee, A., Tummala, M. and McEachen, J. “Military Intelligence Applications for Blockchain Technology.” In *Proceedings of the 52nd Hawaii International Conference on System Sciences*. Honolulu: University of Hawai‘i at Mānoa, 2019. DOI: 10.24251/HICSS.2019.726

“With the world seemingly on edge and America’s military manpower seemingly on the decline, exploring how blockchain can be used for defence purposes is a worthwhile pursuit”.¹⁴

With the United States military’s inability to create a “perfect” communication system thus far, and ambitious communication programs like the Joint Tactical Radio System (JTRS) failing to live up to its potential in more ways than one,¹⁵ further exploration into blockchain technology’s potential military applications include the improved visibility and traceability of expenditure, shipments and contracts – through blockchain’s usage of transparent Distributed Ledger Technology the military can eliminate fraud, waste and reduction of losses. The United States Pentagon is worth an estimated \$2.7 trillion dollars and failed its first official audit in 2018. Ernst & Young, among other private firms hired to perform the audit, could not complete the job due to the fact that the “DoD’s financial records were riddled with so many bookkeeping deficiencies, irregularities, and errors that a reliable audit was simply impossible”.¹⁶

Another application possibility of the technology is securing battlefield messaging – as late as 2017, United States Senator Ron Wyden expressed his concerns over the Defence Information Systems Agency’s (DISA) lack of implementing encryption technology in daily communications, further noting that tech giants such as Google and Facebook employ standard STARTTLS encryption technology.¹⁷ Using Bitcoin as an example of peer-to-peer messaging model that delivers every message to every active node in the world in seconds, all nodes in the Bitcoin network contribute to this service, including smartphones. If a node’s terrestrial, wireless, or satellite internet service is interrupted, a bitcoin message can be sent through alternative channels, such as high-frequency radio, fax, or even barcode-based note, or manually. Upon receipt, the service node checks the message and forwards it to each associated participant. Nodes can independently aggregate messages into new blocks.¹⁸ Finally, the consensus protocol ensures that invalid messages and blocks generated by rogue operators are ignored. Together, these protocols ensure that authenticated traffic can be reliably relayed anywhere in the world, even if communication paths, individual nodes, or the blockchain itself are attacked. Cyber superiority is not individually maintained by the nodes, but the network system can be kept controlled with current and expected data.¹⁹

The technology can mean an increased protection and preparedness against Cyber Warfare – the Defence Advanced Research Projects Agency (DARPA) is currently looking into blockchain’s distributed consensus protocols to “evolve Cybersecurity for an Agile and

¹⁴ Mire, S. “Blockchain for Military Defense.” *Disruptor Daily*, 9 November 2018. <https://www.disruptordaily.com/blockchain-use-cases-military-defence/>, Accessed on 22 May 2020.

¹⁵ Axe, D. “Failure to Communicate: Inside the Army’s Doomed Quest for the ‘Perfect’ Radio.” The Center for Public Integrity. 10 January 2012. <https://publicintegrity.org/national-security/failure-to-communicate-inside-the-armys-doomed-quest-for-the-perfect-radio/>, Accessed on 22 May 2020.

¹⁶ Lindorff, D. “Exclusive: The Pentagon’s Massive Accounting Fraud Exposed”. *The Nation*, 27 November 2018. <https://www.thenation.com/article/archive/pentagon-audit-budget-fraud/>, Accessed on 22 May 2020.

¹⁷ Wyden, R. *Ron Wyden to Alan R. Lynn, 22 March 2017*. Letter. <https://www.documentcloud.org/documents/3527403-Ron-Wyden-DISA-STARTTLS-Letter-March-22.html>, Accessed on 17 April 2020.

¹⁸ Swan, M. *Blockchain: Blueprint for a New Economy*. Sebastopol, CA: O’Reilly Media, 2015.

¹⁹ Haig, Zs. “Connections between Cyber Warfare and Information Operations” *AARMS* 8/2. 2009. 329–337. <http://m.ludita.uni-nke.hu/repozitorium/bitstream/handle/11410/1900/13haig.pdf>, Accessed on 20 April 2020.

Resilient Defence Posture”.²⁰ United States President Donald Trump signed a bill in December 2017 that includes a mandate for a blockchain-based cyber security assessment “of efforts by foreign powers, extremist organizations, and criminal networks to utilize such technologies; ... [and] an assessment of the use or planned use of such technologies by the Federal Government and critical infrastructure networks”.²¹

It is also expected, that DLTs will result in improvements to the military’s manufacturing processes – the Naval Additive Manufacturing Department was a perfect use case for blockchain technology to illustrate its “ability to secure and securely share data throughout the manufacturing process (from design, prototyping, testing, production, and ultimately disposal)”.²² Each key phase in Additive Manufacturing revolves around use of data, or a “Digital Thread: a single, seamless strand of data that stretches from the initial design concept to the finished part, constituting the information that enables the design, modeling, production, use, and monitoring of an individual manufactured part”.²³

Blockchain technology’s ability to highlight and detect hacking and network penetration attempts has led to an international arms race between China, the United States and Russia all vying to solve vulnerabilities within supply chains and data integrity. Protecting and promoting data integrity of military supply chains can be therefore another application of DLTs. Ex-DISA Director Army Lt. Gen. Alan R. Lynn stated, “A few years ago, getting a 1-gigabyte or 2-gigabyte attack at the internet access point was a big deal. Now, we get 600-gig attacks on the internet access points and unique, different ways of attacking that we had not thought of before. There’s now, we would call it the ‘terabyte of death’ – there is a terabyte of death that is looming outside the door”.²⁴ Many weapon systems are designed with a life span of 2-3 decades or even more. However, the computing technologies used by these systems have a short shelf life, rarely lasting more than a decade. As a result, replacing obsolete parts becomes more difficult over time. Furthermore, in several countries, it is prohibited by law to use a component whose origin cannot be ascertained. The loss of ownership renders parts unusable, even if they are functional and in high demand. This would give the resellers an economic incentive to track their identified off-the-shelf commercial components in a block to retain their origin, which in turn adds value.

Decentralized technologies are not dealt with separately in the Hungarian Defence Forces, but international research and development is already underway. NATO’s C4ISR and the US Department of Defence (DARPA – DoD) have already launched their own block-

²⁰ “DoD Digital Modernization Strategy: DoD Information Resource Management Strategic Plan FY19-23.” United States, Department of Defence. 12 July 2019. <https://media.defence.gov/2019/Jul/12/2002156622/-1/-1/1/DOD-DIGITAL-MODERNIZATION-STRATEGY-2019.PDF>, Accessed on 17 April 2020.

²¹ National Defense Authorization Act for Fiscal Year 2018, H.R. 2810, 115th Cong. (2017–2018).

²² McCarter, J. “DON Innovator Embraces a New Disruptive Technology: Blockchain”. Secretary of the Navy. 22 June 2017. <https://www.secnav.navy.mil/innovation/Pages/2017/06/BlockChain.aspx>, Accessed on 22 May 2020.

²³ Nassar, A. R. and Reutzel, E. W. “A proposed digital thread for additive manufacturing”. In *Proceedings for the 2013 International Solid Freeform Fabrication Symposium*. Austin: University of Texas, 2013. 19–43. <http://utw10945.utweb.utexas.edu/Manuscripts/2013/2013-02-Nassar.pdf>

²⁴ Ferdinando, L. “‘Terabyte of Death’ Cyberattack against DoD Looms, DISA Director Warns”. 11 January 2018. <https://www.defence.gov/Explore/News/Article/Article/1414146/terabyte-of-death-cyberattack-against-dod-looms-disa-director-warns/>, Accessed on 20 April 2020.

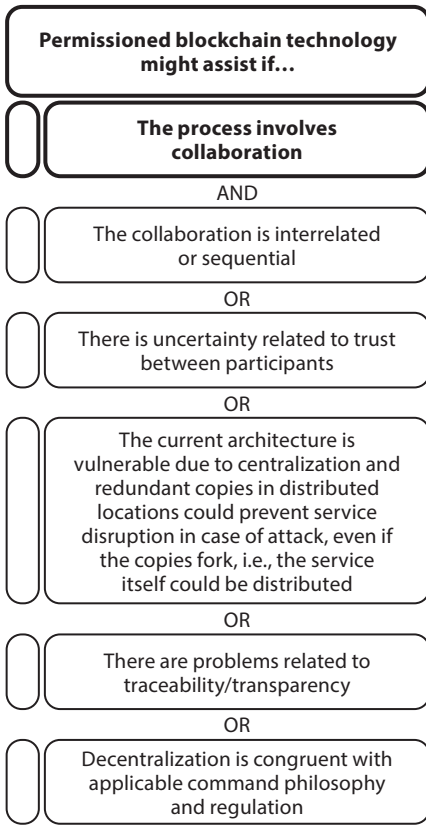


Figure 4 Critical factors in determining when blockchain technology might apply to military intelligence processes²⁹

Eachen, *Figure 3* can act like a checklist if the military is interested in adopting blockchain. The authors propose the following: “If a system meets the first, mandatory tenet identified in bold and at least one of the others, it may be a reasonable candidate for a permissioned blockchain technology model”. The authors also state that such a model will evolve during the course of the study.

chain programs, developing a secure, decentralized messaging application for the military under the name SBIR 2016.2.²⁵

All armed forces thrive to protect the weapon systems. The US Navy’s Aegis Weapon System (AWS) is a “centralized automated, command-and-control (C2) and weapons control system” that is vulnerable to cyber hacks and other threats. The challenge in controlling such a powerful weapon arises when you consider exactly what the system is meant to handle simultaneously. A typical destroyer like the “Arleigh Burke Class includes an upgraded SPY-1 multi-function, phased-array radar, Mk 41 Vertical Launching System, an advanced anti-submarine warfare system, advanced anti-air warfare missiles, and Tomahawk land-attack cruise missiles”.²⁶ Much like the British proved superior weapons integration outguns greater firepower in Jutland, 1916 during World War I, blockchain technology can seamlessly integrate and operate multiple weapons’ systems through its decentralized and distributed architecture.²⁷ DARPA awarded Galois and Guardtime Federal a \$1.8 million contract in 2016 to “verify the correctness of Guardtime Federal’s Keyless Signature Infrastructure (KSI), a formal verification tools and all blockchain-based integrity monitoring systems”.²⁸

According to McAbee, Tummala and Mc-

²⁵ Malik, A. A. et al. “Application of Cyber Security in Emerging C4ISR Systems.” In *Crisis Management: Concepts, Methodologies, Tools, and Applications*. Hershey: Information Science Reference, 2014. 1705–1738. DOI: 10.4018/978-1-4666-4707-7.ch086

²⁶ “Arleigh Burke-Class (Aegis) Destroyer”. Naval Technology. <https://www.naval-technology.com/projects/burke/>, Accessed on 20 April 2020.

²⁷ Babones, S. “Smart ‘Blockchain Battleships’ Are Right Around the Corner.” *The National Interest*, 17 May 2018. <https://nationalinterest.org/feature/smart-battleships-are-right-around-the-corner-25872>, Accessed on 22 May 2020.

²⁸ “Galois and Guardtime Federal Awarded \$1.8 Million DARPA Contract to Formally Verify Blockchain-Based Integrity Monitoring System.” Galois. 13 September 2016. <https://galois.com/news/galois-guardtime-formal-verification/>, Accessed on 20 April 2020.

²⁹ McAbee, Tummala and McEachen. “Military Intelligence Applications for Blockchain Technology.”

Kovács brings to light a number of challenges in his paper, *National Cyber Security as the Cornerstone of National Security*, including that of “the rapid modernization of infrastructure” and whether this exacerbates the “vulnerability of critical infrastructures” as well as the joint roles played by both private and public sectors.³⁰ To solve these challenges, Kovács quotes from the national cyber security strategy of the United Kingdom, “Government has a clear leadership role, but we will also foster a wider commercial ecosystem, recognising where industry can innovate faster than us. This includes a drive to get the best young minds into cyber security”.³¹

MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE (AI)

Project Maven, also known as the Algorithmic Warfare Cross-Function Team, was launched in April 2017 and was overseen by Air Force Lt. Gen. Jack Shanahan. The main goal of Project Maven is to “integrate artificial intelligence and machine learning” into DoD operations and, in particular, to “turn the enormous volume of data available to the DoD into actionable intelligence and insights at speed”.³² Maven was designed to “interpret video imagery, which could in turn be used to improve the targeting capability of drone strikes”, and employs deep learning, neural networks to constantly improve. Technologies developed through Maven have already been successfully deployed. Though the Project has received critical acclaim, “enormous organizational, ethical, and strategic challenges” remain where Maven soon became shrouded in controversy when over 3,000 Google employees signed a petition in protest against the company’s involvement with a U.S. Department of Defence Artificial Intelligence study.³³ The project has since been taken over by Palantir.

One of the main challenges faced by governments across the world amounts to traditional legacy management and operational frameworks integrating new technologies. An example of this is military tanks developed in the first quarter of the 20th century, and ultimately leading to the development of “stealth and precision-guided weapons technology” in the 1970s. Such technologies created the “foundation for a monopoly, nearly four decades long, on technologies that essentially guaranteed victory in any non-nuclear war”.³⁴ The amount of footage drones provide is so vast that human analysts can no longer cope with the sheer volume. Therefore, artificial intelligence is being harnessed, and thanks to machine learning, AI will constantly improve at recognizing and classifying objects.

Today, at least 90 countries have drones, including many non-state groups. While most of them will not be classified as sophisticated within the field of robotics, many are remotely controlled with operators hundreds, if not thousands of miles away. Autonomy is becoming increasingly apparent in the management of different vehicles, especially those used by the military. For example, the Guardium, developed by G-NIUS, is an Israeli

³⁰ Kovács, L. “National Cyber Security as the Cornerstone of National Security.” *Land Forces Academy Review* 23/2. 2018. 113–120. DOI: 10.2478/raft-2018-0013

³¹ Kovács. “National Cyber Security as the Cornerstone of National Security.”

³² Bretl, T., Righetti, L. and Madhavan, R. “Epstein, Project Maven, and Some Reasons to Think About Where We Get Our Funding.” *IEEE Robotics & Automation* 26/4. 2019. 8–13. DOI: 10.1109/MRA.2019.2943271

³³ Crofts, P. and Rijswijk, H. v. “Negotiating ‘Evil’: Google, Project Maven and the Corporate Form.” *Law, Technology and Humans* 2/1. 75–90. DOI: 10.5204/lthj.v2i1.1313

³⁴ Allen, G. C. “Project Maven Brings AI to the Fight Against ISIS.” *Bulletin of the Atomic Scientists*, 21 December 2017. <https://thebulletin.org/2017/12/project-maven-brings-ai-to-the-fight-against-isis/>, Accessed on 22 May 2020.

unmanned ground vehicle (UGV) that “carries more than 660-pounds of cameras, electronic sensors and weapons” and is used for combat and defence along the Gaza border. Though the vehicle is self-propelled, soldiers continue to be responsible for the weapons on board.³⁵

US Security Expert, Paul Sharre believes that Artificial Intelligence applications do not require major modifications to military tasks and can be integrated into weapon systems just as easily as civilian solutions.³⁶ According to General Shanahan, the United States intends to stand apart from Russia and China. Both countries are currently testing their uses of Artificial Intelligence technology for military purposes, but raise “serious concerns about human rights, ethics, and international norms”.³⁷

ARTIFICIAL INTELLIGENCE IN LAW ENFORCEMENT

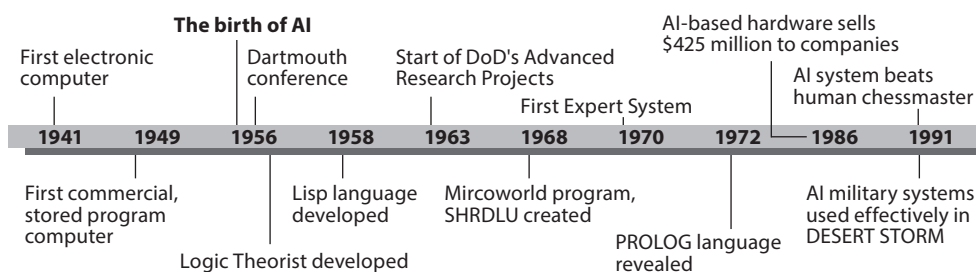


Figure 5 Timeline of major Artificial Intelligence events (Oracle, 1997)

Artificial Intelligence was first coined by John McCarthy, also known as the father of AI, at a Dartmouth conference in 1956.³⁸ Fast forward to July 2018, where Daniel Faggella, the head of Research and CEO of Emerj, addressed the Interpol–United Nations (UNICRI) Global Meeting on the Opportunities and Risks of Artificial Intelligence and Robotics for Law Enforcement. This was the beginning of discussions regarding Artificial Intelligence in policing, security and law enforcement. The following diagram is featured in the UNICRI’s report on integrating Artificial Intelligence into the law enforcement sector.

Kevin McCaney notes in *Law Enforcement Using Analytical Tools to Predict Crime*, that law enforcement agencies are starting to rely on predictive analysis software in anticipating and preventing crime. Until recently, such tech was mostly used by competitive enterprises. An example would be the IBM Blue CRUSH (Criminal Reduction Utilizing Statistical History) software in use by the Memphis, Tennessee Police Department to “analyze crime

³⁵ Reed, J. “Israel’s Killer Robot Cars”. *Foreign Policy*, 20 November 2012. <https://foreignpolicy.com/2012/11/20/israels-killer-robot-cars/>, Accessed on 28 May 2020.

³⁶ Lindsay, J. M. (host). “Killer Robots and Autonomous Weapons With Paul Scharre”. Podcast. 1 June 2018. <https://www.cfr.org/podcasts/killer-robots-and-autonomous-weapons-paul-scharre>, Accessed on 28 May 2020.

³⁷ Pawlyk, O. “If It’s Not Ethical, They Won’t Field It: Pentagon Release New A.I. Guidelines”. *Military.com*. 24 February 2020. <https://www.military.com/daily-news/2020/02/24/if-its-not-ethical-they-wont-field-it-pentagon-release-new-ai-guidelines.html>, Accessed on 23 April 2020.

³⁸ Popescu, V. A., Popescu, G. and Popescu, C. R. “The amazing world of the Internet-Challenges of the Internet Age”. *Manager Journal* 12/1. 2010. 13–23. http://manager.faa.ro/download/536_1202.pdf

and arrest data, and combine it with weather forecasts, economic factors, and information on events such as paydays and concerts to create predictive models”.³⁹

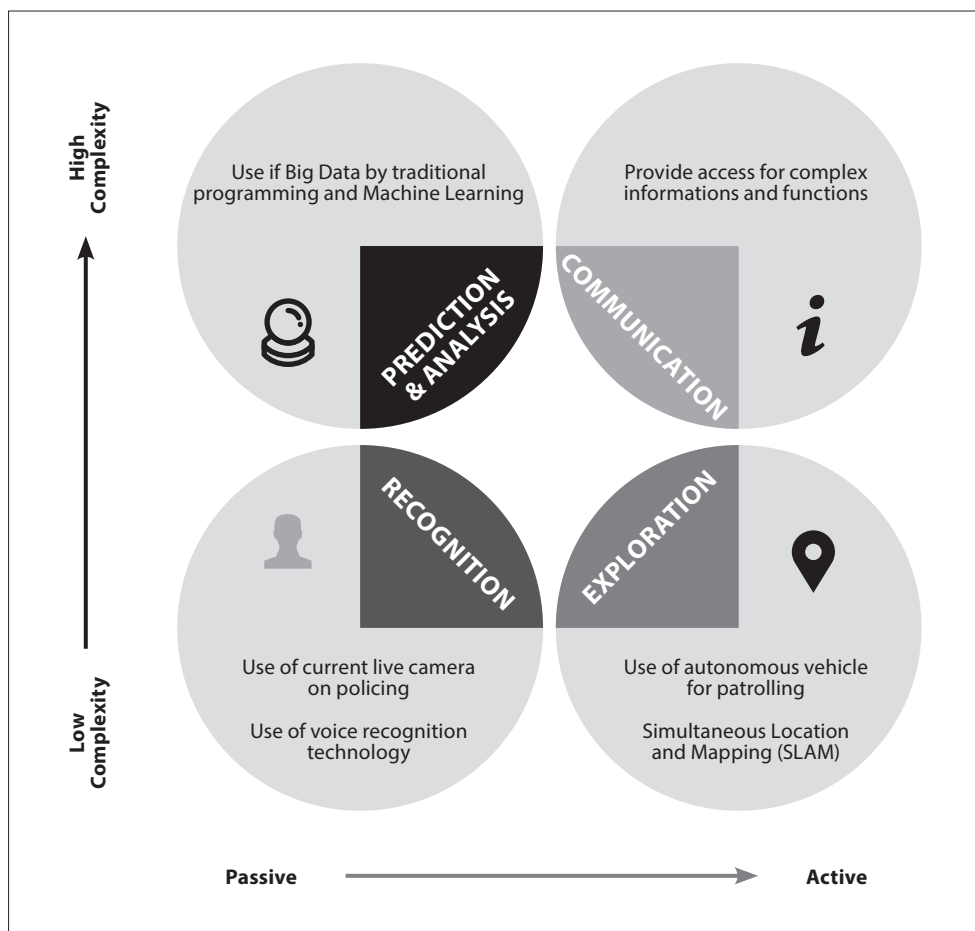


Figure 6 *Artificial Intelligence and Robotics for Law Enforcement (United Nations [UNICRI] Global Meeting on the Opportunities and Risks of Artificial Intelligence and Robotics for Law Enforcement)*

Police, courts, and correctional facilities work in tandem to form the legal criminal justice system. In order to perform at optimal levels, these agencies must have access to experts who are able to analyse crime data and simulate scenarios to enhance precision utilized by Artificial Intelligence programs. One such example is the National Intelligence Model (NIM) in the UK, designed to improve and assist intelligence-led police. NIM consists of nine individual elements:⁴⁰

³⁹ McCaney, K. “Law Enforcement Using Analytical Tools to Predict Crime”. GCN. 22 December 2010. <https://gcn.com/articles/2010/12/22/police-predictive-analysis-software.aspx?m=1>, Accessed on 22 May 2020.

⁴⁰ Alshibly, H., Alzou’bi, S. and Al-Ma’aitah, Mohammed. 2014 “Artificial Intelligence in Law Enforcement, A Review.” *International Journal of Advanced Information Technology* 4/4. 2014. 1–9. <https://doi.org/10.5121/IJAIT.2014.4401>

- Crime Pattern (number/relations);
- Criminal surveys;
- Demographic/ Social Trend Analysis;
- Profiling of criminal operations;
- Network analysis (actors who make up such networks);
- Risk analysis;
- Target profile analysis;
- Operational Intelligence assessment;
- Results analysis evaluating effectiveness of various law enforcement activities.

UNICRI's report concluded that AI and robotics could be weaponized as much as it could be utilized for public good in policing for crime prevention, stating "A recent report by 26 authors from 14 institutions (spanning academia, civil society, and industry) investigated the issue in depth and suggested that many of the same features that might make AI and robotics appealing for law enforcement (such as scale, speed, performance, distance) might make AI and robotics equally appealing for criminals and terrorist groups".⁴¹

The report identified three main areas of attack:

- Digital attacks like automated spear phishing, automated discovery and exploitation of cyber-vulnerabilities.
- Political attacks, such as the spread of fake news or media to generate confusion, conflict or face-swapping (deep fake) and spoofing tools to manipulate video and create trust issues in political figures or even result in the validity of evidence being questioned in court.
- Physical attacks, such as facial recognition capabilities in armed drones or drones smuggling contraband. In the context of digital attacks, the report further noted that AI could be used either to directly carry out a harmful act or to subvert another AI system by poisoning data sets.⁴²

CYBER WARFARE APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN HUNGARY

There had been enough development which had occurred in DLTs and blockchain technology use cases beyond cryptocurrency. It is evident, that these technologies can be combined with other emerging ones, and an examination is required to understand, how the new technologies might be applied in the profession of arms. International research found that the armed forces of the most powerful countries, such as the US, China and Russia have all publicly discussed the military applications of blockchain.⁴³

In Hungary, being the gate for the European Union and Schengen zone, there are numerous challenges in monitoring the border. These challenges could be tackled by using distributed network based computer vision detection tools, such as UAVs (drones) for the lengthy border and fence monitoring. The captured images of the UAVs could be automatically

⁴¹ Madhavan, R. "Artificial Intelligence in Policing: Use-Cases, Ethical Concerns, and Trends." EMERJ. 19 December 2016. <https://emerj.com/ai-sector-overviews/artificial-intelligence-in-policing/>, Accessed on 22 May 2020.

⁴² Simerly, M. T., Keenaghan, D. J. "Blockchain for military logistics". *Army Sustainment*, 4 November 2019. https://www.army.mil/article/227943/blockchain_for_military_logistics, Accessed on 22 May 2020.

⁴³ Bilyana, L. and Sale L. „Weaponising Blockchain: Military Applications of Blockchain Technology in the US, China and Russia". *The RUSI Journal* 166/3. 2021. 46–56, DOI: 10.1080/03071847.2021.1886871

classified and analysed using AI algorithms, which would improve the decision makers to send human resource (military) for further investigation of the designated border zone. Illegal migration and border trespassing could be also monitored in an automated way.

Another smart application of the technology would be to monitor the human activity patterns at the borders. Computer vision based Human Activity Recognition (HAR) is therefore a research area for the future, as it could provide relevant information to the authorities about abnormal activities and events.

A crucial feature of such recognition systems in these VUCA (volatile, uncertain, complex and ambiguous) environments⁴⁴ is the object detection. For law enforcements, manual video review can take enormous manpower and time, while the human error is at a higher possible rate at these manual reviews. Using a distributed network for secure data storage, and artificial intelligence algorithms to detect different types of objects (with customization options, such as type of object, colour of the object, etc.) the armed forces, police and other units could save significant time because of the improved accuracy of object detection.

CONCLUSION

Blockchain military applications are not combat ready yet, but AI applications are getting much more widespread. Biometrical identifications (face recognition) are used at various industries, so computer vision, machine learning and AI will all go through a revolution. While there are novel suggestions for military applicability of these technologies, so far defence logistics seems to benefit the most from DLTs and blockchain.

According to a research report published by Accenture, “six in seven (86%) aerospace and defence companies plan to integrate blockchain within three years” while “93% of aerospace and defence executives believe that the next generation of intelligent solutions are moving into physical environments”.⁴⁵ When a nation decides to develop and/or upgrade its cyber security strategies at a federal level, challenges and dilemmas arise as to the concerns examined by specific approaches and policies and how these cyber-challenges will be addressed. Kovács emphasizes the importance of considering the “recommendations made by the international organizations, which can serve as a basis for building a country’s national cyber security strategy and its key regulatory issues”.⁴⁶

Due to cyber space evolving at such an exponential rate, NATO and the European Union have compiled individual policies regarding cyber security. NATO’s conclusions regarding cyber security policies and regulations discuss the interpretation of cyberspace as a domain of warfare, which has many consequences for member states (for example, delegating broader cyber defence tasks to the army, building cyberattack capabilities, setting up cyber commands).

Another aspect of NATO’s Cyber Pledge is to approximate the differing levels of cyber defence capabilities per member state. As these levels have significant gaps, NATO’s Cyber Operation Centre can play an important role, not only in military but also in the

⁴⁴ Jobbágy, Z. “Innovation Methodologies for Defence Challenges: On Design Thinking and Organic Approaches”. *Hungarian Defence Review* 148/2. 2020. 50–64. <https://doi.org/10.35926/HDR.2020.2.3>

⁴⁵ “Launchpad to Relevance: Aerospace and Defence Technology Vision 2018”. Accenture. 1 June 2018. https://www.accenture.com/_acnmedia/PDF-79/Aerospace-Defence-Tech-Vision-2018.PDF, Accessed on 22 May 2020.

⁴⁶ Kovács. “National Cyber Security as the Cornerstone of National Security.”

civil defence sector.⁴⁷ The Alliance promotes the strengthening of international cooperation between both member states and non-NATO countries in terms of innovative technologies.

Blockchain technology additionally reverses the computer security paradigm. Firstly, it is reliable since both internal and external users must compromise on the network. Second, it is transparently secure and does not rely on malfunctioning nodes, but rather on a cryptographic data structure that renders manipulation extremely complex and immediately apparent. Finally, blockchain networks are fault tolerant, coordinate trusted nodes meaning untrusted entities are rejected. As a result, blockchain networks not only reduce the likelihood of failure, but also significantly increase the cost of attempted breaches by foreign parties.

It is recommended that organic expertise is developed in blockchain technologies within the Central Defence Management Authorities, as well as looking for strong partnerships with the industry to formulate synergies for the development of blockchain-based technologies and the mutual benefits they bring. The Hungarian Defence Forces could adapt artificial intelligence detections at the border protection, at institutional security, and at public safety applications (using existing infrastructure of CCTVs). Further research could go into the application of UAVs and portable optical infrastructures (self-driving cars, such as the ones used for Google Street view). The ever-evolving cyber world requires more stringent regulations and accountabilities. As much as developed nations are trying to grapple with the influx of cyber-related challenges, underdeveloped nations need to prepare as well as each country has a prerogative to protect its people. Blockchain technology and Artificial Intelligence provide the key in developing smarter and more secure cyber defence systems overall.

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⁴⁷ "Cyber Defence". NATO. 17 March 2020. https://www.nato.int/cps/en/natohq/topics_78170.htm, Accessed on 22 May 2020.

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KEEPING OTHERS OUT – THE MODERN SYSTEM OF ANTI-ACCESS/AREA DENIAL WEAPONS

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ABSTRACT: Anti-access/area-denial systems and operational concepts or strategies are the products of the technological evolution of weapons. However, some of them already existed before, and the advent of modern, long range and sophisticated missiles became real game changers. With these weapons put in a well-planned system, a credible deterrence and defence potential can be provided, or the restriction of the use of domains like air, sea, or land of other countries. This article presents these weapons and the most developed of such systems.

KEYWORDS: anti-access/area-denial, A2/AD, missiles, operational concept

Since the first warships and military aircraft appeared on the horizon, coastal and air defence have become priority tasks of militaries; of course, the level of it varied throughout the history. Take the case of Archimedes: many of his inventions served the coastal defence of Syracuse. Although we can say that until the invention of gunpowder, defending a coast was not an easy task, and after it for hundreds of years, it was very restricted as the most effective reconnaissance were the human eye and a good telescope, while countermeasures included forts and some short range smoothbore cannons. The situation turned by the late 19th and early 20th centuries, when many of the basic means were on hand, e.g. long range and accurate cannons, naval mines, torpedoes, and submarines. During WWII these were supplemented by radar as a modern reconnaissance device, and guided weapons, including the very first smart bombs and cruise missiles. Air defence has much shorter but fast-paced history, as it started as shots fired from rifles toward the sky during WWI, then evolved into integrated air defence with radar guided guns, early surface-to-air missiles (SAMs) and fighter interceptors in WWII, and into the highly effective radar guided SAMs of the 1950s and 1960s.

WEAPONS OF CHOICE

For nowadays, the above-mentioned inventions have become highly sophisticated weapon systems, with a range and accuracy that can change the balance of power of a whole region. In addition, electronic and cyber warfare capabilities support these weapons, which provide soft and non-kinetic, otherwise highly disrupting means, while such kinetic weapons like anti-satellite missiles (ASAT) can devastate modern C4ISR¹ systems.

¹ Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance

If we take air defence missiles, we can differentiate on their role, since short range and medium range missiles generally serve as air defence for the troops, while long range missiles, many of which are capable to intercept short to medium range ballistic missiles, can provide theatre defence. Russia has always been a world leader of such systems as they have faced NATO air superiority. Systems like the Russian S-300 are among the most appreciated SAM systems, some types of its missiles have an estimated range between 150–200 km against aircraft, while the newer S-400 can reach 400 km. Similar Chinese system is the HQ-9, its maximum estimated range can be 200 km.² This means a considerable defence capability. On the other hand such systems can enclose areas from others, which, depending on their ranges, can mean a restrictive use of such missiles against the airspace of other countries. These ranges are also sufficient to attack high value support assets, which are usually orbiting outside the operational zone of combat aircraft, in so far stand-off range. These aircraft are the base of Western type air operations, however, their number is very limited. The above missile systems can complicate the successful operations of conventional combat aircraft (N.B. not even stealth planes are totally invisible for radars).

The other group of such weapons is the naval systems, like mines, anti-ship missiles (ASM) and submarines. Mines are the cheapest and most easily deployable, and also the most dangerous assets. The US 2010 Naval Operations Concept considered them as the most widely used anti-access weapon system in the future.³ True, mines are a very heterogeneous group, they can be deployed by ships (almost any type), submarines, or from the air. There are defensive and offensive mine laying techniques, the former means the defence of own shores against the enemy navy, while the goal of the latter is the denial of the use of the enemy's shores. For example, the combined use of submarines and offensive aerial mine laying made it very hard for the Japanese to reach their main islands from the occupied territories, and by mid-1945 the marine traffic was effectively stalled even among the main islands. In 1972 US aircraft started intensive mine laying on the approaches to the North Vietnamese ports and inland waterways, which resulted in a devastating effect on the logistics of Communist forces.⁴ Iran used mines extensively during the tanker war, damaging many ships, including the supertanker *Bridgeton* and the frigate *USS Samuel B. Roberts*, while in the Gulf War Iraqi mines damaged the amphibious ship *USS Tripoli* and the cruiser *USS Princeton*.⁵

Anti-ship missiles are also very efficient weapons, they can be launched from fixed and mobile platforms from the shores, surface ships, submarines and aircraft. Of course, these systems need adequate reconnaissance and targeting capabilities, for example over-the-horizon radars.⁶ They were used successfully in the near past: in 2006 Hezbollah used an anti-ship missile against the Israeli corvette *Hanit*; in 2015 ISIS terrorists launched one against an Egyptian warship; in 2016 Houthi rebels in Yemen heavily damaged an UAE ship and later used missiles against US warships, but in the latter case unsuccessfully.

² Foss, Ch. F. and O'Halloran, J. C. (eds.) *IHS Jane's Land Warfare Platforms: Artillery & Air Defence 2012–2013*. Coulsdon: IHS Jane's, IHS Global Ltd., 2012. 427–428, 509–520.

³ *Naval Operations Concept 2010: implementing the maritime strategy*. Washington D. C.: Department of Navy, 2010. 56.

⁴ Miller, D. and Miller, Ch. *Modern Naval Warfare*. New York: Crescent Books, 1986. 200.

⁵ Russel, R. L. "Future Gulf War: Arab and American Forces against Iranian Capabilities". *Joint Force Quarterly* 55/4. 2009. 39.

⁶ Clark, B. *Commanding the Seas: A Plan to Reinvigorate U.S. Navy surface warfare*. Washington: Center for Strategic and Budgetary Assessments, 2014. 5, 15.

The high end of anti-ship missiles is the anti-ship ballistic missile (ASBM). These weapons are very cost effective, because while an average ASM is around USD 1–3 million and an ASBM is USD 6–10 million, a modern guided missile destroyer of USD 1–2 billion can be sunk by one or two such missiles.⁷ So, a credible and effective asymmetric naval defence capability can be developed easily and at low cost, in contrast to a huge, capable, and very expensive open seas navy.

Submarines can be divided into two great groups: nuclear powered and diesel-electric. Nuclear powered subs are the weapons of great powers, like the US, Russia, UK, France, China and India, while diesel-electric subs became widespread as they are more affordable. They are usually used for coastal defence, while they have the capability for open seas operations as the German Navy's Type-212 submarine proved it during a 2013 exercise, when it crossed the Atlantic underwater in 18 days and practiced attacks on a US carrier group, successfully.⁸ Submarines can be used to attrite enemy surface combatants or interdict the sea lines of communications (SLOCs), minelaying or either as a strike platform with land attack missiles against key installations inland.

A2/AD

These weapons and the doctrines and strategies written on them are called anti-access/area-denial (A2/AD). According to Air-Sea Battle doctrine, anti-access means: *“Action intended to slow deployment of friendly forces into a theatre or cause forces to operate from distances farther from the locus of conflict than they would otherwise prefer. A2 affects movement to a theatre.”* While, area-denial is: *“Action intended to impede friendly operations within areas where an adversary cannot or will not prevent access. AD affects manoeuvre within a theatre.”*⁹ These capabilities invoked a basic fear in the US military as the widespread use of such weapons deteriorates power projection capabilities, hence the possibility of an armed intervention. Also, world trade and freedom of navigation can suffer serious damage if strategic waterways and chokepoints are threatened by states or non-state actors. According to Naval Operations Concept 2010, there are four great threats that the US Navy has to face in the future: 1. the increasingly capable blue water adversaries; 2. theatre anti-access weapons; 3. area denial weapons in the littorals; 4. technologies that disrupt space and cyberspace capabilities.¹⁰ China and Russia own all of these capabilities, however regional competitors like North Korea or Iran can also develop at least 2-3 of them, and as we can see from the above examples and current trends, even terrorist groups or insurgents can own some littoral warfare capabilities.

The situation is similar in the air. While high-end weapon systems like S-400 and HQ-9 are capable of providing theatre denial capabilities, even smaller systems can provide effective denial against not so advanced air forces. For example, advanced MANPADS or short and medium range SAMs forced the Ukrainian Air Force to seriously restrict the air support of their troops in Eastern Ukraine.

⁷ Clark. 18.

⁸ “U 32 gegen US-Flugzeugträgerverband”. *Europäische Sicherheit & Technik* 61/3. 2013. 84.

⁹ Air-Sea Battle: Service Collaboration to Address Anti-Access & Area Denial Challenges. Air-Sea Battle Office, 2013. <https://digital-commons.usnwc.edu/csf/1/. 2>.

¹⁰ Naval Operations Concept 2010. 53.

US Secretary of Defence Hagel said: “...*We are entering an era where American dominance on the seas, in the skies, and in space – not to mention cyberspace – can no longer be taken for granted.*”¹¹ The problem was broken down into four major fields: 1. prepositioned US bases are vulnerable to attacks; 2. major surface vessels are easy to detect, track and engage from long range; 3. non-stealthy aircraft are vulnerable to modern integrated air defence; 4. space is no longer a sanctuary.¹² This led the Pentagon to create the Air-Sea Battle concept to assure the freedom of action in restricted areas and the ability to counter hostile A2/AD forces. This paper presents three countries, which developed highly effective A2/AD capabilities and are also the main subjects of US concern, namely Russia, Iran and China.

Russia

Russia is one of the countries with the longest history in this kind of warfare. After 1945, then Soviet Union, they faced the West. In Europe their Western enemies were stronger on the seas and in the air than on the ground, and the result of a ground war would have been greatly dependent on US reinforcements and supplies through the Atlantic. Meanwhile the US could have attacked the Soviet Union from European and Asian bases, from the US across the Arctic, and by carrier-borne aircraft from the Barents Sea and Arctic Ocean. So, Moscow faced two problems, one, to defend their infrastructure from conventional and nuclear air raids, and two, to cut the SLOCs of the NATO in the Atlantic.

Starting with the latter, this was a classic anti-access task. Because of the geographic location of the Soviet Union and the clear naval superiority of NATO, it was obvious that reaching the Atlantic Ocean was safest and most possible invisibly, so the Soviet doctrine was effectively an updated version of WWII German Navy doctrine, using submarines against NATO convoys.¹³ The Soviets planned a huge submarine force with 1,200 new hulls between 1950 and 1965, but this proved to be too grandiose and “only” 350 new submarines were built. With the technological improvement, nuclear submarines also appeared and beyond torpedoes, many of them were equipped with ASMs, with conventional and nuclear warheads. By the mid-1980s 284 nuclear and diesel-electric attack and guided missile subs could have been used in the Third Atlantic Battle.¹⁴ This force was supplemented by an air component, after the Soviets were able to produce adequate aircraft, including bombers (Tu-16, Tu-22M, Tu-95) with ASMs. In both cases, aircraft and submarines would have launched their missiles (including nuclear ones) en masse, hoping that the convoys’ or carrier groups’ air defence cannot cope with such salvos and some missiles break through, causing critical damage. Therefore, NATO navies developed layered defence, with the first line of AEW&C-supported, carrier-based interceptors, the second with SAMs, and the final with point defence weapons.

The other task was also assigned to naval and air elements, since the mission was to keep out enemy surface, submarine and air units from the Soviet coastlines. Again, submarines had a crucial role in the interception and destruction of US carrier groups. The use of US

¹¹ Martinage, R. *Toward a new strategy offset: Exploiting U.S. long-term advantages to restore U.S. global power projection capability*. Washington D. C.: Center for Strategic and Budgetary Assessments, 2014. 23.

¹² Martinage. 23.

¹³ Martin, L. *NATO and the Defense of the West*. New York: Holt and Winston, 1985. 57–59.

¹⁴ Miller and Miller. 32, 112.

carriers in the northern wing was a possibility after WWII, but with the evolution of Soviet anti-ship missiles, which were deployed on the shores, and technically new ship and aircraft, this possibility turned into a suicide mission, however in the late Cold War these plans were revived.¹⁵ Anti-submarine warfare also became crucial, because with the advent of SSBNs,¹⁶ NATO subs appeared on the Barents Sea to track and, in case of war, destroy Soviet ballistic missile submarines from the point of sail out. For this, Moscow kept strong sea and air ASW¹⁷ groups on alert to create safe zones for their own submarines and also to prevent NATO subs from launching land attack cruise missiles against Soviet targets.

Air defence has always had a distinctive reputation in Russia, lifting it to a service equivalent branch of the armed forces. Because of the vast territory of the Soviet Union and even Russia, the country is hard to be covered entirely. But the fast evolution of Soviet SAMs, supported by interceptors, made the Soviet airspace more and more dangerous to reconnaissance aircraft. Such systems caused hard times for the US aircraft over North Vietnam, and decimated the Israeli Air Force on the Sinai in 1973. So, the survivability of conventional strike aircraft was very far from assured, this is why electronic warfare was strengthened, low flying profile was developed, and one of the results of these trends was the creation of stealth aircraft.

By nowadays, Russian air defence is on the top again and created various A2/AD zones around the strategic territories like Moscow, St. Petersburg, the Kaliningrad exclave, the Kola, Kamchatka and Crimean Peninsulas, and the Arctic region, just naming a few. Russians provide layered defence to balance the advantages and disadvantages of these systems, therefore they use the S-300 and S-400 for theatre defence, while medium range Buk-M2/M3 and short range Pantsir-S1 are used to defend the former complexes. The ground-based assets are also supported by Su-27/30/35 and MiG-29/31 fighter interceptors to cover the gaps. Russian experts analysed the wars of the recent past fought by the West, and created their air defence systems upon these lessons learned. The air defence got new radars with long range reconnaissance capability, passive detection and tracking, and automatized C2 systems are also emphasized with the goal to undermine the combat effectiveness of the yet few US stealth and many vintage combat aircraft, and to have the capability to destroy high value assets like AWACS, JSTARS, U-2, Global Hawk, and tankers, and also to intercept cruise or longer range tactical missiles. An S-300V4 SAM can track 200 targets and attack 24 simultaneously, while the newest S-500 can reach the lower space and orbiting satellites.¹⁸ The clearly defence capabilities can be hardly condemned, but these systems can deny airspace to other countries. Good examples are Crimea or Kaliningrad as A2/AD bastions, or after the shooting down of the Russian Su-24 by Turkey, Moscow deployed the S-400 systems in Latakia, Syria, which can cover the whole airspaces of Syria, Lebanon, Israel and Cyprus, and cover a huge territory of Turkey, Jordan and the Eastern Mediterranean. Russia's current advanced long range SAM complex inventory consists of at least 400 S-300PM/PS, 20+ S-300V and 304 S-400 launchers.¹⁹

Russia acquired many new multi-role fighters like the Su-30 and Su-35. The latter seems to be a very formidable aircraft with fielded R-37M (280 km) air-to-air missiles, posing a

¹⁵ Martin. 64.

¹⁶ Ship Submersible Nuclear Ballistic missile – Ballistic missile carrier, nuclear powered submarine

¹⁷ Anti-Submarine Warfare

¹⁸ Mladenov, A. "Access denied: Fortifying Putin's Skies". *Air Forces Monthly* 334/1. 2016. 70–73., 77.

¹⁹ The Military Balance 2015. London: The International Institute for Strategic Studies, 2019. 196–202.

great threat to conventional aircraft and high value mission support assets.²⁰ Future Su-57 will provide a stealth platform, which can be used in more offensive roles, like precision strikes on high value ground, sea or airborne targets.

Among aircraft, the Tu-22M bomber fleet should be mentioned, which is armed with Kh-22 anti-ship missiles. The Tu-22M3 can carry three missiles, with the combat range of 4,500 km, while the missiles have a further 270-550 km range and claimed speed of Mach 4.5.²¹ Besides lauded great ambitions, the Russian Navy has probably more an A2/AD role, than a traditional blue water offensive capability. It can be the extension of land based A2/AD forces and can provide credible defence close to their shores or in the Baltic and Black Seas or maybe as far as the Mediterranean.²² This means a layered defence, where the first line is composed of nuclear submarines (attack and guided missile), major surface vessels, and aircraft out to 1,000 nautical miles. Much closer to the Russian coast, smaller missile-armed surface combatants and diesel-electric submarines would take up the fight, supported by shore-based anti-ship missiles and naval minefields. The Russians also create strategic bastions, which are nothing else, but safe places with strong ASW forces and deployed sensor systems, where their own SSBNs can patrol in relative safety.²³

Although the vast sub force of the Cold War is the past, the Putin era brought slow but steady development, including brand new submarines. The new Yasen-class guided missile submarine is a very potent one. It has 11,800–13,800 t displacement, and strong missile armament, including 32 Kalibr anti-ship or land attack cruise missiles²⁴ and P-800 ASMs in VLS tubes, beyond the traditional torpedoes. According to US Naval Intelligence, the Yasen-class is quieter than the Improved Los Angeles-class.²⁵ The vintage, but remaining Akula-class attack submarines also get the Kalibr missiles during their overhaul. Such missiles were used effectively from diesel-electric Kilo-class subs against targets in Syria in December 2015.²⁶ The successor of the Kilo-class is the 2,700 t Lada-class, which is quieter, and equipped with air independent propulsion, which increases its submerged endurance to 45 days, with a cruising range of 13,500 km. The class is armed with up to 18 torpedoes and Kalibr missiles.²⁷ NATO naval forces have experienced the highest Russian sub activity since the Cold War, and it is said that Russia executed a technology leap in terms of new capabilities and operating close to NATO ports.²⁸

In the field of ASMs Russia was always a leading nation. One of the current examples of it is the 3M-55 Onyx (P-800, Brahmos) with a 300 km range (export) at a Mach 2.5 speed

²⁰ The Military Balance 2015. London: The International Institute for Strategic Studies, 2015. 162.

²¹ Kopp, C. "Soviet/Russian Cruise Missiles: technical report APA-TR-2009-0805". <http://www.ausairpower.net/APA-Rus-Cruise-Missiles.html>, Accessed on 9 January 2017.

²² Galeotti, M. „Red Alert: Russian military underpins foreign policy". *Jane's Intelligence Review* 28/7. 2016. 14.

²³ The Russian Navy. Suitland: Office of Naval Intelligence, 2015. X.

²⁴ The Russian Navy. 18.

²⁵ Majumdar, D. "U.S. Navy Impressed with New Russian Attack Boat". 28 October 2014. <https://news.usni.org/2014/10/28/u-s-navy-impressed-new-russian-attack-boat>, Accessed on 9 January 2017.

²⁶ Novichkov, N. and Felstead, P. "Russian Project 971 submarines to be armed with Kalibr missiles". *Jane's Defence Weekly*, 24 March 2016. <http://www.janes.com/article/59030/russian-project-971-submarines-to-be-armed-with-kalibr-missiles>, Accessed on 14 December 2016.

²⁷ "Project 677 Lada Class / Project 1650 Amur Class Submarines". <http://www.naval-technology.com/projects/project-677-lada-class-project-1650-amur-class-submarines/>, Accessed on 9 January 2017.

²⁸ De Larrinaga, N. "Russian submarine activity topping Cold War levels". *Jane's Defence Weekly*, 10 February 2016. 8. <http://www.janes.com/article/57650/russian-submarine-activity-topping-cold-war-levels>, Accessed on 7 January 2017.

and the capability of evasive manoeuvres. It can be deployed on surface ships and the Yasen-class submarines, while its coastal defence variant is the K-300 Bastion, and it can be carried by Su-30/33 fighters too. The Kalibr/Klub cruise missile has anti-ship (3M-54), land attack (3M-14) and anti-submarine (91R) versions, it can be deployed on surface ships, submarines, aircraft and shore-based batteries. As its predecessors, it would be launched in salvos and multiple missiles can attack the same target from various directions to overwhelm enemy air defence. The land attack export version has a 450 kg warhead and the range of 275 km, but the domestic type may have multiple times the range up to 2,000+km. The anti-ship variant (export) has a 275 km range, and during the terminal approach it manoeuvres and accelerates to supersonic speed.²⁹

As a quest for two strategic bastions, Moscow has built up considerable A2/AD capability in the Kaliningrad exclave and the Crimea, being able to influence large parts of the Baltic and Black seas. Russia deployed shore-based missiles to the Kaliningrad exclave (Bastion-P, range 300 km; Kh-35 Bal, 260 km; ASMs, S-400 SAMs, 400 km; and Iskander tactical ballistic missiles),³⁰ which can provide A2/AD ability in the eastern Baltic Sea, therefore ranging to the Swedish coast they are able to deny access to the ports of the Baltic states, Finland, and the main ports of Poland. An S-400's range covers half of the airspace of Poland and Latvia, whole Lithuania, a huge territory of the Baltic Sea, and reaches some offshore islands of Sweden. In Crimea, Bastion-P, Bal, S-300 and -400 systems were deployed, which can reach the coasts of Rumania and Turkey, and can totally close the access of Ukraine to the sea, or NATO's naval access to the Caucasus.³¹ Russia used effectively her A2/AD capabilities against Ukraine after the seizure of Crimea.³² Both A2/AD bastions are accompanied with naval forces and modern fighter bombers, strengthening the layered defence.³³

Finally, Russia has one of the most advanced electronic and cyber warfare capabilities in the world, which is a strong non-kinetic element of the A2/AD system. They tried to create a general system to neutralize the advanced technology of the West. This includes for example the disruption of operational support capabilities like the GPS, which is not only crucial for navigation, but for targeting, too. EW systems were used to paralyze Ukrainian communication capabilities.³⁴ It was also used against the USS Donald Cook in the Black Sea in April 2014, by a Su-24 fighter bomber with claimed success.³⁵ In Syria, alleged

²⁹ The Russian Navy. 34–36.

³⁰ Sukhankin, S. „David vs. Goliath: Kaliningrad Oblast as Russia's A2/AD 'Bubble'". *Scandinavian Journal of Military Studies* 2/1. 2019. 95–110. DOI: <http://doi.org/10.31374/sjms.20>

³¹ The Military Balance 2019. 172.

³² Lokshin, J. "Russia's Anti-Access Area Denial". July 2016. <https://missiledefenseadvocacy.org/missile-threat-and-proliferation/todays-missile-threat/russia/russia-anti-access-area-denial/>, Accessed on 11 February 2020.

³³ Ryall, J., Dominguez, G. and Gibson, N. "Russia deploys Bal and Bastion-P missile systems to disputed Kuril Islands, says report". Jane 360, 23 November 2016. <http://www.janes.com/article/65714/russia-deploys-bal-and-bastion-p-missile-systems-to-disputed-kuril-islands-says-report>, Accessed on 7 January 2017.

³⁴ Freedberg, S. J. Jr. "Red Electrons: Army Rapid Capabilities Office Fights Russian GPS Jamming, Cyber, EW". *Breaking Defense*. 22 November 2016. <http://breakingdefense.com/2016/11/red-electrons-army-rapid-capabilities-office-fights-russian-gps-jamming-cyber-ew/>, Accessed on 7 January 2017.

³⁵ "AEGIS Fail in Black SEA, Ruskies Burn down USS Donald 'Duck'". 13 November 2014. <http://www.veterans today.com/2014/11/13/aegis-fail-in-black-sea-ruskies-burn-down-uss-donald-duck/>, Accessed on 7 January 2017.

Russian EW is very active even against US forces, jamming radars and GPS signals, shutting down communications, and operating against drones successfully.³⁶

Iran

During the Iran-Iraq war, both sides attacked the oil industry of each other, since this is the leading industry of the region, and the produced oil is pre-eminently transported via tanker ships from the Persian Gulf. This was Iran's main advantage, because the gate of the Gulf, the Strait of Hormuz was controlled by them from three sides. Although the Iranian Navy inherited considerable equipment from the Shah, they quickly ran out of spare parts after the war broke out, yet it was enough to push Iraqi Navy back into their ports. To compensate for the required, but definitely inadequate naval power and to continue the attack on marine traffic,³⁷ which served the Iraqi war machine, Tehran turned to simple and cost effective techniques, and in 1985 the IRGCN³⁸ was established as an irregular naval force. Speedboats with RPGs, heavy machine guns, autocannons, naval mines, and the newly acquired Chinese made HY-2 anti-ship missiles were used. Speedboats were successful with swarming tactics against lone freighters, however after the US agreed to reflag the Kuwaiti tankers and provided armed escort for the convoys, anti-ship missiles and mines became the primary weapons. Iran deployed ASMs into the strait and to the occupied Faw Peninsula, attacked the Kuwaiti ports from the latter location, and also laid mines on the main routes of ships, which resulted in the heavy damage of the Bridgeton tanker and other commercial vessels, and later the USS Samuel B. Roberts frigate. In retaliation, the US Navy attacked Iranian oil drilling platforms in the Gulf, which were used as stationing and supply bases of the IRGCN. These operations were the Nimble Archer in 1987 and the Praying Mantis in 1988, which halted the effective Iranian naval operations.

On the other hand, Tehran knew that in spite of its inferior forces and defeats, Iran had many successes in naval warfare, so if they improved skills, they could expect more successes in future conflicts.^{39 40} This became an anti-access/area denial strategy, the goal of which is to close the strait in case of conflict, which means both deterrence and because of the heavy dependence on Gulf oil, an economic weapon. Although they are still not in a condition to fight conventional battles against the US Navy, but asymmetric tactics, including hit-and-run and raiding, plus mass assaults and missile salvos in enclosed waters, provide some space for success.⁴¹ To ease operating, Tehran divided the areas of responsibility of the IRIN⁴² and IRGCN. In effect IRIN has the major combatants in the Caspian Sea

³⁶ Varfolomeeva, A. „Signaling strength: Russia's real Syria success is electronic warfare against the US". <https://thedefensepost.com/2018/05/01/russia-syria-electronic-warfare/>, Accessed on 11 February 2020.

³⁷ After Iraqi were cut off, Baghdad used the tanker ships of the Gulf Arabic states to transport oil, who otherwise supported Iraq's war efforts against the Shiite Iran.

³⁸ Iranian Revolutionary Guard Corps Navy

³⁹ Haghshenass, F. Iran's Asymmetric Naval Warfare. Washington: Washington Institute for Near East Policy, 2008. 6.

⁴⁰ Hilburn, M. "Asymmetric Strategy: Growing Iranian Navy relies on 'unbalanced warfare' tactics". *Sea Power* 49/12. 2006. 14–17.

⁴¹ Ward, S. R. *Immortal: A military history of Iran and its armed forces*. Washington D. C.: Georgetown University Press, 2009. 315–316.

⁴² Islamic Republic of Iran Navy.

and the Gulf of Oman, while IRGCN got the Persian Gulf, where their smaller vessels are more effective in the shallow and enclosed waters.⁴³

They created a decentralized system to protect their forces from concentrated air attacks and to preserve their operational capabilities,⁴⁴ and if necessary, to act on their own with minimal logistic demands.⁴⁵ Dedicated units, such as IRGCN, get high quality training and according to US and British naval personnel, the Iranian forces seem to be well trained with good quality weaponry.⁴⁶ Despite the relatively simple and many times obsolete weapons of the Iran-Iraq war, by today the Navy has gone through considerable improvement. They bought advanced ASMs, including the Chinese C-701, C-704, C-802, and the vintage HY-2, which are also copied, improved, and produced domestically. Beyond shore-based static and mobile launchers, smaller and major surface combatants and fighter jets are also armed with these missiles. Tehran procured a large number of fast attack crafts with missile weaponry. IRIN acquired three Kilo-class diesel-electric submarines, too, from Russia, and the production of midget submarines is ongoing in Iran. According to a 2019 US estimate, Iran has 5,000 naval mines. Iran also developed the Khalij Fars and Hormuz 1/2 anti-ship ballistic missiles with a 300 km range.⁴⁷

The IRGCN has 20,000 seamen, including 5,000 marines, and has an inventory of more than 130 coastal combatant craft and probably hundreds of inshore miscellaneous, but combat capable boats of which 56 are ASM equipped, and also owns shore-based batteries. IRIN has 18,000 sailors, three Kilo-class diesel-electric and 18 midget submarines with torpedo armament, and at least 60 coastal combatant craft with half of them ASM equipped, and further ASM coastal defence batteries.⁴⁸

Despite the obsolete air defence capabilities of Iran, including fighters and SAMs, the recent past brought some important news. One of the most important developments is the long desired S-300 system which was sold by Russia; not only can it protect strategic Iranian facilities (such as nuclear reactors), but can also provide an air defence umbrella above the strait, which would significantly complicate effective air strikes against shore- or inland-based anti-ship batteries. In 2016 Iran acquired four battalions (32) of S-300PMU2.⁴⁹ With the UN arms sanctions against Iran expiring in 2020, Tehran probably seeks purchase of modern Russian and Chinese weapon systems, including surface-to-air and surface-to-surface missiles, and modern fighter jets, such as Su-30/35, J-10 or FC-1.

Iran knows that victory against US and allied forces is a remote possibility, therefore their primary goal is the attrition and exhaustion of enemy forces to a point, where casualties become unacceptable. Their doctrine calls for joint operations, where the different services launch attack with different weapons at the same time, for example ASMs, fast attack craft,

⁴³ Himes, J. "Iran's Two Navies: a maturing maritime strategy". Institute for the Study of War. 2011. 12. www.jstor.org/stable/resrep07900, Accessed on 7 January 2017.

⁴⁴ Iran's Naval Forces. Suitland: The Office of Naval Intelligence, 2009. 7–8.

⁴⁵ Haghshenass. 19–20.

⁴⁶ Ripley, T. "Gulf of distrust: Naval stand-offs and the Persian Gulf". *Jane's Intelligence Review* 20/3. 2008. 10.

⁴⁷ Iran Military Power: ensuring regime survival and securing regional dominance. Washington D.C.: Defence Intelligence Agency, 2019. 32, 56.

⁴⁸ The Military Balance 2019. 341–342.

⁴⁹ Binnie, J. "Iranian S-300 deliveries completed". <http://www.janes.com/article/64615/iranian-s-300-deliveries-completed>, Accessed on 7 January 2017.

submarines and UCAVs.⁵⁰ Their aim is to overwhelm the enemy defence with missile salvos and coordinated surface, undersea and air attacks, which would be a hard task for even the very advanced Aegis system to deal with, further the ranges of the Gulf is relatively short and there would be little time for effective countermeasures. Meanwhile marine traffic can be denied by mines on the shipping routes, and by missiles.⁵¹ Although this system is not as advanced (as we will see) as that of the Chinese, but very effective in its own space and this was confirmed by the Americans themselves. In 2002 this kind of clash was simulated on Exercise Millennium Challenge '02, where 16 US ships, including an aircraft carrier and two amphibious assault ships „sank” within minutes.⁵²

China

During the Cold War, China did not have a considerable naval capability compared to the US, Soviet, or Japanese forces in the region, as the People Liberation Army Navy (PLAN) were held solely for coastal defence. The situation changed significantly after the 1995–96 Taiwan Strait Crisis and led to the creation of the A2/AD system. The Chinese part lacked the means to give a considerable answer to the US challenge, but left the painful feeling of an offense against her sovereignty. Although PLAN has improved a lot, their blue water force does not match the US forces so far, and probably will not do in the coming years despite their spectacular achievements.

These factors forced China to turn to alternative methods to create a strong defence posture and deny the immediate and for now extended sea territories. However, this umbrella can be used not only to defend mainland China, but also to enclose areas where the PLA can operate in the future, like Taiwan and the South China Sea, creating a safe space for own operations with the decreased chance of a low-cost foreign intervention. To execute this strategy China developed a three-layer defence to keep out the US forces from Chinese shores. The first one is composed of submarines and ASBMs at 970–1,800 km from the Chinese coasts. The second line consists of submarines and combat aircraft at 480–970 km. In the third line, the joint force of aircraft, submarines, plus all the surface combatants and shore-based ASMs would take the fight. This is also called ‘non-contact warfare’ which depends on long range precision strike weapons.⁵³

China develops and produces many types of ASMs, which are mounted on aircraft, ships, submarines and shore-based launchers. One of the newest is the YJ-18 supersonic cruise missile with a 537 km range, similar to the Russian Kalibr with the capability of supersonic speed on the final approach phase. The DF-21D ASBM is developed to provide precision attack capability on the Western Pacific against enemy ships out to 1,500 km range. The DF-21D is equipped with a manoeuvrable warhead, and its accuracy is enough to hit major surface vessels. But the successor is already coming with the estimated extended range of

⁵⁰ Cordesman, A. H. and Seitz, A. C. “Gulf Threats, Risks and Vulnerabilities: Terrorism and Asymmetric Warfare”. Center for Strategic and International Studies, Washington D.C. 27 August 2009. 24. https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/090827_gulf_terror_assym.pdf, Accessed on 7 January 2017.

⁵¹ Gunzinger, M. and Dougherty, Ch. Outside-In: Operating from Range to Defeat Iran’s Anti-Access and Area-Denial Threats. Washington: Center for Strategic and Budgetary Assessments; 2011. 47–18.

⁵² Borger, J. “Wake-up call”. *The Guardian*, 6 September 2002. <http://www.guardian.co.uk/world/2002/sep/06/usa.iraq>, Accessed on 7 January 2017.

⁵³ The PLA Navy. Suitland: Office of Naval Intelligence, 2015. 8.

4,000 km, this will be the DF-26. China also invests a lot of money in over-the-horizon radars to get proper reconnaissance, tracking, and targeting capability to exploit the maximum range of the missiles because in this field they still have difficulties.⁵⁴ According to Military Balance, in 2019 China had 30 DF-21D ASBMs, 72 YJ-62s, and 54 CJ-10 cruise missile launchers on the ground. The newer Type-052Ds and -055s get the YJ-18, which will be also fielded on various Type-039 class submarines, while the Type-091 and -093 nuclear attack subs currently use the vintage YJ-82, and the Kilo-class uses the Klub.⁵⁵

The vast, but obsolete submarine force of the Cold War has been swapped for a more modern and increasingly capable fleet. The current tactical fleet consists of three Type-091, two Type-093 and four Type-093A nuclear attack submarines, eight obsolete Ming, twelve Kilo, twelve Type-039G, four Type-039A and twelve Type-039B⁵⁶ modern diesel-electric subs. Apart from ASMs and torpedoes, submarines can carry and lay mines silently. For this China owns approximately 50,000 mines, including obsolete moored mines and very advanced rocket-propelled ones, too.⁵⁷

Although the technological level of Chinese subs is definitely inferior to the US, Western or Russian designs, it would be a great mistake to underestimate them. Their stalking capability was proved by a Type-039G diesel-electric submarine in 2006, which closed in on the USS Kitty Hawk carrier group within 5-9 nautical miles undetected, well within firing range, and emerged to the surface. In 2015, the USS Ronald Reagan carrier group was shadowed by a Chinese sub and reportedly it conducted a simulated missile strike on the carrier.⁵⁸

While China has serious disadvantages and capability gaps in the field of anti-submarine warfare, it takes steps to counter the enemy sub threat to the shores. For this reason, an early warning, surveillance, and targeting system is developed to detect the enemy surface ships and submarines. This system includes land-based over-the-horizon radars, electro-optical and radar satellites, and seabed sonars.⁵⁹ The latter is called 'Underwater Great Wall' project, which is similar to the US SOSUS, and beyond the above mentioned assets, it would be supported by towed-array sonars, unmanned underwater vehicles, ASW aircraft, plus shore- and ship-based ELINT systems, which can track and target enemy submarines.⁶⁰

Chinese bombers and fighters also have a strong A2/AD capability with anti-ship and air-to-air capabilities. For example, the obsolete H-6 (Tu-16) bombers, which can be equipped with four to six modern cruise missiles.⁶¹ Furthermore, the upcoming H-20 will provide stealthy strike capability. China leapt forward in the field of modern fighter jets, many of them produced indigenously, like the J-10, J-11, J-15 and J-16, while also possessing a considerable number of Russian Su-27/30/35s. The Chinese versions are improved and the

⁵⁴ O'Rourke, R. China Naval Modernization: Implications for U.S. Navy Capabilities: Background and Issues for Congress. Washington: Congressional Research Service, 2016. 5–6, 10–12.

⁵⁵ The Military Balance 2019. 256, 260.; O'Rourke. 11.

⁵⁶ The Type-039A/B is also called Type-041 or Yuan-class I/II, an improvement over the Type-039G.

⁵⁷ O'Rourke. 17–19.

⁵⁸ O'Rourke. 71.

⁵⁹ O'Rourke. 45.

⁶⁰ Fisher, R. D. Jr. "China proposes 'Underwater Great Wall' That Could Erode US, Russian Submarine Advantages". Jane's Defence Weekly, 25 May 2016. 6. <http://www.janes.com/article/60388/china-proposes-underwater-great-wall-that-could-erode-us-russian-submarine-advantages>, Accessed on 7 January 2017.

⁶¹ Annual report to Congress: Military and Security Developments Involving the People's Republic of China. Washington D. C.: Department of Defense, 2016. 31.

newest batches are thought to have AESA radars and sophisticated avionics. These fighters are equipped with BVR air-to-air missiles like the PL-12 or the PL-15 with the estimated range of 150–200 km. Every current and future 4th and 5th generation Chinese fighter will be equipped with the PL-15.⁶² In practice it means that if the USAF wants to save its tankers in case of a Taiwan contingency, they should be kept in 1,350–1,800 km standoff range from the Chinese coasts to defend them from the J-11 fighters and their PL-12 missiles. The problem is that stealthy platforms, like the F-22 and F-35, do not have the combat radius to reach even Taiwan from such distance without external fuel tanks or aerial refuelling in restricted airspace.⁶³ BVR weapons can also endanger other high value assets like AEW&C, RC-135, JSTARS aircraft or HALE UAVs, like the MQ/RQ-4, which have a crucial mission support role, however their number is very limited. The situation is worsened by the advent of Chinese stealth fighters J-20 and J-31, which are becoming operational, and with BVR missiles providing a good hit-and-run capability against high value assets, which can at least temporarily disrupt the air operations of the adversary.

Fighters with BVR weapons are the extended arm of the Chinese air defence, but if that layer is pierced, closing in on the shores the situation does not become better. At an estimated range of 550 km from the coastline, an integrated air defence receives the intruders with fighter interceptors and long range SAMs. China acquired S-300/400 systems, and also developed its domestic version, using the technologies of S-300 and Patriot. It has an estimated maximum range of 200 km and an altitude of 30,000 m; it is claimed to be able to track and home the electronic radiation of the target and according to tests it has a high hit probability, the newest versions have the claimed capability to intercept low-orbiting satellites.⁶⁴ The HQ-9 is based on the ground, and on the newest vessels, like Type-052D destroyers and Type-055 cruisers. China's current inventory of them is one of the largest on the Earth, with 16 S-400, 160 S-300PMU/1/2 and 202 plus HQ-9 launchers.⁶⁵

China used these systems also in the island disputes of the South China Sea, for example the PLA deployed HQ-9 and YJ-62 missiles on Woody Island creating an A2/AD bastion,⁶⁶ which can deny the sea and airspace to the enemy on a vast territory around the tiny piece of land, in case of a conflict. Such bastions can provide safer access also for the Chinese forces to further territories.

CONCLUSION

It is justifiable that major countries like Russia and China intend to prevent foreign interventions and strikes on their soil and maritime territories, but they can also draw their borders on international waters and airspace which can be considered as a missile umbrella over territories where their own troops can operate safely against other countries. However, declaring them as only offensive moves would not be appropriate either, as these steps are part of an “aggressive look alike” deterrence strategy. On the other hand, many of the

⁶² O'Rourke. 67.

⁶³ Martinage. 30.

⁶⁴ Foss and O'Halloran. 427–428.

⁶⁵ The Military Balance 2019. 260–262.

⁶⁶ Fisher, R. D. Jr. “Imagery suggests China has deployed YJ-62 ASCMs to Woody Island”. *Jane's Defence Weekly*, 30 March 2016. 14. <http://www.janes.com/article/59003/imagery-suggests-china-has-deployed-yj-62-anti-ship-missiles-to-woody-island>, Accessed on 7 January 2017.

sophisticated weapon systems which were listed above are available for non-state actors who lack every responsibility or moral barrier that otherwise Russia, China or Iran own. These guerrilla or terrorist groups can purchase modern SAMs or ASMs, or they can snatch them in the future via such big collapses that happened previously in Iraq, Libya, or Syria, where armouries were quickly emptied.

Today more and more countries develop their own A2/AD systems at various levels to defend their territories and maritime exclusive economic zones, and such activities heavily intensified in Southeast Asia against the assumed Chinese threat. Others, like the United States try to develop doctrines and field technology to counter the A2/AD threat, e.g. through establishing new operational concepts, strengthening the air defence of naval groups, acquiring stealth platforms, improving EW and precision strike capabilities, plus SEAD/DEAD⁶⁷ through joint efforts.

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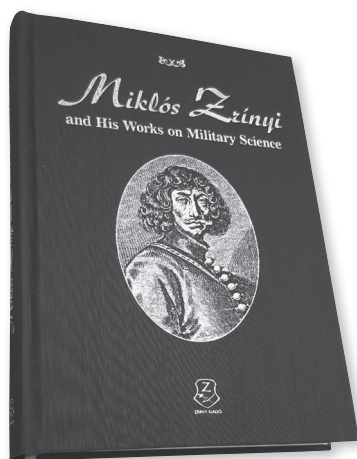
⁶⁷ Suppression of Enemy Air Defense/Destruction of Enemy Air Defense

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The present publication contains the English translation of four works written in Hungarian language on military science by soldier, statesman, poet and writer Miklós Zrínyi in their supposed order of origin. The texts of *Vitéz hadnagy* (Valiant Lieutenant), *Mátyás király életéről való elmélkedések* (Reflections on the Life of King Matthias), *Az török áfium ellen való orvosság...* (A Remedy for the Turkish Opium, or the Antidote to the Peace between the Turks and the Hungarians) and *Tábori kis tracta* (A Short Treatise on the Army) are accompanied by valuable notes by Péter Kulcsár and all the non-Hungarian quotes are also translated into English thus providing a very special novelty for those who are interested in the Hungarian literature of military science.

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THE ROLE OF LAW ENFORCEMENT IN COUNTERING HYBRID WARFARE

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ABSTRACT: For the past six years, hybrid warfare has been one of the focal points of military science research. The activities and role of law enforcement agencies are only considered as complementary in most studies, although the police force is the first line of defence when a hybrid attack occurs, and is of particular relevance to the management of the crisis. The study discusses the historical background of hybrid warfare, the difficulty of definition, its model, and the law enforcement-related elements within it. An analysis of what happened in Ukraine in 2014 illustrates the concepts. The paper also offers some conclusions and recommendations at the end.

KEYWORDS: hybrid warfare, police, non-linear warfare, Ukraine, Russia

PRELIMINARY

This paper focuses on the relationship between hybrid warfare and law enforcement. The complex operational environment emerging in the course of a hybrid challenge is one in which various security, law enforcement and public administration professionals must perform their tasks in a coordinated manner, almost daily. Numerous publications have already discussed hybrid warfare, so some aspects of the debate on the subject are covered in this paper. The activities and role of law enforcement agencies are only considered as supplementary in most studies, which is an error. In the course of a hybrid challenge law enforcement is one of the first lines of defence, and is likely to be of particular relevance in the management of the crisis.

The first part is a discussion of the definition of hybrid warfare and the development of this new crisis management model. The second part is an analysis of the events that took place in Ukraine in 2014. This case study is best suited to explore the role of law enforcement agencies, as this was the first time that a hybrid operation ran its full course, and achieved its strategic goal, the Russian annexation of Crimea. The third part identifies the tasks of law enforcement agencies and the capabilities they must have as a necessary condition for defending against a hybrid belligerent. I then summarize my conclusions and suggestions in the concluding section.

HYBRID WARFARE IN GENERAL

Hybrid warfare has become a hit topic in the last decade, not only in terms of scientific research, but also in the mainstream media. This new form of warfare became the focus of scientific and “less scientific” interest following Russia’s occupation of Crimea and Eastern Ukraine. However, it should be noted that there is no consensus in the international

literature on the concept or content of hybrid warfare. As Zoltán Somodi and Péter Álmos Kiss point out, there are four main categories of opinion on the subject.¹ According to the first group, hybrid warfare represents an entirely new strategy approach that is different from previous wars. The second group includes those who say that in the past some belligerents employed elements of hybrid warfare, but today they are applied in a fundamentally novel approach. Researchers in the third group believe that hybrid warfare is not a new strategy, nor does its analysis help understand the security environment of the 21st century. The fourth and last group is comprised of Russian military scientists, who view hybrid warfare as a strategy of the Western powers against Russia. This division is the best illustration of the lack of uniformity in the perception of hybrid warfare and, consequently, the difficulty of establishing an internationally agreed, uniform definition.

According to the concept adopted by NATO (North Atlantic Treaty Organization) and enshrined in its capstone military doctrine: *“Hybrid threats. Hybrid threats occur where conventional, irregular and asymmetric threats are combined in the same time and space. Conflict could involve a range of transnational, state, group and individual participants operating globally and locally. Some conflicts may involve concurrent inter-communal violence, terrorism, cyberspace attacks, insurgency, pervasive criminality and widespread disorder. Adversaries may also choose a long-term strategy to avoid defeat rather than seeking victory, to try to outlast NATO’s will and determination. Countering such hybrid threats may require a broader approach, employing integrated capabilities some of which may be unconventional in nature.”*² Similarly, in the media, the concept of hybrid warfare is a common, coordinated application of regular and irregular military procedures. In reality the phenomenon shows a much more nuanced picture, and in order to examine the role of law enforcement forces in hybrid warfare, it is important to know how such conflicts develop, their most important stages, and the relationships between each element than the exact definition. First, however, let us examine the most important milestones in the development of hybrid war theory, as well as the related researchers and theoreticians.

Major William Nemeth (US Marine Corps) introduced the theory of hybrid warfare in his master’s thesis on the Russian–Chechen wars.³ Following Nemeth, Frank Hoffman⁴ first outlined the principles of flexible, simultaneous, coordinated use of conventional and irregular warfare as the basis for hybrid warfare, based on the successful tactics and operational principles of Hezbollah⁵ against the Israeli Defence Forces in Lebanon in 2006. With the exception of Hoffman and Nemeth, there are few Western scholars who studied this new form of warfare in greater depth before 2014.

To understand hybrid warfare, it is important to look at the development of Russian warfare principles, along which the system of procedures applied in Ukraine may have devel-

¹ Somodi Z. and Kiss, Á. P. “A hibrid hadviselés fogalmának értelmezése a nemzetközi szakirodalomban”. *Honvédségi Szemle* 147/6. 2019. 22–28. DOI: 10.35926/HSZ.2019.6.2.

² “NATO Standard AJP-01 Allied Joint Doctrine Edition E Version”. 1 February 2017. 2–11. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/602225/doctrine_nato_allied_joint_doctrine_ajp_01.pdf, Accessed on 23 November 2019.

³ Nemeth, W. J. “Future war and Chechnya: a case for hybrid warfare”. Thesis. Monterey: Naval Postgraduate School, 2002.

⁴ Hoffman, F. *Conflict in the 21st Century: The Rise of Hybrid Wars*. Arlington: Potomac Institute for Policy Studies, 2007.

⁵ Lebanese Shia political and paramilitary organization.

oped. In his work on military science, which was first published in 1995,⁶ General Makmut Akhmetovich Gareev⁷ pointed out that technological advances are revolutionizing warfare both in terms of the destructive capacity of conventional weapons and the appearance of new combat methods. His work was further developed by General Vladimir Slipchenko,⁸ who described future wars as “contactless” conflicts. In his view, instead of the military dimension, the political and economic sphere is preferred, while the chances of a traditional military offensive are relatively low.

The most widely known Russian expert mentioned in the field of hybrid warfare is General Valeri Gerasimov, Chief of Staff of the Russian Armed Forces. His 2013 article in the *Voenno-promishlenniy kurier* journal, “*The Value of Science Is in Foresight: New Challenges Demand Rethinking the Forms and Methods of Carrying out Combat Operations*”⁹ was cited as the foundation of hybrid war. His paper and the principles it outlined – which are based on Slipchenko’s earlier work – began to be called hybrid warfare and the Gerasimov doctrine. I agree with János Tomolya,¹⁰ who states that a document of about 2,000 words cannot be considered as a complete military doctrine. It should also be noted that Gerasimov did not use the term hybrid warfare, referring to what he described as a new form of warfare or as a “new generation warfare”. Another name commonly used for hybrid warfare, in Russian relation, is the so-called non-linear warfare, which is not related to his name, but to Russian presidential adviser Vladimir Surkov, who used the term under his pseudonym, Nathan Dubovitsky.¹¹ However, it is remarkable that many analysts still see General Gerasimov’s article as the basis for hybrid warfare.

The naming and propagation of Gerasimov’s crisis management model as hybrid warfare is linked to Mark Galeotti.¹² The acclaimed Russia expert himself later realized¹³ that the choice of name was not the most fortunate and could have implications for the actual perception of the phenomenon and for choosing the right way to deal with the crisis. The 2014 Ukrainian crisis, which, although it erupted after the publication of the article, played an important role in the spread of Gerasimov’s concept of warfare, furthermore, it supports the theoretical approach described there.

A feature of the new form of warfare described by Gerasimov is that it does not involve an open, regular force as long as this move can be delayed. It is of paramount importance that the conflict remains below the threshold of war, and for this purpose paramilitary forces, civilian insurgents, as well as special operations forces, are employed clandestinely. A very

⁶ Gareev, M. A. *If War Comes Tomorrow? The Contours of Future Armed Conflict*. Abingdon: Routledge, 1998.

⁷ General of the Army of the Russian Federation, who was the President of the Russian Academy for Military Science until his death.

⁸ Mattson, P. A. “Russian operational art in the fifth period: Nordic and Arctic applications”. *Revista de Ciencias Militares* 1/1. 2013. 29–47.

⁹ Gerasimov, V. “‘Tsennost’ nauki v predvideniye’”. *Voenno-promishlenniy kurier*, 27 February 2013. <http://www.vpk-news.ru/articles/14632>, Accessed on 26 November 2019.

¹⁰ Tomolya, J. “Az úgynevezett „Geraszimov-cikk” margójára”. *Hadtudomány* 28/3-4. 2018. 79–88. DOI: 10.17047/HADTUD.2018.28.3-4.79

¹¹ Rácz, A. *Russia’s Hybrid War in Ukraine, Breaking the Enemy’s Ability to Resist*. Helsinki: The Finnish Institute of International Affairs, 2015. 37.

¹² Galeotti, M. “‘Hybrid War’ and ‘Little Green Men’: How It Works, and How It Doesn’t”. *E-International Relations*. 16 April 2015. <https://www.e-ir.info/2015/04/16/hybrid-war-and-little-green-men-how-it-works-and-how-it-doesnt/>, Accessed on 4 May 2019.

¹³ Galeotti, M. “(Mis)Understanding Russia’s two ‘hybrid wars’”. *Critique and Humanism* 49/1. 2018. 17–28.

important complement to this is information warfare, waged through traditional and social media, and specific cyber operations. In the late stages of the conflict, regular forces also play a role, but mostly as a deterrent. However, the most relevant feature of such full-spectrum operations is real-time coordination and coherent, synchronized execution. When we examine the involvement of law enforcement agencies in non-linear warfare, the model described by General Gerasimov provides an excellent basis for understanding the strategy used by Russia. He outlined the phases of dealing with a crisis in six steps:

- The appearance of hidden contradictions.
- Tension generation / exacerbation.
- Steps leading to conflict / beginning of conflict.
- The crisis (crisis).
- Addressing the crisis.
- Restoration of peace, post-conflict settlement.¹⁴

Following Gerasimov's work, several Russian military experts have discussed this new type of warfare. Among them is the work of Sergei Chekinov and Sergei Bogdanov, who examined the subject in greater detail, supplementing and developing Gerasimov's ideas. The researchers emphasize the importance of using asymmetric procedures, political, economic, and information technology tools, and the need for these elements to operate within a coordinated, common leadership management system, which thus acts as a force multiplier.¹⁵

To further explore this topic, we need to examine the stages of Russian non-linear warfare, whose best description can be found in András Rác's work.¹⁶ Basically, full-spectrum hybrid warfare consists of three phases, each consisting of three sections:

Preparatory phase

The essence of this phase is for the attacker to map out the weaknesses and vulnerabilities of the target country, which he then exploits through operations. Open violence has not yet taken place, with priority being given to political, economic and diplomatic means. The preparatory phase consists of three sections:

- Strategic preparation.
- Political preparation.
- Operational preparation.

Attack phase

The most important difference from the previous phase is that by this time there has been open, organized violence in the targeted country. The procedures used here can be distinguished from the attacker's traditional diplomatic and foreign policy actions, which is not the case in the first phase. The takeover of media and civilian infrastructure is gradually taking place, in parallel with the attack on the military and law enforcement command and

¹⁴ Deák, A. „Az orosz katonai gondolkodás átalakulása a 21. században az Oroszországi Föderáció hidegháborút követő katonai doktrínáinak tükrében”. PhD Thesis. Budapest: National Public Services University, 2018. 160. based on Figure

¹⁵ Rác. *Russia's Hybrid War in Ukraine...* 37.

¹⁶ Rác. *Russia's Hybrid War in Ukraine...* 57–70.

control systems of the targeted state. At this stage, it is important that regular forces (other than the special forces) are not yet active, but instead support operations as a deterrent force, generally outside the state border. On the international stage the attacker continues to deny its involvement in the conflict, thus maintaining the possibility of withdrawing its forces if the conflict escalates in the wrong direction. When central power is no longer able to maintain control of the state, communication and leadership systems are broken, the attacker offers society an alternative in the form of a force that is independent of the government. There are three sections of the offensive phase:

- Exacerbating the tensions.
- Ousting the central power from the target region.
- Establishing alternative political power.

Stabilization phase

The essence of the stabilization phase is that the situation at the end of the previous phase will be further consolidated by the attacker, legitimizing the power of the separatist forces and, if necessary, separating the area from the target country through the employment of regular forces and openly executed conventional operations. This phase may change significantly in order to achieve the strategic goal set previously. There are three sections of the stabilization phase:

- Political stabilization of the outcome.
- Separation of the captured territory from the targeted country.
- Lasting limitation of the strategic freedom of movement of the targeted country.

It can be seen that there is a considerable debate on hybrid warfare in the research community, particularly in terms of its name and precise definition. However, in terms of implementation, we can speak of a standardized procedure in the literature that provides an appropriate framework for analysing the central topic of the study.

CASE STUDY: UKRAINE 2014

Hybrid warfare elements have already appeared in some conflicts, such as the first war between India and Pakistan in 1947–48, or even in the Gulf Wars, but the best-known example of full-scale hybrid warfare is Russia's war in Ukraine in 2014. The Russian forces were the first to carry out operations in Crimea, the final outcome of which was the annexation of the area, or more precisely the "reannexation". Then they sought to achieve the same effect in the Russian-majority areas of eastern Ukraine (Donetsk and Luhansk), but by that time the Ukrainian leadership was able to resist effectively. The conflict here has not been resolved since then, and it is likely that it will become a frozen conflict in the not too distant future. Due to the limitations of space, I cannot make an in-depth analysis, therefore I focus on the most important events and the situation and tasks of the law enforcement agencies. I carry out the analysis based on the hybrid model discussed in the previous chapter.

We need to go back to autumn 2013 to investigate the events in Ukraine. The country's then-president, Viktor Yanukovich, had been pursuing a pro-Russian policy over the previous three years, seeking to build a strong presidential power. In November 2013, Yanukovich rejected an agreement on an accession treaty with the European Union, which quickly escalated into a wave of demonstrations in Kiev. This series of riots, which almost drove the country into civil war, later became known as Euromaidan. It is difficult to say

whether the events of Euromaidan were part of the Russian strategy. According to the hybrid warfare model, these events were still in the preparatory phase. Russia's goal was to make Ukraine a "buffer" which would not commit itself to the West and would eventually join the "Eurasian Union" advocated by Russian President Vladimir Putin.¹⁷ For Russia, Yanukovich's policy proved to be the perfect tool. As the methods used at this stage of hybrid warfare are difficult to distinguish from the general foreign policy and diplomatic methods used at any given time, it is difficult to judge the depth and exact timing of the preparation of the Russian Federation. Euromaidan also came as a surprise to the Russian leadership, but they made a correct assessment of the situation and were able to exploit it to recapture Crimea and then eastern Ukraine.

Before examining the role of law enforcement forces in key events, it is useful to outline their key features before the crisis. After the dissolution of the Soviet Union, Ukrainian internal affairs did not go through a process of modernisation. Until the 2014 conflicts, police remained unchanged despite attempts at reform. In this sense, we are talking about a deeply politicized organization built around a military structure whose primary task was to execute the directives, and protect those in power. The entire organization was permeated by corruption, which affected not only the traffic police, public order and criminal organizations, but also the senior leadership. Ministry of the Interior Affairs (MIA) and police leaders amassed huge fortunes from the money they received. At the executive level, police often achieved their goals through forced confessions, physical abuse, and crimes. All this was due to the lack of public control over the law enforcement agencies. As a result, the social support of the police was minimal before the crisis.¹⁸

The police officers responsible for general policing were unable to curb or control the events in Euromaidan, so they had a marginal role in hybrid warfare. However, we need to look at the Berkut,¹⁹ a law enforcement organization that played a cardinal role in the process. This unit was the best-trained and prepared riot police organization in the post-Soviet region. The 20-thousand strong (prior to 2014) unit's official duties included protecting public security, fighting organized crime, and providing riot police tasks. However, Berkut was the most politicized organization in the Ukrainian interior affairs system, with loyalty primarily to President Yanukovich. During the Euromaidan events, Berkut was responsible for the deaths of several people as, unlike before, the riot police fired into the crowd.²⁰ Thus, even before the crisis, the police were not in a position to curb such a series of protests and to develop effective resistance in the subsequent hybrid war. Moreover, it is relevant that the MIA's elite unit was closer to the President, thus indirectly to Russian interests than to the Ukrainian people.

Between January and February 2014, the situation escalated further. The protesters wanted to remove the president and demanded a return to the 2004 constitution, in which the executive power was much more limited. Hundreds of people lost their lives during the events. On 21st February 2014, a change of power took place and Oleksandr Turchinov became

¹⁷ Tálas P. "Három évvel az ukrajnai hatalomátvétel után". *Nemzet és Biztonság* 10/1. 2017. 66.

¹⁸ Marat, E. "Ukraine's Public Enemy Number One: The Police". *Foreign Policy*, 24 January 2014. <https://foreignpolicy.com/2014/01/24/ukraines-public-enemy-number-one-the-police/>, Accessed on 27 December 2019.

¹⁹ Бєпкyт – meaning Eagle, in the case of the organization, Golden Eagle.

²⁰ "Ólomsörétes löszérrel lőtték a tüntetőket a kijeji Majdanon". Origo, 4 October 2016. <https://www.origo.hu/nagyvilag/20161004-olomsorotes-loszerrel-lottek-a-tuntetoket-a-kijeji-majdanon-ismerte-el-aegy-ukran-rohamrendor.html>, Accessed on 27 December 2019.

Ukraine's acting head of state. On 23rd February, Yanukovych's situation became untenable and the president escaped to Russia from the demonstrations, and talked with Putin about a Russian intervention. Four days after assuming power, the new Ukrainian leadership dismantled Berkut for its actions during Euromaidan. The organization's duties have been taken over by the re-established Ukrainian National Guard on 13th March.²¹

At the time of the events in Euromaidan, the Kiev government was supported by the Crimean Autonomous Parliament. The Russian-majority population in Crimea also sympathized with Yanukovych and agreed with the withdrawal from the EU accession treaty.²² Putin issued an order to occupy Crimea on 20th February, prior to the Ukrainian takeover, thus bringing hybrid warfare into the attack phase. Russian troops first appeared in the operational area on 27th February, though their nationality could not be established at that time, as they arrived in Crimea without any identification patches or flags. Only soldiers referred to as "polite, green men" in the media later turned out to belong to Russian special forces. Conventional forces did not cross the border, but Moscow continued to conduct military exercises along it, also forcing the Ukrainian leadership and the international community to refrain from intervening. Law enforcement agencies were unable to intervene, and Berkut's Crimean units, as well as many pro-Russian police and soldiers, changed sides, and confronted the Ukrainian central government. Subsequently, the former riot police became part of the Russian law enforcement organization. The Russian Armed Forces occupied the Crimean Parliament and the regional government. Thereafter, a referendum (considered anti-democratic by the international community and recognized only by Russia) was held, followed by a declaration of independence. To close the attack phase, the new Crimean leadership sought admission to the Russian Federation on 17th March. The remaining Ukrainian forces were taken prisoner by the Russians without firing a shot. They were repatriated to Ukraine, but some units, like the Berkut, switched to the new leadership. These events were already part of the stabilization phase. Russia has annexed Crimea in a matter of weeks, without any real military action and serious Ukrainian countermeasures.²³

Pro-Russian demonstrations had been taking place in eastern Ukraine since November 2013, but only after the change of government in February did Russia want to take advantage of the rapid success in Crimea and continue its hybrid operations in the Donetsk and Luhansk regions. Like in Crimea, Russian special forces, together with pro-Russian protesters, carried out the primary actions. The seizures of public buildings began on 6th April 2014, and the Ukrainian administration and the law enforcement agencies collapsed in accordance with the timetable outlined above. By this time, however, the Ukrainian leadership had recovered, and launched regular counter-terrorist operations to fight the separatists. Like in Crimea, the Donetsk and Luhansk populations supported the Russian forces, but to a much lesser extent. Separatists eventually held a referendum in May (also considered illegitimate by the international community), and similarly to Crimea, Donetsk and Luhansk became an independent "people's republic." The conflict in eastern Ukraine has not been resolved since then, and despite repeated ceasefires, fighting between separatists and Ukrainian forces intensifies from time to time.

²¹ "Feloszlatták a Berkutot Ukrajnában". VS.hu. 26 February 2014. <https://vs.hu/kozelet/osszes/feloszlattak-a-berkutot-ukrajnaban-0226#!s0>, Accessed on 20 December 2019.

²² "Решение ВР АРК No. 1477-6/13 'О политической ситуации'". 27 November 2013. <https://web.archive.org/web/20140329215707/http://www.rada.crimea.ua/act/11433>, Accessed on 28 December 2019.

²³ Rácz, A. "Oroszország hibrid háborúja Ukrajnában", *KKI-tanulmányok* 1. 2014. 8.

To sum up the role of the police forces in the events in Ukraine: they were unable to perform their task properly either before the crisis or during its escalation. This was due to the extent of corruption, the embeddedness of politics, and the fact that the majority of law enforcement forces in the areas concerned had a pro-Russian mentality. Berkut, which was designed to curb the riots, also served the interests of the Russian Federation. The strongest evidence of this is that the whole organization was integrated into the Russian law enforcement system after the crisis.

THE ROLE OF THE LAW ENFORCEMENT IN DEFENCE AGAINST HYBRID WARFARE

When examining the role of law enforcement agencies in the fight against hybrid warfare, the first thing we need to do is to identify the difficulties that a country, or possibly the international community, is facing. The first of these difficulties is legal regulation, both in the domestic and international legal environments. Part of the research community believes that the hybrid attacker is looking for a legal loophole in international law, the so-called legal “grey zone,” whereby he seeks to create a legal asymmetry so that his actions are not accountable by international law. In response, several international organizations have stated that existing international legal standards are applicable to the attacking party. NATO members stated in the final statement of the Warsaw Summit in 2017 that any hybrid attack on any NATO member state would be considered as an attack on the entire Alliance and would be subject to the principles of collective defence. This idea was also taken up by Council of Europe, in Resolution 2217.²⁴ Also, the right to self-defence enshrined in Article 51 of the UN Charter is applicable to the member states of the United Nations (UN) in the event of a hybrid war.²⁵ The problem lies in the fact that it is very difficult to detect a hybrid attack because, as I have shown in the model, the tools used during the preparatory phase are difficult to distinguish from the diplomatic and foreign policy tools used in peacetime. The challenged state must have accurate and reliable evidence of a hybrid attack before it directs the conflict to the international stage.

This kind of confusion may also appear in domestic law, which can have a major impact on the work of law enforcement agencies and thus on the fight against hybrid warfare. Clarifying the scope for action against violent demonstrations can be critical, and countermeasures against hate speech should be reviewed. It may also be important to review and supplement certain special legal situations, because if the government of a state under attack fails to recognize a hybrid challenge in time, it is likely that certain acts will take place under the peacetime legal regime, during which the use of military forces is either severely curtailed or against the law. The first priority is that the legal options for defence against hybrid warfare need to be created well in advance, because their absence, even in the preparatory phase of an attack, can cause difficulties in organizing the countermeasures.²⁶

²⁴ Sari, A. “The Council of Europe’s Parliamentary Assembly Takes on the Legal Challenges of Hybrid Warfare”. *Lawfare*, 23 May 2018. <https://www.lawfareblog.com/council-europes-parliamentary-assembly-takes-legal-challenges-hybrid-warfare>, Accessed on 27 December 2019.

²⁵ “UN Charter”. United Nations. 26 June 1945. <https://www.un.org/en/sections/un-charter/un-charter-full-text/>, Accessed on 20 November 2019.

²⁶ Rácz, A. “A hibrid hadviselés és az ellene való védekezés lehetőségei”. *Seregszemle* XIV/2. 2016. 13.

The next building block of defence is the fight against corruption. The actions must be systemic and effective. As we have seen in the case of Ukraine, organizations deeply infected with corruption may be ideal for a hybrid attacker. The elimination of corruption should extend to law enforcement agencies as well as military and intelligence agencies. Corruption has its physical and psychological components, but its impact is in four key areas that may be present in the state, including law enforcement. The first of these is the permissive effect, whereby corruption is what creates the ability to use other hybrid tools. Corruption allows an attacker to gain access to sensitive information, state secrets, extort defence documents, open “back doors,” and disable political opponents. The second area is the widening effect, whereby institutional corruption exacerbates existing weaknesses and deepen fissures. The third and most important area is the destructive effect. Corruption can undermine confidence in democratic institutions, leading to further weaknesses, the exploitation of which is the primary objective of the attacker. Finally, corruption can have a diversionary effect as it can distract attention from other actions of the hybrid attacking party and even divert resources from other important areas of defence.²⁷

The next area is intelligence and counter-intelligence. This concerns both intelligence agencies and the criminal intelligence activities of law enforcement organizations. The most important element of defence against hybrid warfare is the earliest identification of the attacker’s procedures. This can only be achieved by properly resourced, legitimate, democratically controlled, politically neutral intelligence, counter-intelligence and criminal intelligence organizations.²⁸ It should be noted that surveillance of own citizens is always a sensitive political and legal issue. Democratic states have to have severe regulations about these kinds of activities. The key to effective action depends on obtaining information and disseminating it to other competent authorities, for which a high level of intelligence work is essential.

Another important element of defence is that the law enforcement agency itself must be professionally trained and prepared. Not only against hybrid threats but also in terms of general policing. The organizational structure should reflect the differentiation between units designated for public security, criminal tasks and specialized police (counterterrorism, riot police) tasks. While the first two require a more service-type police, special tasks are best assigned to a paramilitary-type force. It is also important that civilian control over the law enforcement agencies be enforced and that the state acts firmly against any abuse. This will increase the societal appreciation of the police and other law enforcement agencies and create a bond of trust between citizens and police, which will harmoniously increase the state’s resistance to hybrid warfare.²⁹

Law enforcement agencies are usually the first line of defence against a hybrid attacker, so it is imperative that they have effective capabilities. The most relevant of these are the competencies of the units performing special law enforcement tasks. The state needs effective riot police capabilities, as an integral element of hybrid warfare is dissatisfaction and incitement within the target country. An outbreak of riots may require effective legal action

²⁷ “‘A Deadlier Peril’: The Role of Corruption in Hybrid Warfare: Information Note”. MCDC Countering Hybrid Warfare Project. March 2019. https://cids.no/wp-content/uploads/2019/06/20190318-MCDC_CHW_Info_note_7.pdf, Accessed on 29 November 2019.

²⁸ Rácz. „A hibrid hadviselés...”. 13.

²⁹ Coffey, L. “How to Defeat Hybrid Warfare Before It Starts”. Defense One, 21 January 2019. <https://www.defenseone.com/ideas/2019/01/how-defeat-hybrid-warfare-it-starts/154296/>, Accessed on 5 December 2019.

against a violent mass, which may include the use of deadly force. In Ukraine, after the new government took over and dissolved Berkut, it lost this capability. As a result, occupying Crimea was a much easier task. Among the law enforcement capabilities, I highlight two areas, one is the fight against organized crime and the other is counter-terrorism. In the case of the former, criminal organizations can provide support to the attacking party's subversive, irregular, or special operations forces in the hope of financial gain, so their detection and containment is of paramount importance. Counter-terrorism capability is also a priority, as it is easy for an attacker to use violent non-state actors in hybrid operations that require the use of such forces. In the worst-case scenario, the defender's counter-terrorism units may be confronted by the attacker's special operations forces, which can lead to the escalation of violence.

One of the most important elements is to strengthen and, if necessary, redefine cooperation between professions in the field of defence. It is essential to build cooperation between law enforcement, military forces, and intelligence organizations based on genuine trust, information and knowledge sharing. To do this, new organizational cultures, learning methods, and collaboration channels need to be developed. Joint practices are also a crucial part of this kind of cooperation, where the participating organizations can learn about each other's procedures and methodologies.

Finally, good governance is the most important form of defence against hybrid warfare. This applies not only to law enforcement agencies but also to the state and society as a whole, the essence of which is to reduce the political, economic and social vulnerability to the enemy. The concept of good governance encompasses several areas that are the building blocks of a modern, democratic state, such as policies to reduce tensions, a credible, corruption-free political elite, transparent management of public funds, respect for minority rights, and freedom of the press.³⁰ Obviously, this is the hardest thing to do but if the public trusts the political system, these areas have a harmonized effect, which strengthens the state's resilience and reduces the likelihood of a hybrid attack.

CONCLUSIONS, SUGGESTIONS

My conclusions and suggestions regarding the law enforcement tasks in hybrid warfare are as follows:

- There is no internationally accepted definition of hybrid warfare. The research community is divided into several groups related to the study of the phenomenon. In the practical application of this new warfare and its theoretical foundations, there is a link between the work of Russian military scientists and the activities of the Russian Federation.
- The conceptualization and application of military, non-military, irregular, and regular elements represent a new, integrated level of warfare. The simultaneous operational application of these forces, tools, and methods and procedures covers the complex concept of hybrid warfare. States, federations, and international organizations must be prepared in a harmonized manner to meet the increase of the number of non-linear (hybrid) conflicts and to authentically provide relevant domestic and law enforcement responses in a pre-existing, codified national and international legal environment.

³⁰ Rácz. „A hibrid hadviselés...” 12.

- In the Russian approach, asymmetric, indirect methods dominate in the early stages of non-linear (hybrid) warfare, with the use of paramilitary, civilian irregular forces. An essential element, parallel to the physical conflict, is the battle waged in the information space. This continues even after the threshold of war is reached and conventional (regular) forces are deployed.
- In Ukraine in 2014, Russia took advantage of the opportunity to conduct a full-spectrum hybrid warfare, which resulted in Crimea's becoming part of the Russian Federation again. Then it embarked on the same operation in eastern Ukraine, but the Ukrainian leadership's response prevented it from achieving its goal, creating a long, variable-intensity conflict. This frozen conflict is slowing Ukraine's Euro-Atlantic integration, which is in Russia's interest. During the crisis, law enforcement forces played a central role in the development of events.
- The tasks of the police forces are differentiated in the defence against hybrid warfare. With the right legal framework in place, the effectiveness of the fight against corruption, both in law enforcement institutions and in other areas of governance, is crucial. Civil control over the police, a bond of trust with society, and a structural separation of tasks are essential to a well-functioning organization, and thus a guarantee of action against a hybrid attack. The most important capabilities that law enforcement agencies need are: riot police, organized crime units, and counterterrorism.
- The key to defence against a hybrid attacker is good governance. Good governance encompasses several areas of democracies whose coexistence strengthens the enhancement of state resilience, which could be the strongest weapon against an attacking country.

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Col. Tibor Szilágyi¹

INTRODUCTION POSSIBILITIES OF INCREASED ENVIRONMENT PROTECTION ASPECTS IN THE DEVELOPMENT PROCESS OF ARMED FORCES – SECURITY, ENVIRONMENTAL SECURITY AND RESEARCH & DEVELOPMENT PERSPECTIVES

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ABSTRACT: The environmental security as a new and increasingly important dimension of security and the holistic approach relating to its handling are informing more and more the security-related thinking and activities of states, international stake holders and non-governmental organisations. It represents a special level of maturity and the increasing responsibility of human society when individuals and their groups of various size, perceiving the effects of the environment and human activities on each other, are eager to act in an organised and coordinated manner for stopping disadvantageous processes and eliminating the damage caused. The effects of environmental security on research, development, and innovation activities are increasing in proportion to the intensity of effects of environment and humans on each other. In case of militaries, those new or increasingly predominating environmental effects which influence the implementation of operations push the defence-related research, development, and innovation capacities of the defence sphere towards procedural, material, and technological reforms. The author's goal was to explore the relevant relations/connections between the environmental security trends and the contiguous capability development of armies.

KEYWORDS: security, environmental security, defence related research development and innovation

INTRODUCTION

Similarly to other organisations and stake holders in the defence arena the national armies cannot make themselves independent from regional and global civilization and natural processes and from their effects – like climate change, decreasing accessibility of potable water, degradation of arable areas, the acceleration of the increase of human population – which can fundamentally effect everyday life, the present and the scientifically forecastable future of societies.

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National armies, as special purpose subsystems of societies, gain their human resources and meet material needs as the results of reproduction and production capabilities of a given society. Although their societal roles and tasks are implemented through special organisational structures and by special equipment systems, procedures and methods, the armies bear the burdens together with other subsystems of society resulting from the above mentioned civilization and natural courses.

On the other hand, the societal subsystems not only suffer from the negative effects of the above civilization and natural processes but also – in different manner and degree – contribute to or directly create them. It is true for armies, as well.

The question arises if an army – having its own human resources, special equipment systems, special organisational structures and special knowledge base – is capable of contributing to those pan-societal requirements and needs to reduce locally, regionally, or even globally those negative effects of civilization and natural passages which hamper societies in prosperity and survival.

The answer to the above question lies in the expedient, timely, effective, moreover, successful development of renewal capabilities. The renewal and prosperity as goals and at the same time as means materialized in the triad of research development and innovation. Armies together with the whole society bear the burdens of the negative effects of civilization and natural processes while they actively act in order to prevent, to cease or to defend against the consequences of them. Their responses – armament development, elaboration and implementation of operational and material standards – are special in nature but at the same time they fit well to the system of responses and reactions given by the whole society.

GOALS

In order to explore if it is feasible to develop the national armies in a manner that military-technical requirements resulting in capabilities needed to implement the fundamental tasks of the armies are met, and at the same time developments and capabilities made can contribute to the improvement of environmental security, as a first step it is necessary to study the relevant trends and results achieved in the areas of security, environmental security, and defence/military related research development and innovation (R&D&I).

The primary goals of this paper are as follows:

- to explore the relevant relations/connections among the above science and research areas;
- to present a short summary of relations between environmental security and security policy, and environmental security and defence/military related R&D&I activities and trends;
- to give a conclusion of the above and a possible way ahead of the possible involvement of militaries in the management of environmental security-related issues.

The ensuing nature of legislation, the holistic and comprehensive approach to and the comprehension of the security in the post-Cold War era, and the ever rapidly changing speed of societal and technological innovation provide the framework for that interdisciplinary field, which gives space to the examination of a matrix which consists of security policy relations, defence/military related capability development and the environmental security. Each of the three components of the above matrix has an abundance of analysable source materials, there are lots of attempts to explore the interdependencies among them, having in mind the identified new tendencies in the global and regional security environment.

METHOD USED

After setting out the analytical framework – the matrix of three analysed components – the paper will examine the components one after the other. The main method used throughout this paper is content analysis. The author assumes that the comprehension of content and the conditions of creation of relevant texts sooner or later lead the researcher up to the recognition of those historical, technological and societal correlations which are important for drawing the proper lessons learned. This paper, mainly from a national perspective, but taking into consideration the determining foreign works, papers and courses of proceedings, as well, tends to explore the context among three unique areas, which at the same time have great influence on each other.

During the research period there was no primary data collection, the analysis based on secondary analysis of relevant books, independent studies, and political and legal documents mainly from the national and the determinative multinational arenas.

ENVIRONMENT AND SECURITY

– NATIONAL AND INTERNATIONAL PERSPECTIVES

The environmental security as a term and as one of the organic parts of comprehensive and overall security appeared in the think tanks of national and international security policy thinking at the end of the Cold War. Making environment and security connected – or using another approach, the securitization of environment – is considered as one of the most significant steps towards securitizing non-military issues. Forasmuch during the hottest times of the Cold War era it seemed unimaginable that security could have non-military dimensions, so it was really a big challenge to widen the scope of the interpretation of security.

One of the first influential pioneers of this paradigm changing is Barry Buzan who in his paper entitled *New Patterns of Global Security in the Twenty-First Century*² while analysing the changes in international relations – mainly between the Centre and the periphery and from the point of view of security – just after the end of the Cold war era gave the following definition of security: “Security is taken to be about the pursuit of freedom from the threat and the ability of states and societies to maintain their independent identity and their functional integrity against forces of change which they see as hostile.”³ Further analysing the main components of security (military, political, economic, societal) he also gave the definition of the then “brand new” component of security, the environmental security: “Environmental security concerns the maintenance of the local and the planetary biosphere as the essential support system on which all other human enterprises depend.”⁴ Buzan declared that the five factors above were the main focus points of ongoing discourses on security and while all of them could be analysed independently, there were strong interconnections, moreover, interdependencies among them. At the end of his paper Buzan jumped to the conclusion that although the majority of environmental issues doesn’t belong to the classical territory of security, the serious changes in global climate and their prompt harmful effects on the existence of human communities on one hand and the altering resilience

² Buzan, B. “New Patterns of Global Security in the Twenty-First Century”. *International Affairs* 67/3. 1991. 431–451.

³ Buzan. „New Patterns of Global Security in the Twenty-First Century”. 432.

⁴ Buzan. „New Patterns of Global Security in the Twenty-First Century”. 433.

capacities and capabilities of states, regions, and local entities on the other hand would soon lead to the conclusion of capable governmental and non-governmental organisations that the potential cross-border humanitarian tensions and crises resulting from climate change could be handled by the classical politico-security set of tools.

Decades after the first steps in the securitization of environment-related issues, in a more mature theoretic milieu Roland Dannreuther in his book entitled *Nemzetközi Biztonság (International Security)*⁵ dedicates a separate chapter to backing up with arguments that the usage of the term “environmental security” is necessary and useful since it draws attention to the fragile but important nature of the connection among human beings and environment. He points out that although environmental challenges are different in nature compared to traditional security ones, at the same time – since more and more politically dominated nowadays – they can easily result in the traditional response to a security threat, namely the engagement of armed forces (*environment shortages – violent conflicts*). Dannreuther emphasises that it is necessary to distinguish between the handling of local, regional, or global problems. He stresses on – using the examples of water security and oil security to clearly demonstrate – that parties involved – societal groups, rival elites and states themselves – do not shrink back from the employment of violence in order to obtain resources and/or to assure the security of supply. On the other hand, the author points out that to solve regional or even global environmental security related issues it is more common to use cooperation via international organisations rather than open confrontation.⁶

With a well-established theoretic foundation available and having the pressing impacts of the climate change in each inhabited area of the world, the urgent environment-related topics requiring prompt solutions begin to appear increasingly on the agendas of national, intergovernmental, non-governmental, and supranational organisations and their specialized bodies.

The *2010 Strategic Concept of NATO*,⁷ which has still been effective for more than a decade, analyses the environmental issues mainly from operational and planning perspective. It was established that “Key environmental and resource constraints, [...] will further shape the future security environment in areas of concern to NATO and have the potential to significantly affect NATO planning and operations.”⁸ Among others, the document puts special emphasis on energy security which is closely connected to environmental issues, such as carbon-dioxide emission of military installations and equipment, and availability of renewable energy resources. On the other hand, via crisis prevention and crisis management operations – in order to prevent potential and high scale inland/cross border humanitarian catastrophes using methods and capabilities typical for military – the politico-military organisation as a whole and the allies individually could be highly involved in resolving situations resulting from harmful changes in the environment.

⁵ Dannreuther, R. *Nemzetközi biztonság [International Security]*. Budapest: Antall József Tudásközpont, 2016. 165–189.

⁶ Dannreuther. *Nemzetközi biztonság*. 190–208.

⁷ “Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organisation”. NATO. 2010. <http://www.nato.int/lisbon2010/strategic-concept-2010-eng.pdf>, Accessed on 11 December 2020.

⁸ “Strategic Concept...”. 15.

In its forward looking final report entitled *NATO 2030: United for a New Era*⁹ the independent Reflection Group, appointed by the Secretary General of NATO, assessed the main trends and their impacts that will likely have formed the operational environment of NATO as a whole by 2030. One of the main findings of the report is about climate change. It declares that “Climate change will continue to shape NATO’s security environment. [...] It should build on efforts to include climate and other non-military threats [...] in NATO planning on resilience and crisis management [...]”¹⁰ Among its recommendations the document emphasises that “NATO should monitor and assess the impact of climate change on security in the forthcoming decade and increase its situational awareness of threats [...]”¹¹ The general climate related findings and the resulting recommendations of the report – mainly ones which have direct influences on littoral operations – are in line with the relevant findings (sea-level rise, melting of arctic ice, frequency of extreme weather phenomena, etc.) of the *State of the Global Climate 2020*,¹² a provisional report of the World Meteorological Organisation.

The high profile importance and currency of the climate related security issues are very much reflected by the *Brussels Summit Communiqué*,¹³ issued by the heads of state and government during the June 2021 NATO Summit. In paragraph 58 of the document the leaders declare that “Climate change is one of the defining challenges of our times.”¹⁴ During the summit the leaders endorsed the Action Plan to NATO Agenda on Climate Change and Security by which the Alliance will increase its efforts to adapt to the changing climatic conditions. In order to adapt to the changes in climate NATO intends to fully take into account climatic related considerations when conducting defence planning, capability development, and exercise related work.

In its 2008 report entitled *Report on the Implementation of the European Security Strategy*¹⁵ (ESS) the Council of the European Union mentions energy security and climate change among the global challenges and major threats. As far as energy security is concerned, it states that since the publication of ESS during the past years the energy dependency has increased. The amount of oil and natural gas exploited by the EU member states reduced which will result in the fact that by 2030, 75% of the oil and natural gas used by the EU will be imported. The import comes from a limited number of countries and a lot of them face stability threats. So the EU will face several challenges which are different in nature and require the solidarity of member states and the responsible participation of them in the solution of problems. Regarding the climate change, the report states that it is a threat

⁹ “NATO 2030: United for a New Era: analysis and recommendations of the Reflection Group appointed by the NATO Secretary General”. 25 November 2020. https://www.nato.int/nato_static_fl2014/assets/pdf/2020/12/pdf/201201-Reflection-Group-Final-Report-Uni.pdf, Accessed on 18 January 2021.

¹⁰ „NATO 2030”. 14.

¹¹ „NATO 2030”. 42.

¹² “State of the Global Climate 2020: Provisional Report”. World Meteorological Organisation. 2020. https://www.brawsassets.panda.org/downloads/final_state_of_the_global_climate_2020___provisional_report.pdf, Accessed on 11 December 2020.

¹³ “Brussels Summit Communiqué”. NATO. 14 June 2021. https://www.nato.int/cps/en/natohq/news_185000.htm, Accessed on 21 June 2021.

¹⁴ „Brussels Summit Communiqué”. 19.

¹⁵ “Report on the implementation of the European Security Strategy: Providing Security in a Changing World”. In *European Security Strategy: a Secure Europe in a Better World*. Brussels: Council of the European Union, 2009. 7–26. DOI: 10.2860/1402

multiplier. Natural disasters, the damage of environment, the struggle for resources increase the chance of possible conflicts, especially in those circumstances where poverty and the growth of population are resulted in humanitarian health, political and security consequences, including the increasing migration, as well.

A barely timely but a really European reaction to the phenomena of our ever changing 21st century's natural, societal, economic, and security environment was the *EU Global Strategy*¹⁶ in 2016. The standing ambition of the document is to give a vision for a stronger Union. Due to its nature, the strategy needs periodic reviewing by all the relevant stakeholders and cooperative bodies/organisations. The document itself has a very strong societal, economic, and development focus by nature but at the same time (pro)actively reacts to security related issues as well. It lays stress upon enhancing energy and environmental resilience. In order to join the environmental security discourse it declares: "Climate change and environmental degradation exacerbate potential conflict, in light of their impact on desertification, land degradation, water and food scarcity."¹⁷ It also calls for harmonized EU-level and regional cooperation among willing member states in order to utilise the limited human and financial resources more effectively on one hand, and to develop and devise sustainable answers to the challenges emerge in the neighbourhood of the Union on the other hand.

By issuing *The World Climate and Security Report 2021*¹⁸ of the International Military Council on Climate and Security (IMCCS)¹⁹ the main goal was to inform the decision makers about those climate security practices and tools which try to address effectively the climate related security issues and phenomena. Through surveys, case studies, and risk analysis the report presents relevant lessons learned and recommend tool sets in order to prepare the relevant stakeholders to make the necessary steps in a timely manner to address effectively the regional and global climate-related security issues. Just to reference back to the above presented European Union's measures introduced to establish the regulatory, financial, and capability bases of handling the climate-related societal, economic, and security issues that emerged along the European borders, the IMCCS's report accordingly points out the climate related risks (climate hotspots around Europe, migration, energy transition, etc.) for Europe, and presents a comprehensive roadmap to handle them in short, medium, and long terms.²⁰

The *National Security Strategy of Hungary "Secure Hungary in a Changing World"*²¹ (NSS) came into effect on 21 April 2020 replaced the former – and outworn – one which had been created in 2012. In its Introduction, the document stresses that "Since publication of the National Security Strategy of Hungary in 2012 the global security environment

¹⁶ "Shared Vision, Common Action: A Stronger Europe: A Global Strategy for the European Union's Foreign and Security Policy". June 2016. https://eeas.europa.eu/archives/docs/top_stories/pdf/eugs_review_web.pdf, Accessed on 8 October 2020.

¹⁷ "Shared Vision, Common Action". 27.

¹⁸ "The World Climate and Security Report 2021". Center for Climate and Security. 2021. <https://imccs.org/wp-content/uploads/2021/06/World-Climate-and-Security-Report-2021.pdf>, Accessed on 24 June 2021.

¹⁹ International Military Council on Climate and Security (IMCCS) is a group of military leaders, security experts and security institutions dedicated to analysing the security risk of a climate change.

²⁰ „The World Climate and Security Report 2021”. 54–65.

²¹ 1163/2020. (IV. 21.) Korm. határozat Magyarország Nemzeti Biztonsági Stratégiájáról [Government Decree no. 1163/2020. (IV. 21.) on the National Security Strategy of Hungary].

has gone through fundamental changes. Those processes extremely appraise the necessity of security related thinking and the identification of answers to new challenges raised.”²² It emphasises that “One of the most determining specifications of processes having influence on security is that their formation development and influence are very hard to predict which results in a growing uncertainty.”²³ Among national conditions the NSS expresses the importance of agriculture as the foundation of food production and the reserves of drinking water, it points out the relation between the geographical location of Hungary and the environmental damage taking place in the neighbouring countries. Presenting the security environment of Hungary the document emphasises that “the rivalry among powers expands more and more on global common goods: there are increasing struggles in progress for the control of [...] international waters and the resources to be found there”.²⁴ It points out that “the scantiness of the most important goods necessary for existence even in short or middle term could be resulted in significant conflicts among or within states. The more and more growing requirement for natural resources involves heavy environmental damages, increasing exhaustion and deterioration of reach of resources which could lead to further tensions. The sustainability of development, the assurance of the stability of societies together with the achievable results cause ever-growing difficulties.”²⁵ Based on the above it can be stated that the current NSS attaches high importance to the relations of security resulting from the interactions between humans and environment, it considers the environmental resources as values and fundamentals, at the same time it points out that vital resources could be limited sometimes, so they are as of critical importance for the progress of the society.

Based on and in accordance with NSS the just issued *National Military Strategy of Hungary*²⁶ (NMS) emphasises that it is necessary to strengthen the national resilience capabilities, and as part of the pan-governmental efforts, the Hungarian Defence Forces mainly by their wide-ranging logistics infrastructure and capabilities have to be prepared to take part in operations in the territory of Hungary to manage the consequences of subsequent natural catastrophes relating to the climate change.

Tyler H. Lippert in his PhD thesis entitled *NATO Climate Change and International Security*²⁷ recommends a look-ahead analysis to NATO, where he points out the probability of security consequences stemming from climate change. He states that the environmental changes triggered by the climate change threaten with high probability all the factors of security, undermine the quality of life, increase migration, could result in political instability, and weaken the resistance of states and those capabilities of states as well by which they can handle effectively the emerging problems. Lippert emphasises that while not all the effects and consequences are known so far one can be afraid of the possibility that the unfavourable changes that may happen in the environment during the 21st century could result in considerable instability, and international organisations like NATO have to have

²² 1163/2020. (IV. 21.) Korm. határozat. Section 1.

²³ 1163/2020. (IV. 21.) Korm. határozat. Section 2.

²⁴ 1163/2020. (IV. 21.) Korm. határozat. Section 48.

²⁵ 1163/2020. (IV. 21.) Korm. határozat. Section 61.

²⁶ 1393/2021. (VI. 24.) Korm. határozat Magyarország Nemzeti Katonai Stratégiájáról [Government Decree no. 1393/2021. (VI. 24.) on the National Military Strategy of Hungary].

²⁷ Lippert, T. H. “NATO, Climate Change and International Security: a risk governance approach”. Dissertation presented in October 2016 in partial fulfilment of the requirements of the doctoral degree on public policy analysis. RAND PARDEE Graduate School, 2016. DOI: 10.7249/RGSD387

inevitable roles to handle it. He states, although the capabilities of NATO are convincing it is of high importance to improve its policies and capabilities suitable for handling the risks of environmental security effectively.

The International Peace Bureau, the oldest international peace association of the world, in its information sheet in 2002, entitled *The Military's Impact on the Environment: A Neglected Aspect of the Sustainable Development Debate*²⁸ stated that the stresses caused by military activities in the environment were not emphasised enough so far. The ongoing international brainstorming on the sustainable development resulted in excellent occasions to present the military dimension. It pointed out that while military activities caused imbalance in several areas (environmental stress) of the physical environment, the contribution to the general damage of the environment did not receive enough attention. The reason behind was that states applied double standards: it was not their intention to make the military transparent and accountable in areas where the control of state organisations and that of civil society was realised.

ENVIRONMENTAL SECURITY

In order to fully understand the importance of environmental security as one of the elements of the overall security on one hand, and the reason and the exact period of time when the conceptual integration took place, it is necessary to clarify the evolution of the environmental security as a term, with regard to the development of the related theories since the end of the Cold War: practically during the last little more than three decades.

László Halász and László Földi in their university textbook entitled *Környezetbiztonság*²⁹ (*Environmental security*) clearly describe the evolution and the content of the term environmental security. According to it, from the general meaning of security – the lack of danger, or the knowledge that one has all the necessary defence capabilities against threats – through a precise list of aspects of security while reaching the requirement when the analysis of interactions among human groups, communities, and the natural and man-made environment, the gradual comprehension of casual relations and finally the recognition of the possible consequences that made it necessary to create the term of environmental security. The authors proceeded cautiously during the creation and introduction of the term, inasmuch as they paid very much attention to the presentation of the environment content (environment protection and nature protection) and the presentation of the process when the actors of the international professional and political community reached the recognition that the environment and the effects coming from it are significant elements of security.

The information sheet of the International Peace Bureau³⁰ presents thematically the effects of military activities on environment – peace time pollution of air, soil and water; immediate and enduring effects of armed conflicts (nuclear explosion, the lack of anti-mining activities in agricultural areas in Africa and Asia, the backwardness of disposal of

²⁸ Hay-Edie, D. et al. "The Military's Impact on the Environment: A Neglected Aspect of the Sustainable Development Debate: a Briefing Paper for States and Non-Governmental Organizations". Geneva: International Peace Bureau, 2002. 1–2. <http://www.ipb.org/wp-content/uploads/2017/03/briefing-paper.pdf>, Accessed on 8 October 2020.

²⁹ Halász L. and Földi L. *Környezetbiztonság* [Environmental security]. Budapest: Nemzeti Közszerzői Egyetem Hadtudományi és Honvédtiszt Képző Kar, 2014.

³⁰ Hay-Edie et al. "The Military's Impact on the Environment". 3–7.

unexploded military ordnance; chemical agents and burning oil wells alongside the Persian Gulf area; the immediate and enduring effects of the deployment of weapons of mass destruction; militarization of space; the effects of military installations (barracks, airfields, shooting and drill grounds) on the environment and on the quality of life of people living in the surrounding settlements.

The principle of sustainable development – a concept introduced by the World Commission on Environment and Development in 1987, with the so called *Brundtland Report*³¹ – points out the special connections among environment, security, and the evolution of human society which – preserving the opportunity of development – represents environmental security substantially and in a wider meaning.

The United Nations' resolution, widely known as *Sustainable Development Goals of the United Nations*³² (UN), set its overall goal as “We are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path.”³³ The ambition of this high priority document is to provide a framework of 17 Sustainable Development Goals (SDG) and 169 targets by which in a 15-year timescale the international community can trigger suitable and tailored actions in order to achieve the overall goal set out. In its Preamble the document declares that the parties “are determined to protect the planet from degradation [...] and taking actions on climate change, so that it can support the needs of present and future generations.”³⁴ Later on in the vision part it adumbrates a future where “[...] envisage a world in which consumption and production patterns and use of all natural resources [...] are sustainable.”³⁵ From the 17 SDGs Goal 13 deals with “[...] action to combat climate change and its impacts”.³⁶

The European Union in its *EU Global Strategy of 2016* takes the responsibility to set an example to carry out commitments on sustainable development and climate change. It declares clear commitments on increasing the necessary financial resources and on creating/modifying the regulatory bases in order to implement the Sustainable Development Goals of the United Nations.³⁷

György Seres in his essay entitled *Fenntartható fejlődés – fenntartható nemzetvédelem*³⁸ (*Sustainable Development – Sustainable National Defence*) gives a special interpretation of the connections among environment, security and national defence. Putting humans in the very centre and having the correlation between support and jeopardy, the author examines the interactions by the societal environment, the economic environment and natural environment on each other and on human beings. After systematically analysing the correlation

³¹ “Report of the World Commission on Environment and Development: Our Common Future”. United Nations. 1987. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>, Accessed on 24 February 2021.

³² “A/RES/70/1: Transforming our world: the 2030 Agenda for Sustainable Development”. United Nations. 2015. https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E, Accessed on 24 February 2021.

³³ “A/RES/70/1”. 1.

³⁴ “A/RES/70/1”. 2.

³⁵ “A/RES/70/1”. 4.

³⁶ “A/RES/70/1”. 14.

³⁷ “Shared Vision, Common Action”. 40.

³⁸ Seres, Gy. „Fenntartható fejlődés – fenntartható nemzetvédelem [Sustainable Development – Sustainable National Defence]”. *Hadmérnök* V/4. 2010. 322–339. http://www.hadmernok.hu/2010_4_seres.php, Accessed on 24 July 2020.

giving the title of the essay the author made an attempt to create a working definition, and says: [*the sustainable national defence is*] “The establishment of a national defence system proportional to threats without provoking increased threatening, and without damaging the economic, social and natural environment, without the prevention of the evolution of the sustainable development.”³⁹

The narrowly interpreted term of environmental security means the strained access to resources which in a consequence of endangering the sustainable development can be resulted in conflicts. The scarcity of natural resources, the inability to access limited or non-exploitable (or exploitable but only in a non-economic way) resources at the level of a given technological development, and all the human activities aimed at obtaining them, which by nature represent environment damage, do not recognise state borders and could be a reason of interstate conflicts. The limited access to or the scarce resources have consequences for the effective and efficient operation of militaries, which – by nature are energy- and technology-sensitive systems – even in the last century were accepted as the traditional means to settle interstate conflicts.

*Decree 1/2014. (I. 3.) of the Hungarian Parliament on the National Development 2030 – National Development and Regional Development Concept*⁴⁰ (Decree I.) states, “[...] in order to fulfil the goals and priorities of the national development and regional development policy the Concept formulates horizontal considerations on one hand, which are represented in comprehensive economic, environment, and societal considerations, which must be enforced throughout the whole regional development, program planning, and implementation process [...]”.⁴¹ Such horizontal considerations determined by Decree I. are the sustainable development – sustainable increase among the principles of resource consumption, the quality-quantity preservation of natural resources, and the preservation and improvement of the natural conditions and values. The Concept determines four long-term comprehensive development goals by 2030 and one of them is the “sustainable consumption of natural resources, preservation of our values, and protection of our environment”.⁴² In order to fulfil the comprehensive development goals the Concept determines thirteen specific goals and within them seven intersectoral policy goals. One of the policy goals is the “preservation and sustainable consumption of strategic resources, the protection of our environment”.⁴³

Decree I. determines the elaboration of policies for the different sectors in order to enable them to fulfil all the provisions of the Concept.

*Decree 27/2015. (VI. 17.) of the Hungarian Parliament on the National Environment Protection Programme for the period of 2015–2020*⁴⁴ (Decree II.) comprises the comprehensive framework of the environment policy goals and measures of Hungary for the related time period. Decree II determines the Hungarian environment protection goals, the necessary tasks and resources to achieve them, paying attention to the capacities of the country, the in-

³⁹ Seres. „Fenntartható fejlődés – fenntartható nemzetvédelem”. 326.

⁴⁰ 1/2014. (I. 3.) OGY határozat a Nemzeti Fejlesztés 2030 – Országos Fejlesztési és Területfejlesztési Koncepcióról [Parliament Decree no. 1/2014. (I. 3.) on the National Development 2030 – National Development and Regional Development Concept].

⁴¹ 1/2014. (I. 3.) OGY határozat. Section 3.

⁴² 1/2014. (I. 3.) OGY határozat. Section 4. c)

⁴³ 1/2014. (I. 3.) OGY határozat. Section 5. ag)

⁴⁴ 27/2015. (VI. 17.) OGY határozat a 2015–2020 közötti időszakra szóló Nemzeti Környezetvédelmi Programról [Parliament Decree no. 27/2015. (VI. 17.) on the National Environment Protection Programme for the period of 2015–2020].

terest and development of society, and the international responsibilities. Within the predictions determining the operation and development of the Hungarian Defence Forces (HDF) for a long time it states “[...] there could be problems resulting from the consequences of global warming which could manifest themselves in increasingly powerful struggles for natural resources, increasing migration, and strengthening inclination to violence [...]”.⁴⁵

Regarding the environment as a strategic influencing aspect the analysis states that from the perspective of defence and security the protection and sustainment of environment are of critical importance. Radical intervention in environmental processes may lead to troubles in societal courses, the use of chemical agents as weapons or in weapons makes vast territories uninhabitable and wasteland. The long term thinking about the environment (urban areas, space, sea, land, air), including living nature as well, is an important aspect of weapon planning and training. It declares, that during the forthcoming decades the climate change will result in a considerable disintegration force thus it may lead to conflicts.

The disturbances in food supply, the increasing lack of potable water, the reduction of biological diversity, the competition for minerals and energy sources will challenge the global cooperation system and the balance of power. The climate change and the rising sea level threaten both individuals and population living on coastlines, resulting in extensive and massive waves of migration and threaten the survivability of whole societies.

Imre Dobos, Tünde Tátrai, Gyöngyi Vörösmarty in their working paper entitled *Fenntartható beszerzés*⁴⁶ (*Sustainable Procurement*) analyse the consequences and effects of sustainability-related decisions made by companies on procurement procedures and on the networks of their suppliers.

During the interpretation of the term of sustainability nowadays we focus on sustainable development, societal responsibility, and nature protection, so those processes are worth examining as well, whose purposes are to meet the requirements and needs of society on one hand, and to realise and support the goals of the above substantial elements on the other hand.

Procurement is a system of tasks and processes whose primary goal is to support large administrative and production units to acquire the required stuffs and services on a societal scale according to strict regulations of related laws and rules. Since the decision-making is generally dominated by rational arguments,⁴⁷ one can raise the question if the procurement related decision-making procedures of the military are dominated by the same rational arguments as in the case of civilian companies. The answer can be complex, due to the special goals, equipment, and “product” (sc. security), but at the same time there are several points and arguments which during the decision-making process made by the actors of either the civilian or the military side – paying special attention to the three above mentioned

⁴⁵ 27/2015. (VI. 17.) OGY határozat. Section 2.3.

⁴⁶ Dobos, I., Tátrai T. and Vörösmarty Gy. „Fenntartható beszerzés [Sustainable Procurement]”. Corvinus University of Budapest, Faculty of Economy Science, 2010. <http://unipub.lib.uni-corvinus.hu/151/1/Vorosmarty-DobosTatrai117.pdf>, Accessed on 8 October 2020.

⁴⁷ Dobos, Tátrai and Vörösmarty. „Fenntartható beszerzés”. 3.

elements of sustainability – are considered, as well. The issue of green procurement can be such an argument,⁴⁸ which has a great importance for sustainable development.

The analysis of sustainable procurement points out the innovation potential, which is generated by the requirements of society as a whole, the business and economy ecosystems, and by the consumers paying very much attention to sustainable development, urging suppliers to invent and develop novel procedures and materials.⁴⁹

ENVIRONMENTAL SECURITY – DEFENCE/MILITARY RELATED RESEARCH DEVELOPMENT AND INNOVATION

If we search for the framework of the defence/military related research, development, and innovation (R&D&I), which determines the foundation of the capability development of the military – moreover its relations with the environmental security – in a long term, we cannot make a big mistake if in the spirit of the holistic approach we reveal those wide range relations, that point out the systems where the environmental security related R&D&I activities are realized.

In the *Brussels Summit Communiqué* of heads of state and government participating in the June 2021 NATO Summit, pointing out that the climate change is one of the most determining factors influencing the forthcoming decades, leaders take a commitment on implementing the necessary technical and armament developments in order to cope with operational challenges caused by the climate change. One of the main challenges determining directly the operations of NATO troops is energy security,⁵⁰ which has many links to environmental security. The document declares that a stable energy supply needs diversified energy resources therefore the development of novel technological procedures and equipment is of great importance to make NATO troops increasingly independent from fossil energy resources, and at the same time it is also necessary to research into new technologies to explore the opportunities of renewable energy sources.

Dealing with the connections between efficient energy provision and sustainable operations in NATO it is unavoidable to mention the NATO Energy Security Centre of Excellence (ENSEC COE), which has the mission to provide “[...] comprehensive and timely subject matter expertise on all aspects of energy security”.⁵¹ One of the most important trends followed thoroughly by the ENSEC COE is the analysis of the context between increased consumption of renewable energy sources by military troops and their possible effects on the environment.⁵²

⁴⁸ Within the framework of related laws and regulations to show favour on purpose toward products and services which environmental footprint (consumption of energy and raw materials from the perspective of quality and quantity; the percentage of recycled materials in the final product; the length of transportation chain, the fit into the all-round economy) is smaller than products made according to traditional ways and technologies (working term for green procurement created by the author)

⁴⁹ Dobos, Tátrai and Vörösmarty. „Fenntartható beszerzés”. 29–35.

⁵⁰ „Brussels Summit Communiqué”. 19.

⁵¹ “2020 COE Catalogue”. NATO Allied Command Transformation. December 2020. 30. <https://www.mgeometoc-coe.org/sites/publications/article/Documents/coe-catalogue-2020.pdf>, Accessed on 29 September 2020.

⁵² Vainio J. „Changing Security Aspects for Future Security Systems: Renewable energy and possible risks at the local, regional and the global levels.” *Energy Security: Operational Highlights* 12. 2019. 7.

Péter Fodor in his essay entitled *A NATO és energiabiztonság*⁵³ (*NATO and Energy Security*) elaborates the topic of energy security – which is one of the critical aspects for societies as a whole and for the continuous operation of militaries – from the perspective of NATO as a politico-military organisation, paying very much attention to tasks implemented by militaries in order to maintain energy security. Fodor – after a short introduction of roles played by fossil and renewable energy sources and the nuclear energy in the operation of different societal subsystems but with special emphasis on the energy requirements of the economy and the population – points out that the disposal of different accessible energy forms is a critical factor from the perspective of the expected operation of all societal subsystems. Consequently, even a short interruption in the energy supply can have a negative effect on a segment of society, or even on the operation or the security of society as a whole. The essay, while elaborating on the connections between energy security and military, presents in detail the question of security of supply, as well.

The analysis by the NATO Science and Technology Organisation entitled *Science & Technology Trends 2020–2040 Exploring the S&T Edge*⁵⁴ contains the outlook of the science and technology community of the Alliance, focusing on trends and processes which will fundamentally determine the operational environment, the capability development directions, and the political decision making of the Alliance and its member states. The document, concentrating mainly on the developing and promising disruptive technology developments and areas and their possible effect on each other, analyses the strategic drivers which will fundamentally determine the R&D&I and the operational environment of NATO. Among the strategic drivers there is a specific stress on the environment.

In its *Annual Report 2020*⁵⁵ the European Defence Agency (EDA) devotes a separate chapter to energy and environment related issues. EDA emphasises the importance of continuing and promoting collaborative research and innovation efforts into sustainable energy, while continuing the preparation of sets of short-, medium-, and long-term concrete actions addressing the link between defence and climate change.⁵⁶ Under the auspices of EDA there is an ongoing Energy and Environment Programme (EEP)⁵⁷ with the clear aim to support the participating Member States (pMS) towards an increasing resilience to – inter alia – environmental change. Expert level bodies like the EDA Energy and Environment Working Group (EEWG) focus their efforts on implementing the tasks arising from the EU *Climate Change and Defence Roadmap*⁵⁸ having one of the main goals to support EU and the pMS to make climate policy implications “[...] an integral part of the EU’s thinking and action on issues such as defence research and development [...]”.⁵⁹

⁵³ Fodor, P. „NATO és energiabiztonság [NATO and Energy Security]”. Hadmérnök IV/3. 2009. 168–179. http://www.hadmernok.hu/2009_3_fodor.php, Accessed on 24 July 2020.

⁵⁴ “Science and Technology Trends 2020–2040: Exploring the S&T Edge”. NATO Science and Technology Organisation. March 2020. https://www.nato.int/nato_static_fl2014/assets/pdf/2020/4/pdf/190422-ST_Tech_Trends_Report_2020-2040.pdf, Accessed on 10 May 2020.

⁵⁵ Annual Report 2020. Brussels: European Defence Agency, 2021.

⁵⁶ Annual Report 2020. 20.

⁵⁷ An EDA programme to analyse the complex nature of energy and environmental factors in the defence sector and to offer a detailed approach to pMS.

⁵⁸ “Climate Change and Defence Roadmap”. European External Action Service. 6 November 2020. <https://data.consilium.europa.eu/doc/document/ST-12741-2020-INIT/en/pdf>, Accessed on 24 June 2021.

⁵⁹ „Climate Change and Defence Roadmap”. 3.

One of the centrepieces of EDA energy and environment related initiatives and actions is the *Military Green*⁶⁰ which is used as an umbrella by the agency for developing more responsible and more effective capabilities for the military, capabilities which use resources in a more sustainable way.

The *Permanent Structured Cooperation*⁶¹ (PESCO), established by Article 42 of the Treaty of the European Union and launched in 2017 by twenty-five pMS, represents a qualitative development in defence cooperation within the EU with the aim to contribute to the implementation of EU Level of Ambition in security and defence. The main difference between PESCO and other forms of EU cooperative development projects is the binding nature of commitments undertaken by the twenty-five PESCO nations. Among the 46 PESCO projects the Energy Operational Function project deals with the development of new energy supply systems for camps deployed in joint operations and with the insurance of taking into consideration energy issues during operational planning and the development of armaments systems.

The supply of forces, armaments, and equipment with energy fundamentally influences operational security and the continuation of mission implementation of militaries. Melinda Zsolt in her essay entitled *A védelmi szféra zöldítése – nemzetközi kitekintés*⁶² (*Going Green of the Defence Sphere – an International Outlook*) examines the special but at the same time forward-looking projection and trends of environmental security and energy security. The author predicts the opportunity for reforms of military within the defence sphere in the dichotomy of new types of technologies and alternative energy sources. The author states that “Modern military is characterized by huge energy dependence since with the spread of novel equipment, modernisation of technology, systems become more and more complex with increased energy needs [...]”.⁶³ The essay examines one by one those economic, financial, logistic, and technological advantages which can inspire the R&D&I community as a whole, including military, to develop new and provident technologies and to use alternative energy sources. It also analyses the limits which in many cases – especially on operational areas – are not compatible with the energy usage and storage requirements of intensive combat actions. It mentions that one has to take into consideration geographical and climate limitations when planning the use of energy from renewable energy sources. Furthermore, the essay presents those programmes and development of the US, NATO and the EU which can lead militaries “going green”.⁶⁴

CONCLUSION

It can be stated that security related thinking and activities of states, international and non-governmental organisations are inspired by environmental security as a comprehensive approach related to one of the newest and most important dimensions of security.

⁶⁰ Military Green: Energy and environment at the European Defence Agency. Brussels: European Defence Agency, 2012. DOI: 10.2836/13547

⁶¹ “Protocol (No 10) on the permanent structured cooperation established by the Article 42 of the Treaty of the European Union”. Official Journal 115. 275–277. 2008. EUR-Lex – 12008M/PRO/10 – EN (europa.eu), Accessed on 24 June 2021.

⁶² Zsolt, M. „A védelmi szféra zöldítése: nemzetközi kitekintés [Going Green of the Defence Sphere: An International Outlook]”. *Felderítő Szemle* XVI/3–4. 2017. 188–201.

⁶³ Zsolt. „A védelmi szféra zöldítése”. 188.

⁶⁴ Zsolt. „A védelmi szféra zöldítése”. 190–197.

Environmental security, when examining the relation between humans and environment, connects increasing dimensions of security, multiplies their effects on each other, and initiates or at least influences processes which in many cases and at least at first glance are unpredictable and untreatable in a human scale, and as a consequence could materialize in global challenges for the whole civilization.

In environmental security related security policy considerations, military power is increasingly represented as the settler of conflicts related to environmental security on one hand, and as a direct creator of environmental security problems on the other hand.

It is possible to draw the conclusion that it represents a special level of maturity and the increasing responsibility of human society when individuals but even more their greater and lesser groups perceiving the interactions between environment and human activities, are eager to act in an organised and coordinated manner for stopping disadvantageous processes and for eliminating damage caused. But the success awaits yet.

The military, as an active and organised part of communities, due to its operational specifications is able to cause and at the same time suffers from environment-related problems.

The military has its own special capabilities – like command and control, logistics and medical corps – through which it can directly take part in the elimination of negative natural and societal effects and security imbalances. Militaries, as traditional depositories of the restricted interpretation of security, this way can be directly involved in the creation and sustainment of one of the relatively new elements of security: environmental security.

It is concluded that the influence made by environmental security on research, development, and innovation activities is increasing in the ratio of the intensity of the mutual impact made by humans and the environment.

The primary motivation of R&D&I is the requirement of users, the emergence of needs where the existing affordable and economically utilizable technological procedures and equipment are not able – or only in a limited manner – to meet the relevant requirements and needs.

In case of the military and defence sphere as a whole, the new and acutely predominating environment effects which influence the implementation of operations urge and force them to develop and invent novel material and operational procedures, and to implement new and forward looking materiel standards. And it is true seen from different perspectives.

On one hand, tasks are changing, ranging from the prevention of the escalation of civilization crisis into conflicts, or if they have occurred, as a last resort of conflict resolution, to support the civil society against harmful environmental effects, with the special capabilities and equipment in military inventory. On the other hand, the natural and as a consequence the man-made environment are about to dramatically change. Since negative trends and tendencies (climate change, water crises, and degradation of arable soil) disregard state borders, depending on their order of magnitude, there is an urgent need for cooperation on a regional, continental or a global scale in order to effectively manage them, and this is a big challenge for the R&D&I community as well.

With the above threefold analysis (sc. security, environmental security, and R&D&I), the summarised findings and estimations, as a first step it is reasonable to state, since the environmental security and the armaments development concurrently have different and at least partially compatible goals it is expedient to analyse further if it is feasible to develop military capabilities in a way to meet both environmental and military requirements at the same time and within a reasonable and executable timeframe and budget.

One can easily think that the period of time since the end of the Cold War has been more than enough to at least establish the global framework to give harmonised answers to the

challenges arising from the global climate change. The truth is that despite all the efforts made so far, we are not closer to the required solutions at all.

The fundamental security policy and societal changes that happened in the region of NATO and the EU, the apparently unstoppable negative tendencies in the global climate, and the lack of real and feasible willingness to create harmonised structures with enough resources to take just the first steps to handle effectively and in a timely manner those natural, societal, and humanitarian crises which directly or indirectly stem from environment-related tendencies show that we are not ready yet. However, one thing is certain, there is no other way but move forward.

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SOME THEORETICAL AND PRACTICAL ISSUES OF MAINTAINING SOLDIERS' PHYSICAL FITNESS DURING AN EPIDEMIC OR IN LIMITED CIRCUMSTANCES

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ABSTRACT: Following the measures taken to contain the novel coronavirus, some attention was drawn to the matter of maintaining the physical performance of soldiers in limited circumstances. This scientific paper analyses the problem of the “detraining” effect and proposes an efficient strategy to counter this phenomenon, in relation to the degree of its severity.

KEYWORDS: detraining, physical fitness, quarantine, “gilded cage”, mission

The Hungarian Defence Forces (HDF) does not only perform military tasks with the aim of protecting the country's independence, territorial integrity, and border. Due to the HDF's level of equipment, its organisation and qualifications, it is also deployable during the aftermath of catastrophes and during epidemics, and it is capable of providing humanitarian assistance as well as, in accordance with the Hungarian Constitution.¹

It is not a new phenomenon that soldiers are deployed in epidemiological emergencies. In the 18th century, during the plague of Marseille in 1720–1721, the famous Bercsényi hussar regiment carried out law enforcement tasks in the French army in southern France. The soldiers patrolled between the plague-infected and healthy areas, blocking traffic. Under strict military orders, they had to act ruthlessly against illegal trespassers.²

In the spring of 2020, during the novel coronavirus pandemic, numerous tasks have been assigned to the HDF. Hungarian soldiers are supporting the Police in securing the borders and maintaining the humanitarian corridor. Patrolling military police officers partake in securing and guarding warehouses. The Chemical Defence Battalion plays a major role in the disinfection of contaminated buildings. Assistance and liaison teams (comprising representatives from the military, law enforcement and disaster relief agencies) are ensuring the steady and functional operation of large corporations and hospital commanders are working in the country's health institutions facilitating the necessary flow of information. At the Hungarian Defence Forces Medical Centre's sites, vaccination points, and mobile

¹ “Fundamental Law of Hungary”. 25 April 2011. para 45. <https://www.parlament.hu/documents/125505/138409/Fundamental+law/73811993-c377-428d-9808-ee03d6fb8178>, Accessed on 22 April 2020.

² Zachar J. „A franciaországi Bercsényi-huszárezred története: 1721–1791”. *Hadtörténelmi Közlemények* 105/4. 1992. 38.

vaccination stations soldiers help with the civilian population's vaccination efforts, as reported by media coverage.³

In addition to fulfilling daily tasks and international commitments, and completing tasks stemming from countering the pandemic, it is also a priority to maintain the combat readiness of the HDF. In these transformed circumstances, it is also essential to prevent the spread of the virus among military personnel as well as to maintain good mental health and physical fitness.

The goal of this paper can be defined as follows. Soldiers often face limited opportunities during their service, e.g. during the initial phase of relocation, under command, during courses, operations, and in cases of epidemiological restrictions. In these situations, there is a lack of adequate sports infrastructure, there is little to no time to partake in activities intended to maintain physical fitness, and there is no sports-focused professional help. The present analysis will examine the sustainability of one's physical condition in a time-frame of maximum six months within limited circumstances.

With these goals in mind, the following hypothesis can be constructed. The problem can be represented along three different dimensions: by the number of limitations, by their duration, and by goals we aim to achieve. By dividing these dimensions into three further categories, a three-dimensional matrix can be constructed whose values can be used to propose an efficient strategy for the purpose of solving this problem.

In this article, the main questions I'm trying to answer are:

- What consequences do limited circumstances have?
- Are countermeasures needed against these consequences? If so, what kinds to be deployed?

To find answers to the raised questions, the following methods seem relevant. During the examination of limited circumstances, overviewing of triggered physiological changes is a must as they create the backbone of the changes in conditioning and physical fitness. The dimensions and categories of the examination are put together, for the study of which a mathematical model is constructed. Using this mathematical model, a proposed solution to the problem is created. Regarding this mathematical model, it is important to note that due to its nature, it is only capable of naming possible solutions. Human activities, including sports, maintenance of fitness and more, however, do not only follow mathematical laws, they are influenced by human factors as well, which are impossible to be mathematically algorithmicised.

By the examination of relevant literature, I concluded that in relation to the main question, no comprehensive study had been done before. Articles studying the changes in physiological processes and the changes in conditioning were especially helpful. A book by Dr. Radák Zsolt titled "Edzésélettan 2.0" has been of tremendous help, as well. The creation of the mathematical model was supplemented with ideas from cluster analysis.

The COVID-19 pandemic has fundamentally changed the lifestyle of most people. They have to live their lives in quarantine or in rather limited circumstances. This poses new challenges to today's society, which is accustomed to free movement and diverse activities.

Soldiers on duty often face limited circumstances. When under command, or during relocation, training and courses, operations, or in other cases of extraordinary duties, they

³ „A katonák is aktívan részt vesznek a járvány elleni védekezésben”. Honvedelem.hu. 18 April 2020. <https://honvedelem.hu/cikk/a-katonak-is-aktivan-reszt-vesznek-a-jarvany-elleni-vedekezésben/>, Accessed on 22 April 2020.

are likely to come across such conditions. This, however, should not affect combat readiness and preparedness; this is why this subject is worth further investigation and examination of the impact that limitations have on changes in physical fitness and health condition.

MAINTAINING PHYSICAL FITNESS IS KEY TO SUSTAINING COMBAT READINESS

The average time spent by soldiers in limited circumstances does not exceed half a year; we are also confident, that the civilian population will not face pandemic-caused hardships for a longer time period – henceforth, I will examine changes within this six-month timeframe. Depending on time and the possibilities available, the goal is to decelerate, stabilise, and halt the deterioration of physical performance, and favourably to improve and increase it.

Physiological changes as a result of detraining

The effects of soldiers' reduced exercise within limited circumstances are similar to the changes in performance, which competing athletes, regular trainers, or sick/injured individuals experience, resulting from either partial or complete abandonment of physical activity. Literature refers to this period of decreased physical activity as “detraining”, “decondition”, or “off-season”. When normal physical activity or training suddenly decreases or stops in its entirety, the body responds to this event. As a result of the reduced load, physiological changes occur in the cardiovascular system, in metabolic processes, and body composition, and can also cause psychological fluctuations. Research is being carried out in connection with these occurrences in the fields of medicine and sports sciences. Several studies deal with the changes in and deceleration of metabolic processes, the increase in blood sugar levels, the mass of visceral fats, and the risk of metabolic diseases and cancer.

For instance, observations in a group of healthy young men have shown reduced peripheral insulin sensitivity as early as two weeks of reduced exercise,⁴ which carries the risk of developing diabetes.

After five weeks of no training, professional swimmers experience an increase in body weight, body fat, and abdominal circumference, and a decrease in levels of the VO₂ max and the resting metabolism rate.⁵ These morphological changes portray that after the human system is no longer subjected to loading, metabolic processes gradually decelerate and excesses begin to be stored within the body. In the long run, the accumulation of visceral fats increases the risk of developing several diseases.

According to one study, Type I (red, slow) and Type II (white, fast) muscle fibres demonstrated a 29% increase after a six-month long high resistance training period, then showed a 12% decrease after a three-month long period of detraining, as compared to previous peak

⁴ Krogh-Madsen, R., Thyfault, J. P., Broholm, C., Mortensen, O. H., Olsen, H. R., Mounier, R., Plomgaard, P., van Hall, G., Booth, F. W. and Pedersen, B. K. “A 2-wk reduction of ambulatory activity attenuates peripheral insulin sensitivity”. *Journal of Applied Physiology* 108/5. 2010. 1034–1040. DOI: 10.1152/jappphysiol.00977.2009

⁵ Ormsbee, M. J. and Arciero, P. J. “Detraining Increases Body Fat and Weight and Decreases VO₂peak and Metabolic Rate”. *Journal of Strength and Conditioning Research* 26/8. 2012. 2087–2095. DOI: 10.1519/JSC.0b013e31823b874c

performance.⁶ The results of another research show that in the first weeks spent without training the skeletal muscle does not alter significantly, however, after eight weeks, a decrease can be detected.⁷ A loss of muscle mass is not only detrimental to mobility, but it also has an adverse effect on the regulation of blood sugar levels, as muscles' sugar uptake is insulin dependent; thus, in case of muscle mass loss, a certain amount of insulin will reduce the skeletal muscles' ability to uptake sugar from the blood. A feature of insulin resistance is the skeletal muscles' lessened uptake of sugar.⁸ Decreased physical activity has significant effects on the cardiovascular system. Changes in the values of blood pressure were examined during training period and in a no-load period. It was found that just within two weeks of inactivity, the values of blood pressure formed as a result of six months of training returned to the values of the period preceding the workout phase,⁹ and that the acquired skills and advantages can be lost rapidly.

Changes in motor skills as a result of detraining

Physical performance changes in synchrony with physiological changes. The effects of an inactive period on physiological changes can be measured in motor skills, too.

Motor skills can be divided into three groups: condition-based skills, coordination skills, and joint mobility. Condition-based skills provide the energetic conditions of the movements, they successfully characterise the current performance capability of the body. Coordination skills play a role in the accurate, effective, and economical execution of movements. Joint mobility reflects the anatomical limitations and neurological regulations of the scope of the movement.¹⁰

Condition-based skills are: strength, speed and endurance. With regard to their optimal interaction and the specificity of the branch of sport, we also distinguish complex condition-based skills, such as maximum strength, strength endurance, speed strength, movement speed, speed endurance, short-term endurance, medium-term endurance, and long-term endurance.¹¹

Condition-based skills are well quantifiable. Research is being conducted to determine the state of fitness and the effects of inactivity. The results clearly portray how quickly the body's abilities – acquired through training – can deteriorate. The generally accepted method of estimating endurance and measuring its change is by determining the VO₂ max, which can be calculated from the difference in arterial and venous blood oxygen concentration, heart rate, ventilation and body weight (ml/kg/min).¹² Higher values indicate better aerobic capacity and better endurance. Development in VO₂ max – gained during a

⁶ Fleck S. J. „Detraining: Its Effects on Endurance and Strength”. *Strength and Conditioning* 16/1. 1994. 22–28. https://journals.lww.com/nsca-scj/Citation/1994/02000/Detraining__Its_Effects_on_Endurance_and_Strength.3.aspx, Accessed on 18 May 2020.

⁷ Mujika, I. and Padilla, S. “Muscular characteristics of detraining in humans”. *Medicine and Science in Sports and Exercise* 33/8. 2001. 1297–1303.

⁸ Radák Zsolt: *Edzésélettan 2.0*. Budapest: Krea-Fitt Kft, 2019. 47.

⁹ Moker, E. A. et al. “The Relationship between the Blood Pressure Responses to Exercise following Training and Detraining Periods”. *PLoS ONE* 9/9. 2014. e105755. DOI: 10.1371/journal.pone.0105755

¹⁰ Meszler B., Tékus É. and Váczi M. *Motorikus képességek mérése*. Pécs: Pécsi Tudományegyetem Természettudományi Kar Sporttudományi és Testnevelési Intézet, 2015. 3–6.

¹¹ Koltai J. and Nádori L. *Sportképességek fejlesztése*. Budapest: Sport, 1973. 13–16.

¹² Radák. *Edzésélettan 2.0*. 238.

two-three month period of training – can be lost in 2–4 weeks of inactivity,¹³ showing an exponential decrease in value.¹⁴

Speed responds most sensitively to periods of inactivity. Progress, achieved through twelve weeks of speed and speed endurance training, drops to the baseline value in 20–40 days during detraining.¹⁵

Determinants of force are age, gender, and the cross-section and type of muscle fibres. Concerning the physiological effects, we have already seen that muscle mass increases due to proper training and hypertrophy develops; meanwhile, the withdrawal from training causes degradation, atrophy in the muscles. Physically active women and men, and men engaged in strength-based sports were studied in one study. Following a ten and a half week long training period, their performance increased significantly in all three skill-groups. Then, after two weeks of detraining, the performance of physically active women and men involved in strength-based sports deteriorated, while the performance of physically active men only slightly increased. Observations gathered from weightlifting Olympians illustrate that their performance decreases very quickly when they stop training.¹⁶

This physiological and sports science research excellently reflects what changes can be expected if physical activity is restricted.

Changes in physical fitness depend on the initial status of fitness, the amount of time spent without training, age, gender, time available to exercise, accessible equipment, expertise, motivation, and nutrition. Among these factors, some may be easily identified and defined, while others less so. For this reason, the examination of the obtainability of desired results along the duration of the limited circumstances and its specific conditions is noteworthy.

Physical fitness requirements of soldiers

The overarching aim is to make the general physical condition of the soldiers in given circumstances as good as possible, to ensure their ability to fully implement their duties, and to preserve their health and combat readiness. The HDF's expectations from its soldiers are determined in Decree 10/2015 (VII. 30.) of the Ministry of Defence, by which all personnel needs to abide.

Objective measurement and evaluation of physical performances provide an assessment of physical fitness, differentiated by gender, age and exercise form. These assessments are evaluated based on the scoring tables in Annex R of Decree 10/2015 (VII. 30.). In accordance with the current legislation, in order to obtain the necessary qualifications of “eligible” and “adequate”, it is necessary to achieve 220 points. This can be considered a basic desired result.

¹³ Kemi, O. J. et al. “Aerobic Fitness Is Associated With Cardiomyocyte Contractile Capacity and Endothelial Function in Exercise Training and Detraining”. *Circulation* 109/23. 2004. 2897-2904. DOI: 10.1161/01.CIR.0000129308.04757.72

¹⁴ Bosquet, L. and Mujika, I. “Detraining”. In Mujika, I. (ed), *Endurance training: science and practice*. Vitoria-Gasteiz: Inigo Mujika, 2012, 100–106.

¹⁵ Singh, Y. W. B. “Investigation of varied intensity interval sprint training and detraining impact on selected speed parameters”. *International Journal of Physical Education, Fitness and Sports* 3/1. 2014. DOI: 10.26524/1416

¹⁶ Fleck. „Detraining ...”.

An analysis of limited circumstances

In limited circumstances, the task is to slow down the deterioration of the physical performance necessary for achieving the basic desired result, to maintain physical condition, and in a favourable case, to improve or even to increase it.

I divided the time spent in limited circumstances into three categories. Subsequently, there is a *short*, one- or two-week interval (this may correspond to the initial phase of quarantine or relocation), a *medium*, one- or two-month interval (which corresponds to the length of training courses, or orders, as well as short, pandemic induced restrictions), and a *long*, one-to-six months interval (which is the average duration of a mission or of a wave of a pandemic).

The grouping of these specific conditions, that is, the degree of restrictions in limited circumstances, is also three-tiered. The first is “quarantine”: the strictest, with the highest magnitude of restrictions. It is a form of complete confinement, such as being in an apartment with limited space at hand, where there is no sports equipment, where no outdoor activities are allowed, where there is no personalised professional help; there are no options, yet one’s schedule is free. The second is the “gilded cage”: where the soldier is also in confinement, where there is no opportunity for outdoor activities, when the sports infrastructure and pool of equipment is limited, and one’s schedule is fixed. The third is the “mission”: the most favourable of limited circumstances. Although the opportunities of sports infrastructure and equipment are limited and one’s schedule is fixed, both indoors and outdoors activities are possible.

In examining the achievement of desired results, under these specific conditions, I consider an activity unjustified if it is not useful for attaining the desired results and if change cannot be detected. An activity of any sort is justified if it results in a detectable, positive change.

The desired result is realistic, if it can be achieved under certain circumstances, in a certain timeframe, and if it promises the attainment of the best possible result. It is unrealistic, if it is not achieved under given circumstances, in the given timeframe, yet, the task remains justified, thus efforts still must be made.

In the tables below, I have included the possibility of achieving the desired result.

Table 1 *Possibility of decelerating the deterioration of physical performance within given limited circumstances*

Circumstance/Time	Short	Medium	Long
Quarantine	unjustified	justified and realistic	justified and realistic
Gilded cage	unjustified	justified and realistic	justified and realistic
Mission	unjustified	justified and realistic	justified and realistic

The results of the above-mentioned research show that performance is maintained for a short amount of time and then it decreases by varying degrees. For that reason, the deceleration of the deterioration of physical performance is only justified in medium- and long-term limited circumstances. However, this does not mean that the one- or two-week long period of detraining can be ignored, as this is where deterioration begins. During this period, we tend to experience slight fatigue and laziness, and we can lose our motivation, which can be dangerous in the long run. In the medium-to-long term intervals, decelerating

deterioration has a major role, especially within stricter restrictions where the preservation of physical performance cannot be solved.

Table 2 *Stabilisation and maintenance of physical performance*

Circumstance/Time	Short	Medium	Long
Quarantine	justified and realistic	justified and realistic	justified and unrealistic
Gilded cage	justified and unrealistic	justified and realistic	justified and realistic
Mission	justified and unrealistic	justified and realistic	justified and realistic

The preservation of their physical condition is a constant responsibility of soldiers. In order to perform their duties, soldiers must have an adequate level of performance at all times, must be combat-ready and must meet the requirements stipulated in the legislation. In the short run, where the degree of deterioration is insignificant, physical performance is stable and its maintenance at a constant rate is not a realistic desired result. In the medium and long run, however, it is both realistic and important, as research has shown that physiological processes as well as physical performance can undergo significant changes as quickly as in one or two months. This research is also supported by the new term that was coined during the novel corona virus pandemic – “quarantine tummy”. People who have lived in confinement for a few weeks’ time and have not been physically active, quickly notice changes on their bodies, which are proportionate to the deterioration of their physical performance and health. In the long run, preserving one’s physical condition in quarantine is not feasible either. Efforts must be made in order to maintain physical condition. While the incorporation of even little physical activity into everyday life is enough to decelerate deterioration, physical fitness requires proper nutrition, choosing the right amount of loading, following the principles of ‘gradual increase of loads’ and ‘regularity’, plus maintaining a balance between exercise and rest.

Table 3 *Increase and improvement of the level of physical performance*

Circumstance/Time	Short	Medium	Long
Quarantine	unjustified	unjustified	unjustified
Gilded cage	justified and unrealistic	justified and unrealistic	justified and unrealistic
Mission	justified and unrealistic	justified and realistic	justified and realistic

Among the set desired results, the most difficult one is to establish the increase of physical performance as usually this requires special circumstances and a rather long period of time.

Due to limited opportunities in quarantine, general development is not feasible. An increase in the progression of certain skills can be achieved, an example being prisoner training programs developed in prisons. However, it is difficult, if not impossible, to improve endurance and speed, thus no development can be realised in a complex manner.

The conditions in the “gilded cage” are not favourable for improving motor skills either, but in a given situation it is formulated as a desired result. Therefore, it is worth addressing at least at a theoretical level.

Development is also unattainable when considering a short-term mission; however, it can very much be a realistic goal during medium- or long-term timeframes. The circumstances and the time available are conditions which allow a deliberate and strategically executed

training program to be successful. However, this also requires motivation, proper professional guidance, and assistance.

These findings can also be analysed in an abstract manner by assigning numerical values to them. By establishing numerical values, the necessity of expected development can be quantified. In the present context, the concept of necessity refers to (measures) the extent to which we can and must make an effort to achieve a desired result. All in all, the greater the necessity, the greater the condition is for success and the greater the need for effort.

Accordingly, the rating “unjustifiable” does not involve necessity, so its numerical value is “0”.

Necessity is directly proportional to justifiability (i) and reality (r). It thus follows, that the more justified and the more realistic an activity, the greater its underlying necessity is. Henceforth, necessity can be expressed as the product of the above-mentioned two features, that is ($P = ir$).

Establishing the proportionality factor between values (i) and (r) seems irrelevant to the result at first glance, as it is difficult to measure which of the two factors is stronger in terms of necessity – therefore, such value is not initially applied in the function. In the given problem, the independent variables (i) and (r) can yield discrete values. That is, a set goal is either justified or not, or the achievement in a given situation is either realistic or not. It seems to be obvious to construct a binary system (0,1), however, in case of the formula described above ($P = ir$), the function would involve a significant loss of data, since on either side of the function, the product of either value and zero is zero, and the product of the ones would also stay one. However, all goals that are justified, even if not realistic, have potential – and thus should be strived for in order to achieve the desired results, despite this situation – ‘should one strive to achieve unrealistic goals?’ – being a complex matter. This problem can be translated into the language of mathematics by supplementing the formula in a way, that any justifiable objective obtains an initial value. Subsequently, the modified formula not only includes direct proportionality but also a constant (k):

$$P = ik + ir$$

P = necessity

i = justifiability, discrete (binary) values {0; 1} 0 = unjustified, 1 = justified

k = constant, which requires effort (1) if the desired result is justified

r = reality, discrete (binary) values {0; 1} 0 = unrealistic, 1 = realistic

Table 4 *The summary of value calculation (self-edited)*

Characterisation	Value	Explanation: $P = ik + (ir)$
Unjustified	0	If $i = 0$, there is no need to measure the value of ‘r’, since unjustified activity involves no hidden potential. $P = 0 + 0$
Justified and unrealistic	1	$P = 1 \times 1 + 1 \times 0$
Justified and realistic	2	$P = 1 \times 1 + 1 \times 1$

After applying the function, various desired results can be expressed numerically as follows.

Deceleration of deterioration in performance			
	Short	Medium	Long
Quarantine	0	2	2
Gilded cage	0	2	2
Mission	0	2	2

Sustaining/preserving performance			
	Short	Medium	Long
Quarantine	1	2	1
Gilded cage	1	2	2
Mission	1	2	2

Intensification/development of performance			
	Short	Medium	Long
Quarantine	0	0	0
Gilded cage	1	1	1
Mission	1	2	2

The matrices above can be summarised and quantified based on the numerical values at the intersection of rows and columns, resulting in the following table.

	Short	Medium	Long
Quarantine	1	4	3
Gilded cage	2	5	5
Mission	2	6	6

This matrix can be visualised in a three-dimensional chart as follows.

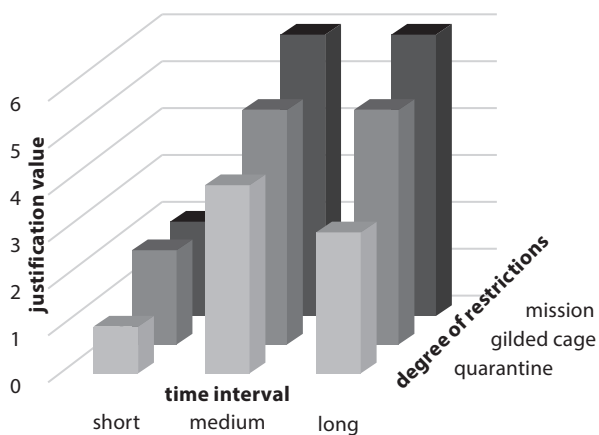


Figure 1

In *Figure 1*, the higher a column the greater the necessity of the desired result in a given timeframe. Or, in a given interval of time we can see the change in the degree of necessity along various desired results.

The central message the figure wishes to illustrate is that there is no specific condition in which there would not be an opportunity, and that there is no specific condition where one should not make efforts as either time or circumstance provide an opportunity to achieve some sort of a result.

However, it is evident, that the situation promising the highest results is mostly in the circumstances of a 'long-term mission'.

It also seems worthwhile to examine the results of these two positions in combination with average values.

Objectives can be studied along the factors of time and specific condition. A summary in diagram-format was constructed, which illustrates where the best results can be achieved and in which cases special attention should be paid to maintaining the physical condition of soldiers, thus also sustaining combat readiness.

Respective of the conditions, the results with the incorporated average are depicted in the graph below.

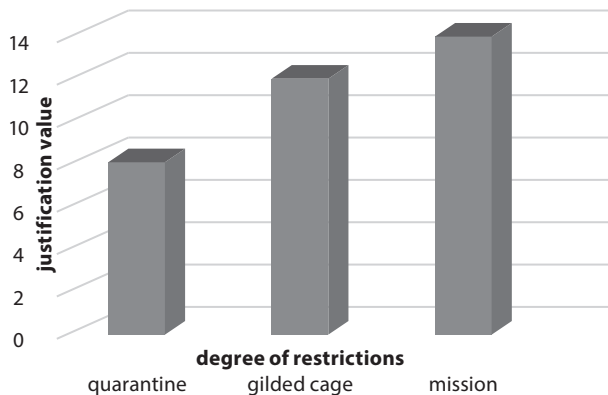


Figure 2

Figure 2 shows a strictly increasing exponential relationship as conditions improve. Consequently, it can be deduced that in terms of fulfilling aims and attaining the desired results, the improvement in special conditions brings forth an increase in potential, too. In other words, the same activity conducted is increasingly effective as limited circumstance improves, thus aiding us achieving our desired results. Henceforth, it is worth investing our specific conditions.

However, the analysis of the factor of time shows an interesting result.

Figure 3 indicates that the initial value of necessity, being very low, shows a preliminary jump in value and is then followed by a slight decline. In practice, this translates to how our objectives of preserving physical condition in various limited circumstances have a better chance of realisation in the short run, than in the long run where opportunity becomes narrower and generally worse.

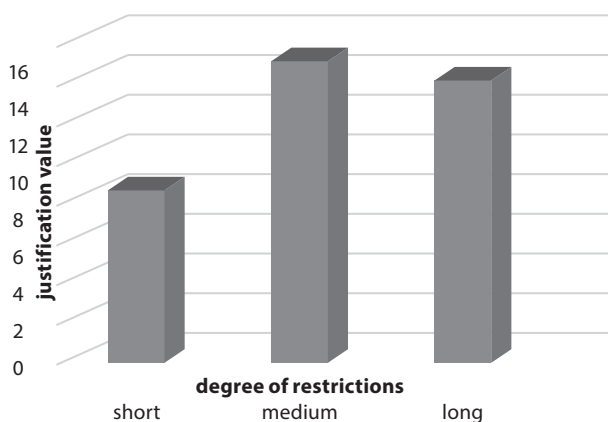


Figure 3

PRACTICAL ADVICE FOR ACHIEVING DESIRED RESULTS

General skill development

The methods used to develop skills portray certain generic features. In many cases, the force is developed on the basis of the same principles, only the means of execution, the movements that is, are different from one another in technicality (e.g.: throwing movements, etc.). These principles prevail mainly in natural movements, because the basic forms of movement are almost the same. Other, special movements require particular techniques of motion, therefore, to acquire, practice, and also develop these skills, a much more concrete movement-mechanism is required. The latter is primarily necessary for the requirements of competitive sports. Subsequently, literature distinguishes between physical ability and athletic ability. The situation is similar regarding the development of endurance. In the training of swimmers, mid- and long-distance runners, cyclists, „the principles of loading may be identical, despite the fact that each sport differs in the structure of movement and effort”.¹⁷ In some cases, different movements elicit approximately the same mode of action. For example, running at medium speed, swimming, rowing, skating, cycling, even jumping or skipping rope have a rather similar effect on endurance.

The selection of training methods

The contents of one's workout is determined by the ability or abilities intended to undergo development. All training parameters should be compiled and defined in line with the desired result(s). In this case, while under limited conditions, general fitness should be the main goal. Achieving overall fitness requires a workout plan that develops all condition-based skills.

During the definition of training methods, one also faces social and existential challenges. The conditions for achieving better performance are to increase the magnitude and intensity of the load. Increasing magnitude in certain sports and in limited circumstances

¹⁷ Koltai and Nádori. *Sportképességek fejlesztése*. 7.

is already pushing the boundaries of opportunity. The number of daily and weekly workouts also poses existential problems in balancing privacy, work, learning, and training. Therefore, it is more important to increase training intensity in achieving, maintaining and raising physical fitness levels, which has a beneficial effect on increasing performance too.¹⁸

Our smart devices have gained massive momentum. Online platforms and applications give birth to countless “personal trainers” and training programs. With everything available online, we do not suffer from a lack of a training partner. Since we are talking about general abilities and not specific sports abilities, the overwhelming amount of material available is not a problem. While these, almost without exception, can be used for preparation and training, it is advisable to seek the personal guidance of a professional, whose expertise and objectivity positively impact one’s physical performance.

Sports science-based background

Extensive studies have been carried out by sports scientists and medical professionals in hopes of eliminating sedentary lifestyles, the prevalence of sedentary work, and the health risks associated with these conditions.

- In the 1980s, Cooper defined optimal training for maintaining health in 80 to 90 minutes of aerobic activity per week.¹⁹
- In 1995, the American College of Sports Medicine (ACSM) and the Centres for Disease Control and Prevention (CDC) recommended a total of at least 30 minutes of moderate physical activity per day.²⁰
- In 2008, previous recommendations were revised,²¹ and the currently adopted position was established worldwide.
- Today, in accordance with WHO recommendations, one should exercise five times a week for at least 30 minutes with moderate (3–6 MET) intensity.²² For ages 18–64, 150 minutes of moderate-intensity aerobic exercise or at least 75 minutes of high-intensity aerobic exercise, their combination, and the strengthening of major muscle groups at least twice a week are recommended. To intensify efficiency, it is advisable to increase medium intensity aerobic physical activity to 300 minutes or high intensity aerobic activity to 150 minutes.²³

Maintaining the physical condition of soldiers

Meeting the requirements stipulated in Decree 10/2015 of the Ministry of Defence of Hungary is the starting point of a military career. Physical performance is measured by performing three tests of motor skills. These forms of movement include push-ups, pull-ups, sit-ups, running/dashing for 2,000 m and 3,200 m, and walking for 1,600 m. In terms of

¹⁸ Koltai and Nádori. *Sportképességek fejlesztése*. 9.

¹⁹ Cooper, K. H. *A tökéletes közérzet programja*. Budapest: Sport, 1987. 108.

²⁰ “Benefits and Risks Associated with Physical Activity”. In *Guidelines for Exercise Testing*. 10th ed. Philadelphia: Wolters Kluwer, 2018. 1–21.

²¹ Physical Activity Guidelines for Americans: 2008. US Department of Health and Human Services. October 2008. <https://health.gov/sites/default/files/2019-09/paguide.pdf>, Accessed on 5 June 2020.

²² *Global Strategy on Diet, Physical Activity and Health*. Geneva: WHO, 2004.

²³ *Global Strategy on Diet, Physical Activity and Health*.

abilities, the latter few forms of activity portray the state of the circulatory system, meaning they are suitable for measuring endurance in the simplest forms of movement. The other exercises measure the strength and endurance of a certain muscle or group of muscles. The technical requirements specified during the execution of the exercises must be met, as they ensure the reliability and objectivity of the measurements.

The score required to be qualified as ‘fit for service’ is 220 points, as mentioned earlier, which is 60% of the maximum obtainable score. In the case of strength endurance elements and exercises the average of optimal value is 60-60, and in the case of endurance (running, walking) it is 100 points. The total value earned thus also grants statutory qualification. That is, if the three results of 60-60-100 are what is considered optimal, then the number of repetitions and time intervals associated with this value can be defined as a target for performance. Naturally, this poses different results in performances among individuals across age cohorts. For example, the specifics of the youngest age group (<25 years) are: 30 push-ups or 12 pull-ups (60 points), 50 sit-ups (60 points), while 100 points are awarded for the completion of the 3,200-metre run if men complete it within 17’30”, and if women complete it within 19’00”.

Neither the basic requirement set for soldiers in Decree 10/2015, nor the attainment of reaching maximum scores do not actually require an outstandingly high physical performance. It merely sets a goal that is achievable for healthy, regularly training soldiers. Therefore, the proposed training methods are the same as those recommended for preserving health.

If the desired results – which are in line with circumstances – are compared with standards, the means and mode of training begin to be outlined. The three-tiered desired result (decelerating deterioration of performance, maintaining performance, developing/increasing performance) and its specific conditions (quarantine, gilded cage, mission) determine the entirety of the training. In essence, the availability of equipment, infrastructure and time are what need to be taken into account primarily. As conditions improve, the range of opportunities for training increases. Under normal living conditions, there are countless opportunities to be exploited for individuals when it comes to exercising. The 21st century brought along an inexhaustible pool of fitness opportunities. Indoor and outdoor gyms pop up around almost every corner. If not a fan of public options, the opportunity to work out at the comforts of one’s home, and practice callisthenics is also dominant. Based on the specifications discussed in practice materials, there is no need for serious material-centred conditions (equipment), especially when it comes to fitness. It is the load on the circulatory system that is more exposed to a decline of circumstances. However, despite an increase in the vulnerability of the physical conditions, it remains possible to train.

Maintaining the proper physical conditions of soldiers is essential in preserving combat readiness, in successfully fighting a battle, in bearing the burdens of service, regardless of the fact that soldiers in different roles are exposed to different loads. All soldiers have to be able to carry out their duties in a tactical situation, to overcome obstacles in full combat equipment/gear, and to perform individual and group engagements over long distances, even in extreme conditions. Therefore, they need a minimum of 150 minutes of moderate or 75 minutes of vigorous (or a combination of these) aerobic activity, and two-three sessions of strength training per week. The recommendations are, ideally, a combination of 300 minutes of moderate and intense aerobic activity and 30–60 minutes of strength training three times a week.²⁴

²⁴ “Army Physical Fitness”. Army Public Health Center. 1 June 2020. <https://phc.amedd.army.mil/topics/healthyliving/al/Pages/ArmyPhysicalFitness.aspx>, Accessed on 5 June 2020.

Even in limited circumstances, continuous and regular training three to five times a week for a duration of at least 30–60 minutes is recommended, with an intensity corresponding to 65–85% of the maximum heart rate. A positive impact only takes effect when the training is performed with adequate loading and at a frequency of three-five times a week. If the number of workouts falls below three per week, or is abandoned for a longer period of time, the impact of the workout will deteriorate.²⁵ It is important to follow a gradual approach in terms of adjusting the intensity, weekly frequency, and duration of training.

When commencing a workout, it is most appropriate to

- do it three times a week;
- with an intensity corresponding to 60% of the maximum heart rate at load;
- for a duration of ten-twenty minutes per workout.

It is then necessary to increase the training load in the following order:

- first, increase the weekly frequency to at least four, but if possible, to five workouts;
- secondly, the duration of a workout can be slowly be increased to 60 minutes;
- finally, the training intensity can be increased to 85% of the maximum heart rate at load.²⁶

In limited circumstances, it is advisable to seize every opportunity to lead an active lifestyle. The most obvious solution at hand is performing and varying those exercises, which are part of the military physical fitness assessment – the callisthenic exercises of push-ups, pull-ups, or sit-ups. Starting position, range of motion, rhythm and more can be varied by preference. In hopes of increasing intensity, the use of dumbbells and rubber bands is suggested. However, store-bought equipment is but one option. Everyday objects can also be used. Dumbbells can be replaced with water bottles, loaded backpacks or handbags, or books. To increase the effectiveness of the physical activity, it is advisable to perform exercises that require the simultaneous use of several muscle groups. Suspended devices (TRX), unstable support surfaces (bosu, fitball, balance board, stability air pad) can be used for this. Treadmills, stationary exercise bicycles, oars, elliptical trainers and stair machines are recommended for indoors aerobic training, or there is always the option to run, walk, jump, and climb stairs, or dance. During quarantine, let us involve our family and children. During a mission, or in the gilded cage, it is advised to find training partners. The overarching aim is to enjoy the physical activity we partake in, so as to help us relieve tension and stress, and to aid us in finding our physical and mental balance.

We must not forget about warming up for and cooling down after training, or to incorporate stretching into our workouts. In this case, the stretching-relaxing breathing exercises of autogenous training, such as yoga or Pilates – prove to be useful.

In order to avoid accidents, the location, means, and method of training must be carefully chosen according to our circumstances.

SUMMARY

Sometimes, life forces people into difficult situations; however, it is in their interest to consciously put effort into reducing consequent negative effects and their impacts. Sustaining soldiers' physical fitness, decelerating their deterioration, or perhaps even attaining

²⁵ Fritz P. „A rekreációs edzés az egészségtudatos életmód építőköve”. In Szatmári Z. (ed.), *Sport, Életmód, Egészség*. Budapest: Akadémiai Kiadó, 2009. 896.

²⁶ Fritz. „A rekreációs edzés az egészségtudatos életmód építőköve”. 899.

some degree of development is possible, too, within limited circumstances. Analysing the possibilities of these circumstances, using mathematical tools it was found that there is no such setting, where efforts could not be made to maintain physical performance. By setting realisable goals, and through consistent and conscious behaviour, desired results can be achieved in all circumstances. In this paper, I have outlined the key principles that can turn our efforts successful.

Despite the fact that this study is designed to analyse the sustainability of soldiers' physical fitness, it may also be useful in a civil setting for those whose jobs pose similar working circumstances.

Last but not least, advice drawn from the objective analysis of facts is, that if our health allows it, we should not abandon leading an active lifestyle! It is important to partake in physical activities that are in agreement with our age and circumstances, as this plays a key role in sustaining our physical and mental health for as long as possible.

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Lt. Col. Csaba Sásik

SOCIAL WORK IN MILITARY SETTING

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ABSTRACT: *One of the key elements of the success of a complex modernization program covering the entire defence sector is the availability of adequate quantity and quality of human resources. Staffing is provided in a highly competitive labor market by attracting members of a target population (generations X, Y and Z) with significantly different characteristics compared to previous generations. In addition to recruitment activities, the organisation's ability to retain manpower has become extremely valuable in terms of the cost-effective organizational operation of armed forces. An important subsystem of sector-level efforts to increase retention is the human services (family support) system, which provides personal social services to personnel. In terms of its goals, orientation, and tools, the professional activity carried out within the framework of the human service system is fully equivalent to the social work known or recognized in the civil sphere (Military Social Work, which has been officially recognized in the US military since 1945).*

The author describes the nature of military social work, utilizing a multidisciplinary-based framework of general social work and the knowledge of the inner functioning of the army as a totalitarian societal organization.

The aim of the study is to help to strengthen the professional identity of military social work, clarify its competence boundaries, take stock of its objectives and tools, and contribute to the effective cooperation of the military's supporting subsystems (social work, health care, psychology etc.) that are provided to the personnel and their family members.

KEYWORDS: *social work; physical, mental and societal welfare; systems approach; interdisciplinary team work; characteristics of a totalitarian organization; dual professional identity*

INTRODUCTION

The objectives of the complex development program of the Hungarian Defence Forces and their practical implementation necessitate a significant increase in the number of personnel (professional, contract, and reserve personnel). In addition to the increase in the number of employees, a further goal has been set to enable the human resources flowing into the organization to perform innovative, high-quality work in accordance with the requirements of the renewable organizational environment and mode of operation. Successful organizational integration, motivation, and long-term retention of a well-qualified workforce acquired in a fiercely competitive labor market at the expense of significant efforts is essential to achieve this goal.

The Hungarian Defence Forces must ensure its effective operation taking into account significantly different generational characteristics in a fundamentally aging and dwindling society, in a severely and structurally changed labor market situation, with changed employment conditions.¹

¹ Globally operating multinational companies, rise of home office work, atypical forms of employment, etc.

The personnel are made up of members of the young (Y and Z) generations, who differ significantly in their way of thinking, preferences, motivational characteristics, lifestyle, social skills, communication, education, and physical fitness from the previous generations. In order to win this target group on the labor market, a competitive salary is already “only” considered as a basic condition (“entry”), without which the effective recruitment of young people becomes almost unthinkable. In the field of retaining the workforce self-rewarding motivating factors, based on internal reinforcement² as well as employer image (brand), pleasant work environment, professional development, and career opportunity dominate. In order to acquire and retain human resources, the military must increasingly rely on the internal motivational needs of the target groups of employees, in addition to the purely material ones (external motivational factors).

Due to the organizational structure and advancement system of the Defence Forces, the generational heterogeneity of the personnel will remain in the future, so the effective cooperation of different generations with significantly different characteristics and needs will be a key factor in the case of the army. This age heterogeneity requires special action plans and intervention strategies on the part of the staff working in the human resources management subsystem.

All in all, the acquisition and retention of the right quality and number of human resources require complex developments and continuous renewal on the part of the Hungarian Defence Forces. Its priority areas are: organizational image; organizational culture; external and internal communication; getting to know the biological, psychological and sociological characteristics of the younger generations, and addressing the target group (recruitment); military socialization/mentor system; the moral/material esteem and moral status of the personnel; career image/career model; provision of modern technical equipment and infrastructural background; social care/family support system.

As the above areas of development are closely interlinked and in constant interaction with each other (they are interconnected in a quasi-“gear-like” way during the organizational operation) they should not and cannot be prioritized.

With regard that it is not possible to analyze the given sub-areas simultaneously and to map the interactions and possible directions of development within the framework of the present study, I will further narrow the topic of this article to one of the important subsystems that contribute greatly to personnel retention. This subsystem is the area of social programs.

SOCIAL SERVICES

Based on the results of recent research and practical experience, it can be clearly seen that there is a significant demand from the personnel for the effective operation of a social support (family support) system capable of providing personal services (personal counseling, life counseling, individual case management, mental health support etc.).

This need is expected to be even more pronounced in the future, given the high degree of mobility required of staff (and their families) (e.g. change of garrison due to deployment or reassignment, long-term individual foreign service, missions abroad, etc.). The social problems that arise in such situations and affect the entire military family often need a well prepared, professional interdisciplinary team with appropriate tools and command support.

² Search for joy in work, novelty and challenge, feeling of efficiency, spontaneous interest, exploration, etc.

The composition of the team depends on the given case, there may be a social worker, psychologist, doctor, lawyer, military chaplain etc. in it. Just a dynamic and resilient team with an adequate multidisciplinary composition is able to give appropriate answers to these complex problems.

The operation of a complex social support system providing personal services on an appropriate professional basis, continuous monitoring of the current social situation of the personnel, development and implementation of prevention programs and, where adequate, intervention strategies can be assessed as factors promoting retention of the personnel in the armed forces.

In the previous establishment of human service of Hungarian Defence Forces both management and co-working professions involved in professional cooperation, as well as human service professionals needed human service's professional orientation, competencies and tools to be defined as precisely as possible.

The legal norm on the establishment of human service³ defines the purpose of human service as "to promote the physical, mental and social well-being of the available human resources and to prepare the relevant decisions of the commander". The complexity of the goal and the detailed task system definition in the legal norm (multidimensional, holistic approach to individual well-being) as well as its interdisciplinary nature made it difficult to define the internal professional content of the activity and its competency boundaries had to be deleted. This made the professionally adequate and efficient implementation difficult, as well. Another challenge was gaining acceptance of the human service system among personnel and commanders, and the elaboration of a system of cooperation with co-services.

In my article, I describe the professional interpretation framework of human service activities. In my opinion, this will help to strengthen the professional identity of the personnel, to clarify their competence boundaries, and to take stock of the objectives of the activity and the means available to achieve them.

Given that during the creation of the interpretation framework I adapt the professional orientation and activity of civil social work to military environment, therefore – in order to strengthen the independent professional profile and identity – in accordance with the terminology used in theme-specific English literature I call professional social work in military setting „military social work”.

DEFINITION OF MILITARY SOCIAL WORK

Considering the fact that military social work as a professional helping activity has been officially recognized and functioning for many decades in the Armed Forces of the United States⁴ as a defining factor in the support system providing complex welfare services to the personnel and their family members, I decided to quote an American originated definition,

³ 83/2011. (VII. 29.) HM utasítás a humánszolgálat kialakításával összefüggő egyes feladatokról

⁴ „Military social work” as a military profession was officially recognized in the Army on 1st July 1945. Rubin, A., Weiss, E. L. and Coll, J. E. *Handbook of Military Social Work*. New Jersey: John Wiley & Sons, 2013. “Major Daniel E. O’Keefe assumed the position as the first Chief of the Army’s Psychiatric Social Work Branch on July 1, 1945.” Harris, J. „History of army social work”. In Daley, J. (ed.), *Social work in the military*. Binghamton, NY: Haworth Press, 2000. 3–22.

i.e. the definition of the Council on Social Work Education (CSWE).⁵ In accordance with it: „Military social work involves direct practice; policy and administrative activities; and advocacy including providing prevention, treatment, and rehabilitative services to service members, veterans, their families, and their communities. In addition, military social workers develop and advance programs, policies, and procedures to improve the quality of life for clients and their families in diverse communities. Military social workers provide assistance and treatment in the transition from military to veteran status, including a continuum of care and services for military personnel and their families. As the signature injuries and diagnoses (i.e. traumatic brain injury, post-traumatic stress, depression, substance abuse, combat stress, readjustment issues, intimate partner violence, and polytrauma) evolve with current combat-related events, military social work strives to respond by developing effective interventions and policies to aid service members, veterans, their families, and their communities.

Military social workers engage in advanced practice including clinical modalities of individual, couple, family, and group psychotherapy; community practice and research; and case management to address a wide range of co-occurring mental health and physical health issues. Treatment goals aim to facilitate promotion of health, wellness, and resiliency for service members, veterans, their families, and their communities. This clinical practice typically involves the dynamic, interactive, and reciprocal processes of therapeutic engagement, bio-psycho-social-spiritual assessment, and research-informed clinical interventions and programs. Military social workers approach their work with a relationally based, culturally responsive, and theoretically informed perspective.

Military social workers can be deployed into hostile and disaster affected environments to provide community, family, and individual assistance for military personnel and citizens in affected countries.

Military social workers strive to assist and to improve the organizations within which their clients work and live. Military social workers adhere to the Social Work Code of Ethics and the best practice and policy principles of the profession.”⁶

PURPOSE OF MILITARY SOCIAL WORK

The basic goal of the human service of defence forces and the activities of the military social workers operating within its framework is to increase and develop the physical, mental and social well-being of the personnel. The goal setting is based on the definition of health in the Constitution of the World Health Organization (WHO), which states: “Health is a state of total physical, mental and social well-being and not merely the absence of disease or disability”.⁷ This multidisciplinary approach to the definition of health based on a complex, bio-psycho-social approach clearly goes beyond the traditional thinking framework interpreted in the relation of health-somatic medicine, extending it to other dimensions of the

⁵ The Council on Social Work Education (CSWE) is the national association representing social work education in the United States.

⁶ „Advanced Social Work Practice in Military Social Work”. Council on Social Work Education. 2010. 2–4. https://cswe.org/getattachment/Accreditation/Other/EPAS-Implementation/Advanced_Social_Work_Practice_in_Military_Social_Work_2010.pdf.aspx, Accessed on 14 Oct 2020.

⁷ „Constitution of the World Health Organization”. https://www.who.int/governance/eb/who_constitution_en.pdf, Accessed on 28 January 2019.

individual's social existence and social functioning. The WHO Constitution states that human health is essential to social peace and security, and that cooperation between individuals and the state is key in this area. Values, such as fundamental human rights, social security, and the responsibility of the state for maintaining and improving health also appear. Thus, the definition extends the concept of health from the intrapersonal (physical/mental) level of an individual's existence – by introducing the social dimension – to interpersonal events that take place at the micro, meso or macro levels of the social structure and (formal and informal) contact systems. By adapting the WHO's complex, extended concept of health as a goal-setting, human service and military social work as a professional support activity face a rather complex system of tasks and professional missions. In order to see clearly in this dynamically changing field of action and to accurately assess the place and role of military social work, it is worth reviewing Ronald Woods's (1994)⁸ interpretive framework, which is a systems-based approach to human ecology, based on Welch's theory (1987).⁹

SCOPE OF PRACTICE OF MILITARY SOCIAL WORK – SYSTEMIC APPROACH

According to the interpretive framework described by Woods, the centre of the system (human ecosystem) is the individual himself, surrounded by the ever-expanding levels of his/her social environment, covering the micro, meso and macro levels of society. Each level has its own characteristics.

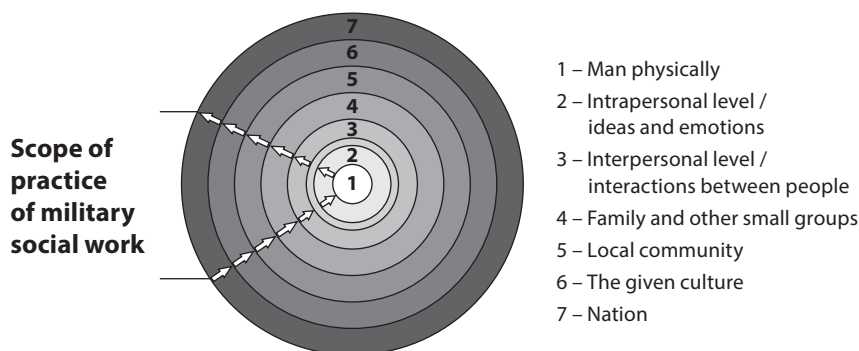


Figure 1 *The human ecosystem*¹⁰

There are two-way interactions between the individual and the social environment around him/her. The individual enters and acts on certain levels of his environment, and there are also interactions coming from his/her environment, as well. The individual at the centre of the system strives to ensure and maintain his/her equilibrium (bio-psycho-social comfort) during interacting with the environment, and to restore it as soon as possible in state of imbalance.

⁸ Woods, R. „A szociális munkások tevékenységeinek egy lehetséges rendszerezése”. In Hegyesi G. and Talyigás K (eds.), *A szociális munka elmélete és gyakorlata: Vol. I.* Budapest: Semmelweis Kiadó, 1994. 32–45.

⁹ Welch, G. „An Integrated Approach to Social Work Practice”. In McKendrick, B. W. (ed.), *Introduction to Social Work in South Africa.* Pinetown: Owen Burgess, 1987. 152–176.

¹⁰ Woods, R. „A szociális munka természete”. In Bácskai E. (ed.), *„Pokolra kell annak menni...”*. Budapest: Népjóléti Minisztérium, 1992. 18. (translated and edited by the author)

At each level of the individual's environment, there are natural resources/supports (e.g. family, friends, local community, municipal social services, etc.) that vary in quantity and quality in the case of each individual. In the case of a tilted equilibrium situation (problem situation), the individual usually turns to these resources primarily for help to restore the equilibrium (i.e. to solve the problem). In an optimal case, by using them, the problem can be solved on the basis of individually developed problem-solving strategies and methods, and the equilibrium situation is restored between the individual and his/her social environment.

However, if these natural supports do not function properly or are missing, non-natural, professional supports in the social environment (e.g. social worker, social educator, psychologist, psychiatrist, addictologist, etc.) should enter the problem-solving process.

TYPICAL SOCIAL PROBLEMS EMERGING AMONG MILITARY PERSONNEL

The focus of military social work activities is on critical life situations that occur during a military career. These are the critical periods around which prevention programs should be planned, and during the existence of these life situations it may also be necessary to increase the monitoring and support of the life of the individual or group/community.

The following can be considered as a critical phase and life situation: integration into the organization (problem of organizational socialization); dislocation and adaptation to associated environmental change; military service abroad and related problems; adapting to increased expectations, obligations and environmental changes resulting from changes in position (e.g. receiving a new assignment); separation from the organization due to a reason beyond the control of the person (e.g. redundancies due to organizational change, damage to health); retirement.

The thematic and individual-specific prevention/intervention program corresponding to the critical phases of the military career is activated before the occurrence of the given life situation and exerts its preventive, helpful and supportive effect. Depending on the nature of the case, the activity may be carried out through an individual facilitator-support relationship (social casework) and/or through group sessions and training programs, as well as through information provided through internal communication channels.

The primary goal of the military social worker's activity is to restore the dysfunctional relationship(s) between the problem individual and the natural or artificial supports in his or her narrower social environment, to strengthen/develop the individual's problem-solving skills and, as a special goal, to support command decision-making (with realistic situation assessment, exploration of causal relationships, and forecasting expected trends).

ROLE OF SOCIAL WORK AMONG OTHER HELPING PROFESSIONS

According to Gordon and Schutz (1982),¹¹ social work should focus first and foremost on the interactions between the individual and his/her environment, its nature and quality. The more it directs its interest and the focus of its activity to one of the actors of the interaction (client or environment), the closer it approaches its professional competence limits.

¹¹ Gordon, W. E. and Schutz, M. „The Roles of Frames of Reference in Field Instruction”. In Sheafor, B. W. and Jenkins, L. E. (eds.), *Quality Field Instruction in Social Work*. New York: Longman, 1982. 21–36.

If it focuses on intrapersonal levels, it comes to the frontiers of medicine, psychology, or psychiatry, but if it focuses on the functioning of the social service system, it reaches the boundaries of social policy.

Thus, social work focuses on the relationship between the supports and resources of the individual and his/her environment. It seeks to restore the functioning of dysfunctional connections, and where these connections are missing, it strives to establish them. It means establishing a connection between the “user” and the “service provider” and ensuring an appropriate level of connection.

In parallel, another key area of intervention for a social worker is to develop the client’s problem-solving skills. The ultimate goal of the social worker is, paradoxically, to make himself/herself “redundant” in the relation of the given client for the future. This means that after the end of the helping relationship, the individual should be able to solve his/her problems on his/her own, with the help of the available problem-solving repertoire and tools – without the use of social work as an artificial professional support. According to Bartlett (1970),¹² social workers do not deal with people who have problems, but with people who cannot cope with these problems.

Returning to the original aim of the study, the question may rightly arise: how can the place and role of military social work be determined in the complex and dynamically changing field of action presented above? The answer must be based on the fact that the army is an integral part of society and, as an organization, can be well placed in the above system (level 5 – local communities). Its personnel is made up of members of civil society, who, despite serving in a special-purpose organization with a special purpose and function, continue to be attached to civil society through a ‘thousand threads’ through their systems of contacts at different levels of the human ecosystem. According to this, the soldier, as a potential client of military social work, must also be placed in the system (multi-level scope of action) presented above.

TOOLS OF MILITARY SOCIAL WORK (KNOWLEDGE, VALUES, SKILLS)

The system of tools available to a military social worker, like social work in a civilian environment, consists of knowledge, values, skills, and a set of objective conditions (natural and artificial resources) found in the environment.

General knowledge of social work

The general knowledge of social work covers the interdisciplinary knowledge corresponding to each level of the human ecosystem. Of course, this does not mean that the social worker has to practice other helping professions (e.g. psychology, psychopedagogy, mental hygiene etc.) corresponding to certain levels of the human ecosystem at the same time, on an in-depth and professional basis. The social worker does not have the necessary professional qualifications or the necessary depth of knowledge for this. Actually, his/her professional activity does not focus on individual levels or events within the individual, but primarily on the system of relationships between the individual and his environment.

¹² Bartlett, H. *The Common Base of Social Work Practice*. New York: NASW, 1970.

Thus, the social worker must have a comprehensive, complex knowledge of the system as a whole, as well as the characteristics of its different levels, the problems that may occur on them, and their prevention and intervention options. In relation to the given client or problem situation, he/she must be able to recognize and adequately identify the nature of special problems at each level, and then involve in the helping process (work of a professional team) a representative of the competent profession (e.g. psychologist, psychiatrist, advocate, etc.).

The social worker coordinates, facilitates and manages the work of the professional team in order to solve the client's problem situation. In addition, of course, he/she maintains the helping relationship with the client throughout, until the problem situation is resolved and the relationship is closed (or in the subsequent follow-up phase, as well).

Knowledge of a special organizational environment and clientele

The military social worker must pay extra attention to the characteristics of the special organizational environment where the service is performed (totalitarian and bureaucratic organization, specific organizational culture). He/she should also be aware that the repertoire of natural and artificial supports in the military's social environment is supplemented by support from the army's human resources support system (e.g. human-, psychological-, housing-, recreational support systems).

In the course of his/her activities, the military social worker must strive to enable those in need of support to make the fullest possible use of the opportunities and services provided by the civil and military care system, in order to solve their problems and increase their well-being in a complex sense.

Additional specifics include the knowledge of a special clientele (soldiers/military families) that can be described with more or less different characteristics from the members of the civil sphere (e.g. observing and appreciating the very specific formal and informal rules in interpersonal contacts, special attitudes toward military service and fellow soldiers etc.). In addition to the formal and informal operation and interpersonal relations of the organization, this knowledge means the knowledge of the attitudes, motives and behaviors of soldiers in general, which has decisive importance for the effectiveness of social work in a military environment.

Values

When discussing the values of military social work, we find ourselves in a seemingly somewhat contradictory situation at first glance. In this case, the democratic and inclusive social work, which has a fundamental value of human self-determination, dignity, diversity, and tolerance, meets a hierarchical, uniformed organizational order. In order to understand the situation, which seems contradictory at first, it is worth examining the explicitly declared moral-ethical norms that fundamentally influence the operation of the two spheres.

The preamble to the Code of Ethics¹³ for Social Work, adopted by the Assembly of Delegates of the Social Professional Association in 2016, states, inter alia: "The principles of

¹³ „A Szociális Szakmai Szövetség Etikai Kollégiuma által 2015–16-ban átdolgozott Szociális Munka Etikai Kódexe”. Szociális Szakmai Szövetség, 15 April 2016. <http://www.3sz.hu/sites/default/files/Etikai.pdf>, Accessed on 14 Oct 2020.

social justice, human rights, shared responsibility and respect for diversity are central to social work. [...] Social work grew out of democratic ideas and is based on respect for human dignity.”¹⁴

The current Code of Military Ethics¹⁵ of the Hungarian Defence Forces, which contains the basic moral and ethical standards of military service, includes the following: “Respect: respect for the values of Hungarian and universal culture, the historical past and military traditions and symbols, respect for service and human dignity, acceptance of human differences and personalities, to the extent that it does not constitute an obstacle to the military profession, as well as appreciation of the authority of rank”.

Comparing the above two ethical approaches it can be seen that the human and world-views of the two spheres are extremely similar. In the case of military ethics, although there are limits to the priority of practicing the profession, similar limits exist in the case of civil social work (respect for the rule of law and respect for the freedoms of other people). So the principles, the ethical attitude are very similar, the difference is only in the framework rules and in the room for maneuver of the social worker.

Skills

Skills are key factors in the practical implementation of theoretical knowledge of social work. The social worker, like other professional helpers, works with his/her own personality, and the activity is based on a relationship of trust between the helper and the client, and a helping relationship based on mutual acceptance and rapport.

The key skills of the social worker in establishing an appropriate supportive relationship with the client and in the further management and facilitation of the support process are: empathy; excellent communication skills (always in line with the situation, tactfully, if necessary diplomatically, and always congruently); assertiveness; the ability to think in a complex, system-wide way and to work with other helping professions (team work). In case of military social work, another important factor is the ability of the social worker to reconcile professional identity with military identity.

Due to the above reasons, personality development group sessions conducted on the basis of different methods (e.g. person-centered/encounter and psychodrama groups) are important and integral parts of social worker trainings. These group sessions aim to develop and deepen the self-knowledge, empathy skills, and problem sensitivity of helping professionals.

Another important skill-level knowledge material comprises those communication techniques that can be used effectively in various – often extreme – situations (e.g. crisis situation on the battlefield). These techniques can be internalized through communication skills development trainings.

DUAL IDENTITY OF MILITARY SOCIAL WORKER

In addition to helping and supporting the client (soldier/military family), the military social worker must also pay attention to the basic interests and objectives of the organization (HDF) that creates a dual identity situation: he is a professional social worker who helps his

¹⁴ Translation by the author from the original Hungarian citation.

¹⁵ 67/2003. (HK 18.) HM utasítás a „Katonai Etikai Kódex” közzétételéről, a „Honvédségi Etikai Tanács” létesítéséről és feladatairól

client, but he is a soldier/military civil servant as well, who is loyal to the military organization at the same time.

Based on my professional experience,¹⁶ I believe that this dual identity does not pose an operational or moral/ethical problem for the activities of military social workers. This is partly due to the fact that both the helper and the client serve in the armed forces on a voluntary basis, accepting the special, in many cases restrictive nature of service, and partly due to the fact that the human image and moral/ethical attitude of military and civil social work are very similar.

MULTIDISCIPLINARY APPROACH, COOPERATION WITH OTHER HELPING PROFESSIONS

As it has already been pointed out in many places, given the complexity and multicausal nature of the problems belonging to its professional competence, social work is based on a multidisciplinary theoretical approach and, accordingly, requires high-grade interdisciplinarity for its preventive and intervention activity. For this reason, social work is also characterized as an “interprofessional profession”, as both its theory and practice synthesize and use the knowledge of other disciplines and auxiliary professions in order to achieve its own professional goals.

In this particular situation, it is not uncommon for a social worker to reach the boundaries of other helping professions (e.g. psychology, psychiatry, addictology, social pedagogy, special education, social policy, etc.) in the course of his/her practical activities. Despite the fact that the social worker has a comprehensive and complex interdisciplinary knowledge and, to some extent, also knows the practical methodology of other helping professions, it is unfortunate and even quite detrimental to the client's interests and the helping process as a whole if he/she starts acting beyond his/her professional boundaries, and takes inadequate intervention steps. In order to avoid this, it is extremely important to recognize and respect the boundaries of professional competence, as well as the planned, coordinated activities of the interdisciplinary professional team, which in most cases forms the basis of effective social case work. (Of course, no two cases are the same, so each case requires a different intervention strategy and a different team of professionals).

The above statements are, of course, also true for social work activities in a military environment, as the members of the target group of the activity (HDF personnel and their family members) are also an integral part of the wider population. In their case the difference is that they are in special service/special status and are members of an organization that operates its own social support system as well. The key actors (cooperating professionals/services) of this social support system within the organization are primarily the followings: human, psychology, health, legal, financial and personnel services; camp pastoral service. These services, regardless of whether they operate on the basis of organizational segregation, must operate on the basis of a holistic approach to the WHO's extended, multidimensional definition of health, maintaining ongoing professional relationships, effective cooperation, and mutual support. Offensive attempts at professional rivalry and, as a result,

¹⁶ My professional experience in the field of human resources at the central personnel body of the Hungarian Defence Forces.

the unjustified extension of competence boundaries, destroying quality and efficiency, point in the direction of dysfunctional organizational functioning.

In addition to the above, I consider it important to emphasize once again that if a given case – due to its nature – falls within the competence of social work as a helping profession, then the coordination, management, and facilitation of the work of the professional team is the task of the social worker. It does all this on the basis of a “contract” (mutual agreement on a helping relationship) agreed with the client, with maximum respect for the competence limits and activities of the representatives of the partner helping professions participating in the professional team.

CONCLUSIONS

One of the basic conditions for the successful modernization of the armed forces and the development of its organization is the provision of adequate quantity and quality of human resources. Not only does this presuppose successful recruitment in a highly competitive labor market but also focuses on retaining the quality workforce acquired at the expense of significant efforts.

An effective human service system (complex family support system) capable of providing personal social care (tangible, real help) to personnel and their family members with appropriate professional standards, can greatly contribute to the retention of HDF.

Given the complexity of human problems, this system can operate effectively only on an interdisciplinary basis, with the constructive cooperation of the various helping professions and services, with maximum respect for the limits of professional competence.

The activities of military social workers with a dual (military / professional) identity working in a military environment are in line with the work of their colleagues in the civil sphere – in terms of its nature, orientation, and moral and ethical norms. However, in addition to general professional knowledge, military social workers must have a thorough and in-depth knowledge of the specific organizational environment in which and the personnel with whom they work.

The work of an interdisciplinary-based professional team organized in connection with social, family support-type cases falling within the professional competence of a military social worker is coordinated by the social worker. During the team work, it is extremely important that the representatives of the partner helping professions involved should respect each other's activities and professional competencies to the maximum.

Military social work, as a helping profession, must find its identity, represent its professional interests, and gain recognition with its results among both personnel and co-helping professions, as well as professionals and decision-makers involved in the development of the human resources management subsystem of the Hungarian Defence Forces.

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Col. László Drót

THEIR MISSION IS TO TRAIN PEACEKEEPERS

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ABSTRACT: The following article introduces four typical training centres, their national training solutions, organisation, and history of establishment show different characteristic features. The first centre is the Bangladeshi BIPSOT, which appears to be a “factory”; the second one is the 50-year-old Finnish FINCENT; the third centre is the internationally established Bosnian PSOTC; and the fourth one is the Hungarian PSTC. Through the introduction of the centres, they will be compared regarding organisation, chain of command, strength, training activities, and course fee systems, in order to highlight the main differences. The training centres were established in approximately identical circumstances. Three of the above mentioned training centres were created with the predominant function of serving the peacekeeping needs of the given country. The Bosnian PSOTC is an exception as it came into existence with some international assistance. This was due to the fact that the localisation and the development of peace support operations training were made an integral part of the peacebuilding process. It must be noted that all the four training centres perform national tasks; however, there is great emphasis on their international involvement as well. If a distinction needs to be drawn, it may be stated that FINCENT and PSOTC could rather be considered institutions of an international nature; however, BIPSOT also plays a major role in the regional training system. HDF PSTC basically serves national needs, but carries out increasing international engagement, too. It is these four basic types that dominate the architecture of training in the world.

KEYWORDS: peacekeeping, training

On 29 May 1948, the Security Council, in Resolution 50 (1948), called for a cessation of hostilities in Palestine and decided that the truce was to be supervised by the UN Mediator, with the assistance of a group of military observers. The first group of military observers, known as the United Nations Truce Supervision Organization (UNTSO),¹ arrived in the region in June 1948. In commemoration of this, 29 May is the International Day of United Nations Peacekeepers every year.² Since 1948 the UN has launched 71 missions. Currently 15 missions are running under UN umbrella all over the world. 110 thousand men and women, out of whom 93 thousand are military personnel, serve in peacekeeping missions. The annual UN peacekeeping budget is about USD 6 billion. To date, 3,644 UN heroes have paid with their lives

¹ “The Palestine Question: S/RES/50 (1948)”. United Nations Security Council. 29 May 1948. [http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/50\(1948\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/50(1948)), Accessed on 24 May 2019.

² “Peacekeeping Operations fact sheet”. Sep 2017. https://peacekeeping.un.org/sites/default/files/pk_factsheet_09_17_e_sb.pdf, Accessed on 25 May

in peacekeeping missions. The training of 110 thousand peacekeepers requires a huge training architecture from the member states each year.³

In UN missions, the training of civilian, police, and military peacekeepers is the responsibility of the member states. In accordance with this training requirement, troop-contributing countries have established their own training institutions. Several countries have set up a training “factory” for peacekeepers, others have sent their mission candidates to regional or neighbouring training facilities. Some countries like Ethiopia (8,340), Bangladesh (7,053) and India (6,695) established a huge training capacity for the training of their troops, others like Finland, Norway, Denmark, etc. have few training staffs to organise peacekeeping training. Bosnia and Herzegovina has its PSOTC established by international partners, NATO, and EU organizations, and has transferred the commanding authority to the MOD of BiH. There are many interests and differences among the training solutions of the countries depending on their national needs and international efforts. It can easily be imagined how many different peacekeeping institutions exist all over the world. An annual conference for the International Association of Peacekeeping Training Centres is held with more than 240 centre commandant participants representing their training centres. In the following article, I introduce four typical training centres. Their national training solutions, organisation, and history of establishment show different characteristic features. The first centre is the Bangladeshi BIPSOT,⁴ which appears to be a “factory”; the second one is the 50-year-old Finnish FINCENT;⁵ the third centre is the internationally established Bosnian PSOTC;⁶ and the fourth one is the Hungarian PSTC.⁷ Through the introduction of the centres I would like to compare them regarding organisation, chain of command, strength, training activities and course fee systems. As a result, you will be able to identify the main differences.

BANGLADESH IN PEACE SUPPORT OPERATIONS

“Bangladesh started its peacekeeping journey by contributing a group of officers to United Nations Iran-Iraq Military Observer Group (UNIIMOG) in August 1988 just after the Iran-Iraq war. Since then, peacekeeping under trying conditions have successfully proved their credibility.”⁸

Bangladeshi “peacekeepers are currently deployed in eleven countries and the nation is one of the highest troops contributing countries in the world.”⁹

According to them, “the daunting challenge is ‘to train regular troops for Peace Support Operations’. The 2nd Secretary General of the UN Dag Hammarskjöld aptly said ‘Peacekeeping is not a soldier’s job, but only a soldier can do it’.”¹⁰

³ “Summary of Troop Contributing Countries By Ranking”. United Nations Peacekeeping. 2017. http://www.un.org/en/peacekeeping/contributors/2017/jun17_2.pdf, Accessed on 25 May 2019.

⁴ Bangladesh Institute of Peace Support Operation Training (BIPSOT)

⁵ Finnish Defence Forces International Centre (FINCENT)

⁶ Peace Support Operations Training Centre (PSOTC)

⁷ Peace Support Training Centre

⁸ “Commandant’s Welcome”. Bangladesh Institute of Peace Support Operation Training. https://www.bipsot.net/index.php?option=com_content&view=article&id=47&Itemid=193, Accessed on 25 May 2019.

⁹ “Commandant’s Welcome”.

¹⁰ “Commandant’s Welcome”.

The troops designated for PSO are given training in compliance with the Core Peacekeeping Training Materials (CPTM) of United Nations Department of Peacekeeping Operations (UNDPKO). “To train officers and troops prior to their deployment in mission areas, a Peacekeeping Operation Training Centre, in short, PKOTC was raised on 24 June 1999. The institution was renamed as Bangladesh Institute of Peace Support Operation Training, in short BIPSOT in the year 2002. Gradually, through hard work, utmost dedication in promoting world peace and sincere efforts of all concerned, BIPSOT has now emerged as one of the region’s premier peacekeeping centres, which is globally recognized.”¹¹ In BIPSOT, not only do they train “the Bangladeshi peacekeepers, but also the peacekeepers of other UN member states around the globe.”¹² The Bangladeshi “contribution has been duly recognised by friendly countries and the international communities as well. The mission of the Institute is ‘to impart specialized training to potential peacekeepers on UN peace support operations’ and developing and dynamic institution with the latest technological support.”¹³ BIPSOT likes “to take a leading role in peace support operations in the region”.

“During the 90s, peace support operations were re-evaluated in the wake of changing dimensions of conflicts, which were mostly intra-state and ethnical in nature. Mr Brahimi’s report of October 2001 paved the way for a new approach to peace support operations for effectively coping with the emerging complex situations. The recommendations of the Brahimi’s report were incorporated into our training curricula, which have required certain changes and review of the then training modalities.”¹⁴

PKOTC has been “remodelled to accommodate these changes; its scope was widened, newer dimensions were addressed and training aspects of all types of peace support operations were incorporated.”¹⁵

Training Facilities

“BIPSOT has a set of well-trained and experienced instructors from Bangladesh Army, Navy and Air Force. This Institution has established a Command & Staff Simulation Room (CSSR) and a modern Language Lab. BIPSOT has both left- and right-hand driving simulators to train our peacekeepers on driving before they are inducted in mission areas. All classrooms are computerized. To keep in touch with deployed forces and to obtain updated scenario of the missions, BIPSOT is connected with high-speed Internet. It has very well organized and highly equipped syndicate discussion rooms, a growing library and an auditorium with 300-men capacity.”¹⁶

¹¹ “Commandant’s Welcome”.

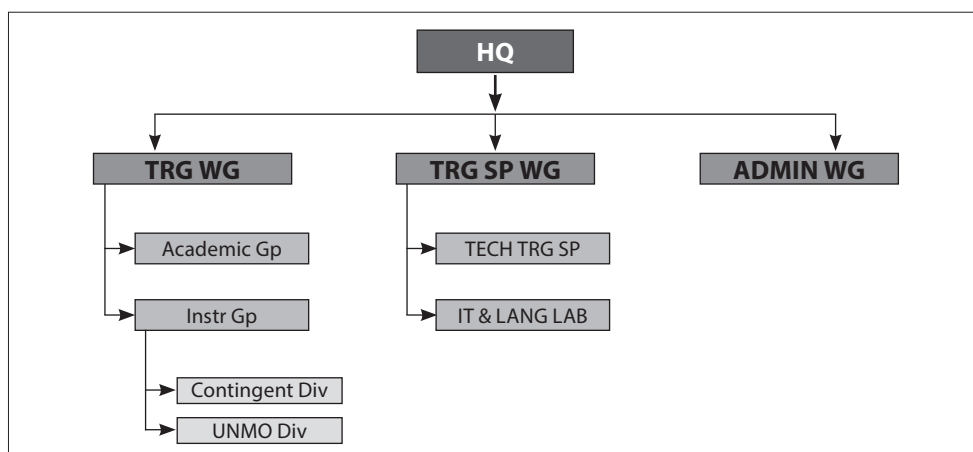
¹² “Commandant’s Welcome”.

¹³ “Commandant’s Welcome”.

¹⁴ “Background”. Bangladesh Institute of Peace Support Operation Training. https://www.bipsot.net/index.php?option=com_content&view=article&id=46&Itemid=177, Accessed on 25 May 2019.

¹⁵ “Background”.

¹⁶ “Facilities”. Bangladesh Institute of Peace Support Operation Training. https://www.bipsot.net/index.php?option=com_content&view=article&id=27&Itemid=189, Accessed on 25 May 2019.



Picture 1 *Organogram of BIPSOT*

Training Support

“The institution has almost 50 acres of land for field training. In addition, other facilities available within Rajendrapur Cantonment are also used. An infantry battalion is affiliated and co-located with BIPSOT for providing necessary training support like conducting demonstration, exercise and necessary administrative assistance.”¹⁷

Accommodation

“BIPSOT has an officers’ mess with 60 rooms and an NCOs’ dormitory with 130 capacities.”¹⁸ “BIPSOT receives requests from UN for peacekeepers to work in different appointments and responsibilities and participates with contingents to perform tasks that can only be taken by military personnel, as observers and UN staff officers at field level. However, one may have to take responsibility peculiar to a particular mission.”¹⁹

Courses²⁰

- Field Training Exercise (FTX) of BANRDB/2 (38 EB), MONUSCO
- Refresher Trg – BANRDB/2 (38 EB), MONUSCO
- Pre-Deployment Training
- United Nations Staff Officer’s Course
- United Nations Contingent Commanders’ Course
- French Language Course
- United Nations Military Observer Course

¹⁷ “Facilities”.

¹⁸ “Facilities”.

¹⁹ “Concept of Training”. Bangladesh Institute of Peace Support Operation Training. https://www.bipsot.net/index.php?option=com_content&view=article&id=55&Itemid=196, Accessed on 25 May 2019.

²⁰ “BIPSOT recent training”. Bangladesh Institute of Peace Support Operation Training. https://www.bipsot.net/index.php?option=com_content&view=category&layout=blog&id=40&Itemid=222, Accessed on 25 May 2019.

- FTX – BANBAT/6 (5 BIR) & BANENGR (Constr)/6, MINUSMA
- United Nations Logistic Officers' Course
- Training of Trainers on Protection of Civilians
- Refresher Trg – BANBAT/6 (5 BIR) & BANENGR (Constr)/6, MINUSMA
- Comprehensive Protection of Civ
- FTX – BANENGR (Constr)/19, UNMISS
- ToT on International Humanitarian Law
- Refresher Trg – BANENGR (Constr)/19, UNMISS
- United Nations Contingent Commanders' Course
- English Language Course
- Medical First Responder Course
- UN Civil Military Coordination Course
- Disarmament, Demobilization and Reintegration Course
- Conflict Related Sexual Violence
- Women, Peace and Security Course
- Ammunition Safety Management Course
- Security Sector Reform Course
- Opportunities for youths to contribute in UN and peace Support Operation.
- Engaging Host Nation during UN PKO
- Protection of children and women in UNPKO
- Current PKO sit and environment: Employment of New Technologies and mil measures



Picture 2 *The Main Building of BIPSOT*

Almost 10% of UN Peacekeepers have been trained by BIPSOT. It has become one of the largest and most famous training centres in the world. Its organization is under the direct command of the International Operation Headquarters. The Commander of BIPSOT is a two-star general, who directly cooperates with the Ministry of Defence and the Ministry of Foreign Affairs. Bangladesh has been taking advantage from the UN reimbursement system, which means the Bangladeshi Defence Forces annually gets USD 300 million from the UN for peacekeepers and for the military equipment provided by Bangladesh for UN missions. This general income is one line in the annual government budget. Peace-keeping training has become an industry in Bangladesh and highlighted national interest. BIPSOT is frequently visited by UN Secretary-Generals, Presidents, Prime Ministers, and diplomats from all over the world. BIPSOT is the leading training institute of the Asia-Pacific Association of Training Centres, and serves as its secretariat. The personnel strength

of BIPSOT is not exactly known, it is confidential, but to my knowledge, it has 18 different course directorates and several additional subject matter experts. In my opinion, the core manpower of the centre is about 100. The total strength of the “Peacekeeper Industry” must be about 1,200 troops with logistic and garrison support.

BIH PEACE SUPPORT OPERATION TRAINING CENTRE

“PSOTC was established as the multinational project of twelve partner nations – Denmark, Finland, France, Hungary, Netherlands, Norway, Poland, Sweden, Switzerland, Turkey, UK and USA – which signed the Memorandum of Understanding (MOU) ‘Concerning Co-Operation in the Establishment and Operation of Peace Support Operations Training Centre in Bosnia and Herzegovina’ on 20 November 2003. The aim of the project was to provide education and training in peace support operations (PSO) for the Armed Forces of Bosnia and Herzegovina and international attendees, as well as to promote benefits of inter-entity co-operation and to support the BiH defence reform. The Partners agreed to provide sufficient funding for the establishment, as well as to provide a certain number of military staff required for PSOTC. It was also agreed that the United Kingdom would act as the contracting agent on behalf of the Partners in relations with BiH. Albania, Austria, Croatia, Germany, Macedonia and Serbia also joined the Partners later.”²¹

Since its foundation, the Centre has evolved into an internationally recognized education and training (ET) institution that has extended its mandate to train candidates from across the region, including NCOs, police officers, and civilians. It became a Partnership Training and Education Centre (PTEC) in 2007, and was recognized as one of the regional training centres in 2009.

In December 2012, after a transition period, the Centre was handed over to BiH and has been fully integrated into the chain of command of BiH Armed Forces (AF BiH) since 1 January 2013. Even after the transition, the Centre has preserved its international profile by having international instructors in its staff, and by educating international students.



Picture 3 *The partners of PSOTC*

On average, PSOTC conducts around 30 education and training events per year, out of which 15–17 are residential courses and 6–8 Mobile Training Team (MTT) activities. From the delivery of its first course in 2005, until the end of 2017, PSOTC educated and trained almost eight thousand students, out of which more than 38% were international.²²

The quality of the education and training delivered by PSOTC was confirmed both nationally and internationally through course accreditations and institutional accreditations. In its course catalogue the Centre currently has six NATO approved courses, two UN certified courses and two courses accredited by the

²¹ “History”. Peace Support Operations Training Centre. <http://www.psotc.org/Content/Read/history>, Accessed on 25 August 2021.

²² “Course catalogue 2017”. PSOTC. http://mod.gov.ba/foto2015/04012016PSOTC%20Catalog%20for%202017_za_stampanje.pdf, Accessed on 25 May 2019.

local academia. In 2014, the US State Department awarded PSOTC with the Full Training Capability Certificate. In May 2016 the Centre received the NATO Quality Assurance Certificate, thus becoming one of the NATO Accredited Education and Training Facilities.²³

PSOTC performs training and education in the field of peace support operations (PSO) for the AF BiH and for members outside of the Ministry of Defence (MoD) of Bosnia and Herzegovina, as well as acts as a NATO Partnership and Regional training centre for education and training in PSO in support of the partners, with the goal of reaching NATO and UN compatible standards and providing support to the AF BiH in overall efforts of BiH's contribution to international peace and security.²⁴ The PSOTC, a NATO Partnership education and training facility, continues to perform as a centre of excellence in PSO in order to support the professional development of the AF BiH, offering education and training to other BiH institutions as well as to NATO and international partners, while still preserving its global and regional reach.²⁵

Tasks of PSOTC

- Deliver high-quality, customer-oriented and internationally recognized (UN, NATO and EU) education and training.
- Support the education and training of the members of the Armed Forces and other security institutions of Bosnia and Herzegovina for peace support operations.
- Contribute to NATO education and training efforts and thereby foster the integration of Bosnia and Herzegovina into NATO.
- Strive for gender equality in the Centre through gender mainstreaming in accordance with relevant international and national regulations.
- Constantly improve learning and working environment which stimulates students' and staff's creativity, learning, interaction, and consensus-reaching ability.
- Maintain continuous improvement of all aspects of quality assurance, with emphasis on personnel development, education and training process, students' welfare and the provision of quality resources.²⁶

The creation of PSOTC was the result of initiatives of an international partners' community. In the first ten years, the partners provided funding and substantial help to build a basis hard enough so that the centre could function independently in the future. Since 2013, the PSOTC has been operating as one of the military training units in the organization of the BiH Armed Forces. The enhancement of PSOTC training is one of the best examples of the peace support activity (called training support) carried out by international partners in the NATO-led SFOR, and after 2004 (when the EU took over the leading position in the mission) by the EU-led EUFOR.

²³ "History". Peace Support Operations Training Centre. <http://www.psotc.org/Content/Read/history>, Accessed on 25 August 2021.

²⁴ "Mission". Peace Support Operations Training Centre. <http://www.psotc.org/Content/Read/mission>, Accessed on 25 August 2021.

²⁵ "Vision". Peace Support Operations Training Centre. <http://www.psotc.org/Content/Read/goals>, Accessed on 25 August 2021.

²⁶ "Goals". Peace Support Operations Training Centre. <http://www.psotc.org/Content/Read/goals>, Accessed on 25 August 2021.



Picture 4 *The building of PSOTC*

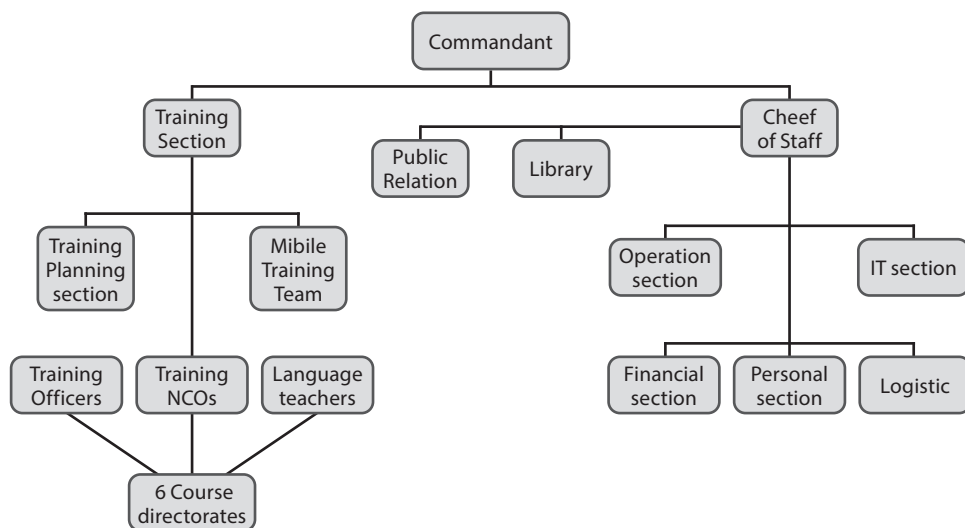
The centre itself is situated in Sarajevo, in Camp Butmir, the same base where the EUFOR and several other BiH Armed Forces Units are located. PSOTC has a modern building, equipped with 21st century technology, also erected by the international partners and handed over to the BiH Defence Forces in 2012 by the international maintaining body. PSOTC has no accommodation capacity and independent logistic support, apart from a small transportation element. The Centre has introduced a course fee system. Students from different parts of the world pay for accommodation, catering, and for the course. The course fees are deposited in an independent bank account, which is used to cover the travel costs of the PSOTC members. PSOTC has no independent PC network system that is why an exemption has been granted by the NATO recognition board.

The following courses are organized annually:²⁷

- Media management in PSO Course
- International Staff Officers Skills Course (ISOSC)
- Essential Staff NCO Skills Course
- UN Police Course
- Utility in gender in PSO Course
- Building integrity in PSO Course
- Defence Attaché Course
- PSO Staff NCO Course (PSOSNCOC)
- Building integrity for senior NCO Course
- Counterinsurgency Course (COIN)
- UN comprehensive protection of civilians Course
- UN Staff Officers Course (UNSOC)

²⁷ “Resident Courses”. Peace Support Operations Training Centre. <http://www.psotc.org/Course/List?category=1&id=seminars>, Accessed on 25 August, 2021.

- Euro-Atlantic Security Course
- Common security and defence policy orientation course
- Hazardous environment awareness training (HEAT)



Picture 5 *The organogram of PSOTC*

PSOTC has 32 training staff members. The organization chart is shown in *Picture 5*. Few staff work for coordination, and the training section operates in a course tutor system. The logistic support is provided by Camp Butmir and the BiH TRADOC. PSOTC is part of the international instructor exchange system, which provides and requests instructors from other similar training centres.

FINCENT

The Finnish Defence Forces International Centre (FINCENT), formerly known as the United Nations Training Centre, was founded in 1969. The Finnish Defence Forces International Centre, FINCENT is part of the Finnish National Defence University (FNDU). Almost 50 years of experience in peacekeeping and in pre-deployment training has been integrated into an academic environment with a high-level research status.²⁸ “FINCENT has been qualified by the UN (UN Certificate of Training Recognition), NATO (NATO ACT Quality Assurance) and FNDU (NDU Assurance of Training Quality).”²⁹ FINCENT has attained the ISO9001 certificate, which is the backbone of the education and training system.³⁰ FINCENT concentrates on military crisis management training and education for commanding and expert personnel. It conducts three types of courses. Firstly, training

²⁸ “Course and Activity Catalogue 2019”. Finnish Defence Forces International Centre. https://puolustusvoimat.fi/documents/1951249/2094941/Fincent_Course_Catalogue_2019.pdf/d04855c5-8292-b60f-4f92-cd26159a0310/Fincent_Course_Catalogue_2019.pdf.pdf. 2019.05.25, Accessed on 25 May 2019.

²⁹ “Course and Activity Catalogue 2019”.

³⁰ “Course and Activity Catalogue 2019”.

is provided for traditional stronghold courses such as the UN Military Experts on Mission Courses (UNMEM) that prepare military observers, liaison officers, and military advisers for any type of UN mission. Secondly, it arranges courses in cooperation with other national and international training centres. The third category consists of courses proposed by external parties and implemented or facilitated by Finland. FINCENT also provides instructor support by sending individual instructors, subject matter experts, and Mobile Education and Training Teams (national and Nordic) to national/international training centres. FINCENT wants to combine research and training to achieve a better understanding of training and education requirements. It is a great opportunity for FINCENT to fulfil those demands, as the task is to act as the Head of Comprehensive Crisis Management Research of the Finnish National Defence University. This task also supports FINCENT in its role as the Department Head of NATO Military Contribution to Peace Support (MC2PS). The goal of FINCENT is to be able to achieve better learning outcomes. Therefore, they are also looking forward to developing the training and education of instructors. FINCENT is looking for solutions on how to train and educate instructors to use more effective methods, for example, by using a wider spectrum of embedded training solutions. It is also very important that the instructors understand and accept the pedagogical ideas of FINCENT on how to support students in achieving their learning objectives more effectively. FINCENT cannot execute any activities without the support of national and international actors. Together, FINCENT and Crisis Management Centre (CMC) Finland, as the Finnish Centre of Expertise in Comprehensive Crisis Management, have been successful in cooperating and coordinating training and education for ten years now. FINCENT is in close cooperation with the Police University College. The staff of FINCENT is dedicated to offering high-quality courses that meet the needs of both national and international students and participants. They consider learning to be a life-long process. The motto of FINCENT is the following: “With valid attitudes, education and training there are always solutions – Every Action Matters.”³¹

The Military Island of Santahamina, Helsinki

“In 2015, FINCENT was relocated to the Santahamina Garrison in Helsinki, some ten kilometres from Helsinki city centre. The Santahamina Building was completed in early 2015. The building is used as premises for FINCENT and some other departments and services of the National Defence University in the campus area of the National Defence University within Santahamina Garrison. The Santahamina Building includes:

- a course hotel for 65 people with laundry facilities, kitchens, a gym, and a sauna,
- a café,
- classrooms and group study rooms,
- an auditorium,
- the National Defence University Library,
- physical training facility.

During courses, a wide variety of sports facilities and equipment are available for the students.”³²

³¹ “Course and Activity Catalogue 2019”.

³² “Course and Activity Catalogue 2019”.

Training Area in Niinisalo

“Some courses conducted by FINCENT, such as the United Nations Military Experts on Mission Course (UNMEM), are arranged partly in the Pori Brigade’s Exercise Area in Niinisalo, as the terrain there has proven to be excellent for the demanding exercises included in the courses.”³³

The Finnish Defence Forces International Centre FINCENT organises military crisis management training for command and expert personnel in crisis management operations led by the United Nations, NATO, the African Union and the European Union. FINCENT also focuses on assuring the quality of training and supervising crisis management education criteria.

“The mission of FINCENT is to execute and conduct the international training of leaders and experts in crisis management in cooperation with its national and international partners. FINCENT monitors and evaluates the range, execution and practices of crisis management training on a global scale and defines training solutions and responsibilities. FINCENT also supports other Finnish Defence Forces units with its expertise in terms of training and evaluation.”³⁴

The main tasks of the Finnish Defence Forces International Centre (FINCENT) are to:

- “Arrange and host national and international courses, exercises and seminars for the UN, the EU, NORDEFCO, NATO and NATO/Partnership and the AU.
- Act as a Department Head of NATO Military Contribution to Peace Support discipline to coordinate the military contribution to peace support training offered by other education and training centres.
- Act as a Finnish Operational Capabilities Concept Evaluation and Feedback Program (OCC E&F) Centre to support all Finnish Defence Forces services in NATO OCC E&F related matters.
- Support Finnish civilian crisis management efforts.
- Send Finnish officers to participate in crisis management courses abroad.
- Cooperate with international and national civilian and military partner organisations.
- Participate in research activities: For example, the IECEU-project that analyses and assesses best practices and lessons learned with a view to enhance the conflict prevention and peace building capabilities of EU.”³⁵

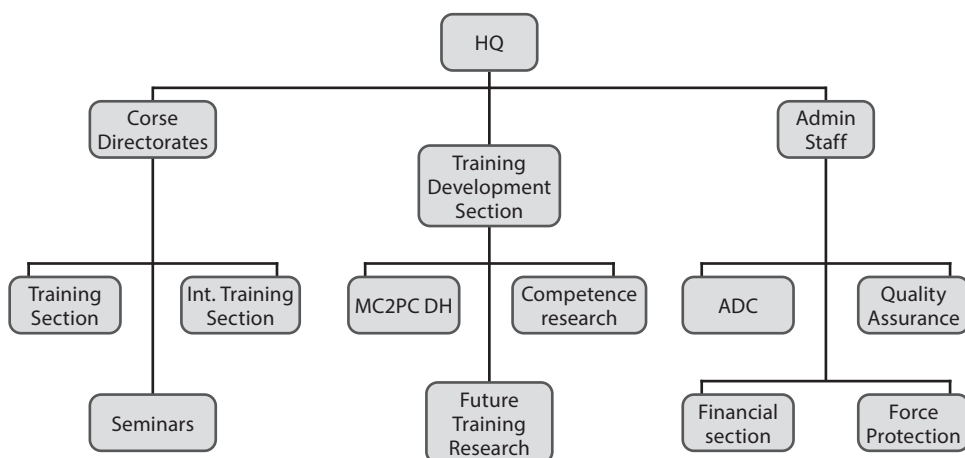
“A cooperation establishment between the Crisis Management Centre (CMC Finland) and FINCENT, called the Finnish Centre of Expertise in Comprehensive Crisis Management, provides common training for both military and civilian personnel in the multidimensional and complex field of comprehensive crisis management.”³⁶

³³ “Course and Activity Catalogue 2019”.

³⁴ “Course and Activity Catalogue 2019”.

³⁵ “Course and Activity Catalogue 2019”.

³⁶ “Course Catalogue 2016”. Finnish Defence Forces International Centre. <https://logistiikkalaitos.fi/documents/1951249/2094941/FINCENT-Course-Catalogue-20162202.pdf/1ec7dfc3-fb03-45f7-a114-d8d855be6078/FINCENT-Course-Catalogue-20162202.pdf>, Accessed on 25 May 2019.



Picture 6 *The organogram of FINCENT*

Courses conducted by FINCENT³⁷

- United Nations Courses
 - UNMEM – NORDEFECO United Nations Military Experts on Mission Course
 - UNCPOC – NORDEFECO United Nations Comprehensive Protection of Civilians Course
- European Union Courses
 - SSR – European Security and Defence College Core Course on Security Sector Reform
 - EUIACM – European Union Integrated Approach on Crisis Management Course
- NATO Courses
 - LOC – NATO/Partnership Logistics Course
 - OCC Database – Operational Capabilities Concept Database Training
 - S5-54-A COPC – NATO Comprehensive Operations Planning Course
- General Courses
 - ICM – NORDEFECO Integrated Crisis Management Course
 - PSOCC – Peace Support Operations Cooperation Course (Tactical level)
 - SAFOC – NORDEFECO Safety Officer Course
 - NCGM METT – NORDEFECO Nordic Centre for Gender in Military Operations Gender Training of Trainers Mobile Education and Training Team Course
- Language Courses
 - METC – Military English Terminology Course
 - MFTC – Military French Terminology Course
- Tailored Courses and Seminars
- Distance Learning

³⁷ “Course and Activity Catalogue 2019”.

FINCENT has no logistic support of its own on Santahamina, but the FNDU has a School Support Battalion (SSB) for training and for logistics as well. The logistic support is available on request for peacekeeping training in the garrison. The role-players are provided by SSB and by the University, and through special contracts by civilian organisations. FINCENT has a budget to pay them a daily allowance of 120 EUR. FINCENT charges the highest course fees in Europe. Students are expected to pay about 1,000 EUR per week for the course in order to cover the daily food and transportation. FINCENT runs 40 different courses annually, and receives 500 students from all over the world. Approximately 150 out of the 500 students are international. FINCENT MTTs operated in 18 countries last year. 26 foreign instructors provided training assistance to FINCENT, and 126 Finnish instructors were deployed in different countries for training support. In 2017, FINCENT worked in cooperation with 72 countries in the field of peacekeeping. The organisation of FINCENT is shown in *Picture 6*. FINCENT employs the fewest staff members in the training centre, including 24 permanent members, 40 additional subject matter experts and 105 contracted researchers.³⁸

HDF PEACE SUPPORT TRAINING CENTRE (PSTC)

“The legal predecessor of the Hungarian Defence Forces Peace Support Training Centre was established on 1st October 2000 within the structure of the Hungarian Defence Forces 1st Light Mixed Infantry Regiment and since 27th May 2004 it has conducted its activity as an independent element in the structure of the HDF. At that time the Centre was founded in order to provide pre-deployment preparation and training of military personnel for two major peacekeeping missions: UNFICYP (United Nations Peacekeeping Force in Cyprus) and MFO (Multinational Forces and Observers) on the Sinai Peninsula. With the increased participation of the Hungarian Defence Forces in international activities the range of the missions of our military unit also further grew. A new element emerged in the activities of the Centre: the preparation of staff officers and non-commissioned officers for various missions in the Balkans theatre, for ISAF (International Security Assistance Force) in Afghanistan, and the organisation of IMOC and other NATO and UN seminars, training and retraining courses. On 28th September 2006 the Training Centre was awarded a unit colour by the President of the Republic of Hungary. The scope of the unit – taking into consideration the short- and medium-term objectives of the HDF special operations capacity development – was increased in 2007. As new elements, the organisation and conduct of national then international special operations basic training courses were included in the activities of the Centre between 2007 and 2011. On 1st August 2020, the HDF PSTC was transferred from the subordination of the HDF Augmentation, Preparation, and Training Command into that of the HDF Transformation Command.”³⁹

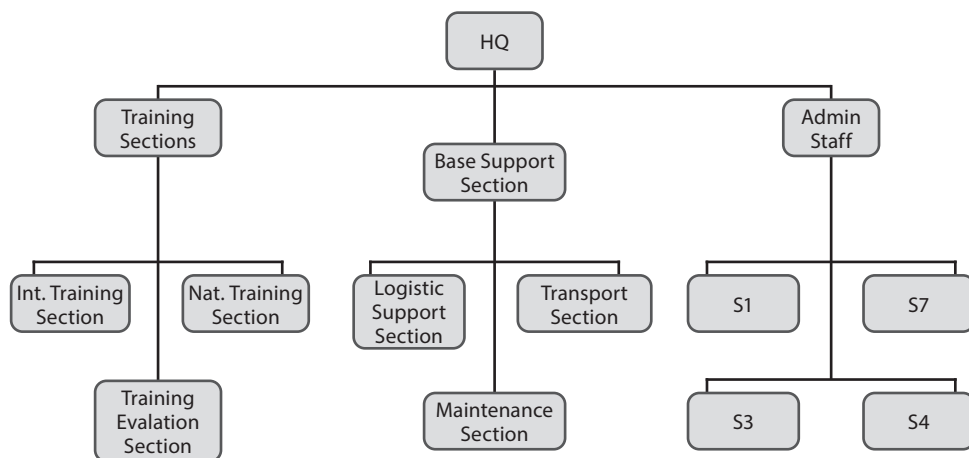
³⁸ “Partnership Training and Education Centres”. NATO ACT. <https://www.act.nato.int/ptecs-news>, Accessed on 10 June 2019.

³⁹ Drót L. (ed.) *Kiképzés a békéért: MH Békétámogató Kiképző Központ. Training For Peace, HDF Peace Support Training Centre*. Budapest: Zrínyi Kiadó, 2018. 12.

Missions

„HDF PSTC is engaged in a number of diverse missions which involve:

- organising and conducting training and preparation programs for Hungarian and international participants assigned for peace support and humanitarian operations organised and led by various international organisations, such as NATO, the UN, the OSCE (Organisation for Security and Cooperation in Europe), and the EU;
- providing training and preparation both in Hungary and abroad for contingents, selected for international crisis management missions, staff officers, non-commissioned officers, and military observers;
- cooperating with the bodies or departments of NATO, UN, OSCE, and the EU, responsible for training;
- active involvement in the joint working groups of the PTEC (Partnership Training and Education Centres), and in instructor exchange programs;
- providing opportunity to participate in English-language professional training courses with the PTEC member states, organised in Hungary;
- processing the lessons learned by the personnel in peace support operations, organising and conducting professional conferences, and integrating the lessons learned during training into the preparation programs;
- cooperating with the Police Training and Education Centre of the Ministry of Interior in the field of IMOC-, PSOC-, and UNFICYP-preparation with the involvement of police trainees and trainers, and the V4 police crisis management Command Post Exercise (CPX) was also supported by an instructor of the HDF PSTC;
- conducting language assessments, preparations, courses, and English maintenance course in the framework of distance learning courses (Military English Terminology Course – METC) with the use of ILIAS distance learning framework system;
- cooperating both in the assessment of entry requirements of missions, and in the execution of career and qualification testing;
- preserving traditions.”⁴⁰



Picture 7 The organogram of PSTC

⁴⁰ Drót. Kiképzés a békéért... 13.

Infrastructure

The Centre has highly developed IT and educational technology equipment. The unit has nine classrooms, allowing the simultaneous training of 300 persons. Our institution is capable of housing nearly 150 persons, and the mess hall provides meals for 120 people simultaneously. The personnel of the Centre and the participants of our training and retraining programs have the opportunity to use our sports facilities, such as a well-equipped gym, all-weather running track, football field covered with artificial turf, and tennis and basketball courts.⁴¹

International and national activities

International training courses have always been in the focus of attention in the life of the HDF Peace Support Training Centre. The genuine indicators of the activities of a training establishment – particularly of one with its main profile of training in the field of international crisis response and peace operations – are the results and achievements of international training courses planned and organised by the training institution.

The “flagship” of the nearly 20-year-long international activities of the HDF PSTC is the International Military Observers’ Course, which was conducted for the 38th time in 2019 IMOC, held in Hungary, was accredited by the United Nations Organisation for the fourth time, which proves not only that the training course meets the expectations of the UN, but also the fact that the training is conducted on the basis of a unified training material – in line with directives and guidelines identified by the UN – and in accordance with control criteria stemming from operational lessons learned. The certificate for the successful completion of the training course is accepted all over the world as a valid document entitling its owner to take an observer position in any type of UN or OSCE missions.

In the past few years, a significant change took place in the international activities of the Centre. Its previous multilateral relations have further developed besides the membership in IAPTC (International Association of Peacekeeping Training Centres) and EAPTC (European Association of Peace Operations Training Centres). Taking into consideration the proportion and ambition level of the involvement of the Hungarian Defence Forces in international peacekeeping operations, it became inevitable to shift towards NATO, parallel with the previous UN orientation. Following a nearly one-year-long preparation phase, the Centre became a full member of the community of the NATO PTEC (Partnership Training and Education Centres).

The membership in NATO PTEC not only allows a wider publicity for our international training courses but also brings along an active involvement in the activities of various working groups (MC2PS – Military Contribution to Peace Support; NATO TEP SO – NATO Training and Education for Peace Support Operations), and the conduct of bilateral instructors’ exchange programs. In order to increase the range of international activities of the Centre, new training courses are being introduced which have already proven to be successful in the international arena. The Peace Support Operation Cooperation Course (PSOCC) provides trainees with theoretical and practical skills that can be applied in any bilateral or multilateral allied operation under UN, NATO, EU, or AU aegis. Besides traditional liaison

⁴¹ Drót. *Kiképzés a békéért...* 14.

activities, the relationship maintenance, open-source intelligence, and efficient information and situation analysis may successfully be completed with such capabilities.

When discussing international operations, the importance of language training must also be mentioned as an essential part of pre-deployment training programs. In most missions the language of command is English or French, which highlights the importance of foreign language training. To date, the methodology and system of foreign language training in the Hungarian Defence Forces are characterised by mostly traditional ways (frontal teaching, small-group language classes). In 2016, the Centre introduced an experimental, blended training course in the field of English military terminology, which consists of several days of classroom training and a four-week-long distance learning phase. It can be stated that the demand for such blended foreign language training has continuously been increasing, thanks to its flexibility and adjustability to individual capacities and requirements. Besides international preparations, domestic training programs also need mentioning. The objective of preparations for operations or specific deployments is to allow soldiers (sometimes police officers or civilians) to successfully perform their activities with the skills and knowledge acquired at the Centre. An important objective is for each military service member deployed in a mission area to possess clear and unified knowledge. During the preparations, topics and issues essential for the participants' integration in a multinational environment and for accomplishing missions are studied and discussed. Complying with the principle of graduated approach, theoretical and practical classes alternate during the training programs. Through the development of individual capacities and skills, soldiers become capable of completing high-level and more complex tasks. By the end of the preparation, each soldier acquires the knowledge which enables them to work in a sub-unit or a higher-level headquarters.⁴²

SUMMARY

The training centres were established in approximately identical circumstances. Three of the above-mentioned training centres were created with the predominant function of serving the peacekeeping needs of the given country. The Bosnian PSOTC is an exception as it came into existence with some international assistance. This was due to the fact that the localisation and the development of peace support operations training were made an integral part of the peacebuilding process. It must be noted that all the four training centres perform national tasks; however, there is great emphasis on their international involvement as well. If a distinction needs to be drawn, it may be stated that FINCENT and PSOTC could rather be considered institutions of an international nature; however, BIPSOT also plays a major role in the regional training system. HDF PSTC basically serves national needs, but carries out increasing international engagement, too.

The second point of comparison is the question of subordination. Among the four training centres, PSOTC and HDF PSTC operate in subordination to the commands in charge of training and recruitment: TRADOC in Bosnia and HDF Transformation Command in Hungary. Both centres are part of the central training systems. BIPSOT is subordinated to the operational command, in the same way HDF PSTC was until December 2016. FINCENT has a special status since it operates subordinated to the Finnish National Defence University,

⁴² "MH BTKK Kiképzési kalendárium: 2019". https://pstc.hu/rovatok/felkeszitesek/kalendarium/kikepzesi-kalendarium/kikepzesi%20kalendarium_2019.pdf, Accessed on 10 June 2019.

as its integral part. Subordination may lead one to infer what the activities of the training centres are focused on. Accordingly, PSOTC and HDF PSTC should focus on training. Currently, PSOTC is not doing so; therefore, in my opinion, its subordinated status is not appropriate; or at least it is not adapted to its tasks and responsibilities. HDF PSTC is an institution that mainly serves the purpose of conducting courses of academic character, depending on its unengaged capacities and the extent of its international involvement. BIPSOT trains peacekeeping units for UN operations both nationally and regionally, hence their training can be described as mission-oriented. FINCENT, on the other hand, has a significant role solely in national and international research, training and education as their being part of the Finnish National Defence University, similarly to PSOTC. The number of staff employed and the organigram of these organisations lend themselves as bases for further comparison. Therefore, the largest institution is BIPSOT with its own staff of 100 and its serving and support staff of nearly 1,000 personnel. The reason for that is the sufficient number necessary to cater for the 15–20 thousand persons' training annually. The operation of BIPSOT can be modified according to the needs, there is no upper limit. HDF PSTC has a staff of 79, out of which the staff directly involved in training are 24 persons. The staff of PSOTC consists of 32 persons and 18 of them are directly involved in training. FINCENT employs the smallest number of 24 persons but they have an unlimited access to resources. The fact that they can employ as many as 40 experts from a pool makes the composition of their training courses highly flexible. The support for their operation comes simultaneously from the budget of the Finnish National Defence University and that of the Finnish Defence Forces. This is due to the fact that FINCENT has taken on a role of national leadership in some significant international projects. Another measurable figure is the number of personnel trained at these institutions: BIPSOT has trained 15 thousand soldiers, PSOTC 718 persons, HDF PSTC 591 and FINCENT 522 trainees.⁴³

In summary, the scopes of activity of the four training centres are rather similar. There are some shifts in emphasis, but basically, all four training centres perform their tasks to meet the requirements and standards defined by international organisations. Representing national interests takes priority. In Bangladesh's case, it is to provide large contingents for the United Nations, and to consolidate their regional leading role (which is considerably difficult besides India and Nepal). In the case of FINCENT, it is to enhance their key role of a scientific research institute and their diplomatic participation in peace operations. PSOTC, as a NATO accredited regional training centre, is the most important one in the West-Balkans and is a significant diplomatic actor. HDF PSTC is the centre for national peace operation training, and is becoming increasingly successful in the fields of international and civilian training. It is extremely difficult to establish hierarchy among these training centres since they operate in different frameworks but still carry out their tasks as defined by the same international standards.

The reason why I have selected these four institutions to analyse training centres is that they fall into different categories. BIPSOT functions as an *industrial training factory*; FINCENT is a research centre and a diplomatic tool; PSOTC acts as a regional institution, fairly similar to FINCENT, created by international actors trying to find their role in the Bosnian armed forces. HDF PSTC is a military unit that focuses on national training and, when their capacity permits, on organising international courses. Over the past 70 years, several attempts have been made to shape the organisational framework of peace operations training. It is these four basic types that dominate the architecture of training in the world.

⁴³ "Partnership Training and Education Centres".

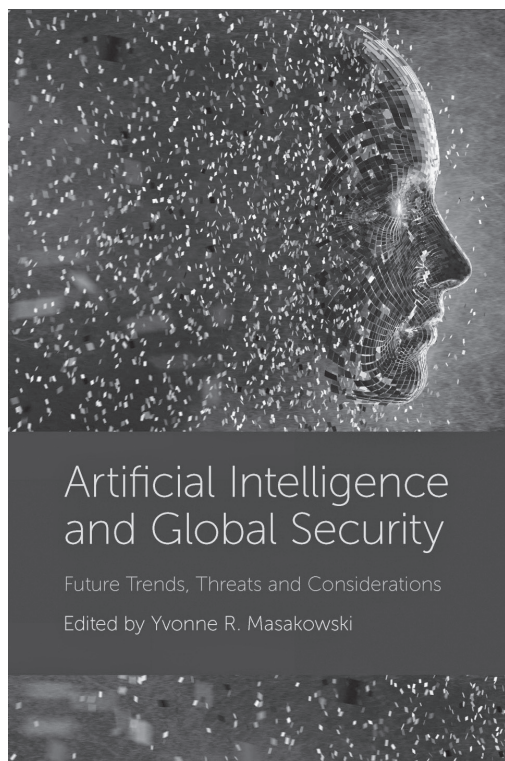
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Capt. Róbert Stohl

A MULTIDISCIPLINARY APPROACH TO IMPLICATION OF ARTIFICIAL INTELLIGENCE

Book review



In the summer of 2020 Emerald Publishing presented a decent book in three different formats (online, epub and print) on one of the hottest scientific topics, Artificial Intelligence, from the viewpoints of global security. This one can be a niche for military scientists as it promises to examine the implementation of AI in daily life, and its influence on society and on war.

As the editor emphasised for the authors, the basic questions to explore were *“What are the implications of AI for the individual, for personal identity, privacy, and freedom, and for society? What are the consequences of AI advances related to national and global security?”* The answers are given by researchers of very different areas from many perspectives.

The detailed enumeration of contributors helps to support the book’s credibility. This is a fascinating list of erudite scholars and genial forethoughtful professionals. Their connection to the US

Naval War College indicates that this circle of researchers is contributing in many ways together, and it ensures the papers’ focus on practical military issues. Two Hungarian authors also appear on the list: a philosopher, Tibor Solymosi (Westminster College), and a soldier, Imre Porkoláb (Hungarian Defence Forces), in the fields of military ethics and leadership philosophy.

The book consists of eleven chapters, balancing between theoretical (moral) and practical questions of using AI in defence and security. In the first chapter (‘Artificial Intelligence and the Future Global Security Environment’), the editor, Yvonne R. Masakowski analyses the issues of emerging AI-driven technologies and ethical decision-making in military application of these technologies. She emphasises the importance of adaptability, learning ability, and awareness for military leaders. The use of AI-based technology raises some hard questions of ethics. During their service, soldiers may meet challenging ethical

decisions in the context of using new technologies. The author states that decision-makers need to be prepared to understand the AI systems at a certain level to be able to look through all the aspects of the application of AI-driven technologies. As declared, these technologies will determine not only our future daily life but also warfare in any domain. The author anticipates that the usage of AI technologies will “enhance military readiness capabilities” and “will continue to present ethical challenges for leaders and soldiers alike”.

The following chapter (‘Artificially Intelligent Techniques for the Diffusion and Adoption of Innovation for Crisis Situations’) discusses how diffusion and adoption (D&A) of technological innovation can help to manage crises. As the author, Thomas C. Choinski states, human and machine interaction may accelerate the D&A of innovation in crisis response, but the human factor of the solution will have little chance to be replaced by AI systems. AI can support crisis management in six ways: by identifying and prioritizing potential solutions, assisting in effective communication, revealing unintended consequences, assisting in building up appropriate partnerships, and finally, by adopting fast-follower strategies.

In the next chapter (‘Something Old, Something New – Reflections on AI and the Just War Tradition’) Timothy J. Demy argues that ‘Just war’ tradition will remain a strong framework for future warfare, though AI is a certain factor with growing importance. He points out that the challenge is to understand how to combine traditions and new technologies ethically. The following study from Keith A. Abney on “Space War and AI” examines new technologies in the context of the challenges of human existence in space. He finds that the ethics of war will change according to future technologies and environment as lethal autonomous weapons systems (LAWS) are used widespread.

Fifth, William D. Casebeer analyses the questions of the ethical use of AI in his study ‘Building an Artificial Conscience: Prospects for Morally Autonomous Artificial Intelligence’. The author agrees that autonomy has an increasing importance in future warfare and he concludes that building an artificial conscience is essential in cooperation between autonomous and human ‘teammates’ on the battlefield, as we need to equip soldiers with the best technology, but ‘machine teammates’ also have to possess “moral sensitivity, judgment, motivation, and skill”.

The following three chapters focus also on the moral questions of using AI technologies. James Peltz and Anita C. Street examine the topics of data privacy and data security in the context of AI and big data. For the best outcome, one option offered is transparency: education and open discussion on these topics can lead to handling and reducing the potential risks. Pauline Shanks Kaurin and Casey Thomas Hart point out that although the application of AI driven tools can be helpful in the process of decision making, they require further rigorous and detailed moral guidance, as until then they cannot replace human judgement and responsibility. In a further chapter, John R. Shook, Tibor Solymosi and James Giordano investigate the variability of the moral guidance as they state AI ethics are determined by the context it is used in (e.g. national security, intelligence, and defence). The authors provoke that for certain communities there could be “locally optimal moral programming for an AI”.

In his paper ‘An AI Enabled NATO Strategic Vision for Twenty-First-Century Complex Challenges’ Imre Porkoláb, urging for a new strategic vision, describes how NATO adapted to the arising challenges, and he raises the ideas how AI could support the Alliance’s digital transformation. He also points on that reliance on disruptive technologies may also create vulnerabilities as well. In his opinion, a new, AI-friendly mindset shift is necessary by reforming Mission Command concept and leadership training. The author also anticipates

that AI will support new generation leaders to “oversee increasingly complex operations and situations” and decentralized execution of human-machine teams will operate.

Gina Granados Palmer – making this review almost unnecessary – summarizes the key messages of some previous chapters on ethical questions with a detailed reflection. As epilogue, James Canton gives another summary on the previous chapters with an outlook on the future of AI. In his vision, Singularity Machines that defy human understanding will be the norm by 2040. He anticipates that digital wars might be the future of conflict, and synthetic cognition may replace humans in the future.

In the end, many ethical questions of using AI-driven technologies need further clarification, but AI supported technologies may help the Hungarian Defence Forces and NATO to cope with and to adapt to future challenges. This well composed book with various opinions on AI from very different viewpoints may be useful for an audience of future leaders and decision-makers.

Yvonne R. Masakowski (ed.):

Artificial Intelligence and Global Security: Future Trends, Threats and Considerations

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Manuscripts must be accompanied by a brief biography or CV of the author detailing such information as would establish his credibility and authority on the subject (e.g. rank, profession, current unit or appointment, educational qualifications, significant courses attended or taught, past appointments in his parent service, practical experience, service under hostile fire, etc.).

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The editors realise that the value and impact of many submissions lie in their timeliness. However, the assessment of papers could take a considerable length of time. To strike a balance between these two contradictory requirements, the editors will respond to each submission with a preliminary assessment within four weeks. Authors are requested not to make further enquiries before three months has elapsed.

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It is difficult to be prescriptive about the use of a certain style in an international multidisciplinary journal. However, as a general guideline, the most important considerations are consistency and clarity: authors may use either UK or US or any other version of English, but not mix them (i.e. no “program” and “programme” in the same paper, except in direct quotes).

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As with all serious professional publications, sources used and ideas borrowed in *Hungarian Defence Review* articles must all be acknowledged to avoid plagiarism. Research containing no references will not be considered. Note numbers should be inserted after punctuation. For the purpose of uniformity and to simplify the editorial process, the use of footnotes is required. The footnote containing the first reference to a specific source should be detailed. The short-title method is used for subsequent references to the same source. The use of *Ibid.* and *op. cit.* is discouraged. All direct quotes require a reference with a specific page number. When referring to a central idea in a specific work, no page numbers are required.

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Abbreviations and acronyms should be given in full when they occur for the first time and the abbreviation/acronym should be given in parentheses. Acronyms such as ECOWAS and HIV/AIDS should be written in caps. Do not use full stops in acronyms, for example USA., RSA., UN. Avoid the use of abbreviations/acronyms in headings. Please note, that acronyms and abbreviations that are well known and in daily use in one professional discipline or in one particular region of the world may be completely unknown in another.

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Start all bulleted lists with capital letters. Semicolons are required between bullets and a full stop after the last item in the list.

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Table, graph, map and figure captions should be placed at the bottom. When reproducing data from a diagram or table, or when copying the entire table or diagram, it should be referenced by means of a footnote.

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Use double quotation marks for quotations. Long quotations (40 words or more) are usually indented and blocked, without quotation marks. Do not use italics in these indented paragraphs. Use square brackets to indicate authors’ insertions and changes to the original. Additional emphases are noted as [my italics/emphasis]. Omitted text is indicated by an ellipsis in square brackets [...]

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For four or more authors, list all of the authors in the bibliography; in the note, list only the first author, followed by *et al.*

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Subsequent reference: Kiras. “Irregular Warfare...”. 200.

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Footnote: Sefara, M. “Beast that instills only fear and loathing”. *The Sunday Independent*, 30 May 2010. Sunday Dispatches. 14.

Subsequent reference: Sefara. “Beast that instills...”. 14.

Reference list: Sefara, M. “Beast that instills only fear and loathing”. *The Sunday Independent*, 30 May 2010. Sunday Dispatches. 14.

Thesis

Last name, Initials. “Title of Thesis”. Thesis presented for degree (stipulate in full). Name of university, year.

Examples:

Footnote: Jordaan, E. “South African Defence since 1994: A Study in Policy-Making”. Thesis presented in partial fulfilment of the MMil in Military Sciences. Stellenbosch University, 2005. 25.

Subsequent reference: Jordaan. “South African Defence since 1994...” 28.

Reference list: Jordaan, E. “South African Defence since 1994: A Study in Policy-Making”. Thesis presented in partial fulfilment of the MMil in Military Sciences. Stellenbosch University, 2005.

Conference paper

Last name, Initials. “Title of Paper”. Paper presented at Name of Conference, Place, Date

Examples:

Footnote: Heuser, B. “Strategy Making: The Theory vs. the Practice”. Paper presented at the First South African Conference on Strategic Theory, Stellenbosch, 11 June 2009.

Subsequent reference: Heuser. “Strategy Making...”

Reference list: Heuser, B. “Strategy Making: The Theory vs. the Practice”. Paper presented at the First South African Conference on Strategic Theory, Stellenbosch, 11 June 2009.

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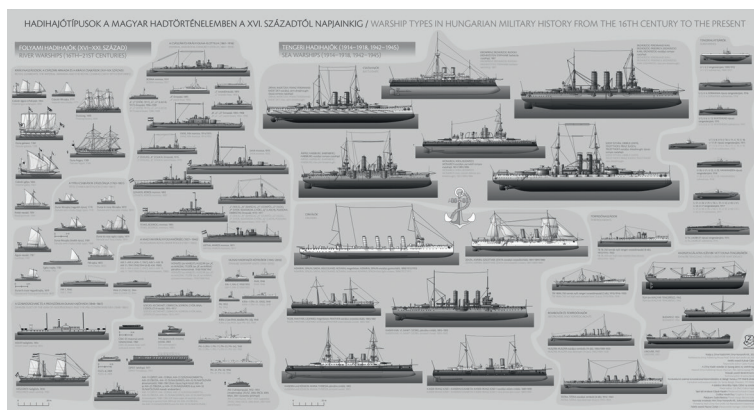
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