HISTORICAL ANALYSIS OF THE ORGANISATIONAL LEARNING OF EXERCISES WITHIN THE ARMED FORCES OF UKRAINE (DECEMBER 1991–FEBRUARY 2022)

Yuriy Pashchuk

Ph.D., Assistant Professor, Hetman Petro Sahaidachnyi National Army Academy, Ukraine
e-mail: ypashchuk@gmail.com, orcid.org/0000-0002-0631-6183

Summary

The article examines the historical aspects of organisational learning of military exercises within the Ukrainian Armed Forces (from their creation in December 1991 until the large-scale Russian invasion of Ukraine on 24 February 2022). It compares this activity with the relevant practice of the North Atlantic Alliance.

The research paper highlights two key stages in the operational and combat training of the Armed Forces of Ukraine: "Decline" (December 1991–April 2014), when the military learning was ineffective, which impacted the ability of Ukrainian troops to adapt and functionally counter Russian armed aggression, and 'Modernization' (April 2014–February 2022), during which the approaches to analyse and implement lessons were improved by the NATO standards.

A comparative analysis of the organisational learning of military exercises within the Armed Forces of Ukraine and NATO during the above period (1991–2022) was carried out on the basis of studying five key elements of the lessons learned capability: organisational structure, process, tools, training, and information sharing.

Key words: lessons learned system, lessons learned process, information sharing, international military cooperation, NATO.

1. Introduction

The vital importance of executing the timely organisational learning of lessons and transforming them into improved actions to ensure the success of activities is obvious. In the military sphere, the learned experiences are particularly invaluable: "There is no reason to send troops into the fight and get them killed when a Lesson Learned the month before could be sent to a commander who could have used it for training…" *(NATO 2022: 3)*. The military organisational learning is defined as the creation of right lessons learned (LL) structure, process, tools, and training and their systematic employment within armed forces to enhance their collective LL ability to obtain and analyse knowledge, disseminate, and transform it into remedial actions aimed at reducing the risks of repeating mistakes and increasing the chances of achieving success and victory in the future *(Dyson, T. 2019; Leavitt 2011; NATO 2022)*.

Historical analysis of organisational learning in the military domain over the past 110 years shows a tremendous development of its theory and practices. First, it concerns the transition from informal to semi-formal LL procedures during World War I, and since the mid-1980s – the shift to formal lessons learned processes *(Dyson, T. 2019; Leavitt, C. 2011)*. Significant improvements in the learning practices of individual countries and coalitions led to the creation of corresponding lessons learned systems (LLS) *(Dixon, N. 2011)*. The LLS

represents an appropriate form of organisational learning, which is determined by the proper methods, techniques, as well as LL organisational structure (LLOS), training, and tools used to carry out a standardized formal LL process to ensure studying from experience is converted into actual improvements *(Landry, A. 1989: 147; Dixon, N. 2011: 227; Waliński Z. 2016: 98; NATO 2022: 9)*. For example, in the late 1980s, the US Armed Forces launched the LLS based on the practice of innovative introduction of formal LL procedures *(Dixon, N. 2011: 227; Landry, A. 1989: 147)*. This LLS, which was constantly evolving, as well as other newly created national LL systems of Alliance members, became the basis for the formation of NATO Joint Lessons Learned System (JLLS) in the early 2000s *(Dixon, N. 2011: 227; Waliński Z. 2016: 98)*. Since most LLs are derived from operations and exercises *(NATO 2022: 10)*, each of the above Systems can be conditionally divided into two relevant components: Operations and Exercises LL Subsystems. The last one is considered a key tool for generating lessons and best practices from training.

From December 1991 to the present the military learning in the Ukrainian Armed Forces (UAF) has been carried out in the form of two successive LLSs *(Doctrine 2020: 8; Pashchuk, Y. & Pashkovskyi, V., 2023: 27)*:

1) System of Lessons Analysis and Dissemination (SLAD: December 1991–December 2018), which was inherited from the Soviet Armed Forces and went through three stages: "Stagnation" (December 1991–May 2013), "Reformation" (May 2013–April 2014) and "Adaptation" (April 2014–December 2018).

2) Lessons Learned System (LLS: January 2019–present), that was developed based on the SLAD and NATO's advanced theoretical and practical achievements. There are two stages in the LLS evolution: "Establishment" (January 2019–February 2022) and "Transformation" (February 2022– present).

Characterizing the essence and peculiarities of the UAF military exercises over the last thirty years (December 1991–February 2022), it is worth distinguishing between two types of exercises – national and international, as well as two radically different periods in the operational training of Ukrainian troops:

1) "Decline" (December 1991–April 2014).

2) "Modernization" (April 2014–February 2022).

During the 1st period, the UAF experienced continuous degradation, primarily because of the national strategic culture, which manifested in the form of a "multi-vector foreign policy" that led to the unjustified UAF reduction. So, there was a steady degradation in the troops' training, which was indicated by a steady decline in the number and scale of national manoeuvres. For example, from 1991 to 1995, the UAF conducted only 1 regimental exercise, and until 2014, training at this level and higher was not organized at all *(Wilk, A. 2017: 22)*. In contrast, there was a positive trend in increasing Ukrainian participation in the international exercises, including manoeuvres led by NATO. Thus, from 2006 to 2011, more than 23000 Ukrainian servicemen took part in 95 multinational exercises, 43 of which were held on the territory of Ukraine.

Since gaining independence in 1991 Ukraine has actively developed military cooperation with many countries and international organisations, including NATO. In 1994 Ukraine was one of the first countries to join the Partnership for Peace program. Under this program, the UAF personnel took part in a wide range of multinational exercises including the first joint exercise of Ukrainian and American marines called "Peacekeeping Mission of the Marine Corps 95" from July 25 to 28, 1995. In the same summer, NATO soldiers first arrived at the Yavoriv training area in the Lviv region as part of the manoeuvres "Peace Shield 95". Since then, most multinational exercises on the Ukrainian territory have taken place at this location

and until 2014 were mainly focused on peacekeeping and crisis response. As a continuation of the "Shield of Peace", the international manoeuvres "Rapid Trident" were held annually from 2006 to 2021 (except in 2009). In 2006 and 2007, these exercises included only a command post phase and since 2008, they have covered a field training phase *(Pashchuk, Y., Prokhovnyk, P., Fedorenko, V. 2020: 4-5)*.

Overall, before 2014 most of the UAF exercises, including those with NATO, lacked creativity and focused primarily on the basic military drills without truly engaging in critical thinking or developing adaptive skills. Such training has not challenged participants to analyse, innovate, or respond to complex, dynamic real-world combat scenarios. So, these exercises became "sugar coating" and more about presenting a favourable image to the senior Ukrainian and foreign leaders rather than fostering genuine improvements in the UAF *(Dyson, T., Pashchuk, Y. 2022: 20)*.

Due to Russia's aggression in 2014, Ukraine's "non-aligned policy" was changed to the priority course towards NATO membership. Accordingly, the UAF permanently improved the quality of their training and shifted its focus based on the war lessons learned. Also, Ukrainian forces increased their participation in international exercises. For instance, in September 2014 the "Rapid Trident 2014" was held at the National Army Academy (NAA) with 1200 soldiers from 16 countries and the use of more than 850 pieces of weapons and vehicles. Later, in 2015, 1800 servicemen from 18 nations were involved in such event; in 2016 – 1832; 2017 – 2500; 2018 – 2200; 2019 – 3682; 2020 – 4100; and in 2021 – about 6000 servicemen *(Prokhovnyk, P. 2023: 122-127)*. The primary goal of these exercises was to enhance the level of interoperability between the UAF and partner nations.

As part of Ukraine's strategic initiative, in 2020 and 2021, supplementary exercises "Joint Efforts" were carried out to improve Ukrainian defence capability. More than 12000 servicemen, 50 artillery pieces, 80 tanks, 450 combat vehicles, and 20 warships were involved in the "Joint Efforts 2020". For the first time, the UAF used new weapons, particularly the "Neptun" anti-ship missile system, the "Vilkha" multiple launch rocket system, and the "Bayraktar Tb2" unmanned aviation system *(Prokhovnyk, P. 2023: 118-119)*. Besides, the Ukrainian troops from different branches were synergistically employed based on NATO procedures. The "Joint Efforts 2021" became one of the most important training events conducted by the UAF before the full-scale Russian invasion of Ukraine.

Even though after 2014 the exercises within the UAF became more effective and largely achieved the planned results, significant problems remained. One of the most pressing issues was the substantial disparity in training between Ukrainian and partner forces, and the lack of sufficient interoperability including the organisational learning domain. For instance, during coalition exercises, the Ukrainian personnel acquired needed skills in executing the Alliance decision-making frameworks, such as MDMP and TLP. However, after training the officers had to revert to the fundamentally different procedures for planning and conducting operations that were used in the UAF.

Given the above material, the following questions should be formulated:

1) What was the state of organisational learning of military exercises within the UAF during the "peacetime" (December 1991–April 2014)?

2) Was this practice effective in supporting the proper training of Ukrainian troops to counter external threats, especially Russian armed aggression?

3) Was the military learning changed within UAF in the first period of the Russo-Ukrainian War (April 2014–February 2022)? If so, what were the main adjustments in studying exercises?

4) To what extent did the learning of training experiences in UAF meet the main characteristics of the relevant NATO model?

These scientific and practical problems are poorly studied in the literature on military reforms in Ukraine. A respective approach for this research was applied including the historical-comparative method. It was used for the analysis of the organisational learning of exercises within the UAF and NATO (1991–2022), namely, to study five key elements of the Ukrainian LL Capability (organisational structure, process, tools, training, and information sharing) during two stages in the UAF training: "Decline" (December 1991–April 2014) and "Modernization" (April 2014–February 2022).

The article aims to investigate the historical aspects of organisational learning of military exercises within the UAF (1991-2022) to ensure its improvement and compatibility with relevant NATO practice.

2. Analysis of organisational learning of military exercises within the Armed Forces of Ukraine (1991–2022)

2.1. "Decline" in the Ukrainian troops' training (December 1991–April 2014)

The timeframe of the 1st stage "Decline" in Ukrainian troops' training corresponded to two phases of the SLAD operation: "Stagnation" and "Reformation". Unlike NATO JLLS, the SLAD was based only on three 'pillars': LLOS, semi-formal LL process, and LL tools. The LL training (fourth "pillar") in the UAF was not used until May 2021 *(Dyson, T., Pashchuk, Y. 2022: 19-20)*.

From 1991 to 2014 the UAF did not have a centralized, developed LL structure. At that time the UAF retained the Soviet organisational culture, which was represented by splitting the LL responsibilities between two branches (operational and training) starting from the regiment level. The separation in executing the 1st (Analysis) and 2nd (Implementation) stages of the LL process, as well as the low level of interaction between the two bodies, significantly reduced the organisational learning effectiveness within the UAF *(Dyson, T., Pashchuk, Y. 2022)*. Principally the following personnel formed the LLOS:

Tactical level – deputies of chiefs of staff, and heads of operational sections.

Operational level – military scientific teams (2-3 officers).

Strategic level – the Military-Scientific Department in the UAF General Staff.

In practice, these bodies were only partially involved in studying of exercises, as such responsibilities were usually transferred to the training cells, who also were directly tasked with international military events. In fact, all commanders and the UAF officers should have been engaged in the LL practices since it was their duty. However, as is often the case with the notion that "if everyone is responsible, no one truly is", the organisational learning of military exercises within the UAF during the "Decline" stage can be seen more as a declaration than a carefully planned and effective execution *(Dyson, T., Pashchuk, Y. 2022)*.

From 1991 to 2014, the UAF lacked a standardized approach to the LL process due to the absence of a relevant legal framework. An exception was the "Directive on Organizing Participation of National Contingents (Personnel) of the UAF in International Peace Support Operations (PSO)", which was adopted in 2011. It primarily outlined the LL tasks for units that took part in PSOs, but did not identify coordinating LL bodies and did not contain the LL procedures.

While many countries developed formal military learning following the end of the Cold War, the UAF continued to rely on a semi-formal approach inherited from the Soviet Armed Forces. Mainly it involved the submission of partial LL data within specific sections of reporting

documents, as well as the analysis and sharing of such information. The effectiveness of this LL process was low, primarily due to the lack of interest of personnel in submitting observations on negative experiences, as well as the overall poor LL studying and information assurance. As a result, the LL data predominantly moved through the chain of command in a bottom-up manner, where it was insufficiently analysed before being redistributed downwards and largely used as reference material. Overall, from December 1991 to April 2014, the UAF employed a deficient semi-formal LL process that did not align with the conditions and demands of that time.

The primary methods for gathering LL information from exercises during the 1st stage of Ukrainian forces training included: collection of formal observations within reporting documents, study of informal observations and analysis of results from exercise research teams' activities.

The following key tools were employed for the LL sharing: briefings, after actions reviews, printed publications, mass media, and the Internet. Compared to NATO LL Capability, the UAF produced a smaller number of LL bulletins that were mainly focused on blaming personnel, imposing punitive measures and enforcing restrictions. There were far fewer instances where adequate analysed lessons and best practices from training were communicated to the UAF personnel. Moreover, the study of exercise experiences of other armed forces was conducted through the lens of Russian strategic thinking.

Due to insufficient funding, the introduction of modern information technologies in the UAF occurred at a slow pace, considerably lagging more advanced nations. Thus, the UAF did not possess an LL database until November 2017 *(Dyson, T., Pashchuk, Y. 2022: 8)*, whereas some NATO members had used such databases since the 1980s *(Landry, A. 1989: 170)*. Consequently, the average time between the submission of observations and the return of their analysis to troops was approximately 3 months *(Pashchuk, Y., Pashkovskyi, V., 2023)*.

Predominantly the organisational learning of exercises in the UAF from 1991 to 2014 was characterized by low "potential absorptive capacity" and extremely limited "realized absorptive capacity" *(Dyson, T., Pashchuk, Y. 2022: 7, 9)*. This was evident in the slow and insufficient implementation of lessons identified (LI) and potential best practices (PBP) derived from the analysis of training experiences. The primary challenge for the UAF at that time was their foundation on the Soviet Armed Forces principles, which extended to the SLAD's operation, resulting in its low efficiency. Consequently, by early 2014, the Ukrainian forces were inadequately prepared to counter Russian aggression.

2.2. "Modernization" in the Ukrainian troops' training (April 2014–February 2022)

Russia's war against Ukraine forced the UAF leadership to radically change approaches to training, which marked the beginning of its 2nd stage "Modernization". Its timeframe coincided with the 3rd phase of the SLAD functioning ("Adaptation") and the 1st phase of the LSS operation ("Formation") *(Pashchuk, Y., Pashkovskyi, V., 2023)*. Since the beginning of the war, the UAF have introduced considerable changes in organisational learning *(Dyson, T., Pashchuk, Y. 2022)*:

A centralized LLOS was formed mainly at the operational and strategic levels, and predominantly in the Antiterrorist Operation zone.

The relevant LL regulatory framework was launched, and the semi-formal LL process was improved.

A formal list of urgent LL reports was introduced.

The mobile LL teams were widely employed to improve capturing and studying observations.

The Interactive Electronic LL Database (IELLD) was launched in November 2017.

In contrast to learning from operations, the Exercises LL Subsystem within the UAF has not undergone serious adjustments and remained largely ineffective in generating lessons learned and best practices from training.

In November 2018, the UAF initiated a prospective LLS *(Plan 2018)*, prompted by the low effectiveness of the previous SLAD and Ukraine's goal toward achieving Alliance membership. This effort was carried out in collaboration with the NATO Representation to Ukraine aiming to meet the objectives of the "LL Capability Development Programme" *(NRU 2020: 1-2)*. Certain aspects of the LLS Roadmap *(Plan 2018)*, such as the expansion of the UAF LLOS at all levels, were completed promptly. Other key points, implementation of the NATO LL process and organisation of LL training, were carried out with serious delays, and the creation of the LL Portal, scheduled for June 30, 2021, has not yet been completed.

First, by December 30, 2019, the relevant LLOS was formed and included *(Doctrine 2020: 18)*:

Lessons Learned Staff Officers (LLSO): responsible for organizing the LL process within their units (bodies).

Lessons Learned Points of Contact (LL POC): assist LLSOs in ensuring the LL process operation.

The primary advancement involved the unification of LL agencies at the strategic and operational levels, and this mainly concerned the Operations LL Subsystem. However, no dedicated LL bodies were established to manage the systematic learning from exercises that hindered the use of adequate mechanisms for transferring LL across various levels of command, significantly diminishing the effectiveness of Ukrainian forces training.

The dominant area of the LLS Roadmap was the implementation of the NATO standardized LL process *(Plan 2018: 1-2)*. Approval of the "LL Doctrine" *(Doctrine 2020)* and "Temporary LL Standard Operating Procedures (SOP)" *(SOP 2020)* in July 2020 marked a final shift from the semi-formal to a formal approach in organisational learning within the UAF achieving compatibility with the Alliance *(Dyson, T., Pashchuk, Y. 2022)*. In this regard, the results of the 'pilot' experiment on implementing the NATO LL procedures during the "Rapid Trident 2019" proved invaluable. The potential lessons and best practices were captured by the NAA research group through "Post Event Reporting" and "Post-Exercise Interviews" using the following methods *(NATO 2010: 12; NATO 2020: 83-89; NATO 2022: 27-28)*:

Monitoring the activities of personnel that took part in the manoeuvre.

Analysing the planning and reporting exercise documents.

Surveying the participants with questionnaires in Ukrainian and English.

The study results indicated active cooperation from both Ukrainian and foreign military personnel, supporting the assertion that most NATO representatives were well-versed in the functioning of the LL process, whereas the UAF servicemen required additional LL training *(Pashchuk, Y., Prokhovnyk, P., Fedorenko, V. 2020: 13-14)*. Furthermore, the experiment demonstrated that Ukrainian soldiers were able to rapidly and effectively acquire the skills needed to apply formal LL procedures.

A major advancement in enhancing the LLS effectiveness was the introduction of dedicated LL training at the NAA:

From May 18 to 20, 2021, the LL course was conducted with the involvement of a mobile training team from the NATO Joint Analysis and Lessons Learned Centre (JALLC): 25 LLSOs and 18 LL POCs were trained.

From June 14 to 18, 2021, the first national LL course was held: 11 LLSOs and 8 LL POCs graduated.

From October 18 to 23, 2021, the second national LL course was completed: 8 LLSOs and 12 LL POCs were instructed.

The national courses included theoretical and practical sessions on analysing the LL from exercises based on the key provisions of "LL Doctrine" and "Temporary LL SOP" as well as "Methodological Guidelines for Organizing and Conducting Research at Operational and Combat Training Events in the UAF" *(Guidelines 2018)*. In the first two documents, the learning of the exercises' experiences was hardly considered. It was only briefly mentioned in the "SOP 2020" that LL analysis of training should be conducted "as part of activities of the exercise research teams during the training" *(SOP 2020: 62)*. Furthermore, these documents did not contain any references to the "Guidelines 2018", despite this directive being the primary framework for obtaining LL from the UAF training. Besides, the "Guidelines 2018" included comprehensive instructions for developing the exercise research's objectives, as well as the methodology for forming the research teams. The document also defined the main stages of exercise research *(Guidelines 2018: 5-8)*:

1) Determining research objectives before the exercise.

2) Conducting research during the exercise.

3) Analysing research results and developing recommendations after the exercise.

Despite these innovations, the directive did not specify which bodies were responsible for submitting observations from exercises, nor did it provide an algorithm or timeline for their capturing. Principally, the "Guidelines 2018" on learning from exercises did not align with NATO standards. This discrepancy limited the ability of the UAF to fully integrate the effective NATO LL procedures into their training, thus hindering their overall employment effectiveness.

After 2014, the UAF continued using the same LL tools that had been in place before the Russo-Ukrainian War. Although the creation of the LL database was planned as early as 2014, the IELLD was not launched until November 2017. However, this database operated obsolete software, contained only open LL information, and did not ensure reliable and quick access for the UAF personnel. Then the LLs were mainly disseminated through print and electronic periodicals and urgent bulletins. After the introduction of the Electronic Document Management System in mid-2018, the mean speed for lessons learned sharing was increased from 3 months to 2 *(Pashchuk, Y., Pashkovskyi, V., 2023)*.

Hence, the training of Ukrainian forces underwent major modernization due to Russia's war with improvements in the UAF learning from operations but limited progress in exercises. The centralized LLOS, NATO LL process, national LL courses, and IELLD were introduced after 2014. Despite these efforts, no dedicated LL personnel was used for systematic learning from training, and the functioning of the Exercises LL Subsystem did not meet NATO standards. Besides, the outdated IELLD, insufficient coverage, and slow sharing of lessons from exercises continued to pose challenges for the improvements of UAF training and employment.

3. Analysis of organisational learning of military exercises within NATO (1991–2022)

It is important to acknowledge the considerable distinctions in organisational learning between the UAF and NATO, especially from 1991 to 2014. During this period, NATO LL practices underwent fundamental changes. One of the first coordinative LL bodies within NATO was the Permanent Maritime Analysis Team (PMAT) *(JALLC 2022)*. In 1997, after it became apparent that NATO LL Capability was "insufficient", the Alliance leadership decided

to establish the Joint Analysis and Lessons Learned Centre based on the PMAT *(NATO 2022)*, *(JALLC 2022)*. September 2, 2002, when the JALLC staff officially began its activities, can be considered as a starting point of the NATO Joint Lessons Learned System *(Dixon, N. 2011; JALLC 2022)*.

A core principle underpinning NATO LL Capability is the engagement of all personnel in the LL process: "Everyone within an organization needs to be involved in learning lessons for a formal approach to learning to be successful" *(NATO 2022: 11)*. The formal LL process, which has been continuously improved, is a primary "pillar" of the NATO JLLS to appropriately develop LLs and ensure their sharing and utilizing *(NATO 2022: 14)*.

The most important innovations in the definition and structure of the LL process were submitted in the NATO guidelines in 2010, 2018, and 2022. The first volume of the "NATO LL Handbook" *(NATO 2010)* introduced the LL process as "a procedure for deliberately staffing observations arising from an activity until a LL is reached" and covered three key phases *(NATO 2010: 2-10)*:

1) "Identification": Activities from reporting an observation to approving the lesson identified.

2) "Action": Changing existing practices based on the lesson learned.

3) "Institutionalization": Communicating the changes from obtaining the implemented lesson.

A modernized LL process has been introduced in the "NATO LL Directive" *(NATO 2018)* and in turn was implemented in the UAF in mid-2020. The fourth edition of the "NATO LL Handbook" *(NATO 202: 17)* states: "The LL process is part of a formal approach to organisational learning that deliberately processes observed issues arising from an activity until either a LL is reached, or the lesson is rejected/noted for various reasons". The last version of the standardized LL process involves two main stages *(NATO 2022, p. 18)*:

1) "Analysis" (1.1. Plan, 1.2. Observe, 1.3. Analyse): Producing lesson identified and potential best practice.

2) "Implementation" (2.1. Decide, 2.2. Implement and validate, 2.3. Share): Achieving lesson learned and best practice.

To organize formal learning a robust LLOS was established at the beginning of the 20th century and was continuously renovated. It currently includes the following key bodies *(NATO 2018; NATO 2022)*:

NATO Joint Analysis and Lessons Learned Centre.

Lessons Learned Staff Officers.

Lessons Learned Points of Contact.

Local NLLP Managers for the NATO LL Portal.

NATO Bi-SC LL Steering Group, a collective body that coordinates and controls the execution of NATO LL policy.

Centers of Excellence that provide subject matter expertise to assist in the LL analysis.

Cross-functional LL Working Groups and Boards, which facilitate solving all LL-related issues.

The LL training for the NATO personnel means "providing staff with the skills and knowledge to fulfil their LL roles effectively" *(JALLC 2022: 14)*. It is organized through the following primary courses *(JALLC 2022: 13; NATO 2022: 16-17)*: JALLC Analyst Training Course, NATO LLSO Course, NATO LL Online Course, and NATO LL Management Course. In addition, various LL seminars, scientific conferences, and training sessions with NATO leadership and LL officers were regularly held within the Alliance.

NATO LL tools were mostly used for the collection, storage, archiving, tracking, and dissemination of LL information. Among these means, the leading one has been and remains the NATO LL Portal *(NATO 2022: 14)*. It was created in 2010 and became fully operational in 2013, replacing the NATO LL Database, which had been in use since 2005 *(JALLC 2022)*. The Portal highly improved the sharing of acquired experience and enhanced the reliability of authorized users' access to the full range of LL data. Its main advantage is the instant and wide sharing of LL information circulating within the NATO JLLS.

The essential difference between the NATO's and UAF's Exercises LL Subsystems is the employing of Alliance additional LL bodies, as well as using of special reporting rules during and after exercises. For example, the capturing of observations and providing their preliminary analysis is based on the Post-event reports that usually include first impression reports, after-action reviews, and final exercise reporting *(NATO 2022: 27-28)*. In this context, a key NATO document regarding the organisational learning of exercises is the "Bi-SC Collective Training and Exercise Directive 075-003" *(NATO 2022: 42)*. Three major versions of this Directive, issued in 2010, 2013, and 2020, continuously refined the procedures for collecting observations, analysing lessons, and making decisions on LI and PBP obtained from exercises. In the latest edition of the Directive, the consecutive exercise stages and phases are defined *(NATO 2020: 24-25)*:

1st stage "Concept and Specification Development".

2nd stage "Planning and Product Development".

3rd stage "Operational Conduct" includes four phases: 3.1. "Foundation Training"; 3.2. "Crisis Response Planning"; 3.3. "Execution"; 3.4. "Assessment".

4th stage "Analysis and Reporting".

Additionally, the above document outlines the roles and responsibilities of personnel involved in planning and executing exercises *(NATO 2020: 24-29)*:

Officer Scheduling Exercise (OSE): leads the 1st stage and is responsible for developing the Exercise Specification.

Officer Conducting Exercise (OCE): leads the 2nd stage and is in charge of developing the Exercise Plan.

Officer Directing Exercise (ODE): responsible for executing the Exercise Plan and conducting the exercise during the 3rd stage.

The 4th stage "Analysis and Reporting" is a central period for capturing LI and PBP from exercises and involves the following LL procedures *(NATO 2020: 83-89)*:

1. The ODE must no later than 15 days after the exercise submit to the OCE: the "First Impression Report", "Evaluation Report", "Training Analysis Report" and Annex to the "LI" Report.

2. Each participating organisation should submit its "LI" Report to the OCE no later than 15 days after the exercise.

3. The OCE:

Leads Post Exercise Discussion and conducts its Report within approximately 30 days of completing the exercise, summarizing observations and indicating whether they were approved or rejected.

Prepares "Final Exercise Report" and sends it to the OSE no later than 60 days after the exercise.

Develops the "LI List" based on the "Final Exercise Report" or the "Training Analysis Report".

4. The OSE prepares a "LI Action Plan" and assigns tasking authorities and action bodies responsible for implementing the lessons.

5. The OCE provides a "Remedial Action Report" no later than 90 days after the exercise.

This comprehensive LL reporting algorithm allows for a structured and timely approach to capturing and processing experiences from exercises. It ensures that key lessons and best practices are systematically documented, analysed, and disseminated across all relevant levels. Moreover, the NATO LL Portal serves as a centralized digital platform designed to facilitate the above LL reporting from exercises across the Alliance. It allows the participants to submit observations, track their progress, and access a wide array of LL reports and data. This approach ensures that learning from exercises is systematically integrated into planning and doctrinal documents, thus improving overall operational effectiveness and interoperability within NATO.

4. Conclusions

Based on the comparative study of organizational learning of military exercises in the UAF and NATO (December 1991–February 2022), which analysed five key components (organizational structure, process, tools, training, and information sharing) ensuring such activities, the following conclusions can be drawn:

From December 1991 to April 2014 the training of Ukrainian troops was in a state of decline. During this period, the UAF significantly lagged behind NATO member countries in organizing analysis and implementation of exercises' lessons learned and best practices. The existing System of Lessons Analysis and Dissemination operated in a semi-formal manner, which greatly reduced the effectiveness of learning from training. The absence of a centralized LL structure, insufficient coordination among LL bodies, and inadequate informational support resulted in the low ability of the UAF to adapt and transform new knowledge from exercises. Consequently, the UAF's capability to counter Russian armed aggression was significantly compromised.

From April 2014 to February 2022, the UAF underwent a modernization phase in operational and combat training, driven by Russia's war against Ukraine. Since January 2019, considerable improvements have been made in the UAF organisational learning, particularly with the establishment of the Lessons Learned System aligned with NATO standards, focusing on studying lessons from operations. The key developments included the revisions to the LL regulatory framework, the formation of a centralized LL structure in 2019, the introduction of the NATO LL process within the UAF in 2020, and the creation of a training LL system in 2021.

Despite these advancements, no radical changes or serious progress were achieved in the analysis and implementation of lessons from exercises. The primary reason for this was the substantial discrepancies between UAF doctrinal documents and NATO's corresponding requirements, leading to only partial and fragmented adoption of the Alliance's best practices in organizational learning of military exercises. Furthermore, one of the key limitations to the UAF LL capability for learning from exercises was the absence of the LL Portal resulting in low efficiency of LL sharing and unreliable access to critical LL information.

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