

Rapid-cycle learning for effective remedial action & dissemination: Ukraine EOD case study

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Abstract

Rapid adaptation has always been an imperative for military organizations facing dynamic threats. Learning lessons from experience is equally familiar as a way of tackling problems to military personnel. However, militaries have often struggled to institutionalise that learning so that it becomes available at scale and in potentially strategic ways. 'Lessons Learned' is a highly-developed NATO process supported by a NATO Handbook (1), related other NATO handbooks and courses, and consultancy services from the NATO Joint Analysis and Lessons Learned Centre (JALLC). And yet our current study and recent others (2) show that most lessons-learned systems fail to achieve their full potential impact. Just how that happens, and why that shortfall persists even in the face of direct threat, is puzzling; it indicates that learning involves far more than just resources like databases and training to collect new information.

Introduction: Learning for EOD - Ukraine's Experience

The Ukrainian Armed Force's maturing capabilities illustrate the challenge highlighted to achieve effective organizational learning (3), a problem heightened in the rapid-cycle context of direct and deadly threat. This chapter will show how chronic gaps may persist between concepts and implementation of good learning, even in the vital case of addressing EOD. By tracing Ukraine's evolution of Lessons Learned in terms of the conditions that foster it and practices that bring it alive, we can better understand what it takes for leaders at all levels to

convert EOD lessons-learned into effective action and capability transformation. We outline how progress has been achieved, unevenly but significantly, in Ukraine, in three stages.

Stage 1: Building from Weak Foundations (2014-2018)

Prior to 2014, the Ukrainian Armed Forces (UAF) had few robust mechanisms for organizational learning. Mine warfare received little priority. Tactics and procedures instead relied on informal sharing within stove-piped units and a centralized database was launched only in Oct 2017 that was difficult to access. The 2014 outbreak of armed conflict in the Donbas exposed debilitating gaps, as mine and IED incidents accumulated with deadly consequences. Between 2014 and 2018, in Donetsk and Luhansk regions the UAF engineers checked more than 2,500 hectares of territory for the presence of mines, detecting and neutralizing 122,000 units of EO (LL bulletin October 2018).

In the 5.5 years from April 2014, 601 mine incidents caused around 1,000 UAF casualties and killed or injured 833 civilians due to the density of mining (Figure 1). Yet Ukraine lacked systematic information flows, analytical expertise, effective communication capabilities and implementation capacity to transform episodes into solutions.

Initial attempts at centralization demonstrated difficulties in institutionalizing disciplined learning processes without foundational elements in place. From 2014-2018, the military expanded data gathering through new, but relatively ad hoc channels. Observations passed from frontline units towards a newly-established Lessons Learned (LL) cell in the Antiterrorist Operation (ATO) HQ. However, untreated tactical reports flowed directly into basic military channels for dissemination without supporting assessment. This raw information pipeline reinforced existing orientations, rarely stimulating capability growth.



Figure 1: Ubiquitous danger of multiple types of EOD

Further constraints (human, procedural, and technical) inhibited exploiting available data. Inadequate resourcing left the UAF General Staff LL cell understaffed and undertrained,

struggling to keep pace with inputs or produce actionable outputs. Analytical products focused narrowly on technical considerations, rarely integrating human and organizational factors. Reliance on manual dissemination methods constrained timely sharing across the ATO force and in particular limited dissemination to the wider UAF. Cultural obstacles also persisted, as the habits of secrecy reduced transparency. Without leadership emphasis on learning, frontline teams were reluctant to expose errors or uncertainty up their chain of command. This constrained open flows of knowledge necessary for improvement.

Learning is always a dynamic challenge - the adversary also learns. The Russians used the Donbas war as a training area to polish and improve their mine warfare tactics. While at the beginning the enemy used mostly unguided landmines, since 2016 Russian troops have been actively using wire and radio-controlled landmines, including those controlled by mobile phones. Figure 2 illustrates variants of a specific method of mine warfare (combined landmines EO, for the simultaneous destruction of a vehicle and troops located on its armour) that Russian troops began actively using from at least 2016. Drone-based munitions have more recently added a whole new aspect to EOD tactical challenges, enabled by rapidly evolving technological possibilities.

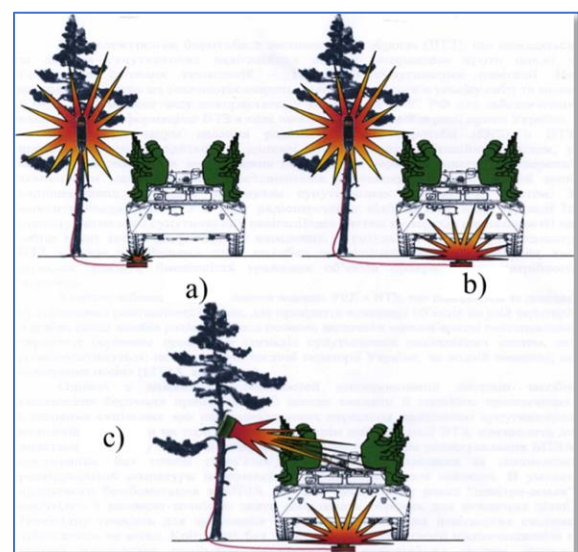


Figure 2: Variants of Russian tactics using combined EO from 2016.

In summary, stage 1 established a more formalized architecture for collecting lessons, but substantial maturation was required. Poor analytical capacity, dissemination barriers, and ingrained pathologies prevented meaningful organizational change. The same root causes of problems recurred in reports, evidencing weak implementation of recommendations.

Stage 2: Building Analytical Muscle (2019-2022)

With guidance from NATO advisors, Ukraine updated its LL structures and processes between 2019-2022 to enact Lessons Learned doctrine. National LL courses launched in 2021 trained 82 LL officers, with clearer responsibilities assigned across the chain of command that designated on-site collection points (LL Staff Officers (LLSO)/LL Points of Contact

(LLPOC)), analysts at tactical and operational headquarters (LL Analysts), and a central LL Section for aggregation. While the intensity of hostilities decreased from late 2018, and frequent LL bulletins had some effect in raising awareness of EOD threats, learning about the changing technologies continued to be a life-saver. Whereas in 2015, IED accounted for the majority of attacks (123 IED accidents), by 2018 anti-personnel mines had become prominent (20 attacks 2018; 17 in 2019; of which PMN-2 APMs accounted for 12 and 16 accidents respectively).

These data were collected via the Lessons Learned process. However, progress remained slow and information quality was variable; even acknowledged lessons typically took three months to be disseminated. This was evidenced clearly in the frequent repetition of the same root causes for mine problems in the 21 LL bulletins issued in the period leading up to February 2022; it was also reflected in the repeated recommendations regarding the need to implement remedial actions in fundamental areas: (i) recruiting and proper training of EOD personnel to fill often half-strength units; (ii) mine awareness training of troops and junior officers; and (iii) urgent needs to repair and provide spares for key engineering equipment. The implementation of remedial actions improved to a degree through the innovation of deploying Mobile Lessons Learned Teams (MLLT) that could engage units at their worksites; but resourcing of the MLLTs and senior leadership attention to their findings were not adequate.

Leadership attention improved, however, after the UAF Lessons Learned branch led a cross-functional systematic evaluation from January 2021 to February 2022 of why learnings from 2014-2016 - with EOD a key issue - and more recent data collections were failing to have enough impact. One of the best examples was the cross-functional team (CFT) established in the Joint Forces Operation HQ (J7) in January 2021 to study combat experiences and pursue remedial actions across procurement, doctrine, training and related issues. Six MLLTs operated from April 2021 to November 2022 to provide in-depth research on military operations and analyze the most important experiences of the Donbas war in 2014-2015. Following that internal review, the UAF implemented refinements to begin to convert tactical observations to overarching insights. The central Lessons Learned Section provided technical oversight, publishing recurrent analytical products drawing together narratives that helped explain the evolving situations in terms that previous 'Cold War' mindsets could not easily embrace. This formalized architecture facilitated the accumulation of data for trend analysis and developing of linkages between themes.

Resulting procedural improvements addressed some of the identified key shortfalls. Mandatory mine safety training courses increased familiarity with fundamentals of good practice across the force; central guidance expanded perspectives beyond basic mine awareness to broader capability issues like maintenance of the outdated engineering equipment. Analysts increasingly paired problems with recommendations for action. Linkages to knowledgeable actors working with civilian communities for humanitarian de-mining, in particular the HALO Trust¹, provided a source of best practices that the UAF could learn from. Year-on-year, the LL bulletins helped reduce mine accidents in the UAF (Figure 3).

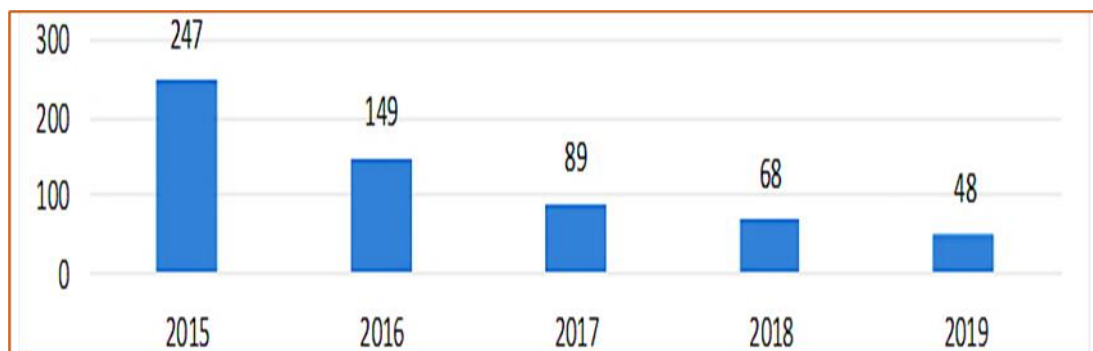


Figure 3: Number of Mine accidents in the UAF (2015-2019); Source: LL Bulletin, June 2020, NAA

However, turning recommendations into actions remained stubbornly challenging. Implementation and enforcement procedures remained weakly developed. Dissemination timelines marginally improved but still averaged two months. Without modern information systems, reports depended on ad-hoc emails, bulletins and military journals. Enduring manpower and skill gaps undermined analytical quality. Furthermore, the antiquated database was not replaced by an easily-accessed LL portal, despite the many recommendations made by the LL function; we conclude that cultural resistance to transparency persisted.

Stage 2's strengthened analytic focus honed Ukraine's ability to identify lessons. But observations seldom led to solutions. Chronic inadequacies in implementation procedures, dissemination, training and leadership engagement restricted learning's strategic impact.

Stage 3: Adapting Under Fire (2022-Present)

¹ <https://www.halotrust.org/where-we-work/europe-and-caucasus/ukraine/>

Russia’s 2022 invasion provided an unprecedented stress-test, as Ukraine fought to rapidly adapt lessons-learning to new realities. With the nature of conflict transformed, previous observations in the EOD area faced increasing irrelevance. Priorities shifted to challenges like breaching fortified zones and clearing mines under fire – capabilities that lagged due to underemphasis and under-resourcing. Long-identified gaps in specialized engineering units continued to prove challenging, if not potentially catastrophic given the intensity of operational demands.

In response, the UAF moved to reinforce successful innovations while addressing persistent weaknesses. Mobile Lessons Learned Teams again expanded, leveraging their proven embedded role for rapid collection and analysis. Since there were no opportunities to train LL officers at stationary courses, in summer 2023 the LL mobile training group operated in the frontier zone and trained more than 170 LL Officers (LLPOCs and LLSOs). Enhanced training increased the pool of qualified specialists able to translate observations into insights, streamlining lines of communication to accelerate information flow. In these important ways, the UAF was improving its alignment with the evolving NATO Lessons Learned process (Figure 4, combined with an innovative approach to Mobile Lessons Learned Teams.

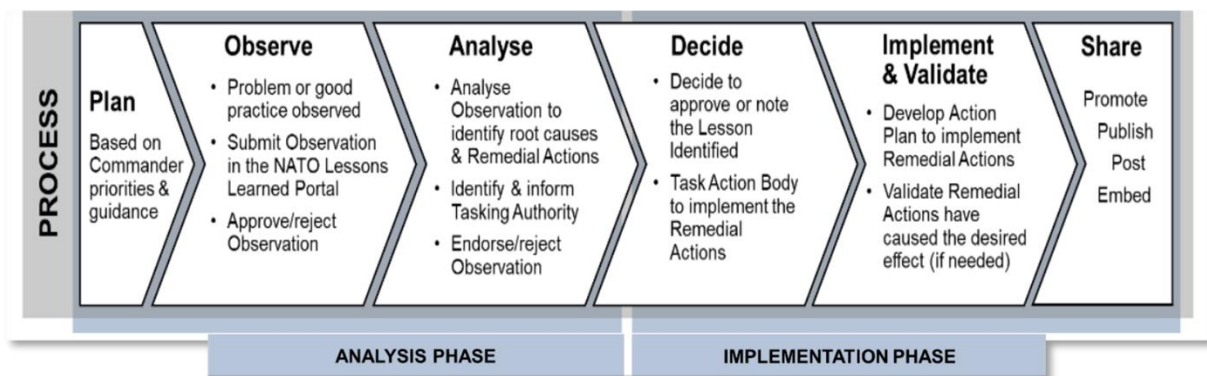


Figure 4: NATO JALLC Lessons Learned Process (source - reference (1)).

However, chronic deficiencies continue to hamper organizational learning’s contributions to the UAF's overall effectiveness. Inadequate involvement of military leadership in organising the LL process is evidenced in continuing low LL awareness of UAF personnel and under-resourcing of learning relative to the complexities and intensity of the threat; these impact timelines and quality of analysis of learnings, and translation into meaningful action. Even with recent efforts to improve timeliness (lessons now taking typically one month to be disseminated), entrenched hierarchical gatekeeping and dissemination methods delay

information sharing; weak enforcement procedures can restrict follow-through on recommendations.

Conclusions and Action Recommendations

Three key enablers stand out from the Ukraine case for determining the Lessons Learned process' ultimate impacts on EOD and other challenges, based on Ukraine's continuing maturation:

First, cultivating expertise through trained specialists with the access and trust to link perspectives – epitomized by Mobile Lessons Learned Teams – is invaluable for distilling observations into action. Second, becoming consistently rigorous in methodology, enabled by aligned doctrine, transforms information into knowledge. Finally, senior leadership engagement to mandate greater transparency and accountability breaks down cultural obstacles. Replicating the resulting innovations in EOD can unlock learning's latent potential for the wider military.

As action steps, we identify 10 recommendations that have been proposed to address these requirements to improve military learning:

1. Cultivate expertise through dedicated, trained Lessons Learned specialists able to link perspectives across the armed forces, e.g. Cross Functional Teams (4).
2. Embed Lessons Learned roles within operational units, facilitating trust and access.
3. Methodological rigor to improve information quality and enable better alignment of doctrine and standards with effective practice.
4. Senior leader emphasis on transparency and accountability to reinforce learning behaviors, prioritising the linking of tactical, operational, and institutional perspectives.
5. Timely dissemination channels unimpeded by hierarchies and geography.
6. Continuous analytical capacity for trend analysis of accumulated data.
7. Implementation procedures to transition from identified lessons to solved problems.
8. Validation processes to close feedback loops and confirm integration of identified lessons into remedial actions that transform capabilities.
9. Sufficient resourcing and personnel to maintain the analytical bandwidth under fire.
10. Responsive adaptation of systems and priorities to evolving threat environments.

For Ukraine, the jury remains out on applying lessons amidst an existential war where EOD is a central challenge. While maturing capabilities show promise, lagging institutional support fosters disconnects between concepts and implementation - for example, the UAF remains tied to an obsolete, under-used LL database rather than implementing the Lessons Learned Portal as recommended by the NATO JALLC. Overcoming chronic challenges will shape learning's contributions as the war pushes forward. Their model of progressive improvement, however, provides signposts for militaries worldwide striving to institutionalize success despite uncertainty. With willpower and resources, harvesting failures' benefits remains within reach.

Acknowledgments

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