



NATO's Digital Transformation and Lessons Learned

The Force Multiplying Effect of AI

Ethical AI Use

Cognitive Bias in Lessons Learned

Enhancing National-NATO Lessons Sharing

Lessons From Russia's War Against Ukraine

The Crucial Role of Analysis in NATO's Future

News and Updates

The Explorer

Digital Transformation and AI Special Edition

Image generated by AI. Canva text to Image generator: NATO AI thinking about the future of Lessons Learned, in blue.



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From the Commander's Desk

Welcome to this edition, of The Explorer; the JALLC's annual publication covering: the latest in Lessons Learned and Analysis, updates on our activities, and thought-pieces on trending topics.

This edition of The Explorer focuses on a topic that is high on NATO's agenda: Digital Transformation, and in particular the way Artificial Intelligence (AI) is influencing the world today and the potential impact it will have on NATO and the JALLC. In particular I recommend that you read the article on NATO's Digital Transformation on page 3 which features an article based on an interview with Rear Admiral

(RADM) Nick Wheeler, Director of NATO Digital Staff (formerly the NATO HQ C3 Staff). RADM Wheeler provided some fascinating insights into NATO's Digital Transformation and on its AI journey and what we can perhaps expect from the future.

You can also read articles written by the JALLC's staff on some interesting trending topics at the moment, such as AI Ethics, Cognitive Bias in Lessons Learned, and Innovation at the JALLC, as well as enjoy the memoirs of one of our longest serving Military Staff members, LTC Rigo Genz.

Of course, there are the regular updates on the JALLC including updates on our Lessons Learned activities and Analysis projects. We will also be providing a glimpse of the upcoming NATO Lessons Learned Conference that will take place in Lisbon early next year.



Finally, this year marks the 20th Anniversary of Allied Command Transformation (ACT), to which the JALLC belongs. The JALLC and all its staff wish ACT and all our colleagues a happy birthday. We also want to wish our sister command, the Joint Warfare Centre, a very happy 20th Anniversary as well as they share this special year.

I do hope you enjoy reading this magazine as much as we have enjoyed putting it together. In this respect, I'd like to take the opportunity to personally thank the JALLC's Editor and all of the JALLC's staff

who have contributed to this edition of The Explorer. This magazine relies on the voluntary personal contributions and extra effort from the JALLC's staff; the content and quality of this edition is a testimony to their professionalism and commitment to the organization. Happy reading.

Fernando Artilheiro
Commodore, PRT N
Commander JALLC

Dear Readers,

What a fascinating Explorer this has been for me personally. When we decided on the theme for this year's edition, I think that, like most non-tech-y people, I was a bit daunted, and even skeptical, about diving into the realms of Digital Transformation and AI.

I confess to not really bothering too much with the technological (r)evolution that is taking place at our desks, until now. I think there are quite a few of us (me absolutely included) who are content to sit back and be reluctantly resigned to it just happening to us; the inevitable rise (and rise) of AI.

But having spent some time researching the topic, experimenting with AI, and talking to people in the know—such as RADM Nick Wheeler, Director of the NATO Digital Staff—I found myself well and truly gripped by the topic. Digging into industry statistics, reading expert opinion articles, daring to try ChatGPT; I felt a bit like Sleeping Beauty waking up after a hundred years and wondering where I am and what has happened. The (digital) world is not the same place it was ten or twenty years ago when we still had to dial in to the internet... have I been sleeping?

Disney references aside, I am a convert. After having *played* with generative AI for myself, I see the power of it. I also see the risks, I do, especially in the NATO context (i.e. global security and working with classified information). But there is a lot of untapped potential—even here at the JALLC. There is much talk in the media about concerns that AI will take over from humans, that we will lose our jobs to machines (to the extent that hasn't already been happening since the industrial revolution). But I am inclined to agree with RADM Wheeler: AI really has the power to enhance our human abilities; to make us more efficient (by freeing up our time) and to make us more creative and innovative (by carrying out the mundane tasks). That can only be a good thing. Perhaps instead of worrying about AI taking over our jobs, we should be honing in on ways we can use it to enhance what we do?

Of course, as we highlight in couple of the articles in this edition of the Explorer, these seemingly endless benefits do come with risks attached. The potential to mis-/abuse AI is also seemingly endless. And, more importantly, these are not *potential* risks, they are a reality. From fake news to cyber attacks, from spyware to identity theft. These are all threats that challenge the Alliance as well as the one billion people it serves.

BUT.... NATO has always been good at facing challenges; good at adapting to the ever changing global security threat environment. In fact, as Ms Oana Lungescu—former NATO Spokesperson—said in her briefing to the JALLC on our 21st anniversary, “NATO’s *ability to adapt is what has made it the most successful Alliance ever.*”

I guess this is just another phase of adaptation for this great Alliance of ours. And for one, I want to be part of it. How about you?

Jodie

The JALLC's Editor





Recent developments in Artificial Intelligence (AI) have grabbed the world's, and its leaders', attention. As such, Digital Transformation is high on NATO's agenda. After talking to Rear Admiral (RADM) Nick Wheeler, Director of the NATO Digital Staff, about NATO's Digital Transformation and the impact of AI on NATO, we share some thoughts on the benefits, the risks, and what it means for the JALLC in practice.

A BRAVE NEW WORLD

NATO's Digital Transformation & Lessons Learned

In this article, we first get to grips with what Digital Transformation means for NATO generally. We then take a look at some of the relevant challenges NATO faces in implementing its Digital Transformation at the speed of relevance and how we are addressing them as an organization: the Risk of Over-Regulation, the Challenge of Consensus, the Future of Warfare, and finally the Right Mindset. We then briefly look at the importance of data as a strategic asset for the Alliance and finally, what Digital Transformation means for the JALLC and Lessons Learned.

Everyone is talking about it: NATO's Digital Transformation and the implementation and impact of AI in NATO. But what does this mean for the NATO Lessons Learned (LL) Capability in practice? With ever increasing amounts of data being generated that reveal valuable potential lessons and best practices, as part of NATO's Digital Transformation, the JALLC is looking at innovative ways to exploit the opportunities that the increasingly digital future will present in terms of data collection and analysis, how trends are identified, and ultimately how lessons information can be pushed back into NATO.

AI has already started to become integrated into Digital Transformation of industry, and indeed our day-to-day lives. And although AI offers multiple benefits that have the potential to improve and enhance how we humans live and work, increasingly AI pioneers have been warning global leadership about the risks of the misuse of AI and the potential threat it can pose, comparing AI to a: "...societal-scale risk such as pandemics and nuclear war..."

The benefits of using AI in the NATO LL Process seem infinite. In a recent workshop held by the JALLC on LL Semantic Representation (see the article on JALLC Innovation on page 27 of this magazine), participants imagined the future of LL; from microchip implants that could collect observations from our brains to fully automated analysis and trend identification processes. Until AI reaches its limits, the possibilities of what it can do seem endless. However, as easy as it is to imagine these benefits, it is as easy to imagine the risks of letting AI loose in the NATO LL Process. For example, it's not hard to imagine AI misinterpreting collected data, resulting in faulty (or fake) observations resulting—in turn—in potentially faulty (or fake) Lessons Identified and flawed decision-making.

In this Brave New World of Digital Transformation, with AI playing an increasingly prominent role, where does NATO stand in balancing the tremendous opportunities AI presents against the potential risks?

We spoke to RADM Nick Wheeler, Director of the NATO Digital Staff (formerly named the NATO HQ C3 Staff), to find out more about NATO's approach to AI and the binary choice that NATO is faced with: keep up and retain our (technological) edge OR fall behind and risk global security.

RADM Nick Wheeler

RADM Nick Wheeler was born on the Channel Island of Jersey in 1970. He joined the Royal Navy in 1991 and trained as a Warfare Officer specializing as a Submariner in 1996. Career highlights include commanding the HMS TORBAY and HMS TURBULENT, being assigned as Deputy Commander of the NATO Submarine Command and Assistant Chief of Staff SM to Allied Maritime Command (MARCOM), an assignment at the UK Strategic Command, and working in intelligence support to military operations for the UK government. Upon promotion to Rear Admiral, in July 2022, he became the Director of the NATO Digital Staff (formerly NATO HQ C3 Staff).



For RADM Wheeler, it really is that binary: NATO either does it, and does it now, or the Alliance risks potential adversaries getting the better of it and losing its (technological) edge.

However, for a political-military defence organization, tasked with ensuring the global security for over one billion people, it's never going to be as simple as taking the latest algorithms developed by AI Pioneers and letting them loose in NATO. There are many factors to consider when talking about NATO's Digital Transformation, and none of them are trivial: e.g. from how far to allow AI access to classified information, to the practicalities of when and how staff can use AI, to recognizing that our potential adversaries may not have the same set of principles regarding the (mis)use of AI as we do. The universe of AI will need regulating in NATO if the Alliance is to ensure it retains its technological edge and interoperability (e.g. through policy, standardization, and training), while remaining true to its core values and principles.

In this respect, the Alliance is well on its way. NATO has already developed an AI strategy, a Digital Transformation Vision, an Implementation Strategy on Emerging and Disruptive Technologies, and the NATO 2030 Agenda—to name but a few key documents. For example, pictured on the next page are NATO's Principles of Responsible AI Use. These range from Lawfulness to Governability and recognize the need for the Alliance to maintain its technological edge while respecting its values, norms, and international law. It's a fine line that NATO needs to walk, but one it is fairly used to walking as it navigates the global security threat environment while upholding its core values.

The Risk of Over-Regulation

But there is a flip-side to this regulation coin: and that is the risk of *over-regulation* hindering NATO's ability to implement AI and digitally transform at the speed of relevance. This balancing act between Digital Transformation's *need for speed* (in terms of development: training, testing, implementation) vs the need to remain true to NATO's core values and the desire to be responsible AI-users, is realistically not something NATO's potential adversaries are too worried about. In an unconstrained environment, it is much easier to develop AI, or use the latest algorithms, to achieve the latest objectives.

Russia's war against Ukraine is a good example of how quickly progress can be made where there are no constraints and you are facing a real aggressor: effectively *fighting for your life* as the RADM put it. This type of environment is where innovation thrives. But at what cost? Time will tell how big the bill will be from Russia's war against Ukraine, but lessons can certainly already be learned from how the nature of warfare is changing in the battlefield and how NATO's Digital Transformation will need to reflect that.

Continued on page 7.



NATO Secretary General, Jens Stoltenberg, speaking at the Weapons of Mass Destruction Conference in April this year, called for a new approach to deal with the rapid spread of new, disruptive technologies. "We are determined to develop a shared, universal gold standard for the responsible use of new technologies in defence," he said. "At NATO, we have started this process with our Artificial Intelligence Strategy and its principles of responsible use."

Source: [NATO website: https://www.nato.int/cps/en/natohq/news_213954.htm?selectedLocale=en](https://www.nato.int/cps/en/natohq/news_213954.htm?selectedLocale=en)

Read more about NATO's Artificial Intelligence Strategy on the next page.



NATO's Data and Artificial Intelligence Review Board (DARB) met on 07 February 2023 to start the development of a user-friendly and responsible AI certification standard to help industries and institutions across the Alliance make sure that new AI and data projects are in line with international law, as well as NATO's norms and values.

Source: [NATO website: https://www.nato.int/cps/en/natohq/news_211498.htm](https://www.nato.int/cps/en/natohq/news_211498.htm)



NATO's Deputy Secretary General Mircea Geana addressed the C3 Board Spring Plenary meeting (23-24 May 2023), which approved the Implementation Strategy for NATO's Digital Transformation.

Source: [NATO website: https://www.nato.int/cps/en/natohq/news_214878.htm?selectedLocale=en](https://www.nato.int/cps/en/natohq/news_214878.htm?selectedLocale=en)

NATO ARTIFICIAL INTELLIGENCE STRATEGY

In 2021, NATO published its NATO Artificial Intelligence Strategy. Recognizing the need for the Alliance to maintain its technological edge, the Allies committed to working together in the field of AI for transatlantic defence. The aim of the Strategy is fourfold:

- To provide a foundation for NATO and Allies to lead by example and encourage the development and use of AI in a responsible manner for Allied defence and security purposes;
- To accelerate and mainstream AI adoption in capability development and delivery, enhancing interoperability within the Alliance, including through proposals for AI Use Cases, new structures, and new programmes;
- To protect and monitor our AI technologies and ability to innovate, addressing security policy considerations such as the operationalization of our Principles of Responsible Use; and
- To identify and safeguard against the threats from malicious use of AI by state and non-state actors.

At the forefront of the AI Strategy are the NATO Principles of Responsible Use which will help steer transatlantic efforts to implement AI in accordance with NATO's values, norms, and international law. These principles are based on widely accepted ethical, legal, and policy commitments under which NATO has historically operated and will continue to operate under.

You can find out more about NATO's AI Strategy on the NATO main website [here](#).

NATO's Principles of Responsible AI Use



LAWFULNESS

AI applications will be developed and used in accordance with national and international law, including international humanitarian law and human rights law, as applicable.



RESPONSIBILITY & ACCOUNTABILITY

AI applications will be developed and used with appropriate levels of judgment and care; clear human responsibility shall apply in order to ensure accountability.



EXPLAINABILITY & TRACEABILITY

AI applications will be appropriately understandable and transparent, including through the use of review methodologies, sources, and procedures. This includes verification, assessment and validation mechanisms at either a NATO and/or national level.



RELIABILITY

AI applications will have explicit, well-defined use cases. The safety, security, and robustness of such capabilities will be subject to testing and assurance within those use cases across their entire life cycle, including through established NATO and/or national certification procedures.



GOVERNABILITY

AI applications will be developed and used according to their intended functions and will allow for: appropriate human-machine interaction; the ability to detect and avoid unintended consequences; and the ability to take steps, such as disengagement or deactivation of systems, when such systems demonstrate unintended behaviour.



BIAS MITIGATION

Proactive steps will be taken to minimise any unintended bias in the development and use of AI applications and in data sets.

The Future of Warfare is Now

However, as RADM Wheeler pointed out, the real-world scenario that Ukraine and Russia finds themselves in, is precisely the type of scenario that NATO is designed to avoid. So how relevant are the AI-Lessons from the war against Ukraine for NATO? Perhaps not relevant in the sense of how NATO should be developing its own AI-solutions. But they could be very relevant in understanding the potential future threats the Alliance could face. For example, in a recent research report published by the JALLC on Russia's war against Ukraine,¹ the study identified one of those potential future threats as coming from the increased and effective use of drones on both sides of the Russian war against Ukraine, noting the need for robust anti-drone defence systems and the recognition of autonomous systems as a potential game-changer in modern warfare. Another example is that both Russian and Ukrainian forces are using AI to fuel disinformation campaigns and collect intelligence on troop whereabouts. This use of AI has raised questions about AI ethics in NATO. Questions that need to be discussed (see the article on AI ethics in NATO in this magazine on page 21) and ultimately answered.

The Challenge of Consensus

The reality NATO faces, however, is that it simply doesn't have time to spend discussing these ethical, and indeed other, questions for very long. Decisions need to be made. As is often noted, the strength of the Alliance can also be its weakness; with (currently) 31 Allies needing to reach consensus on hard-hitting topics like AI implementation in 360° defence of the North Atlantic area, once consensus *has* been reached, it is deeply meaningful. So many Nations agreeing on a way ahead on anything has a huge impact, sending out global ripples that reach NATO's Partners, Dialogues, other International Organizations and, yes, its potential adversaries. But, it takes time to reach that consensus because there are many voices at the table, and they all need to be heard.



Note: Consensus decision-making is a fundamental principle of NATO. It has been accepted as the sole basis for decision-making in NATO since the creation of the Alliance in 1949. Consensus decision-making means that there is no voting at NATO. Consultations take place until a decision that is acceptable to all is reached.

Sometimes member Nations agree to disagree on an issue. In general, this negotiation process is rapid, as Nations consult each other on a regular basis and therefore often know and understand each other's positions in advance. You can find out more about how NATO takes decisions on the NATO HQ website: https://www.nato.int/cps/en/natohq/topics_49178.htm

1. JALLC; Open-Source Publications Research on Russia's War against Ukraine -Operational and tactical level lessons; JALLC/CG/23/092; 03 July 2023; NATO Restricted. Copies of the JALLC's classified reports can be obtained from the JALLC subject to appropriate security clearances.

The good news is, NATO's Leadership and the Nations are fully on board the Digital Transformation train. From the NATO AI strategy, to its Digital Transformation Vision, and Implementation Strategy, NATO is now focusing on how it needs to move into this new digital era. Digital Transformation is top of the NATO agenda and it needs to be as far as RADM Wheeler is concerned:

"The truth is that AI has tremendous potential to really increase the speed at which NATO can work. Not only the speed at which we can work at the tactical and operational levels in terms of getting the day-to-day business done more quickly, but also the speed at which decisions can be taken by our leadership. Data-informed decision making is not even the future of NATO anymore, it's the now. The Alliance has made tremendous strides towards its Digital Transformation: the (initial) thinking has been done, the framework developed."

But as RADM Wheeler puts it: this is perhaps the easy part. Now we need to act. Basically, if NATO doesn't act now, it risks falling behind the technological (r)evolution curve, and it may become difficult to catch-up to its peers and potential adversaries, let alone *keep-up* with them or even *out-pace* them as the NATO Warfighting Capstone Concept suggests we should.

The Right Mindset

However, as RADM Wheeler also notes, it's not going to be possible to *act* and meet NATO's Digital Transformation needs by doing the same things we've always done, the same way. According to the RADM, there are two aspects to the required mindset change: the first relates to NATO's relationship with new technology; the second relates to how humans may feel threatened by (fast) change.

Regarding the first mindset shift, NATO has historically needed to conduct in-house development of its technological needs because of the nature of the data we work with and the military environment we work in. However, technology development is expensive and it takes time. Having now established that NATO does not have time, the reality is that NATO, as an organization, is going to have to change how it approaches technology (soft- and hardware) development vs technology acquisition. Semi-trained off-the-shelf AI-solutions would seem to be the way forward, rather than taking the time it takes to develop our own algorithms.

As such, there are still hurdles to overcome in this respect, not least of which are the security implications, the ethical implications, and the financial costs. But these are challenges that NATO has faced before in terms of implementing technological solutions, and it can—and will—face and overcome them now. The COVID-19 pandemic was perhaps a (much needed) catalyst to advance NATO's technological

"Recognising the urgency of a digitally-transformed Alliance, we have endorsed a Digital Transformation Implementation Strategy to underpin our ability to conduct Multi-Domain Operations, drive interoperability across all domains, enhance situational awareness, political consultation, and employ data-driven decision-making.

The Vilnius Summit Statement, July 2023

IF YOU DO WHAT
YOU'VE ALWAYS DONE,
YOU'LL GET WHAT
YOU'VE ALWAYS
GOTTEN.

evolution, proving that, when faced with a crisis, NATO can implement technological solutions at the speed of relevance with off-the-shelf remote working tools being swiftly adapted and approved for use and then rolled out remotely. However, when NATO is not faced with a crisis, our technological evolution can be somewhat Darwinian. An example of this, is the ongoing IT Modernization of the NATO Enterprise. As is so often the case in IT, the project has been faced with delays and programming constraints that have generated technological challenges that the project has had to adapt to in order to address. Progress is being made, and it will lead to a more efficient workforce, but that progress is slow.

The second mindset issue is perhaps more relevant from the human workforce perspective. Let's talk about the elephant in the room:

Will AI take over our jobs?

This question is one of the leading *water-cooler* topics at the moment as more of us experiment and get comfortable with using generative-AI in our private lives, acknowledging how powerful it is, and realizing what that might mean for our jobs.

As far as the answer to this questions goes, RADM Wheeler isn't too concerned about it. The RADM sees the future of AI as one of enhancing and enabling our current way of working. Recognizing that skill-sets will perhaps need to change and to adapt to the new reality of working with AI, there will always be a need for the human aspect in terms of how we use AI, at least for the foreseeable future.

Generative-AI needs clear instructions and usually follow-up correction and guidance to produce something that could reasonably be accepted at a professional standard. Moreover, AI simply can't (yet) do the critical thinking and logical inflection that a human can do. From the JALLC's perspective this means that, while AI can potentially save the JALLC a lot of time in carrying out tasks currently performed by its staff, such as data collection work, even the initial data analysis, and perhaps creating a first draft of a report, it will still take a keen critical human eye to spot the mistakes in the AI "thinking."

Continued on page 11

The JALLC AI Voice-bot Experiment

In 2021, the JALLC published its Analysis Report on Virtual Collaboration Tools.⁵ Part of the data collection process for the study involved staff across multiple NATO entities being interviewed by an AI voice-bot tool.

The AI voice-bot tool worked by having the researcher define questions (known as seedling questions) that provided the common structure for each interview. Then the AI engine decided, in real time, based on the answers given by the individual interviewee, whether to ask one or more follow-on question(s), and what the follow-on question(s) should be: either generic (e.g. "Please could you tell me more?"), or specific (e.g. "You mentioned email attachments, could you tell me more about that?").

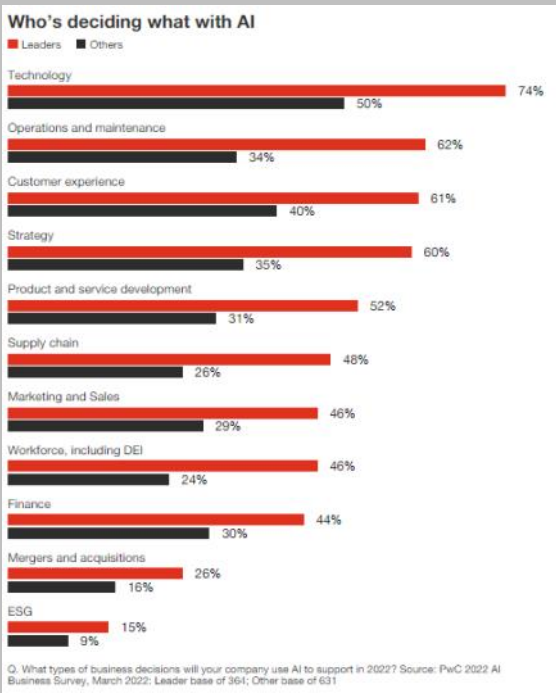
Although the interviews were not perfectly conducted, and some staff commented that the follow-up questions could be repetitive or off-topic, significantly more staff could be interviewed from a more diverse selection of NATO entities because JALLC staff were not needed to conduct the interviews in person. The results were also more comprehensive than those collected using a survey because the AI voice-bot tool could solicit more information in the follow-up questions, improving the quality of the data collected.

Although JALLC analysts won't be out of a job anytime soon, this experiment did serve to show how AI could be employed by the JALLC to free up valuable human resources to perform tasks AI could not do.

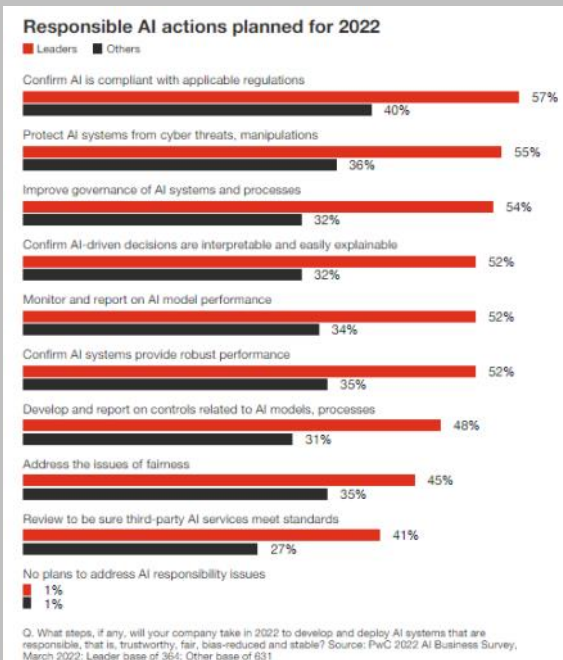
If you are interested in finding out more about the underlying study, you can download a copy of the factsheet on this report available from our website [here](#).

5. JALLC; Collaboration Tools in NATO - Experiences during the COVID-19 Pandemic; JALLC/CG/21/157; 17 December 2021; NATO Unclassified

What Industry is saying...



++++ZOOM to view++++



Don't just take our word for it. From big name tech companies, such as Oracle and Google, to investment hedge funds, such as Bridgewater Associates, and world leading accounting firms, such as Price waterhouse Cooper (PwC), everyone is now, not only just hopping on the AI-bandwagon, but heading down the AI-highway so fast, its hard to compare this technological (r)evolution to any other time of human evolution in the past.

According to Markets Insider,² Bridgewater Associates (currently the worlds largest hedge fund) has compared the ChatGPT Chatbot to having millions of investment associates. Recognizing that the Chatbot is unlikely to replace human employees anytime soon, and that some of it's answers regarding investment are outright "hallucinations," as long as you have the ability to control those hallucinations (against a rigorous statistical backdrop in this case), you have a significant amount of brainpower at your fingertips.

Reuters recently reported³ that Oracle is adding generative AI features to its human resources software for businesses, aiming to help draft job descriptions and employee performance goals, among other tasks. Noting that many business users have approached generative AI technology more cautiously because it can make up untrue facts and be tricked into saying unsettling things, the software development giant acknowledges that AI isn't about to replace the human touch. "We don't expect generative AI is going to write your goals for you. It's going to give you a starting place, and it's going to give you useful information that you can get going with," Buchheim, vice president of product management for Oracle Adaptive Intelligence Applications said in his interview with Reuters.

PwC (one of the World's leading accounting firms), conducted an AI Business Survey in 2022⁴ which looked at how industry leaders are leveraging data, cloud, and analytics to increase success. One area that the survey looks into, is decision-making with AI support. The survey notes that Leaders in the use of AI (i.e. those who are advancing all three key areas of AI in industry: business transformation, enhanced decision-making, and modernized systems and processes) are using AI more in their decision-making processes than those who are not considered leaders, suggesting that in order to really benefit from AI, it needs to be exploited across the board for maximum effect (expand the graphs on the left, taken from the PwC 2022 Survey).

Another area that is of relevance to NATO's AI journey, is responsible use of AI. The PwC survey showed (see left) that, AI leaders are more driven to take actions to ensure the responsible use of AI in their organizations. It seems the more you "do AI," the more you feel you need to protect yourself, and others from its impact.

One conclusion that can be drawn from analysis of what industry is up to in terms of AI, is that NATO should perhaps consider engaging with industry to learn the AI lessons that have already been identified and harness the power of AI for NATO use responsibly.

2. Sor, J.; The biggest hedge fund in the world says ChatGPT was able to pass its investment associate test - and it's like 'having millions of them at once'; Markets Insider; 06 July 2023; <https://markets.businessinsider.com/news/stocks/chatgpt-passed-investment-test-ai-artificial-intelligence-investing-bridgewater-2023-7>; date last accessed: 17 July 2023.

3. Nellis, S. ; Oracle adds generative AI to its human resources software; Reuters; 28 June 2023; <https://www.reuters.com/technology/oracle-adds-generative-ai-its-human-resources-software-2023-06-28/>; date last accessed: 17 July 2023.

4. PwC; PwC 2022 AI Business Survey; <https://www.pwc.com/us/en/tech-effect/ai-analytics/ai-business-survey.html>; date last accessed: 17 July 2023.



The X-factor: Data is Everything

The real next challenge for NATO will likely be its data. Most commercial AI solutions are designed to work with vast data sources and mimic human thinking/behaviour. The more data available; the more examples the AI has to learn from; the better it is/gets. Let's take ChatGPT as an example. Basically, ChatGPT is a large language model that relies on the vast data source that is the internet. Based on user input, it trawls the internet and compiles an average response. True, ChatGPT's average response is still usually better than an average person's response, but this is really down to the fact that ChatGPT can quickly and efficiently trawl through exponentially more data than your average human being can get through in a lifetime (well, a career anyway). However, as RADM Wheeler pointed out, ChatGPT, and indeed any AI solution, is only as good as the data it is based on and the training it has been provided with. If either (or both) are flawed, the content generated will likely also be flawed.

We prove this point in the next article in *The Explorer*, where we asked ChatGPT to write an article about the JALLC and how it should be implementing AI. We then asked our Editor and Principal Operational Research Analyst (i.e. two people with a lot of experience in writing for the JALLC) to critically review it. The results—see the article on page [15](#)—highlight nicely the challenge that NATO faces with regard to picking up off-the-shelf algorithms: NATO doesn't have a clear, comprehensive, and standardized data collection method and data lake (or even a puddle by industry standards) for AI to work with.... yet.

This is then one of the key areas of research and work in NATO at the moment with regard to Digital Transformation: standardization of its data. As RADM Wheeler pointed out, *"Our understanding of our data landscape is not comprehensive and we must establish a robust and dynamic picture of what data we have, where they are, and who is responsible for them. Getting the NATO Data Lake ready is a huge priority, but also a huge challenge. Humans don't really like doing things they don't see the immediate benefit of. You can introduce obligations to fill in meta data, you can create single databases for types of data, you can make Information and Knowledge Management the highest priority in every command, and still, human beings will stare at that meta data form and only fill in the bare minimum for them to be able to get on with their job."* This is perhaps another mindset problem rather than one of procedure, training, hardware, or software. And as such, it's much harder to solve. However, this is perhaps where we can let the *snake eat its tail* and deploy AI to help us fill in those meta data fields. The more NATO can automate at this level, the more the data lake can be filled with quality data, the more chance NATO has of implementing AI solutions efficiently and effectively in NATO.

What does it mean?

So what does all of this mean for the JALLC? The JALLC's Analysis studies are the culmination of evidence-based research, vast (by human standards) quantities of data, application of appropriate analysis techniques to said data, synthesis of the information, drawing conclusions, and making recommendations. AI has the potential to, at least, take some of the *leg-work* out of this process. From collecting the data to be analysed, to conducting an initial categorization of the data. From conducting AI voice-bot interviews (see the column on page 9) to preparing and sending out surveys. This is actually technology that the JALLC already applies or has experimented with; so imagine how future AI-solutions could further enhance and enable the JALLC Analysts to do the bit that AI is not really equipped to do yet: critically reviewing, fact checking, and identifying and filling in the gaps in the logic. Effectively, until AI has developed a keen ability to fact check and critically review it's own work, humans will always be required to start (i.e. instruct) and finish the job.

It doesn't look like AI will be taking over the JALLC for now. But AI does already have the potential to enhance the way its analysts work if used judiciously. For example, the preparation (i.e. data collection and processing) of JALLC studies could be conducted faster and more efficiently with the help of AI. This could potentially increase the speed at which the JALLC *humans* are able to conduct the studies (analysing, synthesizing, reporting, and critically reviewing), ultimately resulting in the JALLC being able to deliver products more rapidly. However, the lines between what AI can do and what humans can do are perhaps already blurred. As such, the JALLC will need to carefully examine these lines and figure out where it wants to—and needs to—draw them more clearly to ensure that staff can work with AI responsibly, for the benefit of the Alliance.

In short, working together with AI could enhance and enable the way the JALLC works. And the same is true for all of NATO. AI implementation is not a matter of replacing the human element with AI alternatives, but rather enhancing what NATO humans can do so that we can work *Faster, Better, and Smarter, and Win as a Team*.

In closing, RADM Wheeler noted that it's a Brave New World out there. As an optimist, he said, he believes that this is an exciting time of change for NATO; and there can be no progress without change. Perhaps the most progress is yet to be made, because we don't know what we don't know. The field of AI is moving so quickly, that it's hard to imagine the future. Indeed, just a few decades ago, could we imagine being told to trust our mobile phones to get us from A to B? And yet today, does anyone have a paper map in their car?

I'll tell you a secret: I do. But that's just in case my mobile phone battery runs out.

JALLC Innovation

The JALLC has already been experimenting with work-enhancing technology for some years. Since the New Technologies Event was held in 2018, which saw the JALLC bring together Industry and Academia leaders to present concepts and ideas about the future of Lessons Learned, the JALLC has always striven to be forward-leaning when it comes to the adoption and adaptation of new technology.

It's not always easy to advocate change in an organization, the right culture and mindset is required. At the JALLC we work hard to make sure that everyone feels empowered to suggest changes that will improve the way we work.

As such, the JALLC has allocated resources (staff and funds) to explore innovative solutions to making the JALLC more efficient and effective. Staff are encouraged to present ideas and suggest technological solutions to enhance the staff's ability to work at the speed of relevance.

For example, recently, the JALLC has been trialling generative AI (ChatGPT and Canva) as well reviewing potential AI add-ons to our analytical software (MAXQDA). You can read about these case studies in the next article.



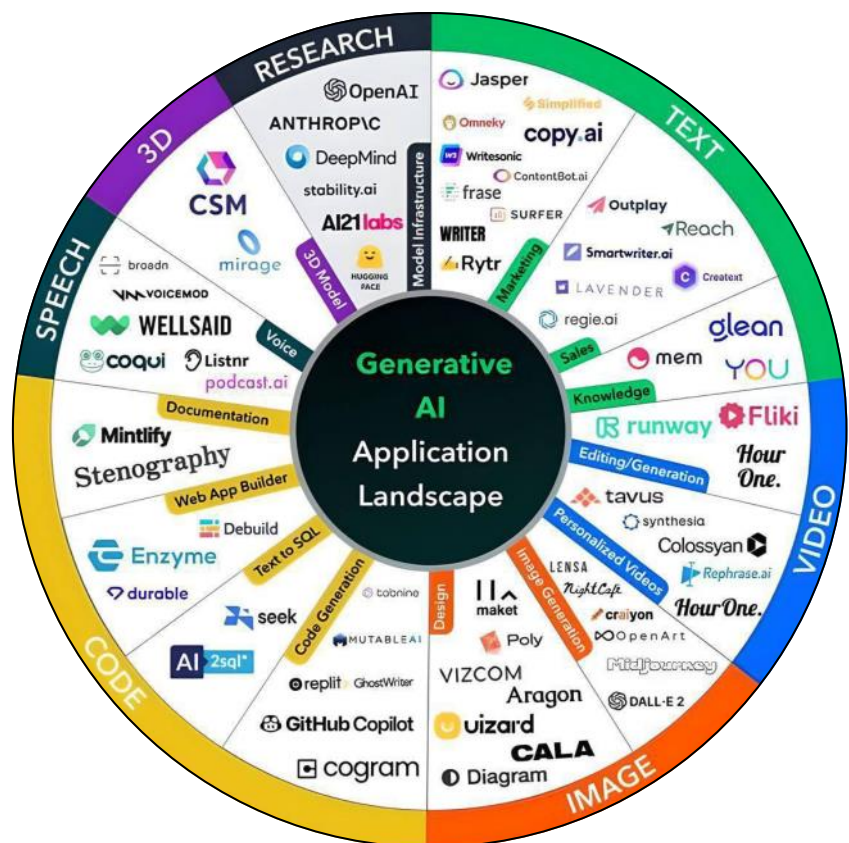
The Force Multiplying Effect of AI

According to **Forbes**, the global artificial intelligence market size was valued at USD 136.55 billion in 2022, and is expected to grow exponentially in the upcoming years, backed by mounting investments in AI technologies, digital disruption, and competitive advantage in this fast-growing global economy. The financial giant goes on to note that the greatest economic gains from AI are expected to be in China which will receive a boost of a 26% rise to GDP in 2030, followed by North America (14.5% boost), totalling USD 10.7 trillion and accounting for almost 70% of the global economic impact.¹

That is a lot of global wealth and gives an indication of the growing importance and impact AI is having on the global economy.

But NATO is not a profit making organization. So what does NATO stand to “gain” from the use of AI? In this article we explore how the JALLC has been experimenting with and re-viewing AI solutions as potential Force Multipliers, in different areas and across different activities, in order to understand how we can “gain” in terms of cost and human resource savings.

The results are in. And they’re interesting. Find out if AI could be a Force Multiplier for the JALLC and how we experienced working with AI for the first time.



Source: Generative AI Application Landscape (rapidops)

1. Forbes Advisor; Top AI Statistics and Trends in 2023; undated, <https://www.forbes.com/advisor/in/business/ai-statistics/#:~:text=The%20global%20artificial%20intelligence%20market%20size%20is%20projected%20to%20expand,37.3%25%20from%202023%20to%202030>

The Rise of AI

Google-search the use of AI tools (and by the way, you are using an AI tool by just googling AI tools), and Google will return about 1.150.000.000 results. Perhaps this is no real surprise these days. In a [report by leading consultancy firm McKinsey](#) on the state of AI in 2022,² it's noted that AI adoption has more than doubled (in industry) since 2017, although the proportion of organizations using AI has plateaued between 50 and 60 percent for the past few years. The results from the McKinsey survey suggest that the average number of AI capabilities that organizations use, such as natural language generation and computer vision, has also doubled—from 1.9 in 2018 to 3.8 in 2022. Among these capabilities, robotic process automation and computer vision have remained the most commonly deployed each year, while natural language text understanding has advanced from the middle of the pack in 2018, to the front of the list just behind computer vision.

This explosive increase in AI adoption over the past five years is more than a trend. It's being seen as the next step in the technological (r)evolution that seems to be defining this 21st century. The Alliance too has been making steady headway in adopting AI tools insofar as the security environment permits. From off-the-shelf solutions during the COVID-19 pandemic, to home-grown NATO tools that are designed to take some of the human legwork out of the daily grind. This is also true for the JALLC.

As Internet-based generative AI tools absorb the queries and inputs provided by the user into their knowledge base and could share this information with other users indiscriminately, it is important that, for now, NATO staff limit their use of generative AI to support public communications. However, as the technology is maturing quickly—there are already a number of impressive standalone generative AI tools that can be deployed in local networks—it won't be long before these powerful tools become widely available within NATO's secure networks.

As such, in this article, we take a closer look at the use of two popular generative AI solutions: ChatGPT and Canva AI Text to Image Generator, which the JALLC has been trialling in support of the JALLCs public communications activities, and consider what benefits 'the JALLC may gain from these tools. The JALLC has also reviewed the AI add-on to the qualitative analysis tool MAXQDA as a force multiplier for JALLC's future analysis capability.

2. QuantumBlack, AI by McKinsey, the state of AI in 2022—and a half decade in review; 06 December 2022; <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai-in-2022-and-a-half-decade-in-review>

The AI tools

Recently, the JALLC has been looking into generative AI (ChatGPT and Canva.AI), as well as AI add-ons to our analytical software (MAXQDA). Find out a bit more about each of the applications we trialled.



ChatGPT is an Artificial Intelligence chatbot that uses natural language processing to create humanlike conversational dialogue. The language model can respond to questions and compose written content.

Canva

Canva is a visual communication software application with user-friendly interfaces that allow users to design and create visual materials. You can use the Canva AI platform to create anything from PowerPoint presentations and graphs to social media posts, logo designs, and video content.



MAXQDA is the go-to software for managing and analysing qualitative research. JALLC analysts use it to code and analyse large volumes of documents in the context of a JALLC Analysis project. The new AI feature functions as a virtual research assistant, simplifying the work by automatically analyzing and summarizing information, using the power of OpenAI.

AI Case Study



We write a lot at the JALLC. A lot. We spend hours and hours writing, and rewriting. We then spend hours quality assuring the written work, not only fact checking, but also the quality and clarity of the writing. An average JALLC Joint Analysis Report takes six to nine months to produce. The “writing” phase often takes up to two months or more.

It’s therefore no surprise that we wanted to see if ChatGPT could possibly take some of the writing leg work out of this job.

We were also curious to find out if ChatGPT would have enough material to work with, based solely on open-source material and not on the classified information the JALLC relies on for its analysis activities. How much could ChatGPT find to work with? How relevant could ChatGPT make the article? How well written would it be? These are just some of the questions we asked ourselves.

So, we hopped on over to OpenAI and asked ChatGPT to perform the following:

“Write an article about NATO’s Joint Analysis and Lessons Learned Centre regarding what the Centre should be doing to apply artificial intelligence to improve its key activities.”

This is what ChatGPT has to say....

Leveraging Artificial Intelligence to Enhance NATO's Joint Analysis and Lessons Learned Centre

*Introduction: In an era defined by rapid technological advancements, the successful integration of artificial intelligence (AI) has become imperative for organizations across various sectors. The North Atlantic Treaty Organization (NATO) is no exception. As NATO's Joint Analysis and Lessons Learned Centre (JALLC) plays a crucial role in enhancing alliance capabilities, it must actively embrace AI to optimize its key activities. By leveraging AI technologies, JALLC can bolster its analytical prowess, streamline data processing, improve decision-making, and **enhance the overall effectiveness of NATO operations.***

Harnessing AI for Data Analysis: Data analysis forms the backbone of JALLC's mission. By employing AI algorithms, JALLC can efficiently process vast volumes of information, identify patterns, and extract valuable insights. AI-powered data analysis tools, such as machine learning and natural language processing, can aid in categorizing and structuring data, facilitating easier retrieval and

analysis. This would enable JALLC to derive actionable intelligence from diverse sources, including reports, documents, and multimedia content.

Enhancing Information Fusion and Collaboration: AI can significantly enhance JALLC's ability to fuse and integrate information from various sources. By implementing AI-driven systems for data fusion, JALLC can seamlessly merge data streams, including open-source intelligence, satellite imagery, and real-time situational data, to create a comprehensive operational picture. Moreover, AI-powered collaboration tools, like intelligent chatbots and knowledge management systems, can streamline information sharing and foster cross-functional collaboration within NATO and its member states.

Strengthening Predictive Analysis: One of the key advantages of AI is its ability to process historical data and generate accurate predictions. By employing predictive analytics, JALLC can forecast emerging threats, identify potential vulnerabilities, and develop proactive strategies. Machine learning algorithms can analyze historical operational data, intelligence reports, and other relevant information to identify trends, patterns, and potential indicators of

future events. This predictive capability would enable NATO forces to stay one step ahead and mitigate risks effectively.

Automating Routine Tasks: AI technologies offer immense potential for automating repetitive and mundane tasks, freeing up valuable human resources for higher-level analysis. JALLC can leverage AI-powered robotic process automation (RPA) to handle routine administrative tasks, data entry, and report generation. By automating these processes, JALLC analysts can focus on complex analysis, strategic planning, and generating actionable insights, ultimately enhancing the center's efficiency and productivity.

AI-Enabled Decision Support: In complex and time-sensitive operational environments, AI can provide invaluable decision support to commanders and analysts. JALLC can develop AI-driven decision support systems that offer real-time intelligence updates, scenario analysis, and course-of-action recommendations. By integrating AI algo-

rithms with NATO's command and control systems, JALLC can empower decision-makers with enhanced situational awareness, improved risk assessment, and more informed decision-making capabilities.

Conclusion: As NATO's Joint Analysis and Lessons Learned Centre continues to play a pivotal role in strengthening alliance capabilities, integrating artificial intelligence into its key activities is paramount. By harnessing AI for data analysis, information fusion, predictive analysis, task automation, and decision support, JALLC can unlock new levels of operational effectiveness and **enhance NATO's ability to respond to evolving security challenges**. Embracing AI technologies will enable JALLC to extract valuable insights from vast amounts of data, improve collaboration and knowledge sharing, and provide decision-makers with timely and accurate intelligence, **ultimately bolstering NATO's collective defense efforts**.

This is what the JALLC's Editor and Principal Operational Research Analyst have to say...

Editor: When I first started reading this, I thought: "Oh wow, I'm going to be out of a job soon." But actually, although it's nicely written and it seems to tell a coherent story, there's a lot of information here that doesn't quite add up or really feel right. It's not quite how we would phrase it; it's a bit loose and fast with the bold claims about what the JALLC can do. For example, the first bit of green text: well, although the JALLC definitely contributes to enhancing the effectiveness of operations through our various activities, I think I would want to tone down the way it is phrased here; it's bit *too much*. The other highlighted pieces of text are sort of the same thing: while it is all true to a degree, it's not quite as ChatGPT has phrased it here. It also doesn't seem to have understood that our key activities already exist (on the website). It seems to have identified key activities we could be doing to apply AI.

Principal Operational Research Analyst: I looked at the quality of the analytical thinking and accuracy in the text. While on the surface it is well written, it contains several errors and doesn't join up the ideas from top to bottom very well. The main problem is that it hasn't really grasped what the JALLC's key activities are. The JALLC does not provide intelligence or situational awareness in operations. But, large parts of the article—for example, the "enhancing information fusion and collaboration" paragraph—describe the use of AI for these purposes. I would guess these ideas were introduced by biases in the ChatGPT library, which likely contains many more examples of the benefits of AI for intelligence and C2, than for LL. The way ChatGPT seamlessly mixes valid and invalid ideas like this, makes it too unreliable to use for analysis, especially in the early stages of analysis when the analyst is forming their initial ideas. That said, a secure version of ChatGPT could significantly speed up report-writing after findings have already been validated.

Conclusion: Although ChatGPT is astoundingly good at sounding like it knows what its talking about, in fact it mostly takes information it can find and spins it into a coherent story. That coherent story is reasonably well written, but is not necessarily factually correct, even though it may sound like it is. The benefits are clear: it can quickly write up large chunks of text that sound good. The risk, however, is that it sounds too good to be true; and it usually is. So, for the time being, I don't think any of us at the JALLC are out of a job. However, what ChatGPT does seem to offer, is a quick start to sometimes tricky/tedious chunks of writing. As such, we'd consider ChatGPT as a potential force multiplier at the JALLC, if used correctly, by the right people, for the right purpose.

AI Case Study



The JALLC's staff number 50 in total. That's a small HQ by NATO Command Structure Standards. The need to "punch above our weight" means that we are always looking for Force Multipliers. The JALLC's Communications Team is comprised of just two staff members (the JALLC's Public Affairs and Protocol Officer and STRATCOM advisor, and the JALLC's Editor), neither of whom have graphic design in their Job Description. Nevertheless, the JALLC (like any other organization) needs graphic design products on a regular basis (take this magazine for example, or the JALLC's promotional material). As such, it falls to the JALLC's Communications Team to "make it happen," and "by any means necessary."

So when the option arose to trial Canva for our graphic design purposes, we jumped at the chance and we haven't been disappointed. Using the JALLC's promotional material, social media platforms, and this magazine as a "laboratory," we've been trialling Canva for a couple of months. Here are the results of the trial. From dealing with training NATO Branding Requirements, to the challenge of Cognitive Bias in AI, read how we will be, and importantly, will not be, using Canva as a graphic design force multiplier at the JALLC.

Canva AI uses the power of AI to simplify and to enhance the design process. This technology has redefined the boundaries of what is achievable in graphic design. The professional quality and user friendly interface has meant it has been fairly easy for the JALLC's team to pick up, despite the lack of formal training. The results have been mixed, often depending on how (military/NATO/JALLC) specific the design needed to be. Canva, like most online AI solutions, relies on open-source data to generate original artwork, and given the nature of the

JALLC's work and the general bias regarding the military and NATO, Canva can have a somewhat warped opinion of what the JALLC and NATO do, which is then expressed in the artwork designed.

By way of an example, we asked Canva's text to image generator to design artwork based on the following description: "The Joint Analysis and Lessons Learned (NATO) writing an analysis report while using AI technology in Portugal." Here is what it came up with:



You don't have to be terribly familiar with the work of the JALLC (just read this magazine to get an idea of what we actually do) to understand that these Star-Wars-esque images are a far cry from what we could ever use in the JALLC's promotional material, which is the number one type of product we use graphic design in. However, these images do highlight one of the challenges we faced when trialling Canva; Cognitive Bias in AI. You can read more in detail about Cognitive Bias in the article in this magazine on page [25](#), but these images offer an interesting reflection of the biased perception of the military / NATO / JALLC

that must exist online for Canva's algorithms to come up with these images. We noticed this bias in multiple design projects (again, see the article on Cognitive Bias for another prime example, but this time a gender-based bias) and found ourselves having to *rethink* how we asked Canva to generate artwork for us. As such, not only was the model being trained, but the users as well. This experiment (coupled with our ChatGPT experiment, described in the previous pages) really highlights that the weakness and strength of using generative AI lies with the user. We need to remember that AI is only as good as the instructions it is given and *training* it receives.

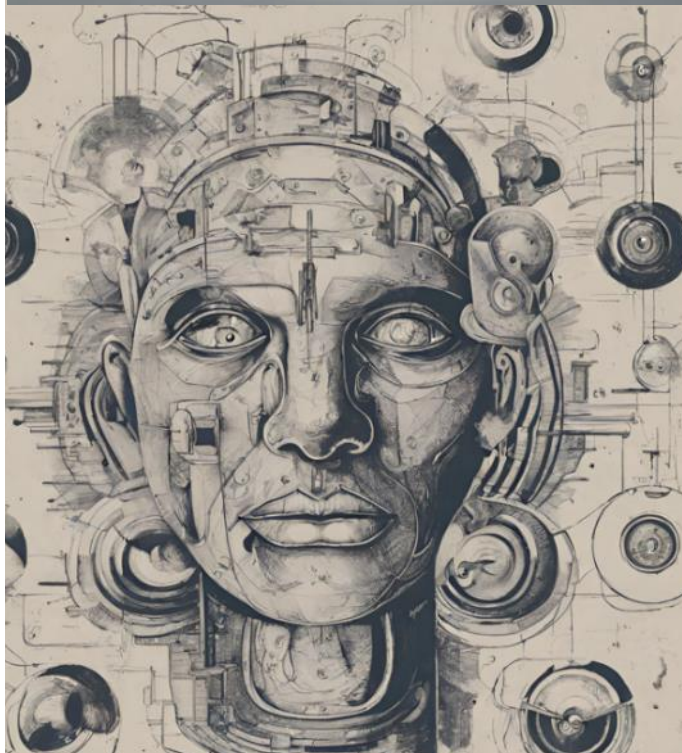
It's not all bad news though. Canva's text to image generator came up with the artwork on the right which has been used in this magazine. The first image was generated from the instruction "*Innovation expressed as Lessons Learned*," the second image was from the third cycle of artwork generated based on the instruction: "*Cognitive Bias in Lessons Learned*." Both are worthy, not only of being published in the Explorer, but also as original artwork expressing a concept.

In this respect, we see a lot of benefit in terms of cost and time management. Where we would normally have to contract in graphic design support, we can now at least try and use Canva to generate wither a finished product, or some ideas we can work with to show to a human graphic designer.

As such, this particular piece of AI has the potential to save the JALLC, and thereby the Alliance, funds. It could also save us something perhaps even more valuable in such a small HQ: time and human resources. It takes time to prepare the paperwork to contract a graphic designer, to select the right one, to brief, to provide feedback, etc. If we can do at least some of the work in-house, then that is a clear benefit for the organization.

Time will tell how much the JALLC will come to rely on this force multiplier. It certainly multiplies the JALLC's Communications (work)force by taking the time and effort out of some of our projects. For example, by using Canva to generate our social media posts, we have been able to increase our following, generating more visibility for the JALLC and its activities.

In conclusion, there is still lots to learn about using Canva's text to image generator and other features, but as long as it has the ability to multiply the JALLC's Communications (work)force, we will continue to test the boundaries of how it can be used to enhance our messaging.



“Canva is a powerful tool that could shape the future of design.”

LTC Sonia Guerra, Public Affairs and Protocol Officer, STRATCOM advisor, and the JALLC's social media manager

AI in Review



AI ASSIST (BETA)

Our core business is in the JALLC's name: **ANALYSIS** and **LESSONS LEARNED**. JALLC's analysis enables the identification and exploitation of Lessons Learned with Alliance-wide impact—saving lives, saving money, and saving time.

Around 1/3 of the JALLC's joint military and civilian staff is involved in analysis. But this is never enough. Every year the JALLC receives more requests for analysis than it can satisfy, and so anything that can multiply the analysis workforce leading to faster and better products, would be a welcome addition to JALLC's working practices.

The JALLC already uses various software applications to help our analysts take some of the legwork out of processing information in JALLC Analysis Projects. Especially with the common task of identifying themes across multiple data sources, such as interview transcripts or documented Lessons Learned.

One software application used by the JALLC is MAXQDA, which is designed for computer-assisted qualitative and mixed methods data, text, and multimedia analysis. MAXQDA is currently undergoing testing of an AI add-on that acts as virtual assistant, selecting and summarizing source material for the human analysts, potentially saving time and (human) resources. As this AI add-on currently relies on Internet-based AI services, the JALLC cannot use it on any of its real analysis tasks yet, but it's never too soon to discover how it could be used in the JALLC, in the future, to deliver relevant output more quickly and effectively.

MAXQDA AI Assist is a new AI add-on—powered by OpenAI—that is currently being tested by the developers. AI Assist offers the possibility to have text passages summarized automatically. According to the developers it will be able to automatically summarize multiple texts and create code summaries for segments of text. To the untrained ear this might not sound like music, but for trained analysts, this means these routine tasks that currently takes days, weeks or even months may be achievable in minutes or hours in the future. Below we review some of the features in order to understand if this AI add-on could reduce the time it usually takes to conduct one of our complex Joint Analysis projects (i.e. six to nine months) to perhaps six to nine weeks (or less) in the future.

Trend Recognition: AI Assist's data analysis capabilities can identify emerging trends and patterns across multiple documents and reports. This trend recognition could enable the JALLC to highlight challenges and opportunities for Alliance learning as soon as they show up in the NATO LL Portal content, and to proactively connect staff with similar problems to share knowledge faster.

Sentiment Analysis: Understanding the sentiment within text is crucial for assessing the success or failures of NATO operations. AI Assist excels in sentiment analysis, and could help the JALLC identify weak signals of potential new Best Practices or Lessons Learned to enhance NATO's ability to make well-informed data-driven decisions.

Boost Collaboration within NATO: The tool could enable the JALLC to create visually engaging, data-driven presentations and reports that resonate with diverse stakeholders, from military personnel to civilians. This could increase the impact of the JALLC's products, helping to deliver decision-makers and staff with the knowledge they need, when they need it, in a format that is easy to understand.

Speed and Precision: By quickly identifying key patterns, themes, and sentiments, in vast datasets, AI Assist has the potential to accelerate the analysis process.

Enhanced Content Categorization: By using Natural Language Processing (NLP) algorithms to categorize and tag textual data automatically, the add-on can help identify important information that human analysts may have missed. For the JALLC, this could mean a more comprehensive, repeatable and reliable understanding of the data being reviewed.

Multilingual Capabilities: AI Assist may enable JALLC analysts to analyse documents in various languages, breaking down language barriers and ensuring that no valuable information is missed. Find out more about the potential consequences of language barriers in Lessons Learned in our article on Enhancing National-NATO Lessons Sharing on page [37](#).

Sounds great. Sign us up!

Right?

However, it's not that simple. It never is. While the AI Assist is still in its beta phase (i.e. testing) and only works on the Internet, it won't be possible for the JALLC to perform any tests with real NATO data. The bulk of the data used for JALLC Analysis is sensitive or classified and cannot be safely shared on the Internet.

This is a perennial and organizational issue for NATO, highlighted in the key feature article of this magazine on NATO's Digital Transformation on page [3](#). The constraints of the security information environment, may make it difficult for NATO to tap into the true potential of AI as a force multiplier until we can either (more efficiently) develop our own AI solutions, or we can somehow resolve the issue of releasing private sector off-the-shelf solutions into the classified information environment.

However, it is interesting to watch this development of a software tool that is already being used in its pre-AI form on the NATO Classified system. It gives some hope that, in the not too distant future, we could tap into this potential that could allow AI to enhance the JALLC's analysis capability and enable the JALLC to increase its ability to meet the high demand for its relevant and impactful analysis products.

At least for now, JALLC Analysts will have to be satisfied dreaming of a future of AI-assisted analysis, with human and AI analysts working in harmony to deliver relevant and timely products.

What has the JALLC's Principal Operational Research Analyst got to say?

There are many tasks during a typical JALLC Analysis project that are excessively resource intensive and prone to human error due to the volume of information being processed. It's quite typical for JALLC project teams to use over 100 documentary sources to inform their research; ranging from interview transcripts to doctrine publications. This is too much information for even for the brightest human analysts to hold in their brains at any one time.

Therefore, before MAXQDA, JALLC analysts would copy and paste relevant extracts from the documents into an Excel spreadsheet, mark the extracts with relevant topics, and then use sort and filter functions in Excel to explore the data.

MAXQDA has significantly sped up this process, by automating some aspects of this process, and the AI add-on promises to deliver the next level, automating nearly everything about the process.

However, early trials with using OpenAI on real NATO data indicate there is still some way to go before this AI can be trusted not to miss relevant content, or include irrelevant content. Not to mention the questions over the factual accuracy and validity of the results.

Also, these AI solutions have not been trained on NATO language yet, so their ability to accurately and meaningfully mark-up extracts, rich with acronyms (and acronyms of acronyms), and verbs like "*to task*" and "*to deconflict*" that are not used outside military circles, is currently limited.

In order to accelerate research into overcoming these limitations for NATO, the JALLC is co-chairing a NATO Science and Technology Organization multinational research group on Semantic Representation to Improve Exploitation of Lessons Learned as one of its innovation activities. You can read more on this, and other JALLC Innovation activities, on page [27](#).



Ensuring Ethical AI in NATO's Digital Transformation

In our rapidly evolving digital landscape, the ethical considerations surrounding AI have come to the forefront of international discussions. As technology advances, so does the need to ensure that AI is harnessed responsibly and ethically. NATO has already recognized the importance of integrating AI ethics into its digital transformation efforts. In this article we find out what NATO has done, is doing, and plans to do in terms of ensuring responsible use of AI in the



Ms Ana Saraiva was an Intern for the Lessons Learned Management Division at the JALLC in 2023. She holds a PhD in Management, and currently works as a Project Manager in Ethics on Artificial Intelligence for the Portuguese AI Ethics Association.

In the NATO AI Strategy, endorsed by Defence Ministers in October 2021, Allies agreed to operationalize six Principles of Responsible Use for AI in defence and security. These principles are: lawfulness, responsibility and accountability, explainability and traceability, reliability, governability, and bias mitigation. To put these principles into practice, NATO is working to encourage responsible-by-design innovation, including through the conduct of risk and/or impact assessments. As Emerging and Disruptive Technologies, including AI, will help *scale* and accelerate military decision-making, NATO must ensure that they do not also *scale* biased outcomes. With bias mitigation having clear links to the other principles, including how *explainable* and *reliable* systems are in real-world contexts, operationalizing the Principles through practical, user-friendly tools may help account for issues, such as ways that gender bias reduces the intended impact of AI systems. In doing so, responsible AI practices can help shape technological trajectories in accordance with democratic principles and international legal commitments.

This is all admirable, but to understand the magnitude of what NATO is trying to deal with in terms of ensuring responsible use of AI, it is essential to comprehend what AI Ethics entails and how it aligns with international perspectives. AI Ethics refers to the ethical principles and guidelines that govern the development, deployment, and use of artificial intelligence technologies.

Organizations such as the European Union (EU) and the United Nations (UN) have played pivotal roles in interpreting AI Ethics. The EU's AI Ethics Guidelines emphasize transparency, fairness, and accountability, while the UN has recognized the need for AI to respect human rights and not perpetuate discrimination.

As such, NATO is on par with peer organizations and the international community more generally. There is a growing sense that AI could be used for the greater good, but like most leaps of faith in humanity's evolution, it can also be harnessed for evil.

Continued on the next page.



Top: AI will have an impact on all of NATO's core tasks, as defined in the Alliance's 2010 Strategic Concept, namely collective defence, crisis management, and cooperative security. © ITCILO

Middle: NATO's experience not only in operations, but also in trials, exercises, and experimentation provide several avenues in which Allies and NATO can test principles against intended use cases. Pictured: U.S. ground troops patrol while robots carry their equipment and drones serve as spotters. Illustration by U.S. Army

Bottom: Allies and NATO commit to ensuring that the AI applications they develop and consider for deployment will be in accordance with the six principles explained above. Pictured: Allied Defence Ministers meeting at NATO Headquarters on 21-22 October 2021. © NATO

Source publication: NATO Review: <https://www.nato.int/docu/review/articles/2021/10/25/an-artificial-intelligence-strategy-for-nato/index.html>

A brief history of AI ethics

The journey of AI Ethics traces back to science fiction and the visionary work of Isaac Asimov, who proposed the famous: "*Three Laws of Robotics*" in his stories. These laws laid the foundation for the ethical treatment of intelligent machines and have inspired subsequent discussions.

In recent years, as AI technologies have advanced, governments and international bodies have taken steps to regulate AI and ensure its responsible use. For instance, the EU introduced the General Data Protection Regulation (GDPR) and is actively developing the Artificial Intelligence Act, which aims to address AI's ethical and legal aspects.

Societal concerns

The rise of AI has sparked concerns in society, with prominent figures such as Stephen Hawking, Elon Musk, and Bill Gates expressing concerns about its potential misuse. Issues such as bias in AI decision-making, deepfake technology, and the automation of lethal weaponry have raised legitimate concerns about AI's impact on humanity.

With the *Big Bosses* of AI such as Geoffrey Hinton (often referred to as the Godfather of AI) leaving their positions over concerns about where AI is headed, is it any wonder that the *rest of us* are starting to feel a little uneasy about the potential risks that are now being highlighted by experts and prominent figures in the field?

Moreover, with the growing threat of the weaponization of AI, what is NATO doing to address concerns about the risks of misuse of AI in the military sphere?

AI (ethics) in the military sphere

When it comes to AI in the military domain, NATO understands the unique responsibilities it bears. Recent conflicts have highlighted the complex nature of AI's involvement in warfare, including issues related to autonomous weapons systems and cyber warfare. NATO is committed to ensuring that AI is employed ethically and in compliance with international humanitarian law.

This commitment is unwavering and progressive. For example, on 07 February of this year, NATO's Data and Artificial Intelligence Review Board (DARB) met to start the development of a user-friendly and responsible Artificial Intelligence (AI) certification standard to help industries and institutions across the Alliance make sure that new AI and data projects are in line with international law, as well as NATO's norms and values. The standard, which also applies to data exploitation and will include quality controls, is due to be completed by the end of 2023. Its aim is to translate NATO's Principles of Responsible Use into concrete checks and balances, notably in terms of governability, traceability, and reliability. This is intended to build trust among the innovation community, operational end users, and the general public.¹

1. NATO; NATO starts work on Artificial Intelligence certification standard; 07 February 2023; https://www.nato.int/cps/en/natohq/news_211498.htm; date last accessed 08 October 2023.

“ AI is the most serious threat to the survival of the human race... If I had to guess at what our biggest existential threat is, it is probably that. So we need to be very careful

Elon Musk, 2014

NATO's AI Principles

As mentioned in the introduction, NATO has established its own set of AI principles to address AI-related concerns and protect against the misuse of AI in the military and security context. These principles emphasize the importance of ethical considerations in the development and use of AI, ensuring that human decision-making remains central in AI-enabled systems.

By adhering to these principles, NATO seeks to harness the potential of AI while upholding its core values and the rule of law. Through responsible AI integration, NATO aims to enhance its effectiveness in safeguarding global peace and security.

As explained in an article in NATO Review from December 2021,² today, society faces multiple emerging technologies that promise to disrupt our established ways, including AI, bio- and quantum technologies. The article presents a good example in the NATO-, and specifically the Lessons Learned context, which has already been explored by the JALLC: the combination of AI, Big Data (as input to AI), and autonomy (as one of the main applications of AI). This technology has the potential to influence multiple areas of the way NATO works, from maintaining situational awareness to supporting decision-making, from predictive maintenance to cyber defence.

However, in the broader context of AI ethics, NATO must continue to ask itself critical questions about how to integrate and/or develop, feed, and use such systems: Should we accept black-box algorithms for data processing, when they present results, but cannot explain their plausibility? Should we apply AI in critical decision-making, where we seek to maintain human oversight?

In conclusion, as AI continues to shape the future of warfare and security, NATO needs to remain at the forefront of ensuring that ethical considerations remain paramount. By adhering to AI ethics principles and actively seeking to mitigate the potential risks, NATO will demonstrate its commitment to a responsible and secure digital transformation.

2. Dr Ulf Ehlert; Why our values should drive out technology choices; NATO Review; 16 December 2021; <https://www.nato.int/docu/review/articles/2021/12/16/why-our-values-should-drive-our-technology-choices/index.html>; date last accessed 08 October 2023.



Picture courtesy of the Foreign Policy Research Institute



Exercise Cyber Coalition. Source NATO

Early AI Principles - 1942

Isaac Asimov set out what could perhaps be considered the first AI ethical system with his three laws of robotics in his 1942 book "Runaround" (1942),

- 1. A robot may not injure a human being or, through inaction, allow a human being to come to harm;**
- 2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law;**
- 3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.**

Asimov later added another rule, known as the fourth or zeroth law, which superseded the others. It stated,

"a robot may not harm humanity, or, by inaction, allow humanity to come to harm.

Cognitive Bias in LL Analysis



Ms Jackie Eaton is the Principal Operational Research Analyst at the JALLC where she also began her NATO career as the Senior Operational Research Analyst in 2006. Between 2016 and 2018, she was the Science and Technology Advisor to the NATO Chief Scientist at NATO HQ, and has more than 15 years of NATO experience in a wide range of analysis in the context of defence, security, and military operations.

There is one big problem with Lessons Learned analysis: humans. On the one hand, we cannot learn lessons without involving humans. Humans need to share their experiences and other humans need to be able to reuse these shared experiences. But on the other hand, humans are limited in their ability to process information in all sorts of predictable ways. These are our cognitive biases.

Cognitive biases are systematic errors in thinking that occur when people are processing and interpreting information in the world around them. Cognitive biases affect all the decisions and judgements that people make.¹ Therefore, cognitive biases are unavoidable in any task involving a significant amount of information processing and judgement, such as Lessons Learned analysis.

There are all sort of potential negative impacts of cognitive biases on Lessons Learned analysis. In the worst case, unchecked cognitive biases could lead us to learn the wrong lessons or miss out on learning lessons that could have saves lives or won the war. Therefore, it is essential for JALLC analysts to be aware of cognitive biases in themselves and others, and to manage cognitive biases in their work.

A common cognitive bias JALLC analysts need to overcome is confirmation bias. Confirmation bias is the tendency to search for, interpret, favour, and recall information in a way that confirms or supports our prior beliefs or values.²

Confirmation bias can come up in many forms during a JALLC analysis project—from influencing the questions an analyst may ask an interviewee such that they lead the interviewee to confirm the analyst’s own beliefs, to selecting only the information in documents that supports the *preferred* finding, while ignoring contradictory information.

1. K. Cherry; What is Cognitive Bias; verywellmind; updated on 07 November 2022; <https://www.verywellmind.com/what-is-a-cognitive-bias-2794963>
2. Wikipedia; Confirmation bias; https://en.wikipedia.org/wiki/Confirmation_bias

JALLC analysts must constantly play devil's advocate to themselves to check they are not biased in their interpretation of the data. The JALLC also employs dedicated quality assurance staff to provide an independent perspective on all the analysis it produces, which is a best practice for professional analysis organizations.

What about AI, is that biased?

It's not only humans who can be tripped up by cognitive biases. Strictly speaking, as cognition is a mental process, AI does not suffer from *cognitive* biases, but that doesn't mean it is immune from biases in general.

Some biases can be introduced into AI by humans providing the AI with data that was created or selected by humans in a biased way. Other AI biases are inherent in the way the AI learns using statistical models. Exposure bias is one such example.

The exact definition of exposure bias is quite technical as it comes from the world of cutting edge machine learning research. But simply stated, exposure bias refers to the problem caused by forcing machine learning models to produce results based on patterns that occur most frequently in their training data. This can limit their ability to form new ideas or discover new connections between ideas.³

The human equivalent of exposure bias would be a person who only gets their knowledge from close family members and never interacts with anyone outside this inner circle. By doing this they would not be exposed to knowledge that could be highly relevant to their survival, but that they are not exposed to by their limited community.

Exposure bias has been shown to exacerbate the well-known problem of the social media *bubble*. Many recommender systems, such as those baked into social media platforms to recommend new friends or relevant content, have been shown to limit results to those that are similar to those the user already knows (and agrees with). This effect was one factor behind the claims of election rigging through social media, and is thought to pose a significant threat to democratic societies.

3. S. Gupta et al; Correcting Exposure for Bias Link Recommendation; <http://proceedings.mlr.press/v139/gupta21c/gupta21c.pdf>

4. Cognitive superiority is the concept of possessing more effective thought processes than others.


5. Alternative Analysis; <https://www.act.nato.int/activities/alternative-analysis/>

Cognitive Superiority is everyone's responsibility

Cognitive biases make us vulnerable to manipulation by bad actors. Thankfully, NATO is not ignoring the threat posed to the safety and security of the North Atlantic area in the cognitive domain. In fact, achieving cognitive superiority⁴ is one of NATO's warfare development imperatives. Significant research and military expertise is being applied to better understand the concept of cognitive warfare and how to position NATO at the forefront of protecting its populations from the dangers of cognitive manipulation.

But we also all have a personal responsibility to defend ourselves against cognitive effects. We can educate ourselves to recognize cognitive biases in our own and others' thinking, and learn to question whether the results provided by algorithms and AI are free from biases. This means developing our critical thinking skills and learning how to ask the AI the right questions to get an unbiased answer.

To learn more about cognitive biases and some techniques for conquering them, check out the NATO Alternative Analysis Handbook⁵ and training course at NATO School Oberammergau.



Gender Bias in AI

When we asked generative AI to create an image of a professional analyst, it came up with four male images (top left). Only when we specifically asked for a female, did we get the above image.



JALLC INNOVATION



Steve Jobs

Innovation distinguishes between a leader and a follower

The JALLC is NATO’s Lead Agent for Lessons Learned. And what is Lessons Learned if not a golden opportunity to turn necessity into innovation. The JALLC is also responsible for ensuring the process is properly enabled with trained personnel and effective tools.

But more than this, Innovation and Lessons Learned have an important common denominator: Failure - and more importantly, the concept that Failure is part of the process. “*Failure is Success, if we learn from it,*” as Malcolm S. Forbes is famed for saying. Innovation too feeds off of failure. Elon Musk is noted for saying, “*If things are not failing, you are not innovating enough.*” As such, it seems wholly natural for the JALLC to embrace innovation in support of Lessons Learned. And in fact, it has always done so. From the very first NATO Lessons Learned Database which has evolved over the years into the NATO Lessons Learned Portal—and is evolving still—to the NATO Lessons Learned Conference which recently saw Deputy Supreme Allied Commander Transformation address the audience as a hologram.

The JALLC has always been forward-leaning and innovative. But, over the past year, this natural instinct to innovate was formalized and now forms part of the JALLC’s regular activities.

The JALLC’s Innovation Plan 2023 sets out the JALLC’s innovation efforts for this year, to be conducted within the framework of the NATO Lessons Learned Capability Improvement Roadmap (2021 – 2025) and include activities that will: focus, inform, and/or contribute to the development of the future NATO Lessons Learned Toolset (NLLT); and more generally, support JALLC Human Capital.

“Creativity is thinking up new things. Innovation is doing new things.”
Theodore Levitt

These activities will remain connected to the Warfare Development Agenda (WDA) by relating to different workstrands associated to:

The Cognitive Superiority WDA Imperative, especially the NATO Data Exploitation Programme (2021-2025) Line of Delivery; and

Data and Right People – Right Skills as two of the critical enablers of the WDA.

JALLC innovation activities and their deliverables reflect Supreme Allied Commander Transformation’s (SACT) Vision and Intent for 2023. As such, they are tailored to anticipate the needs of the wider Lessons Learned community, to enable embedding advanced and new technologies within the NLLT development, and support high-performance and self-development of the JALLC’s talented human resources. Moreover, the JALLC’s innovation efforts are aligned and synchronized with other Allied Command Transformation efforts that will contribute to NATO being an *Multi-Domain Operations-enabled Alliance*.

Some of the JALLC’s 2023 innovation activities include testing an Observation Collection and Analysis Tool (OCAT) delivered by HQ SACT innovation Hub in 2022, improvements to the NATO Lessons Learned Portal (NLLP) dashboard, and exploration of semantic representation in support of Lessons Learned.

The latter is a good example of how the JALLC isn’t just guilty of creative thinking, but is actually getting on with the business of innovation. In May 2023, the JALLC organized a Workshop in partnership with a NATO Science and Technology Organization (STO) Research Task Group (SAS-IST-179) on Semantic Representation to Enhance Exploitation of Military Lessons Learned.

Continued on the next page.

What is JALLC INNOVATION?

According to the JALLC's Standard Operating Procedure on Innovation in support of Lessons Learned (14 February 2023), the JALLC conducts two types of Innovation:

Open Innovation which is mainly conducted via:

(1) **Innovation transfer**. it includes attending different activities organized by the JALLC or other organizations where innovation results in support of Lessons Learned are shared and discussed. Examples include conferences, workshops, collaborative working, and inviting speakers and subject matter experts to contribute to JALLC organized events and share insights from innovation efforts outside the JALLC;

(2) **Innovation creation**: it includes events and products where JALLC staff are encouraged to share ideas and potential solutions towards improved ways of doing business in the JALLC or with potential to contribute to and improve the NATO Lessons Learned capability. Examples include workshops, off-site brainstorming sessions, research papers, and food for thought papers.

Directed Innovation which is conducted mainly in relation to:

(1) **Development, implementation, and improvement of a new NATO LL Toolset (NLLT)**: it includes activities that support designing, testing, and deploying various modules of the NLLT as well as their improvements over time. Examples include research papers, inputs to various documents, events, testing and experimentation, wargaming, and verification and validation of software.

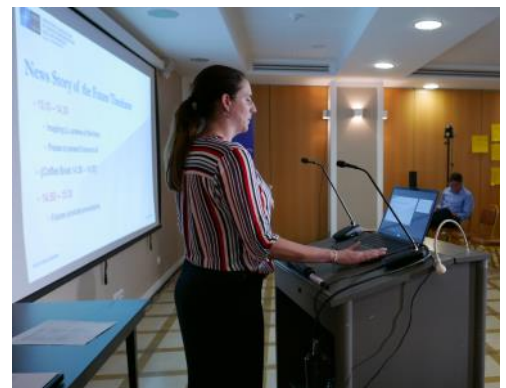
(2) **Contribution/support to NATO innovation workstrands**: it includes Lessons Learned related efforts tasked by HQ SACT or the JALLC's Commander by the JALLC following requests from external entities. Examples include assisting other entities to conduct innovation by preparing/developing Lessons Learned use cases based on NATO Lessons Learned Portal (NLLP) content for wider innovation activities.

LL Semantic Representation

Lessons Learned, as knowledge artefacts, are usually documented as unstructured or semi-structured text, and tend to be highly dependent on context. Semantic Representation is an abstract (formal) language in which meanings of terms can be represented to explain how sentences are understood by humans.

Lessons Learned Semantic Representation could therefore help connect the knowledge stored in Lessons Learned with wider military domain knowledge, speeding up the processes of implementing Lessons Learned into doctrine and standards, training and exercises, and tactics, techniques, and procedures.

The workshop explored how semantic representation could be used to enhance Lessons Learned exploitation in future AI-driven Lessons Learned systems. NATO and many nations are currently working on modernizing and transforming their Lessons Learned systems to increase the automation of Lessons Learned activities. Semantic representation enhances the ability of machines to understand context, and offers the potential for future Lessons Learned tools to be smarter and more automated.



29 participants from 15 nations, from diverse backgrounds in the field of Lessons Learned, attended the workshop. These participants included information scientists, analysts, Lessons Learned professionals, and other subject matter experts (SME).

The participants were placed into three syndicates and set the task of sharing and capturing the details of their most challenging tasks with regard to exploiting Lessons Learned. Starting with a brainstorming session, each syndicate first identified all of the *pain points* they currently face with Lessons Learned tasks, which they then developed into User Stories, identifying who was trying to do what task and why.

The syndicates then took a deep dive into developing the User Stories into fully-fledged User Journeys. This started with development of a Persona, which brought the *who* of the User Story to life.

For example, a generic Lessons Learned Staff Officer, became Lisa, a 45 year-old OF-4, who has just rotated into a new post. Next, syndicates identified the phases of Lisa's User Journey in terms of what activities, tool interactions, challenges, and opportunities Lisa would likely experience in trying to complete her task.



The workshop ended with a final exercise that required each syndicate to *Imagine the Future*. The syndicates were asked to *report the breaking news*, as if they were a news broadcaster on TV, announcing the launch of a new innovative tool for NATO that would dramatically improve LL in NATO. The syndicates were allowed to imagine anything, except a time machine. This is what they came up with:

RAPID: The need for speed

Really All Predictable Incidents Detected: NATO's new life saving RAPID Lessons Learned System.

LLAMA: "Como se LLAMA?"

Lessons Learned Analysis Management Application LLAMA, attacks Lessons Learned Challenges.

JAILLS: A new dimension in LL,

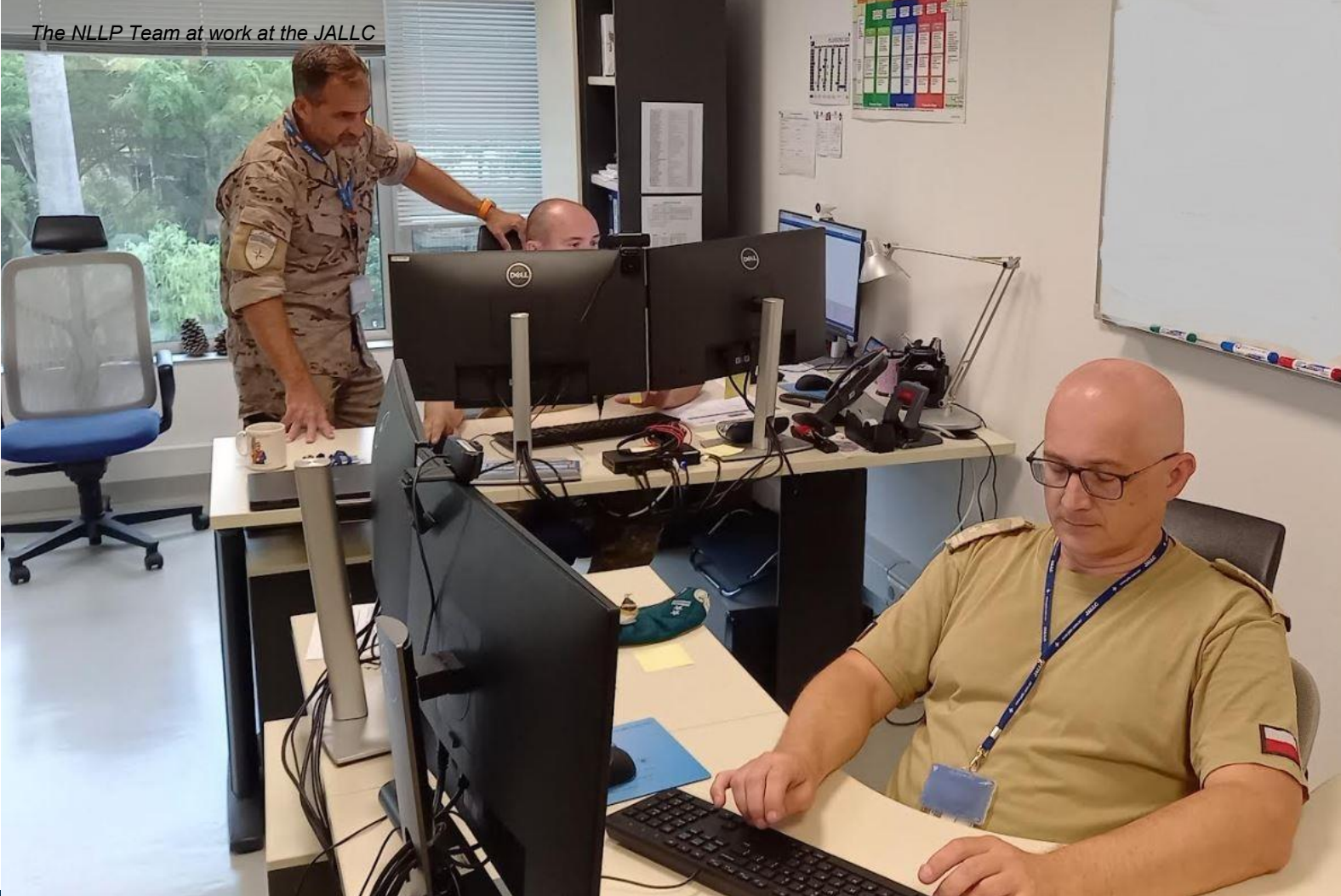
Joint Artificial Intelligence Lessons Learned System, JAILLS, captures all Lessons Learned.

The User Stories, combined with User Journeys and Imaginary Futuristic Lessons Learned Tools will inform detailed Use Case development by the STO Research Task Group. In turn, the Use Cases will inform the pre-capability development phase of the NLLT, which is mapped out under the Innovation Line of Effort in the NATO Lessons Learned Capability Improvement Roadmap 2021-2025.

You can read more about the workshop in the factsheet which can be downloaded [here](#).

The Six User Stories

- As a Lessons Learned Analyst, I need to get relevant Lessons Learned info from the Lessons Learned tool in a timely and intuitive manner so that I can produce effective analysis reports.
- As a Lessons Learned Staff Officer, I need to manage, collate and track observations so that I can prioritize work and assign Subject Matter Experts to Lessons Identified.
- As a Lessons Learned Staff Officer, I need to easily access the NLLP from my national network so that I do not lose time accessing different portals.
- As a Commander, I need to motivate service personnel through evidence of change so that they are motivated to record their issues.
- As a Lessons Learned Staff Officer, I need to enable personnel to create high quality observations so that definitive Lessons Identified are created.
- As a Lessons Learned Staff Officer, I need to engage leadership to push the LL Process so that the organization can make effective change.



LESSONS LEARNED UPDATES

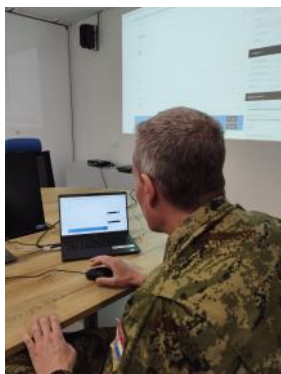
On the next pages, you can read some highlights from the JALLC's Lessons Learned (LL) activities including: updates to the NATO LL Portal (NLLP), the next edition of the NATO LL Conference, the JALLC's periodic NLLP Active Content Management (ACM) reports, and read about some of the challenges of National-NATO lessons sharing.

Lessons Learned Activities Overview

The JALLC has been very busy over the past year, developing our training material, working on updates to the NLLP, and producing reports. Below we provide a summary of some of the highlights from the past year.

The NLLP

The demand for training in the NATO Lessons Learned Process and the use of the NLLP continued to grow during 2022 and 2023. As such, the JALLC has been working on a special unclassified training version of the NLLP (the NLLTP) that will be rolled out for use in the beginning of 2024. The NLLTP will provide trainees with a “safe space” to really try out the features of the NLLP in a more realistic environment. The NLLTP will not only be used for training but also for demonstrations such as the recent engagement with the Ukrainian Ministry of Defence, whereby the NLLP Team provided a demonstration of the capabilities of the NLLP in order to inform the development of Ukraine National Lessons Learned Portal. You can read more about that engagement in the Ukraine special in this magazine on page [56](#).



In other news, the NLLP Workshop was held in April in order to collect Users’ inputs for the next NLLP Improvement Plan to promote the use of the NLLP as the single tool for the LL Process and LL information in NATO.

LL Outreach and Training

The JALLC’s Advisory and Training Team (JATT) deployed to twelve engagements in 2023, providing LL Capability assessments, training and advice to entities across the NATO’s Command Structure, NATO Force Structure HQs, and Centres of Excellence. The team also delivered three iterations of the LL Staff Officers Course and one LL Management Course, provided Pre-Deployment Training to Kosovo Force (KFOR), and supported NATO exercises in the form of LL Training to NATO HQ’s Crisis Management Exercise 23. The JATT also engaged with various members of the NATO Partnership Programme including with Algerian and Irish Armed Forces.

You can read more about some of the highlights from the JATT’s year on page [41](#) of this magazine.

The Local NATO LL Portal Managers Course (LNMC) was held from 16 to 18 May at the NATO Communications & Information Academy’s facilities in Oeiras (Portugal). The aim was to provide NATO personnel assigned as Local NLLP Managers with the required knowledge and technical skills to effectively and efficiently use the NLLP to support the NATO LL Process in their organizations across the Alliance, ultimately improving NATO’s overall LL Capability. Due to high demand and interest, the JALLC will organize a second iteration of this successful course, from 21 to 23 November 2023.



Local NLLP Managers Course, 16 to 18 May 2023

LL Events

The NATO LL Spring Week was held in March 2023 which proved to be another fruitful iteration of this coming together of the LL community. The LL Fall week will be held in November 2023.

The LL weeks are ideal moments for the community to discuss topical issues and developments.



Group photo of the 2023 LL Spring Week

Exploiting Lessons Learned Information



The NATO Lessons Learned Portal (NLLP) is the centralized hub for all NATO Lessons Learned (LL) information, is the gateway to the NATO LL Process, and, as such, facilitates shared knowledge and learning amongst NATO and national entities. In order to support the exploitation of NLLP content and inform on the *health* of the NATO LL Process, the JALLC produces a periodic NLLP Active Content Management (ACM) report, which provides an overview of the NLLP items submitted and staffed within a given reporting period. See the “At a glance” image (below) or access the full report on the classified NLLP for an update on the NLLP activity over the last period (01 April—31 August 2023).



At a glance: NLLP activity over 01 April 2023 - 31 August 2023

296 ↑

Submissions to the Tracking Area

208 ↑

Submissions to the Document Library

185 ↑

Lessons Learned or Best Practices

24 ↑

Different entities made submissions

Summary

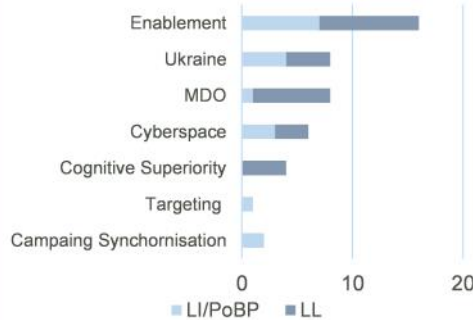
The majority of observations submitted to the NLLP during the reporting period resulted from Exercises (71%), NATO Mission Iraq (7%), and Russia's war against Ukraine (4%). The top three contributing HQs are MARCOM (36%), AIRCOM (16%), and LANDCOM (12%). Five reports were submitted by national entities from DEU, GBR and USA.

The majority of NLLP items that became Lessons Learned (LL) related to the NATO Standing Naval Forces (12%) and exercise DYNAMIC MANTA 2020 (10%).

The top three topics this quarter are **Enablement**, with relevant NLLP items mainly relating to the reception, readiness and deployment of NATO Forces; **Cyberspace**, with items describing a range of cyber-related issues; and **Russia's war against Ukraine**, with items mostly relating to NATO's procedural and structural adaptation.

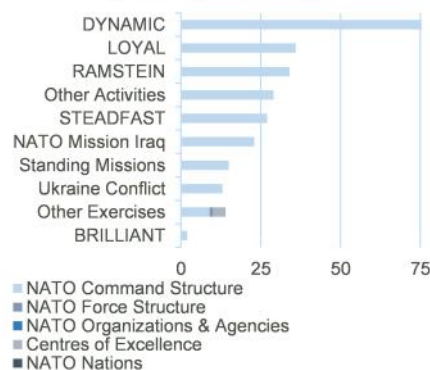
Key Topics

NLLP items that reached or progressed in the Implementation Phase and relate to the key topics



Activities

New NLLP submissions over the quarter by activity and entity



THE NLLP

NLLC24 Back to Basics



Mr. Stefan Olaru is one of the JALLC's Research Analysts. Before joining the JALLC in 2012, he served for 15 years as an officer in the Romanian Army, mainly as an instructor, researcher, and Lessons Learned analyst. His work includes over forty studies, projects, research papers, and publications in the fields of law, capability development, and international security. As a JALLC analyst, he has contributed to multiple analysis projects, Lessons Learned and Innovation activities, including the NATO Lessons Learned Conference. Mr. Olaru has a Master's Degree in Private Law and a post-graduated diploma in management.

This year marks the 20th anniversary of the NATO Lessons Learned Conference (NLLC). Although for 2023 there is no iteration of the NLLC planned as the new NLLC Battle Rhythm has changed from an annual to a biannual event, we take this opportunity to reflect on how the format of the event has evolved over the past two decades.

We will also take a sneak peak at next year's iteration, which sees the event move from the COVID-19 Pandemic virtual/hybrid set-up, back to its original format of an on-site, in-person event.



Two Decades

For the past two decades, one of the JALLC's key tasks has been to provide support to the Lessons Learned Community. This occurs in various ways: from analysis projects and Lessons Learned training, to facilitating forums for discussions and networking opportunities among practitioners.

As such, since its very first edition in 2003, the NATO Lessons Learned Conference (NLLC) has been the premier forum for the NATO- and wider Lessons Learned community to get together and share experiences and expertise, ideas and insights, and generally just meet each other face-to-face. The NLLC, in fact, provides NATO with the ideal forum to discuss challenges and shortfalls as well as best and suitable practices for improving the NATO Lessons Learned Capability in support of continuous transformation of the Alliance.

Until the COVID-19 pandemic, there was never any question on the format of the event: an on-site, in-person event was the best, and often only, opportunity for the entire community to meet. This all changed, however, in 2020, with the outbreak of the COVID-19 pandemic and the global lockdown that ensued. Nevertheless, even when we couldn't meet face-to-face, the Lessons Learned Community recognized the need to create some kind of virtual space to meet and exchange ideas and experiences. The JALLC stepped up to the plate and presented two consecutive iterations of the NLLC in a first fully virtual- and then hybrid format.

NLLC24

Although these iterations of the NLLC were as successful as past iterations, now global COVID-19 restrictions are lifted, the time is right to return to the traditional in-person get together that underlies the NLLC; the opportunity to meet, face-to-face, and exchange ideas in real-time, in the real world.

As such, the JALLC is proud to announce that NLLC 2024 (NLLC24) will return to this traditional format, to be held in Lisbon, Portugal during the week of 15 – 19 April 2024.

NLLC24 promises to be another Lessons Learned-packed and interesting packed event, with plenty of opportunities for learning, networking, and sharing experiences.



John Redmayne, former Principal Operational Research Analyst for the JALLC, asks a question at an early iteration of the NLLC.



Behind the scenes at NLLC21. This full virtual iteration of the NLLC was broadcast live from the "JALLC Studios" at the JALLC's facilities in Lisbon. This format was hugely successful and saw the NLLC Team being invited across NATO to share their experiences, best practices, and lessons from planning and executing the event.



With some, but not all, COVID-19 pandemic restrictions lifted globally, the NLLC22 iteration was held in a hybrid format that saw speakers and key guests attend in person, with participants joining virtually via the dedicated NLLC22 platform.

NLLC24: A Sneak Peak

In terms of the theme for NLLC24, it will centre around the NATO 2030 efforts and how development of the NATO Lessons Learned Capability can support these efforts. We will discuss opportunities and ways to enhance Lessons Learned coordination and sharing among Allied Nations, accelerating digital transformation, and highlighting findings for improving the overall NATO Lessons Learned Capability. This magazine provides some excellent material to prepare yourself for the debate ahead, such as the key feature on NATO's Digital Transformation on page 3.

Image Source: NATO 2030 Agenda site



The NLLC24 will be another great opportunity to network and share ideas, insights, and future plans with leadership and experts from NATO HQ; the NATO Command Structure; NATO Agencies and Offices; Centres of Excellence; the NATO Force Structure; NATO Nations; Partner Nations and other non-NATO entities; and representatives from Industry and Academia. In short: everyone who is anyone in NATO Lessons Learned will be there, and so should you!

NLLC24 will come together as a blend of individual presentations and panel discussions in order to provide the best opportunities to learn, share, explore, and discover the information on offer at this important event in the NATO Lessons Learned calendar. Although the agenda is yet to be fixed, topics to discuss will range from: Digital Transformation to Multi-Domain Operation Enablement, to LL Interoperability, Improved Understanding, and Capacity Building to ensure a broad scope of Lessons Learned and on-trend topics are covered.

We aim to engage speakers of the highest calibre to make sure that you receive the highest quality information from this event. You will also have the opportunity to put your questions and ideas to the speakers and panels, giving you the chance to influence Lessons Learned thinking at the highest levels. Presentations will range from updates on the NATO Lessons Learned Capability, Allied Nations, and Partners, as well as key briefings on efforts relating to Lessons Learned interoperability, War Fighting and the Warfare Development as we head towards the NATO 2030 Horizon. We will also invite Industry and Academic leaders to talk to us about the latest Lessons Learned technology that is (or will be) available. And finally, we are considering an extra *post-conference day* which could be used to host specific Lessons Learned community meetings and a VIP round-table.

Keep an eye out for the NLLC24 *Save the date Letter* and *Calling Letter* which will be issued in due course. You can also keep up to date with the latest progress on the NATO Lessons Learned Portal, the JALLC's website, and our social media.

ENHANCING NATIONAL-NATO LESSONS SHARING



COL Arturo Sabando is the JALLC's Lessons Learned Management Division Head. He joined the Spanish Army in 1985 and served in Infantry Units and staff positions. He has already served three NATO tours at CC-Land Madrid, Joint HQ Lisbon, and SHAPE prior to joining the JALLC. He comes to the JALLC after serving as Chief J7 at the Spanish Joint Operations Command where he was responsible for exercises, training, evaluation, and Lessons Learned

The NATO Lessons Learned Capability has evolved over the years into a successful model for the capture, analysis, and sharing of Lessons in NATO. Lessons are successfully being exploited by, and within, the NATO Command Structure; and to great effect. Where progress still needs to be made, is in terms of sharing National Lessons products.

Despite the NATO LL Policy encouraging Nations to, "...proactively share all kind of Lessons Learned products..." and Nations agreeing that Lessons are important to NATO, there is still a lack of National Lessons products uploaded to the NATO Lessons Learned Portal.

In this article we explore the reasons for this and the potential challenges Nations face in sharing National Lessons with NATO along with some recommendations as to how this could be resolved in the future.



The NATO Lessons Learned Capability, is universal. It applies to every activity conducted, to every entity, to every situation, everywhere, all the time. There is not a single situation where it is not a good idea to share our experiences. Why would we ever want our colleagues, our Allies, our Partners to repeat the same mistakes we did? Why would we not want to share the best way possible to do something? Our Alliance is built upon the concept of sharing: Collective Defence is nothing but sharing the risk of attack and the burden of defence. Lessons Learned is therefore connected to everything NATO does. In this respect, the NATO Lessons Learned Policy encourages Nations to, “...proactively share all kinds of Lessons Learned products...”

NATO has been setting out its vision for the future. This vision is set out in a suite of documents that codify key Future NATO Workstrands for an Alliance that is not just fit for purpose, but Fit for FUTURE Purpose. These documents include, for example, the [NATO 2030 Agenda](#), the [Warfare Development Agenda](#), the [Climate Change and Security Action Plan](#), and the [NATO Warfighting Capstone Concept](#). One thing that all these Future NATO Workstrands have in common, is Lessons Learned; in the sense that each activity defined in all of these documents will stand to benefit greatly from potential relevant Lessons being captured, analysed, validated, learned, and importantly: shared.

However, although the NATO Lessons Learned Capability is successful in doing that within the confines of the NATO Command Structure (and perhaps increasingly across NATO more widely), there is a potential gap in Lessons related information that could greatly benefit the Alliance in terms of its ability to prepare for the future. And that is the gap in National Lessons.

Allied Nations produce a wealth of Lessons Learned data from their national experiences (operations, missions, exercises, and day-to-day

business) that has the potential to enrich the information available to Allies and the Alliance in the NATO Lessons Learned Portal.

Supreme Allied Commander Transformation (SACT), General Philippe Lavigne, has highlighted this issue by making it a priority in the field of Lessons Learned to enhance the coordination and sharing of Lessons related information among Allied Nations and NATO. In this respect, and during his recent visit to the JALLC, he emphasized that it was everybody’s responsibility, at their level, to promote the exchange of Lessons related information with the Capitals. As an example, SACT recently reached out to the Nations, requesting National observations and lessons reports relating to the Russian war against Ukraine.

In order to accomplish SACT’s task, the JALLC will create opportunities that will allow the Lessons Learned Community to explore ways and means to enhance National-NATO Lessons Sharing, and conduct relevant activities to promote and encourage Lessons Sharing by showing the benefit that can be gained from comprehensive Lessons Learned information.

For example, the JALLC is currently developing a NATO Lessons Learned Portal Active Content Management Report that will review National contributions to the portal over the past five years. The report will be shared with NATO Nations together with a questionnaire designed to capture information about issues with Lessons related information sharing.

The results of this project will be shared during the NATO Lessons Learned Conference 2024 (see page 34 of this magazine for more details on the conference) and discussed in a dedicated panel, with the aim of taking forward the findings and potential recommendations to inform SACT on the way ahead in terms of enhancing National-NATO Lessons Sharing.

Continued on the next page

Challenges to National-NATO Lessons Sharing

There are various challenges that Nations face in sharing Lessons with NATO. These range from a perception that failure is weakness, to the international problem of the language barrier, to security concerns. Below we describe some of the key challenges briefly and offer some recommendations for ways to address these challenges, now and in the future.



Source: Official Facebook Page of the Spanish Army;
[click here for link](#); date last accessed 06 October 2023

Mindset: Turning Failure into Success

Ensuring the right *Mindset* among both Leadership and Lessons Learned staff, is probably the most persistent challenge. But perhaps the most difficult to address.

While Nations are (quite) confident to share their doctrine, training, even their structures, they are more *concerned* about sharing their *failures*, whether, for example, regarding shortfalls in materiel, Command and Control (C2) issues, or other sensitive matters. This is often down to the popular perception is that Lessons are about failure, and that failure is weakness. As such, Nations may be concerned their Lessons, could be perceived as weaknesses, which could affect national credibility, economy, and impact its influence on the international stage.

And while it is true that Lessons (whether National or NATO) are often born from a failure, it is equally true that where we learn from our past failures, we breed success for the future. As such, what we need to realize is, that it is only our *reluctance to share* these failures that is the real weakness, and not the underlying failure itself. This is the NATO Lessons Learned Mindset, and it is one that, at a time when the Alliance needs to be stronger than ever, we need to encourage within NATO and among our Allies. Because, Lessons not only contribute to NATO's transformation, but they can also save lives.

Currently Nations do share National Lessons products, but these are rarely classified products (i.e. rarely anything higher than “*unclassified*”) and they are rarely shared of their own accord; it often requires a direct request (from the JALLC or other entity) to acquire copies of relevant National Lessons products. What would greatly benefit NATO in this respect is if Nations felt secure, encouraged, and empowered to submit National Lesson products on a regular basis to the NATO Lessons Learned Portal.

The Language Barrier

Another challenge to National-NATO Lessons sharing has to do with the language barrier. NATO’s official languages might be English and French, but there are currently 31 NATO Nations. As Nations write their National Lessons products in their national language, unless that language is English or French, these products require translation before they can be shared with other NATO Nations. This presents a barrier to international (i.e. NATO) use. Currently, most Nations do not have the capacity to translate all of their Lessons related information into NATO’s official languages, and as such, these reports—generally speaking—don’t get uploaded to the NATO Lessons Learned Portal.

The consequence is obvious: NATO is losing out on potentially valuable Lessons related data that could enrich NATO’s ability to learn and transform. Although there are industry-based (AI) solutions to this problem (swift and cost-efficient translation), as yet, there are none available on the NATO Classified System where the full (classified) version of the NATO Lessons Learned Portal resides. This longstanding NATO challenge of balancing the convenience of off-the-shelf industry solutions vs the need to know principal, is discussed in more detail in the key feature article of this magazine on NATO’s Digital Transformation on page 3.

It is the intention for the New NATO Lessons Learned Toolset (the successor of the NATO Lessons Learned Portal which is currently being imagined, innovated, and developed), to address this option with AI-based translation solutions. But until this—or any other NATO Enterprise—solution comes into being, this will likely remain a challenge.

Access to the NATO Lessons Learned Portal

The final challenge highlighted here has to do with access to the NATO Lessons Learned Portal. Un-

fortunately, there is a real shortfall in the number of (a) NATO Classified System workstations at the National level, and (b) classified infrastructure (facilities) that can host/accommodate them, especially in National Lessons Learned Centres. This shortfall contributes to the challenge for Nations to upload Lessons related information to the (Classified version) NATO Lessons Learned Portal.

Even where there is National access to a NATO Classified System workstation—often at the General Staff level, for operational command purposes, or at single services commands—this access is often limited to operational staff and not made readily available to Lessons Learned Staff. This further limits the possibility for Nations to upload Lessons related information, at least on a regular basis.

Solutions for this issue remain at the National level, but deploying additional appropriate workstations where Lessons Learned Staff can access them, could be one way for NATO-National Lessons sharing to improve. There may be other solutions and even other challenges depending on the Nation, but where the challenge is related to logistics and/or materiel, it can, at least, be more readily be resolved than where it relates to mindset.



Source: Official Facebook Page of the Spanish Army; [click here for link](#); date last accessed 06 October 2023

In conclusion, the ideas set out above, and the actions taken by SACT and the JALLC to enhance National-NATO Lessons sharing, may go some way to addressing the challenges presented in this article. However, if the Lessons Learned Community is to enhance and enrich current Lessons data available to the Alliance, it will take a National-NATO effort; but isn’t that the very essence of the Alliance? #StrongerTogether.



Outreach & Engagement

It's been another busy year for the JALLC's Advisory and Training Team (JATT). From the Lessons Learned week to the 2023 NATO Crisis Management Exercise, to providing Lessons Learned training in Bulgaria, to contributing to the Lessons Learned Staff Officers Course in Sweden. In this article we take a brief look at some of the JATT's activities over the past year.



For the first time, an Israeli officer joins the Lessons Learned Staff Officers Course in March 2022. The course is open to Allied and Partner Nations. Israel is part of the Mediterranean Dialogue. Outreach is an important part of the JATT's tasking.



The training the JATT provides is a mix of passive and active learning techniques which makes the Lessons Learned Staff Officers course interactive, and popular. Here we see officers taking part in syndicate work.

Since its establishment back in 2010, and subsequent refocus and realignment in 2017-2018 to bring the JATT's activities in line with Global Programming ([NATO's Training System](#)), the JATT has been busy engaging with staff all around the NATO globe and beyond to train, advice, and assist NATO and Partner Nation organizations on the NATO Lessons Learned Capability, and the past year has been no different. Since September 2022, members of the JATT have represented the JALLC at multiple events, including the NATO Lessons Learned Spring Week, the NATO Military Strategic Partnership Conference 2023, and the NATO Crisis Management Exercise.

The JATT executed 24 training events over the past year, including the Lessons Learned Staff Officer Courses (LLSOC), the Lessons Learned Management Course (LLMC) and Lessons Learned Point of Contact (LLPOC) training, all of which were delivered at locations across the Alliance. The JATT also travelled to 10 NATO Command Structure (NCS) HQs, nine NATO Force Structure (NFS) HQs and engaged directly with representatives of the armed forces of one NATO nation (Spain) and one Partner nation (Ireland).

Among these was the first ever training engagement with the NATO Crisis Management and Disaster Response (CMDR) Centre of Excellence (COE) in the beginning of 2023, which saw three members of the JATT deploy to Sofia, Bulgaria to provide Lessons Learned training to 20 Lessons Learned Staff Officers and Points of Contact.

The CMDR COE Director, provided opening remarks, highlighting the importance of Lessons Learned within the COE, going on to note after its conclusion that through the training provided, the organization had taken a step forward in being able to implement the NATO Lessons Learned Process and related doctrine. As a key player with regard to NATO's Crisis Management capability, the increased Lessons Learned engagement of the CMDR COE will serve the Alliance in the future.

Another prime example of the JATT's outreach and engagement efforts over the past year was the visit to the Ireland Defence Forces (IDF) in June this year. This training event was attended by 16 Lessons Learned leaders and staff, including the Head of Lessons Learned and Evaluation of the Defence Forces. The training provided was tailored to meet the requirements of the IDF, with a focus on the NATO Lessons Learned Capability and Process; an introduction to the NATO Lessons Learned Portal, and an introduction to analysis techniques used by NATO. The course also included a lecture and discussion by the IDF Lessons Learned Staff Officer on their National Lessons Learned Capability, process, and portal, drawing similarities to the NATO Lessons Learned Capability.

Overall, the engagement was considered a great success with the expectation that members of the IDF will be applying to attend the NATO LLSOC in 2024.

The JATT also deployed to Allied Land Command HQ (LANDCOM), Theatre Land Component and Land Advocate to provide Lessons Learned training and advice. LANDCOM

leadership were very appreciative of the training noting the key role of Lessons Learned Doctrine and the NATO Lessons Learned Process in support of its unique mission in NATO.

Based on the experiences of the past year and the requests for support in 2024 it is clear that the demand across the Alliance for Lessons Learned training by the JALLC is still very high. Based on this need, the members of the JATT are hard at work updating and refining training material and lessons plans to guarantee NATO's, NATO Nations', and Partner Nations' personnel continue to receive the highest level of LL training.

The JALLC and the JATT will continue to spread the Lessons Learned word throughout NATO and beyond, contributing to enhancing the effectiveness of the NATO LL Capability with the goal to improve overall transformation of the Alliance.

If you think that your organization could benefit from tailored Lessons Learned training and/or an assessment of your entity's implementation of the NATO Lessons Learned Process, why don't you get in touch with the JALLC at cos.office@jallc.nato.int to find out more about how you can request a JATT engagement?



JATT engagement with the Spanish Joint Staff



JATT engagement with the CMDR COE

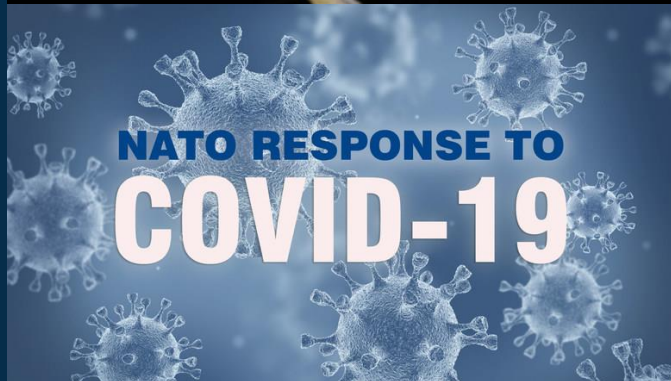


JATT engagement with IDF

JALLC ANALYSIS UPDATES

The JALLC conducts different types of analysis depending on the nature of the topic being analysed, the type of data being used, and the required timeframe for results.

In the next pages, we take a look at some highlights from the JALLC's analysis projects from the past year.



Military Strategic Assessment

NATO is an organization that is involved in responding to and managing complex crises, conflicts, and disasters. These activities demand a coordinated planned response across a wide spectrum of activities. To ensure the best possible outcome, it is essential that each mission/operation follows a carefully crafted and agreed Operations Plan (OPLAN) and that a feedback mechanism is in place to assess progress and provide timely advice and recommendations to decision makers.



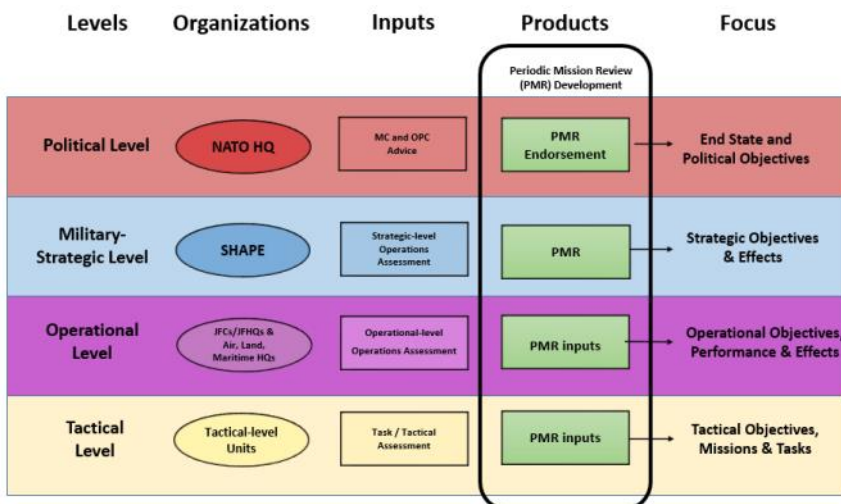
In NATO, Operations Assessment (OPSA) is a continuous process that determines the results and progress of operations towards mission accomplishment. The purpose of OPSA is to provide feedback to decision makers on whether an operation is being executed as planned and if it is achieving the desired results. The primary document to provide feedback to the NATO Nations, is the Periodic Mission Review (PMR).

Key Findings

The topic of OPSA in NATO has been the subject of a number of studies that, collectively, have documented challenges faced by OPSA practitioners across multiple operations. However, the majority of these studies focussed on OPSA conducted at the operational level. The study conducted by the JALLC, however, focussed on OPSA conducted at the military strategic level (i.e. SHAPE). The JALLC's study into OPSA centred on two main aspects: the PMRs as the product of military strategic OPSA; and the role of SHAPE in the development of PMRs.

One of the issues identified in this study is that PMRs do not include all the key elements and, where they are included, often the assessment is conducted at the operational—not military strategic—level. Further content analysis of the PMRs also indicated that some PMRs contain information that decision makers in NATO HQ consider as extraneous, which may not always be useful/required for decision makers at the political level. Lastly, the report includes analysis of a notional PMR lifecycle and highlights the impacts of different staffing and approval times between selected missions/operations.

Aside from highlighting issues with the PMRs, the report describes the different approaches adopted by SHAPE to the development of PMRs, and outlines a number of factors that could be addressed to potentially improve the content and usability of PMRs, and SHAPE's approach to their development.



PMR content is developed across the different levels, from the tactical level to the political level. Each level is responsible for refining the input to the PMR with aim of ultimately informing the Political Level on how the End State and Political Objectives are being met. The figure above shows the levels and focus of PMR content, as identified by the JALLC project team

You can download the full factsheet from the JALLC's website [here](#).

Collaboration Tools in NATO Experiences During the COVID-19 Pandemic

The COVID-19 pandemic had a wide-reaching impact in working practices globally. This new way of working presented many challenges for NATO staff, as well as revealing new requirements for tools to support routine work and decision making.

NATO responded quickly to the increasing demand for these virtual *collaboration tools* that would allow its staff to work safely from home, while still ensuring that the Alliance could conduct *business as usual*. Moreover, it was considered that at least some of the tools could potentially benefit the Alliance in the longer-term, even after the COVID-19 pandemic.

As such, the JALLC was tasked to provide an overview of staff experiences using the collaboration tools available during the COVID-19 pandemic, in order to inform efforts to develop potential tools that could be used NATO-wide in the future.

The assigned JALLC project team collected data from two sources: the NATO Lessons Learned Portal and interviews that were conducted by an AI voice-bot as part of an experiment in connection with the JALLC's ongoing innovation efforts (see page 9 of this magazine for more details on the ex-

periment with the voice-bot).

A number of challenges and suggestions for improvements to the use of collaboration tools and/or the online collaborative working environment were identified in the study, including in:

- Standardization and Standard Operating Procedures;
- Training on available tools;
- Accessibility (remote working);
- Classification of NATO information; and

Key Findings

The study showed that the military needs for collaboration tools are diverse, ranging from the need for staff to be able to work with classified information from home—e.g. for intelligence or current operations functions—to the need for staff to be able to work with others who do not have access to NATO networks—e.g. during exercises, training and education events, and conferences.

The observations and suggestions captured during the study will contribute to ensuring that the Alliance continues to function as efficiently as possible, even under challenging circumstances such as the COVID-19 pandemic presented.

You can download the full factsheet from the JALLC's website [here](#).



NATO RESPONSE TO COVID-19

NATO Involvement in Evacuation Operations; Lessons from Operation ALLIED SOLACE



Picture courtesy of JFC Naples. Click on the picture to find out more about NATO's support to Afghan evacuees.

In summer 2021, following the collapse of the Afghan government and the Afghan National Defence and Security Forces, NATO focused on ensuring the safe departure of personnel from Allied and partner countries, and NATO-affiliated Afghans.

In August 2021, more than 120 000 people were evacuated in the Allied airlift from Kabul airport as part of the coalition effort—including around 2000 Afghans working for NATO, and their families.

Operation ALLIED SOLACE (OAS) was the NATO operation to receive NATO-affiliated Afghans evacuated from Afghanistan in Temporary Staging Areas and to arrange their onward transport to resettlement in Allied territories. OAS was a great success in terms of the number of people evacuated and resettled. However, NATO recognized that there was potential to learn from OAS in order to ensure that future NATO involvement in evacuation operations could be executed with the benefit of the experiences from this operation.



Picture courtesy of JFC Naples. "NATO's commitment is to ensure a safe and compassionate transfer of the evacuees, through temporary locations and on to more definitive resettlement. It is a huge effort, and Allies and partners have come together to make it happen as quickly as possible," said Admiral Robert Burke, JFC Naples commander.

Against this background, the need was identified to analyse and report on NATO's involvement in Evacuation Operations, focusing on lessons from OAS, and to assess the relevance of OAS lesson to future NATO involvement in Evacuation Operations.

Key Findings

Although OAS was unique in terms of the circumstances under which it occurred, it is conceivable that NATO will be involved in Evacuation Operations in the future. As such, the range of scenarios envisaged for NATO involvement in an Evacuation Operations in doctrine does not fully cover some of the conditions experienced in OAS, and needs updating in this respect.

Advance Plans are critical to enable NATO forces to respond quickly and efficiently and are especially important in evacuation operations where thousands of lives may be at risk from delays. NATO should ensure it has evacuation operation advance plans in place as appropriate.

Finally, Allies showed immense resolve and commitment to find ad hoc solutions to generate the force elements needed for OAS. These ad hoc solutions included using the Joint Logistics Support Group to act as the coordinating Joint Task Force HQ and contracting local civilian medical support. Some ad hoc solutions are potential best practices for rapidly generating a force for any potential future NATO evacuation response.

You can download the full factsheet from the JALLC's website [here](#).

NATO's Future Challenges and Adaptations

The Crucial Role of Analysis



Ms Helena Worthington holds a Master's degree in Electronic and Electrical Engineering and is currently one of the Senior Operational Research Analysts at the JALLC. For the last five years, she has also worked at the UK Ministry of Defence, presenting science and technology research across the UK and at NATO Science and Technology Organization boards.

The future waits for no one. In this article we take a look at how NATO is applying analysis to stay ahead of the game when it comes to facing increasingly complex global security issues. From emerging security challenges such as climate change, to the NATO 2030 Agenda, NATO will need its analysis compass to guide it through the current and future security landscape.



Virtual speech by NATO Secretary General Jens Stoltenberg at the Vilnius Summit where he sets out the complex security landscape NATO finds itself in. [You can read the full transcript here.](#)

Navigating the complex web of global security

Historically, NATO has focused on collective defence and deterring external aggression, particularly after its conception in the aftermath of World War II, maintaining peace across Europe and the northern Atlantic region. However, the modern security landscape is now characterized by many complex challenges; ranging from the traditional to the non-traditional. Threats such as cyberattacks, terrorism, pandemics, climate change, and hybrid warfare have blurred the lines between state and non-state actors, global crises, and present problems with attribution of responsibility. As we advance further into the 21st Century, new challenges will continue to emerge, necessitating NATO's adaptation to secure a safer future.

The role of analysis in sustaining NATO's continuous adaptation

From historic activities, Lessons Learned, current operations and exercises, to forward planning for future threats, opportunities and new technologies, analysis plays a pivotal role in NATO's ability to adapt to all types of challenges. The following are a few key areas within NATO that utilize analysis, in many forms;

Assessing Emerging Threats: NATO relies on analysed intelligence and risk assessments to identify and comprehend emerging threats, in order to proactively prepare for scenarios that were once unforeseen, such as the destabilizing impact of cyberattacks or the security implications of climate change.

Tailored Response: Analysis allows NATO to tailor its responses to specific threats. This customization ensures that the Alliance can employ a range of tools, from diplomacy to military force, as necessary. For instance, supporting NATO with the information and direction required to create the optimum balance between deterrence and dialogue in dealing with potential adversaries.

NATO and National responses to Russia's war against Ukraine involved a combination of military reassurance measures, economic sanctions, and diplomatic negotiations, all guided by continuous analysis of the evolving situation.

Strategic Planning: Analysis is at the heart of NATO's strategic planning process. By providing a clear understanding of the security environment, analysis enables the Alliance to set strategic objectives and develop coherent plans for achieving them.



Emerging Threats: NATO tests smart energy technologies in its efforts to reduce emissions. Capable Logistician exercise 2019. Source: NATO ©



Tailored Response: On 12 July 2023, the NATO International Military Staff Office of the Gender Advisor hosted its twelfth Deep Dive Session focused on Chemical, Biological, Radiological and Nuclear (CBRN) Defence and the Gender Perspective. The session highlighted how NATO is considering the gender perspective in force protection and protection of civilians to increase military readiness and support national resilience against CBRN threats. Source: NATO ©



Military Committee Conference Conférence du Comité militaire

Oslo, Norway
15-17 September 2023

From 15 to 17 September 2023, the NATO Chiefs of Defence gathered in Oslo for their annual Military Committee Conference. The agenda focused on strengthening the Alliance's deterrence and defence posture. The NATO and Invitee Chiefs of Defence will take forward the decisions taken by the Allied Heads of State and Government at the Vilnius Summit in July 2023. In Vilnius, NATO leaders took major steps to strengthen NATO's defence and deterrence for the long term, across all domains and against all threats and challenges.

NATO's 2022 Strategic Concept, shaped by extensive analysis, outlines the Alliance's core tasks, including deterrence and defence, crisis prevention and management, and cooperative security, setting the parameters for its adaptation in the following years.

Learning from the Past to inform the Future:

Understanding and analysing the past, previous operations, and practices, is key to informing successful future activities. In order to continue to improve and learn, not only from mistakes, but also from positive actions and results, NATO harnesses analysis to interpret and distil these lessons into constructive feedback and actionable recommendations.



Strategic Planning: Click on the image for the overview of the NATO 2022 Strategic Concept.

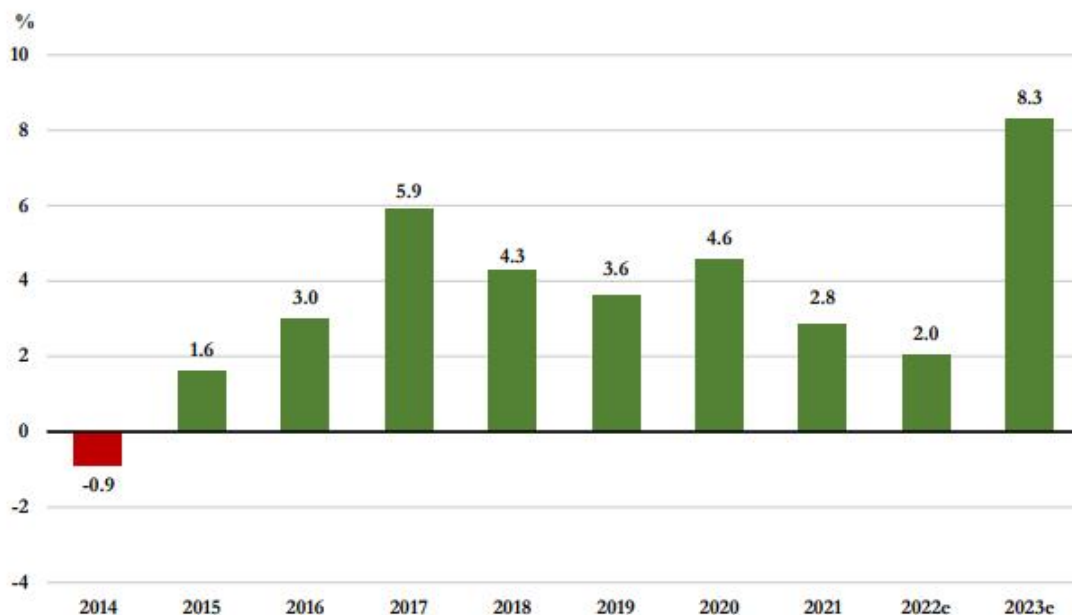
The NATO Lessons Learned Portal, as the single tool in NATO for all things related to Lessons Learned, plays an important role in the NATO Lessons Learned Process, allowing Lessons Learned Staff to capture and analyse observations from inputs across NATO, including NATO exercises.

In-depth and high-quality evidence-based analysis products identify enduring systemic improvements to complex problems that NATO faces, in order to inform change initiatives and identify critical shortfalls.

Resource and Capability Development: In an era of “learning to do more with less”, effective resource allocation and maintenance is key. Through analysis, NATO can optimize its defence spending, employ more effective training methods, ensuring that investments align with the most pressing security concerns and maintaining more resilient and deployable forces.

Moreover, NATO Nations can determine how to allocate their defence budgets efficiently, ensuring that critical capabilities are funded while eliminating redundancies, guided by decision-makers informed by thorough analysis.

Graph 1 : NATO Europe and Canada - defence expenditure
(annual real change, based on 2015 prices and exchange rates)



Notes: Figures for 2022 and 2023 are estimates. The NATO Europe and Canada aggregate from 2017 onwards includes Montenegro, which became an Ally on 5 June 2017, from 2020 onwards includes North Macedonia, which became an Ally on 27 March 2020 and from 2023 onwards includes Finland, which became an Ally on 4 April 2023.

Taken from the 07 July 2023 NATO HQ Press Release on Defence Expenditure of NATO Countries (2014-2023). Click [here](#) to download the full press release from the NATO HQ website.



NATO 2030: **MAKING A STRONG ALLIANCE EVEN STRONGER**

NATO is continuing to adapt to keep us safe in this decade and beyond. The NATO 2030 initiative is about making sure our Alliance remains ready today to face tomorrow's challenges.

As part of current efforts to rejuvenate NATO with the Alliance's 2030 Agenda, analysis does—and will continue to—play a key part in establishing a stronger and *fit for the future* NATO. This reflection, set out by Secretary General Jens Stoltenberg in December 2019, outlines nine clear proposals (see right) to uplift and shape the international organization into one that is adaptable to current and future challenges. As NATO works towards this goal, analysis will play a key role to inform each stage and development.

Continued on next page.

What is NATO 2030?

In December 2019, NATO Leaders asked Secretary General Jens Stoltenberg to lead a forward-looking reflection process to strengthen NATO.

In June 2020, the Secretary General laid out his priorities for NATO 2030: making sure NATO remains strong militarily, becomes even stronger politically, and takes a more global approach.

To support the Secretary General's work, NATO 2030 brought together Allied parliamentarians, civil society, public and private sector experts, and youth to provide fresh thinking on how to make NATO an even stronger Alliance.

- 1. Deeper Political Consultation and Coordination**
- 2. Strengthened Deterrence and Defence: Understanding**
- 3. Improved Resilience**
- 4. Preserve our Technological Edge**
- 5. Uphold the Rules-Based International Order**
- 6. Boost training and Capacity Building**
- 7. Combat and Adapt to Climate Change**
- 8. Next Strategic Concept**
- 9. Investing in NATO**

Examples of the Alliance's commitment

These are couple of examples of NATO's current and ongoing adaptation efforts that demonstrate the Alliance's commitment to addressing future challenges:

Enhanced Cyber Defence: NATO has recognized the growing significance of cyberspace and established a Cyber Operations Centre to bolster its cyber defence capabilities. Continuous analysis of cyber threats informs NATO's responses to ensure the security of its networks, both operationally and in standard business.

In this respect, NATO launched the Virtual Cyber Incident Support Capability (VCISC) to support National mitigation efforts in response to significant malicious cyber activities.

Climate Security: There is growing concern about the security implications of climate change. Analysis of climate-related risks helps the Alliance incorporate environmental factors into its planning, from assessing the vulnerability of critical infrastructure to understanding the potential for resource conflicts.

For example, NATO's Centre of Excellence for Energy Security, analyses energy-related vulnerabilities of Nations and recommends strategies to mitigate risks.

Strategic Concept 2022: NATO's Strategic Concept 2022 is a prime example of the Alliance's adaptability. Informed by extensive analysis, this document outlines NATO's vision and approach for the next decade, addressing not only military concerns but also resilience, innovation, and cooperation with global partners.



Exercise Nighthawk 21 brought together Special Operations Forces from 13 NATO Allies and partners to test their ability to work together through a series of complex counter-terrorism and hybrid warfare scenarios. Source: [NATO](#) ©



Climate Change and Security are high on NATO's Agenda. The Mediterranean heatwaves and wildfires, coupled with the onset of the climate phenomenon known as "El Niño" are sounding the alarm that 2023 may be even worse. It does not come as a surprise that, according to a recent NATO poll, as many as 32% of Allied citizens consider climate change to be the greatest concern to their security – ahead of the risk of war, terrorism, political instability or cyber attacks. Read more about NATO's Climate Security Agenda in the NATO Review, [here](#):

A Dynamic and Resilient Future for NATO

NATO's future challenges are complex and diverse, and demand responses and solutions that mirror those complexities. Analysis will be able to guide the alliance through this new landscape, helping NATO anticipate, prepare for, and ultimately overcome the security challenges of the 21st century. In the face of uncertainty, one thing remains clear: NATO's commitment to collective defence, and the role of analysis therein, will be key to a safer future for all. The Alliance's adaptability—learning from experience—will be essential in navigating emerging global security threats, and ensuring peace and stability for future generations to come.

JALLC ANALYSIS

JALLC Analysis comprises three types of analysis that are unique and tailored to NATO's needs and different requirements: Joint Analysis, Short Term Analysis, and NATO Lessons Learned Portal (NLLP) Content Analysis. In this article we take a closer look at these different types of JALLC Analysis.

Joint Analysis

Joint Analysis is the systematic and in-depth study of a complex issue involving multiple entities in order to identify enduring systemic improvements at the operational and strategic levels. JALLC Analysts use applied research and different types of analysis techniques to combine existing knowledge from inside and outside the organization in order to understand complex issues from different perspectives. The result of a Joint Analysis project is a knowledge product tailored to support specific decisions or staff work, and to capture and preserve knowledge as part of NATO's long-term organizational learning. A Joint Analysis project typically takes six to nine months to complete due to the depth and breadth of the research and analysis undertaken.

To get an idea of the JALLC's Joint Analysis capability, have a look at some of our fact-sheets by clicking [here](#); summaries of the full reports that we produce for NATO.

NLLP Content Analysis

NLLP Content Analysis (NCA), part of NLLP Active Content Management (ACM), is the analysis of Lessons Learned information and trends in the NLLP in order to facilitate the reuse of LL information. NCA is intended to support NATO and the Nations exploiting the Lessons Learned information contained in the NLLP. The results of NCA may identify the need for follow-on analysis such as STA or Joint Analysis.

NCA products typically take the form of routine reports that present an analysis of NLLP content and activity over a set reporting period, or ad-hoc reports that present a one-off summary of NLLP content relating to a specific topic of interest. Ad-hoc reports have previously been used to inform discussions at National and NATO committees, as well as capability development and doctrinal reviews. NCA may also include the development and use of NLLP data visualization tools, such as dashboards, some of which are made available to all NLLP users to support them in monitoring, reporting and exploiting LL information in the NLLP.

Short Term Analysis

Short Term Analysis (STA) is the study of multiple sources of information/experience relating to a specific topic or activity in order to respond to priority LL information needs.

The JALLC is tasked with conducting STA when there is a need to know about issues with strategic implications in a timely manner in order to inform relevant stakeholders including NATO HQ and the Allies. STA is also employed when decision makers need LL information from a wider variety of sources than available in (just) the NLLP to support their work. In these circumstances, the JALLC produces reports which identify key issues and may include initial recommendations tailored to the needs of senior decision makers. The JALLC handles STA through direct observation, interviews, statistical analysis and documentary research.

STA projects usually take one to five months to complete in order to provide a satisfying answer in a concise and timely manner appropriate to the situation.

Support to NATO's Response to Russia's War Against Ukraine



David Noon is an ex-Royal Navy officer who joined the JALLC in 2017 as a Research Analyst. He has worked on a variety of topics including Air-Land Integration, Military Strategic Operational Assessment, and Standing Naval Forces. He is currently the JALLC's point of contact for Ukraine-related projects.

It has often been stated that wars are not just contests of weapons and will; they are also laboratories of sorts that provide lessons that will shape the way future wars are approached. Russia's war against Ukraine is such a laboratory, one in which every military across the globe is studying to learn lessons that will impact on military plans and technologies for future conflicts. As such, the JALLC has been involved in supporting both NATO's and Ukraine's lessons learned process with regard to Russia's war against Ukraine.

In this article, we take a brief look at some of the ways the JALLC has supported both NATO and Ukraine, including the creation of a Ukraine Hotspot in the NATO Lessons Learned Portal (NLLP) as a landing spot to upload related observations and documents; a compilation of a number of routine reports providing an analysis of the NLLP content; development of, and contribution to, several reports on a range of focused areas for customers spanning the political-strategic-to-tactical spectrum; and providing training and demonstrations to representatives of the Ukrainian Ministry of Defence (MoD) to help support the development of their National Lessons Learned Portal.

Tailored Analysis Reports

One of the areas that has been the focus for the JALLC tailored analysis reports, is the implementation of lessons into exercises and training. To this end, in the JALLC's Programme of Work 2023, Supreme Allied Commander Transformation tasked the JALLC to conduct a set of related analysis projects. These included analysis of inputs to the NLLP relating to Russia's war against Ukraine and of open-source publications in order to inform the exercise process at the tactical level. The intent was to enhance operational dilemmas and scripting for the LOYAL LEDA series of NATO exercises delivered by the Joint Force Training Centre (JFTC).

Operational Dilemma: A situation where a commander has to make a choice between equally undesirable alternatives, i.e. difficult or perplexing situations or problems that will require the Training Audience to demonstrate all the skills outlined in their Training Objectives.

In response, the JALLC produced two reports, both of which were delivered to the JFTC in July 2023. One was an Active NLLP Content Management (ACM) report that considered all NLLP items submitted between the start of Russia's war against Ukraine in February 2022, and May 2023 as the cut-off date. In total, 31 relevant items were identified and analysed. The other was a Short Term Analysis (STA) report of open-source publications written in Q1 of 2023 i.e. on/around the first anniversary of the start of Russia's war against Ukraine. In total, 17 publications were reviewed, comprising a mix of reports from Think-Tanks and Research Centres such as the Royal United Services Institute (RUSI) and The Hague Centre for Strategic Studies (HCSS), as well from articles written by prominent authors such as former top military commanders.

Notwithstanding that the lion's share of the information contained within the open-source material had not been endorsed or validated by NATO, the content did offer a glimpse of how the nature of the war was unfolding across a number of functional areas. As such, the JALLC was able to offer some proposals for JFTC exercise planners to consider in their development of operational dilemmas for future LOYAL LEDA exercises.

Drones

The war highlights the increasing stealth, speed, lethality, and availability of drones posing significant challenges to air defences. They are primarily being used for Intelligence, Surveillance, and Reconnaissance (ISR) as well as for offensive missions. They can also be used for psychological warfare missions, recording and sharing videos, documenting battle damage, and intimidation of enemy soldiers. Their non-kinetic effects have transformed the dynamics of the lower airspace—sometimes referred as the *air littoral*—proving land forces (on both sides) with increased capabilities for targeting and artillery control. The widespread use of drones congests lower airspaces which creates challenges for Close Air Support and ground attack aircraft.

Recognizing that drones are a potential game-changer in modern warfare, training should focus on the need for robust anti-drone defence systems and counter-drone tactics conducted in a highly contested environment where enemy ISR capabilities are highly capable and persistent.



Drone pilots defending Ukraine. Source: [www.newscientist.com—https://www.newscientist.com/article/2307922-meet-the-amateur-drone-pilots-defending-ukraines-border-with-russia/](https://www.newscientist.com/article/2307922-meet-the-amateur-drone-pilots-defending-ukraines-border-with-russia/)

Private sector support to the military

Waves of cyber-attacks conducted by Russia against Ukrainian communications and critical infrastructure were largely unsuccessful due to a combination of Ukrainian preparations for such attacks, and because of support provided by private sector companies such as Microsoft and Space X. The collaboration with private companies could be an enduring feature of future warfare and therefore planning and execution of NATO exercises should consider integration of specialized private sector companies and cyber defence teams.

Battle for cognitive superiority

The war highlights the clash of ideologies and blurs boundaries of what is fact and fiction. The Russian disinformation campaign propagates the moral decay of the West, positioning itself as a defender against *wokeism* and political correctness. Both sides have extensively used social media platforms as tools to spread their narratives and, at times, to manipulate public opinion. In terms of how training could be adapted, the JALLC reports offer proposals to include the need for training audiences to recognize and understand the disinformation strategies potentially being used.

Sustainment

The war has brought into sharp focus the importance of logistics and to highlight shortfalls in the provision of support and sustainment for an enduring, high-intensity collective defence conflict. The reports suggest that mass of stocks and equipment are critical enablers to sustain a conflict of high attrition rates and that *just in time* manufacturing is no longer conducive to meet the demands of conflicts that require Maximum Level of Effort.

Further, the reports highlight that safe areas within a theatre of operations are a thing of the past. Sophisticated intelligence gathering tools, complemented with information provided by human sources—often using web applications and other social media platforms—coupled with deep-strike precision weapons, render third-line rear area logistics sites vulnerable to attack.

In addition to these specific reports, since March 2022, the JALLC has produced periodic NLLP ACM reports (first daily, then weekly, and now monthly) on new submissions to the NLLP relating to Russia's war against Ukraine to inform NATO leaders on the latest lessons emerging from the war.

The JALLC's analysis on this topic indicates that, one year into Russia's war against Ukraine, new realities of war are emerging characterized by, among other factors, extensive use of drones, false-flag operations awash with fake news and disinformation, increasing need to utilize specialized services provided by the private sector, and a rethink on how to sustain masses of troops in a high-intensity fight throughout a long-haul operation.

In terms of proposals for training, the reports suggest operational dilemmas should include the need for dispersed logistics sites and for development of contingency plans for disrupted logistic operations. Scripting should include incidents of disrupted supply lines (strategic and in-theatre), damage to logistics infrastructure, and provision of supplies to front line units in highly contested areas.

Civilian resilience

Since Russia's invasion of Ukraine, a significant number of Ukrainian citizens have been displaced. There have been reported incidences of intimidation tactics used by Russian soldiers, including beating and detaining Ukrainian citizens. Vulnerable groups, such as Roma people, LGBTQ individuals, and the infirm, have been targeted for intimidation. Local business has collapsed, civilians denied access to critical services such as schools and hospitals, and coercive levers applied to encourage collaboration with Russian administration.

All the above paints a picture where the social fabric of a country has been ripped apart. Yet, in the face of this, the reports emphasize the resolve of the Ukrainian people to win the war, their resilience, and the means to ensure that critical infrastructure and services are maintained.

The reports suggest that operational dilemmas could focus on military support to maintenance of critical infrastructure (dams, electricity supply, hospitals, churches, etc.), protection of vulnerable groups, and the need to work in unison with impartial humanitarian groups.

Image Source: [The Hague Centre for Strategic Studies; Lessons from land warfare: One year of war in Ukraine.](#)

Support to development of Ukrainian National Lessons Learned Portal



Left: Image Source: NATO ©. Right: the JALLC team meets with the Ukrainian National Lessons Learned Portal designers to exchange insights and experiences on the development and use of a Lessons Learned tool and process.

Throughout the year, the JALLC has been contributing to the NATO-Ukraine Comprehensive Assistance Package (CAP) Trust Fund with briefings on the NATO Lessons Learned Portal (NLLP) and our analysis work to support the Ukrainian MoD in developing their National Lessons Learned Portal. An effective National Lessons Learned Portal is key to ensuring that the Ukrainian Armed Forces can take advantage of the valuable experience, best practices, and Lessons that are being captured in the field, and ultimately share this valuable information with NATO to enhance the Alliance's own Lessons Learned data. The Ukrainian Lessons Learned Portal has been developed in the context of the real-world experience of collecting observations on and from the battlefield, and its design and functionality has been influenced by the NLLP.

In this context the JALLC and representatives of the Ukrainian MoD including from the Ukrainian Special Operations Forces Lessons Learned Branch, the Centre of Information Projects, the Centre of Scaling Technical Solutions, and the Centre of Innovations (Aerorozvidka), as well as from the National Defence University attended a session with a live demonstration of the NLLP. Participants were able to follow the demonstration in real time, ask the NLLP team members questions, and discuss experiences and insights from developing their National Lessons Learned Portal.

This session was followed-up with a more in-depth session with the National Lessons Learned Portal developers and the JALLC's NLLP team and JALLC analysts who have been involved in recent analysis studies relating to Russia's war against Ukraine. During the session, JALLC staff were able to offer insights and answer questions about the NLLP and the NATO Lessons Learned Process. In turn, the Ukrainian team were able to share their experiences and answer questions regarding the comparatively rapid development of their National Lessons Learned Portal.

This successful and mutually beneficial session is just an example of how the security of Ukraine is of great importance to NATO and its member states. The Alliance fully supports Ukraine's inherent right to self-defence, and its right to choose its own security arrangements. Since Russia's full-scale invasion in 2022, NATO and Allies have provided unprecedented levels of support. In this respect, this demonstration session is just the latest JALLC activity in support of the Ukrainian Armed Forces this year which has seen the JALLC publish various reports on different aspects of Lessons from the war against Ukraine, support development of the Ukrainian Lessons Learned Portal, and deliver topical briefings.



Members of the JALLC's NLLP team demonstrating the NLLP in real-time to their Ukrainian counterparts.

The JALLC's Contribution to NATO Exercise DYNAMIC MESSENGER



Dynamic Learning

From 18 to 29 September 2023, Allied Command Transformation (ACT), in conjunction with Allied Maritime Command, hosted the second edition of NATO's DYNAMIC MESSENGER 2023 exercise.

This remarkable event took place at Portugal's Maritime Operational Experimentation Centre (CEOM) in Troia, Portugal, which is one of two Portuguese Defence innovation centres affiliated with NATO's new Defence Innovation Accelerator for the North Atlantic (DIANA).

The JALLC contributed to this exercise, with one officer providing support during the Distinguished Visitors' Day and an intern (Ms Viviana Angelini) working with the ACT Experimentation and Analysis (E&A) team to support HQ Supreme Allied Commander Transformation (SACT) and gain valuable professional development experience.

In this article we find out more about Exercise DYNAMIC MESSENGER from Viviana and about her experience observing the exercise and what she gained from it.

NATO's DYNAMIC MESSENGER 2023: Advancing Maritime Innovation and Collaboration

Exercise DYNAMIC MESSENGER 2023 stands out as the sole operational experimentation exercise with a primary focus on Maritime Unmanned Systems (MUS). It successfully brought together military, industry leaders, and academia to foster innovation, drive capacity development, and promote interoperability.

During this exercise, several MUS', designed for underwater, surface, and air operations, were used to conduct exercises, testing and training both the systems and the handlers.

The Distinguished Visitors' Day on 22 September, marked the conclusion of the Portuguese-led exercise Robotic Experimentation and Prototyping with Maritime Unmanned Systems (REPMUS) and the transition to NATO exercise DYNAMIC MESSENGER 2023. Representatives from the military, industry, and academia converged to display cutting-edge technologies, exchange best practices, and demonstrate capabilities that will significantly influence the future of NATO operations.

While exercise DYNAMIC MESSENGER primarily focused on the integration of MUS into maritime operations, REPMUS emphasizes capability development and interoperability. Both exercises underscore the importance of collaboration between industry and academia, exemplifying the essence of Multi-Domain Operations (MDO).

Over the course of the two-week exercise, participants conducted numerous operational experiments to explore and implement the MDO concept. These experiments yielded valuable observations, analysis, and lessons that will inform the development of NATO's tactics, techniques, and procedures concerning the use of MUS.

ACT, as NATO's Warfare Development Command, and a leading agent of Alliance Innovation, played a pivotal role in executing the exercise and contributing to the assessment of Emerging Disruptive Technologies tested in an operational maritime context. These endeavours aimed to support the Alliance's capability and concept development by enhancing information sharing, consultation, command, and control, and the integration of MUS into NATO Force and Command Structures.

“Alongside a commitment to digital transformation, DYNAMIC MESSENGER 2023 contributes to NATO's efforts to become a Multi-Domain Operations-enabled Alliance.”

SACT: General Philippe Lavigne

A notable highlight of exercise DYNAMIC MESSENGER 2023 was its focus on experimenting with Emerging Disruptive Technologies to address the threat to critical undersea infrastructure. As previously noted at the Vilnius Summit, NATO stands ready to support Allies in protecting critical undersea infrastructures on their territory. ACT's contributions in this area enhance NATO's Maritime Common Operating Picture at the tactical and operational levels, by providing indications and warnings of potential threats, as well as the ability to deploy NATO assets to investigate and address these threats.



The JALLC's Contribution

JALLC Intern, Ms Viviana Angelini got the opportunity to, not only observe the exercise, but also work with HQ SACT's Experimentation and Analysis (E&A) team. This team is responsible for collecting observations from each of the warfare areas involved in exercise DYNAMIC MESSENGER—e.g. underwater warfare, critical undersea infra-

structure, naval mine warfare, amphibious assault, force protection—to identify lessons and improve the next iteration of exercise DYNAMIC MESSENGER in 2025.

Viviana sat with the E&A team in the Maritime Operations Centre in Troia, but the overall experience of the Exercise was much broader. In Troia, Viviana witnessed the take-off and landing of multiple unmanned aerial vehicles as they departed and returned from sorties, supporting minesweeping, reconnaissance, and other experiments. She also attended multiple interviews with leadership, including with the commander of NATO's Standing NATO Mine Countermeasures Group 2, to collect data to inform the E&A team's subsequent analysis. Viviana also accompanied E&A team members on a site visit to Sesimbra (also in Portugal), where she learned about the execution of critical infrastructure protection and mine clearing operations by subsurface MUS, on-board two ships, the Portuguese Navy frigate, the NRP Dom Francisco de Almeida and the Italian Navy minesweeper, the Stromboli.

The importance of tactical level lessons for strategic level understanding

Viviana noted: *“As an intern at the JALLC, I have been immersed in the analysis and reporting of lessons learned at a strategic level. But exercise DYNAMIC MESSENGER serves to demonstrate how lessons are also critical at the tactical level. For example, how well an unmanned aerial vehicle supports an amphibious assault, not only dictates the MUS' requirements on a technological level (camera bands, operating frequencies, endurance, range, and so forth), but also dictates how that system should be used to support the forces on the ground. While this is obvious for conventional warfighting methods, unmanned systems are only just entering the battlefield. As a result, exercise DYNAMIC MESSENGER begins to fill a critical gap in NATO's doctrine and force employment by placing MUS' into operational situations where it is unknown if their presence will assist or jeopardize the mission's success. Without exercise DYNAMIC MESSENGER's providing the opportunity to determine whether MUS' will succeed or fail in missions during peace, NATO would be forced to undergo this learning process during conflict*

It's been a really amazing experience getting to see how the NATO Lessons Learned Capability works in practice. It all starts with observations—from the MUS operators, the warfare leads, and even the interns—that will go on to inform higher-level doctrine and policy and contribute to the decision-making process. The importance of Lessons Learned in exercises cannot be underestimated.”

All of the pictures used in this article are courtesy of Allied Maritime Command (MARCOM) and were taken over the course of the exercise.



Did You Know?

Exercise DYNAMIC MESSENGER 2023 is the only operational experimentation exercise focused on unmanned maritime systems and brought together military, industry, and academia to promote innovation and drive capacity development and interoperability.

The exercise witnessed the participation of 16 Nations and one Partner nation, along with three observer nations. Approximately 1100 civilian and military personnel were involved in the exercise ashore. In addition, around 1000 personnel participated as part of the crews on the ships.

While NATO's Exercise DYNAMIC MESSENGER has a focus on integrating maritime unmanned systems into maritime operations, Exercise REPMUS focused on capability development and interoperability. Both exercises were enabled by significant partnerships between industry and academia, a true reflection of MDOs.

NATO stands ready to support Allies if and when requested." The support provided by ACT will contribute to enhancing NATO's Maritime Common Operating Picture at the tactical and operational levels by providing indications and warnings of potential threats, as well as the ability to vector NATO assets to investigate and prosecute threats, respectively.

If you want to find out more about this or other relevant NATO Exercise, you can visit the ACT website's Exercise page [here](#).

The JALLC support to exercises is multi-faceted and underpins all aspects of the JALLC's Mission. The JALLC's exercise support team, participate in all stages of the NATO Exercise Process. Exercises are excellent venues to collect observations and to complete surveys, questionnaires, and interviews to collect the maximum amount of data possible in order to conduct analysis of a particular topic or subject area. Find out more about the JALLC's support to exercises [here](#).

REPMUS

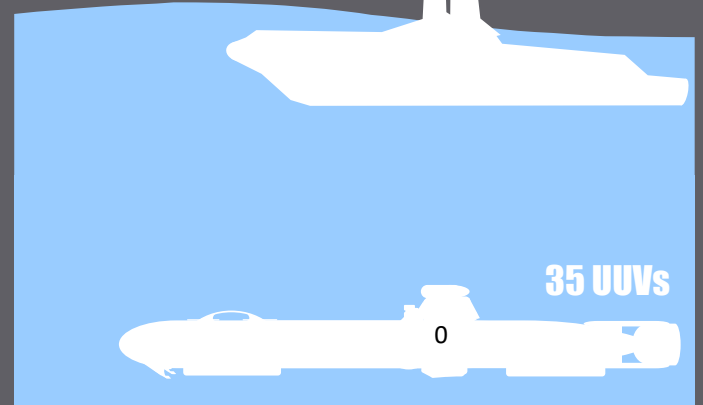
1400 personnel

16 Nations

11 ships

2 Partners

Industry



DYNAMIC MESSENGER

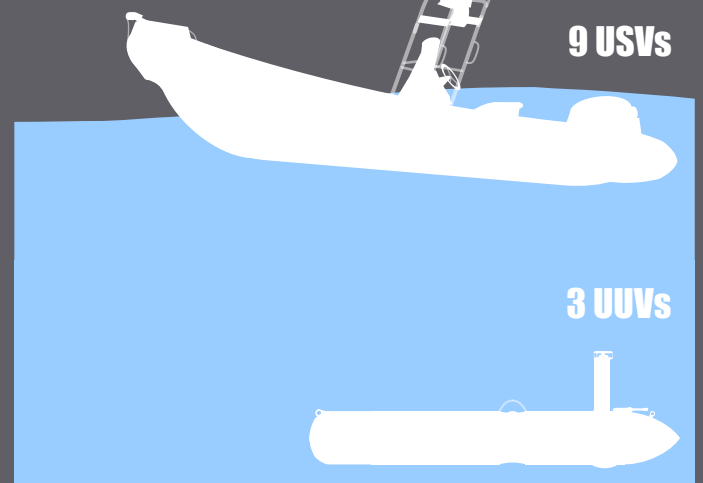
2100 personnel

16 Nations

13 ships

3 Observers

1 Partner



WELCOME TO KABUL

ARRIVALS



In fact, LTC Rigo Genz was pretty much welcome anywhere in the world, and not just in Kabul. With an impressive career that spans 44 years in the German Bundeswehr, 27 of which were spent in NATO, and 7 of those spent working in the JALLC's Advisory and Training Team (the JATT), LTC Rigo Genz is retiring after his final Tour of Duty here at the JALLC.

After seven years of traveling the globe, conducting Lessons Learned Outreach and Training activities for the JALLC and for NATO, LTC Genz has seen a lot of the world and a lot of budding Lessons Learned staff officers.

His outstanding performance has meant that hundreds (if not thousands) of officers from Allied and Partner Nations now have a comprehensive understanding of what the NATO Lessons Learned Capability is and how it makes NATO a truly learning organization.

In this article, we dive back to when LTC Genz joined the JALLC as he shares his 'Memoirs of a JATT Member' with us.

All that's left to say from us is: Thanks Rigo. Thanks for all your efforts, your big smile, the endless treats from far away places...

Enjoy your retirement and.. Auf Wiedersehen.

Memories... of a JATT Member

LTC Rigo Genz

When I arrived at the JALLC in July 2016, the job description of my post was that of a military analyst in support of the JALLC Analysis Projects. However, in 2018, the JALLC underwent a major restructuring as a result of the drive to optimize the NATO Lessons Learned Capability, enhance the JALLC's Lessons Learned activities, and to create more scope for the JALLC to adjust to NATO's needs.

As part of this re-imagining of NATO's Lessons Learned, Training was added to the NATO Lessons Learned Capability as a new pillar (see next page for a description of the NATO Lessons Learned Capability). Although the JALLC had always provided both analysis and Lessons Learned training in the past, the 2018 reorganization meant that Training would now become part of the JALLC's Outreach activities with the aim to engage with all NCS commands at least once every two years to assess their implementation of the NATO Lessons Learned Capability, and to provide Lessons Learned training to staff. In addition, the JALLC was to engage with Nations and Partners in order to train staff and share experiences and expertise on Lessons Learned which would result in an impressive programme for Outreach and Engagement. These engagements required a dedicated team of specialists within the JALLC to be stood up that could provide on-site assessments and training. This was the JALLC Advisory and Training Team, or JATT as it is more commonly referred to, and this became my new post at the JALLC, one that I would remain in until 2023.



Left page picture: LTC Genz arrives at Kabul for a JATT engagement providing LL Training to Resolute Support Mission (RSM) staff in Afghanistan. This page: LTC Genz (Middle) hitches a ride with his colleagues LTC Paulo Dias (left) and LTC Sinisa Cular (right).

The JATT

The JALLC Advisory and Training Team, or JATT as it is more commonly referred to, was originally established in 2010 to assist member and Partner Nations as well as NATO commands and agencies, to establish and enhance their Lessons capabilities. The JATT advised on

Lessons related processes, including NATO's own Lessons Learned Process, Lessons related organization, and supporting tools. The JATT mostly worked through assisting structured NATO training and also by sending out Mobile Training Teams and conducting various mentoring activities, but also acted as a hub for the NATO Lessons Learned Community. The original team comprised of two members, but the demand for the team's support quickly became so great that the team was expanded to include a third member. The JATT members were civilian and military JALLC personnel from different backgrounds and nationalities ensuring the broadest possible scope and reach of the team as well as a broad experience base.

However, in 2015, due to a reshuffle in resources, the JATT was stood down and staff reallocated to new posts. Its re-establishment in 2018 saw a dedicated pool of JALLC Lessons Learned training officers once again travelling all over the NATO globe and beyond to spread the word about Lessons Learned.

The NATO Lessons Learned Capability

NATO defines its Lessons Learned Capability as follows: "A Lessons Learned Capability provides a commander with the structure, process and tools necessary to capture, analyse and take remedial action on any issue and to communicate and share results to achieve improvement."

The purpose of the NATO Lessons Learned Capability is to learn efficiently from experience and to provide validated justifications for amending the existing way of doing things in order to improve performance for (subsequent) operations. As such the NATO Lessons Learned Capability comprises several important elements: leadership, mindset, structure, process, tools, training, and information sharing.



What it means to me

Once I learned, at the Lessons Learned Staff Officer Course (LLSOC), what *Lessons Learned* actually means in NATO, it caught my interest. Although by that time I had already worked for various NATO HQs for 20 years, I never really knew how a Lesson Learned develops from an Observation to a Lesson Identified, into an actual implemented change and finally into a validated Lesson Learned.

Now, with my years of experience, not only in Lessons Learned, but in particular as a trainer of the concept of Lessons Learned, I fully understand just how important Lessons Learned training is to really enable an HQ to build its capability and become a Learning Organization.

In this respect, there is another factor that goes hand in hand with training which is of equal—if not more—importance, and that is people's *mindset* on this subject which translates to their attitude and willingness to engage in the NATO Lessons Learned Process.

The mindset investment

In particular, over the years, I have noticed how critical Leadership engagement is. When Leadership, the foundation of the Lessons Learned Capability (see left), is not actively engaged in the Lessons Learned process, it becomes very difficult to expect the rest of the staff to be engaged, and moreover, to expect real, impactful change to come out of the NATO Lessons Learned Process.

For a Lessons Learned process to be successful and impactful, it requires careful monitoring of each stage and phase. Feedback on the process needs to be given to Leadership, who in turn needs to assign resources, time, and manpower, to ensure the outcome of the process is efficient and effective. As such, the Lessons Learned Process is an investment, but the returns on that investment can be high where Leadership engages fully in the process, allowing (and encouraging) staff to participate, ultimately advocating change where and when it is required.

As such, the responsibility for Lessons Learned really lies with Leadership. However, with routinely rotating Leadership, from Commanders to Division- or Branch Heads, we must make sure that there is high quality, effective, and efficient Key Leader Training available, to ensure that Leadership is aware of the importance of the NATO LL Process for their own organization as well as NATO-wide. This, in turn, ensures that Lessons Learned is given the importance it requires among Lessons Learned staff. Only by ensuring this top-down approach to Lessons Learned awareness and training, can we begin to guarantee the NATO Lessons Learned Capability is able to function properly for the Alliance.

The art and science of teaching

Throughout the years of my military career, I was fascinated by the art and science of teaching. Military equipment training is often developed over decades, as trainers strive to improve how they can train soldiers and civilians more efficiently and effectively; requiring the minimum time, but ensuring the highest professional performance possible from the students.

The psychomotor learning approach (Psychomotor learning is the relationship between cognitive functions and physical movement), whereby an action is trained repeatedly to make it a behaviour, is the most common approach to military training. This is mostly because cognitive and intellectual performances within a process, system thinking, and mental models are a bit more difficult to influence, especially in a short period of time (such as is the case in Lessons Learned training) and when the task being trained is something completely new to the student.

The NATO environment is especially challenging from a training perspective due to the constant rotation of staff, the varying levels of experience coming into the training (some have had national Lessons Learned experience, some have never even heard of Lessons Learned), the varying levels of language competency (almost everyone is communicating in their second, or even third, language), and the limited time available to provide the training. Nevertheless, this training is critical for both Leadership and Lessons Learned staff to be able to make the NATO Lessons Learned Capability function properly throughout NATO, and this is a huge responsibility for the JATT and the JALLC.



From top to bottom: Training at NATO Rapid Deployable Corps (NRDC) Greece during COVID-19 pandemic, JATT engagement in a huge hangar at NRDC-ITA; JATT engagement in Australia in 2018.



From left to right: JATT engagement at NRDC-Turkey in 2020; the signpost at Kabul, Afghanistan. JATT engagement with the Istanbul Cooperation Initiative (ICI) Centre in Kuwait in 2019.

As Confucius said:

**“I hear and I forget.
I see and I remember.
I do and I understand.”**

This is as true today as it was in 500 B.C.E. when Confucius taught us this concept.

Lessons Learned training is therefore based on this concept of learning by doing and not just by listening to lectures and staring at a power point presentation. The Training provided by the JATT is intended to be *active training*; a balance of interactive lectures, where the group is encouraged to ask questions and discuss the topics, and group work whereby teams of students are asked to get their hands dirty and really “do” Lessons Learned.

Of course, there is a time and a place for pure informational or *passive training*, but we have learned over the years that we do not need to “waste” human resources on that type of training which can be provided online, as e-learning modules, or through hand-outs and read-ahead packages. Much like any military operation, we only put soldiers on the front line where they will have the most impact, and in terms of the Lessons Learned front line, that is in the classroom delivering (inter) active training.

The results of this approach to applying the art and science of teaching to Lessons Learned training speak for themselves: consistently good feedback from the students and a small army of Lessons Learned leaders and staff officers that have been trained over the decades.

Confucius (551—479 B.C.E.). Better known in China as “Master Kong” (Chinese: Kongzi), Confucius was a fifth-century BCE Chinese thinker whose influence upon East Asian intellectual and social history is immeasurable. Best known for his wise words which are captured in the Analects in which Confucius claimed he was merely transmitting the he Dao (Way) of the sages of Zhou antiquity.



Learn from the past to excel in the future

But there is another aspect to Lessons Learned that is almost a consequence of the Lessons Learned training, and that is that through each individual's act of *doing Lessons Learned*—i.e. submitting our observations to the NATO Lessons Learned Portal—, NATO becomes a learning organization. In this respect, we can draw upon the musings of another great philosopher and teacher: Aristotle. As this great teacher is supposed to have said: “*The whole is greater than the sum of its parts*”. The impact of how NATO learns as an organization is far greater than we as individuals can imagine when we record that observation in the NATO Lessons Learned Portal.

As such, NATO's ability to learn from exercises, missions, and in real operations is dependent on its Leadership and Staff understanding the importance of capturing the potentially valuable individual observations that could become Lessons Learned for the Alliance. In essence, the Lessons from past events shape the future of the Alliance, but only if we take responsibility for capturing them and putting them to work through the NATO Lessons Learned Process.

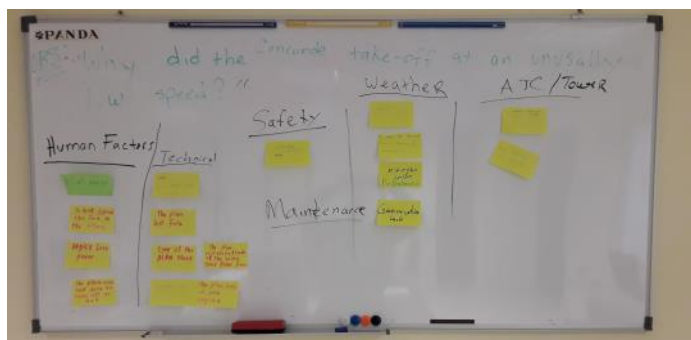
This means that relatively simple NATO doctrine such as Lessons Learned Standard Operating Procedures (SOP)—that set out how each NATO entity should capture its own observations and feed them into the wider NATO Lessons Learned Process—are actually vital to the success of NATO as a learning organization. For example, if an HQ's Lessons Learned SOP is not effective, or is not being followed by staff, this could mean that valuable lessons for NATO are being lost.

The importance of ensuring that the NATO Lessons Learned Capability runs true throughout the NATO Command Structure (NCS), was recognized by the two NATO strategic commands when they assigned the JATT its second core task: assessing and advising on the implementation of the NATO Lessons Learned Capability across the NATO Command Structure.

The JATT is tasked with carrying out assessments and providing advice to NCS Entities once every two years to monitor and ensure that the NATO Lessons Learned Capability is being implemented as effectively as possible. These assessments and advice sessions are often combined with Lessons



A rare picture of LTC Genz in civilian clothing, teaching in Australia back in 2018. The JATT provides its services to NATO Partner Nations as well as to NATO entities and NATO Nations. This means JATT members are often “Frequent Flyers,” travelling the globe to provide Lessons Learned support.



Learning by doing. During the JATT training, participants don't just sit in their chairs and listen to lectures. Group work forms a key part of Lessons Learned training under the concept of Learning by Doing. Picture from the JATT engagement to Qatar in 2019.

Learned training, which has the double effect of being time efficient, but also allowing the JATT members to provide training on any advice given regarding improving the implementation of the NATO Lessons Learned Capability.

Again, the success speaks for itself. The Annual NATO Lessons Learned Capability Assessment report consistently shows that progress is being made across the NCS in terms of implementing the NATO Lessons Learned Capability, something I am proud to have contributed to in my own way.

In closing...

It seems that learning a lesson is never easy; whether you are a child learning to ride a bike, or an international organization trying to improve a key process. It comes down to accepting that failure is only a negative thing when we fail to learn from it. As long as NATO is learning lessons, it will remain the most successful Alliance the world has seen, and I was part of that Alliance for a long part of my career, something I will cherish now and into my retirement.



JALLC Photo Album

Our 20th Anniversary







20 YEARS OF ACT

On 07 June 2023, Allied Command Transformation (ACT) celebrated its 20th anniversary. Norfolk, VA is NATO's home in North America, where ACT leads transformation and modernization for NATO to understand better, decide faster, and be stronger together. The JALLC, is one of Allied Command Transformation's subordinate commands together with the Joint Warfare Centre in Norway, and the Joint Force Training Centre in Poland. In the US, Norway, and Poland. In true Transatlantic Bond style, we celebrated ACT's Birthday together.

On 07 June 2023, the JALLC celebrated ACT's 20th Anniversary with a special Birthday Cake and a toast to the next 20 years.

The JALLC forms part of ACT together with HQ Supreme Allied Commander Transformation (SACT), in the USA, and with our two sister HQs: The Joint Warfare Centre, in Norway, and the Joint Force Training Centre, in Poland. ACT is one of NATO's two strategic commands and its mission is to contribute to preserving the peace, security, and territorial integrity of Alliance member states by leading the warfare development of military structures, forces, capabilities, and doctrines. From its inception in 2003, ACT has demonstrated the importance placed by NATO Nations on the roles of transformation and development as continuous and essential drivers for change that will ensure the relevance of the Alliance in a rapidly evolving and complex global security environment.

For 20 years, ACT has improved military effectiveness and interoperability throughout the Alliance, anticipating security needs, designing capabilities, and educating talents to maintain and refine NATO's edge. Highlights include the NATO Defence Planning Process and the NATO Warfighting Capstone Concept, all of which are part of ACT's deliverables to the Alliance.

The JALLC is proud to have been part of ACT since its inception. Our contribution to the ACT mission through our key activities which help drive NATO's transformation and warfare development and supports ACT-wide activities.

The JALLC's Commander attended the birthday celebrations at HQ SACT in the US which commemorated the 20 years of ACT. *"June 2023 will mark 20 years for Allied Command Transformation as NATO's home in North America. For 20 years, we have been NATO's military leader for change,"* said the current SACT, General Philippe Lavigne. Over the last 20 years, ACT has led NATO's transformation, leading strategic warfare development of the Alliance's military structures, forces, capabilities, and doctrines. The world continues facing emerging threats and changing security environments; ACT works to ensure that the Alliance can defend the security and interest of its member nations.

The history of ACT dates back to 1952, originally formed as the Allied Command Atlantic. Following the 9/11 terrorist attacks against the United States, NATO leaders realized the need for a new command structure that serves as the architecture of the Alliance, focusing on forward-looking change, future capabilities, and interoperability. In 2003, ACT was formed, taking its role as NATO's Strategic Warfare Development Command. *"Allied Command Transformation remains resolutely focused on improving the Alliance's Military Instrument of Power, while continuing to scan ahead. Anticipating new security needs, designing the capabilities, and educating the talents that NATO will need to keep its edge,"* shared General Lavigne.



From top to bottom: Unveiling the ACT Insignia in 2003. SACT, General Philippe Lavigne, addresses his guests at ACT's 20th Anniversary. The JALLC enjoyed a slice of birthday cake to celebrate. JALLC staff look on as the JALLC's Chief of Staff addresses them on the occasion of ACT's 20th anniversary.

The JALLC

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