

Workshop:

Enhancing LL Exploitation through Semantic Representation

Overview

In the ever-changing global security threat environment that we are faced with today, NATO needs to be doing everything better and faster than its potential adversaries. Every area of the NATO enterprise needs to keep pace with technological advancements if it is to, not only keep up with its potential adversaries, but to outpace them and stay ahead. The same is true for Lessons Learned (LL).

In this context 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. The JALLC is co-chairing this three-year Research Task Group with the US Naval Information Warfare Centre Pacific.¹



From 23 to 25 May 2023, NATO hosted a three-day workshop in Cascais, Portugal. The purpose of the workshop was to facilitate LL end-users and LL staff to explore the ways in which incorporating semantic representation into LL tools could better support their everyday work.

LL Semantic Representation

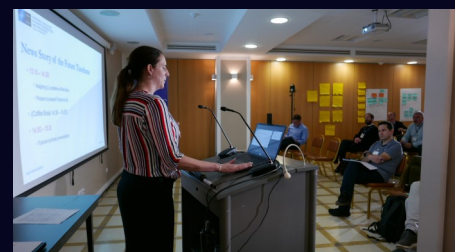
LL, as knowledge artefacts, are usually documented as unstructured or semi-structured text and tend to be highly dependent on context. Semantic Representation is an abstract (formal) language in which meanings of terms can be represented to explain how sentences are understood by humans.

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

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

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1. The US Naval Information Warfare Centre Pacific provides technological and engineering support critical to information warfare for the U.S. Navy, Marine Corps, Air Force, Army and Coast Guard programmes, conducting basic research and prototype development through systems engineering, and integration to life cycle support of fielded systems).



The Workshop

29 participants from 15 nations and from diverse backgrounds in the field of LL attended the workshop and 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 LL. Starting with a brainstorming session, each syndicate first identified all of the pain points they currently face with LL tasks, which they then developed into User Stories which identified 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 LL 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.



Use Case:

A use case describes the ways in which a system being built will interact with the user to provide them with the results they are looking for. It will look at many different angles of how the system needs to perform based on an intended outcome and specific testable requirements can be formulated from these for the development team.

User Story:

A user story is a short description of system functionality that is valuable to either a user of the software or the customer of the software. User Stories are told from the perspective of a user and what they need from the system. For example: "As an LL Analyst, I need to get relevant LL info from the LL tool in a timely and intuitive manner so that I can produce effective analysis reports."

User Journey:

A user journey defines the phases and activities involved in reaching the user's goal using a system. For example, a user journey for producing analysis reports may involve the user following phases: Understanding Scope and Requirements, Analysis Planning, Interrogation and Data Extraction, Analysis Production, and Validation.

Persona:

Persona is a user archetype based on role and other characteristics that influence how a user interacts with the technology feature.

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.

The Six User Stories

- As an LL Analyst, I need to get relevant LL info from the LL tool in a timely and intuitive manner so that I can produce effective analysis reports
- As an LL 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 NATO LL Portal 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 an LL Staff Officer, I need to enable personnel to create high quality observations so that definitive Lessons Identified are created.
- As an LL Staff Officer, I need to engage leadership to push the LL Process so that the organization can make effective change.

The syndicates showed great imagination and creativity with their ideas which included LL microchip implants that would automatically register your observations and potential recommended actions, and AI-generated audio-video recreations of experiences that could allow the person reusing the LL to relive the situation where the lesson was learned in a realistic virtual setting.



RAPID: The need for speed

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

Imaginary Future News ???

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.



29 Participants
15 Nations
6 User Stories
3 Futuristic LL Tools

The Way Ahead

The workshop was another successful LL event hosted by the JALLC. As the JALLC's commander noted: *"This workshop has provided participants with the opportunity to work closely together in syndicate work allowing them to capture experiences as Lessons Learned Experts and Users in their different roles, with different expectations, and with different objectives. This valuable information will go on to be developed into Use Cases, which will be shared with capability developers in NATO, with the Nations, with Industry and Academia, and Innovation Hubs to ensure NATO continues to adapt in the face of current and future challenges."*

These User Stories, combined with User Journeys and Imaginary Futuristic LL 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 NATO LL Toolset, which is mapped out under the Innovation Line of Effort in the NATO LL Capability Improvement Roadmap 2021-2025.



The NATO Lessons Learned Portal

This Workshop was held in the context of the continuous improvement of the NATO LL Portal (NLLP) which is NATO's centralized hub for all NATO LL related information and is managed by the JALLC. Observations, Lessons, and Lessons Learned-related documents can be submitted to the NLLP from all over NATO, Nations and Partner Nations.

The NLLP ensures that this valuable information finds its way through the NATO LL Process, which is how NATO deliberately learns as an organization and transform the Alliance. The NLLP also contains dedicated areas for LL Communities of Interest which are set up for specific communities, allowing them to capture, manage, and share their topic-specific LL information.

The NLLP is managed by the NLLP managers in the JALLC's LL Management Division, in coordination with HQ SACT and SHAPE. The NLLP Managers, among many tasks, manage the NLLP content, facilitate contributions to the NLLP, and provide NLLP training and guidance.

You can find out more about the NLLP on the JALLC's website or visit the NLLP at <https://nllp.jallc.nato.int>.