



FINABEL

EUROPEAN ARMY
INTEROPERABILITY CENTRE

AUTONOMOUS SYSTEMS: THE FUTURE OF WARFARE? WEBINAR

On December 15, 2020, the Finabel Permanent Secretariat hosted a webinar titled “Autonomous Systems: The Future of Warfare?”, which coincides with the publication of the Finabel Magazine on Automated Weapons Systems (AWS) on the same week. The webinar focused on opportunities and challenges presented by Autonomous Systems, with the involvement of military, industrial and academic stakeholders.

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YASMINE BENCHEKROUN

RESEARCH MANAGER AT FINABEL PERMANENT SECRETARIAT



Ms. Benchekroun, on behalf of the Finabel Permanent Secretariat, introduced the discussion about AWS and moderated the event.

She outlined the global trends currently underway for the development and use of AWS, while pointing out their benefits and challenges from industrial, military and academic perspectives.

Particular emphasis was placed on land forces' operations, as robots have been proved to facilitate both tactical doctrine officers and front-line soldiers' work.

GENERAL RIHO TERRAS

FORMER COMMANDER OF THE ESTONIAN DEFENCE FORCES. CHAIRMAN OF THE SUPERVISORY BOARD OF MILREM ROBOTICS. MEMBER OF THE EUROPEAN PARLIAMENT



General Riho Terras carried out an analysis of the disruption that modern technologies will allegedly bring about in future battlefields, focusing on three main aspects:

- A changing environment: transformations are driven by rapid developments, predominantly stemming from civilian industries. These advances may not only create better tools but also replace humans. However, in this scenario, every player may end up surrounded by new developments as the breakthroughs can be easily detected and emulated.
- Europe's readiness: Whilst the public advocates for peace and the industries keep offering existing solutions (like MBTs), the defence sector is increasingly aware of the new threats and calls for investments to keep track of the ongoing "arms race". Europe has currently fulfilled only the first two stages of the OODA loop for maintaining competitiveness, whereas other powers keep moving forward. This is due to prolonged debates that delay investments and to the pursuit of excellency, rather than taking on existing assets already deployed elsewhere.
- Samples of AWS: Milrem Robotics developed a Battlefield IoT – UxV Based system that has been tested over air assault operations and in support of urban area assaults. As a hybrid system, it can operate 24/7, unlike the fully electric ones. In addition, the Milrem Type-X RCV is proven to reduce troops' lethality risks and ensure low maintenance costs.

LODE LAUWAERT

PROFESSOR AT THE INSTITUTE OF PHILOSOPHY AT THE UNIVERSITY OF LEUVEN



Professor Lode Lauwaert drew up the ethical implications of autonomous systems from a primarily academic point of view. He brought forward the notion of “killer robots”, highlighting that AWS are designed to kill and that they may develop independent will once activated, without any room for human intervention (human-out-the-loop).

Nevertheless, there are nuances to this concept as shown by the South Korean SGR-A1, which has a low degree of autonomy and responds to human command (human-in-the-loop).

The analysis went on by singling out all the initiatives advocating for a ban on AWS, including campaigns, declarations, and resolutions of international and regional bodies. On that basis, there was an overview of arguments pro and contra the use of killer robots

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- Pro: higher survivability (without considering PTSD); technically advanced to conduct high precision strikes and ensure limited collateral damages (although human-controlled weapons may provide the same result); financial advantage, as they are less costly than other technologies; lack of human factors such as emotions, memory or necessity of nutrition and rest.
- Contra: moral responsibility, as nobody can be held responsible for their acts, especially regarding machines constructed through a bottom-up approach (however, those who decided to use the system may be considered responsible); denial of human dignity (which would be similarly infringed by other weapons); lower tension threshold to start a war due to advantages coming from their use (yet, enemy's casualties cannot be the only deciding factor); principle of discrimination, i.e. no distinction between soldiers and civilian (however, technology might reach such awareness in the future).

Ultimately, given the lack of regulations, it appears evident that further debates and discussions are required to determine an internationally shared definition of AWS and their roles.



NICHOLAS NELSON

SENIOR TECHNOLOGY ADVISOR AT GEORGIA TECH
RESEARCH INSTITUTE (GTRI)



Nicholas Nelson carried out a presentation about "Understanding Unmanned Systems (UxS) and their impact on the Future of Warfare". UxS are revolutionising all defence, civil and commercial sectors. In the defence sector, their impact crosses all warfighting domains: air, sea, land, space, and cyber. UxS do not exist in a vacuum, they are part of a much broader ecosystem, together with battle-management manned-unmanned teaming and joint intelligence operation. In his analysis, Nelson focused on the following aspects:

- The rapid technological evolution of these weapon systems is shrinking the capability gap between militaries and non-state actors. Since the end of the Cold War, militaries have switched part of their focus from open and conventional conflict to terrorism and counterinsurgency. The efforts of western militaries in the last two decades in those kinds of conflicts relied on airpower. The assets required to enforce airpower have high operational costs, such as 5th gen. multirole aircrafts or aircraft carriers.
- UxS are advanced in terms of technology and at the same time relatively cheap to acquire. They can be accessed not only by major powers, but also by non-state actors and other countries that had relatively less technologically advanced forces in the past.



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- In recent conflicts, such as Ukraine or Nagorno-Karabakh, UxS demonstrated their effectiveness against critical infrastructures, armour, and infantry. Air defence systems struggled against UxS, especially against UxS swarms. The cost equation is in favour of UxS. For instance, an Unmanned system can cost about ten thousand dollars and can destroy 50 million dollars vehicles. Analogously, air defence systems such as the Patriot cost much more than a UxS.
- UxS are not meant to replace conventional weapon systems, but they are most effective when paired with conventional units.
- In conclusion, UxS are changing warfare, switching into a new logic. For instance, the mass production of low-cost assets instead of smaller numbers of high-cost multi-mission assets. In addition, the long development timelines for assets are being supplanted by a rapid development and deployment of new assets.



FINABEL'S CONSIDERATIONS ON WHAT HAS BEEN DISCUSSED DURING THE WEBINAR

- It is extremely important to encourage debate and constructive conversation, especially between research, academia, military, and defence industries. During the webinar, during both the presentations and the debate, ethical, technical, and theoretical issues emerged.
- The ethical discussion on autonomous systems focused in particular on two scenarios: human-in-the-loop and human-out-of-the-loop. The importance of the human-factor in the decision-making process, when there are autonomous systems involved in operative scenarios, is a starting point on which all the panellists agreed.
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- Autonomous systems represent the present and the nearest future for armed forces. At the current stage, aerial autonomous systems are the most developed and the most widely used. Despite that, land autonomous system will definitely have a deep impact on land forces. Technology moves at an extremely fast pace and Finabel could play a pivotal role in facilitating and boosting the introduction of these kinds of technologies in European land forces in a way that will favour innovation, standardisation and interoperability.

Created in 1953, the Finabel committee is the oldest military organisation for cooperation between European Armies: it was conceived as a forum for reflections, exchange studies, and proposals on common interest topics for the future of its members. Finabel, the only organisation at this level, strives at:

- Promoting interoperability and cooperation of armies, while seeking to bring together concepts, doctrines and procedures;
- Contributing to a common European understanding of land defence issues. Finabel focuses on doctrines, trainings, and the joint environment.

Finabel aims to be a multinational-, independent-, and apolitical actor for the European Armies of the EU Member States. Thee Finabel informal forum is based on consensus and equality of member states. Finabel favours fruitful contact among member states' officers and Chiefs of Staff in a spirit of open and mutual understanding via annual meetings.

Finabel contributes to reinforce interoperability among its member states in the framework of the North Atlantic Treaty Organisation (NATO), the EU, and ad hoc coalition; Finabel neither competes nor duplicates NATO or EU military structures but contributes to these organisations in its unique way. Initially focused on cooperation in armament's programmes, Finabel quickly shifted to the harmonisation of land doctrines. Consequently, before hoping to reach a shared capability approach and common equipment, a shared vision of force-engagement on the terrain should be obtained.

In the current setting, Finabel allows its member states to form Expert Task Groups for situations that require short-term solutions. In addition, Finabel is also a think tank that elaborates on current events concerning the operations of the land forces and provides comments by creating "Food for !ought papers" to address the topics. Finabel studies and Food for !oughts are recommendations freely applied by its member, whose aim is to facilitate interoperability and improve the daily tasks of preparation, training, exercises, and engagement.



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