

EDA R&T seminar, 25-26 April 2016

Report

The 2016 EDA R&T Conference ‘*Setting Priorities for Research and Technology (R&T) in Europe to prepare the future together*’, hosted by the NL Ministry of Defence during the NL EU Presidency, focused on emerging and critical technologies, innovation in defence and strategic agenda setting for R&T in Europe. The Preparatory Action for CSDP-related research, currently in planning stage, represented an important part of the discussion. The seminar’s recurrent theme was that Europe needs to invest in future-oriented defence research to develop the capabilities of tomorrow and can only achieve this by cooperation. The meeting attracted 150 high-level policy makers, experts, and researchers from industry and Research and Technology Organisations.

The **NL Vice Chief of Defence Vice Admiral Rob Bauer** stated in his **welcome address** that technological development has changed the face of warfare throughout history, providing unique opportunities to safeguard the national security of states. He emphasized that the defence community wants more innovation. Investment in innovation, concept development, cross-border cooperation, fast-track acquisition programmes and a European agenda for R&T are needed. The Netherlands is in favour of a European R&T defence programme that would help to adapt fast enough to the pace of technology change instead of focusing on maintaining status quo. He called for a globally competitive European Defence industry. Significant funding for Defence R&T is of the utmost importance, he concluded.

In his opening speech, **EDA Chief Executive Jorge Domecq** highlighted the opportune timing of the seminar in a moment of crossroads for European Defence. He mentioned the ongoing work for an EU Defence Action Plan and underlined that research is vital for strengthening the EDTIB while also calling for a renewed target of 2% of defence investment for R&T. He stressed the importance of the Preparatory Action as a test phase for an anticipated defence research programme under the next Multiannual Financial Framework. In this context, he pointed out that EDA is in the unique position of playing a significant role and ensures that the EDA will capitalize on the seminar conclusions.

The **Deputy Director General European Commission – DG GROW Pierre Delsaux** stated that we all agree what to do, the problem is how to deliver. The Commission’s objective is a broad, innovative, robust and fit for purpose EDTIB, able to increase the strategic autonomy of the EU. But the defence is facing challenges such as fragmentation, decreasing funds, fewer business opportunities and

bigger international competition. He mentioned that there should be a shift from the prevailing focus on national interests to an avoidance of duplication. On this point, he emphasized we need to find projects that are important for the final users and that EDA plays an important role in this process. It is not enough to agree on the importance of Defence R&T amongst ourselves. The benefits for the entire society have to be explained to all the citizens if we are to succeed, The Commission believes that a strong Preparatory Action is important, but Delsaux cautioned the Member States not to be complacent and urged the defence community to talk to Ministries of Finance and other sectors to explain the importance of the Preparatory Action and the follow on program, for which room has to be found within the budget.

The **UK R&T Director and the EDA R&T Steering Board Chairman, Bryan Wells** welcomed the seminar as a timely event that will be remembered for setting future strategic direction. He set out the UK defence research strategies and approaches. He pointed out the international character of innovation: no single country has all the knowledge or all the capabilities and therefore needs to do research collectively. Europe should acknowledge and embrace the existing differences and create an ecosystem to learn from each other. The rapid rate of technological change should not be underestimated and the risk of disruptive innovations emerging in unexpected places is not unreal.

The first panel, “From emerging to critical technologies”, chaired by EDA Head of Unit Innovative Research Gerlof de Wilde, focused on the methods of anticipating the technologies of the future and looked into examples of trends and possible future work areas.

The session was opened by Oliver Eulaerts (Joint Research Center) who stressed that it is essential to watch the identified emerging technologies to alert policy makers early about future maturation of technologies. Automation of technology watch activities is needed to serve a wide audience and to avoid duplication and he welcomed the ongoing cooperation between EDA and JRC.

Hans-Martin Pastuszka (Fraunhofer) focused on emerging technologies that have an impact for defence such as transient materials, CNT Chem-Bio sensors, electromagnetic gun, but also on long-term trends in artificial intelligence, autonomous high-speed flight, manned-unmanned teaming.

The subject of artificial intelligence (AI) was addressed by Robert Meijer (University of Amsterdam, TNO). His presentation contained examples of possible applications of AI in the military field, specifically on aircraft and on securing networks which can change before they can be reverse-engineered. He underlined that the combination of Cyber, robotics and AI is the way to progress into the future where the winner will be the one with the ‘smartest’ army.

Also in the field of computer science, Rogier Verberk (QUTECH) addressed quantum technologies and their impact. As opposed to conventional computing, the scaling of computing power grows

exponentially in quantum computers. He mentioned possible military applications: computer chips, bio-systems, communication, managing logistical issues, development of aircraft and encryption. He called on European companies to get more involved in the exploitation of the excellent basic research in European universities in this area, as it is currently dominated by the US industry.

The field of additive manufacturing (AM) was the topic of Johannes Gumpinger (ESTEC) who outlined the main advantages of creating parts with unparalleled geometrical complexity and with less weight. He also pointed out that AM is seen as an enabling technology for future space missions and will increase competitiveness of the European space industry.

Prior to the second panel session, Paul de Krom (CEO TNO and member of the GoP) reflected on the recommendations of the GoP report, starting with the encouragement of cooperation. Cooperation is needed, because innovation is too complex and too interconnected for any member state to cover the spectrum individually. He stated that continuous innovation is needed to stay ahead, to counter security threats and to maintain the status of the EU as a credible partner. Innovation is only a part of the capability process. The next steps must also be effective, R&T needs to stimulate joint development and find its way to actual procurement. The European industry needs investment and he highlighted the opportunities arising from the PA. It is clear that PA should be considered as complementary to national efforts. It should focus on defence research. He called for strong cooperation between MS, industry and academia (“triple helix”) and for SME involvement, where the large industry could point out the needed technologies and the ASD and NIAs could set up a network for SME involvement.

The second panel session, “How to Innovate in defence”, chaired by the EDA Head of Unit Information Superiority Michael Sieber, focused on the challenge of creating a better and more cooperative climate for innovation. There seems to be a gap between our high academic potential and the moderate output.

Dan Jenkins (RAND) explained how the US successfully drove innovation in defence in the last 100 years by analysing and addressing capability shortfalls and imbalances between the US and the adversaries. The US’ current 3rd offset strategy aims at harnessing the rapid technological developments of the civil domain in defence with a focus on protection. For Europe, there is the choice to recognise the US analysis and invest, or ignore it and lag behind the US developments.

On the European approach, Jyrki Suominen (European Commission, DG RTD) explained how the Commission’s programme on Key Enabling Technologies (KET) with a budget of 6 billion euros creates jobs, unlocks innovation and creates pilot lines in the areas of nanotechnology, advanced materials, bio-technology, additive manufacturing, microelectronics, photonics. KETs are highly dual use in nature. The difficulty remains to translate academic achievements into commercial

success. Additionally he emphasized that new models for cooperation and regulation can be drivers for the innovation process, but regulation should not become a bottleneck for SME participation. The EC is increasingly looking at regulatory activities.

Michel Peters (NLR), addressing the NL perspective on innovation in aerospace, stated that innovation is a means but the overall goal is to make operations safer, sustainable and efficient. He outlined the existing EU programmes in this field and called for a Future sky like programme for defence. Rita Rinaldo (ESA) took the discussion further by illustrating ESA's successes in exploiting innovative research projects and bringing solutions to the market or the end-users including new funding schemes. ESA also identified the next big trends in the defence domain: cyber-security, unmanned maritime vehicles, CBRN and emergency response.

Albert Husniaux (NATO Chief Scientist) called for a change of mind-set in defence R&T: more entrepreneurship and less risk aversion. He identified three steps for fostering innovation: identification, evaluation and implementation. Firstly, he pointed out the importance of technology scouting beyond the traditional military fields where we need to find partners and gain access to creative thinkers. Secondly, NATO believes that a collaborative approach on evaluation, using experimentation and military exercises is an opportunity for risk-sharing. Thirdly, he stressed that implementation is difficult because the military will only implement solutions when they are fully understood. Therefore it is important to make them part of the entire process. He concluded by highlighting the opportunities arising from interinstitutional collaboration, calling for continued coordination and consulting with EDA within the limits of the organisational frameworks.

The panel discussion focused on common key words identified throughout the seminar, with a particular focus on the nexus of 'trust', 'ecosystems' and 'sustainable development of innovation'. Europe benefits from the presence of capable universities, applied research organizations and industry, but has the weakness of insufficient common goals.

The third panel session "Delivering Europe's Defence Research Agenda for the future", chaired by EDA Director European Synergies and Innovation Denis Roger, was dedicated to the strategic agenda setting for defence R&T, requiring both vision and realism. Starting from the objectives and motivations of the future Commission's defence Action Plan, Sylvia Kainz-Huber (European Commission, DG GROW) focused on defence research as one of its key elements, and called for increased European cooperation. On this point, there is a need to create cross-border supply chains and to address interoperability in early design stages. She underlined that defence research will receive funding from the EU budget for the first time and that it should be viewed as complementary to national budgets. The budget for the pilot project is limited, however, the pilot project is primarily about testing the way of working together. The planned PA has a strong defence character to fund defence technologies, and, after the pilot project that is in progress, represents a wide-scale test

of implementation of EU-funded defence research activities. The PA should be a catalyst for defence cooperation, take into account current and future military requirements, ensure industrial uptake and lead to procurement in the long run.

David Chinn (EDA) addressed the Overarching Strategic Research Agenda (OSRA) initiative as a structured, pragmatic and systematic approach to translating capability goals in future R&T programmes. The novelty is that the OSRA is driven by R&T funding to support capability needs of the Member States. It also aims at enabling EDA to provide a coherent input to the Commission for the Preparatory Action and its potential follow-up programme. Auke Venema (NL R&T DIR) also identified several challenges in defence R&T by drawing lessons from the Dutch approach. Especially he mentioned the benefits from the close links between research institutes and defence, and the specific role of research institutes bridging industry and government. He presented areas of growing consensus between MS on the PA: proper budget size to ensure the PA's effectiveness and success, the central role of the technology demonstrator, clustering proposals and the importance of permanent dialogue. He stated that efforts should continue on Technology Watch and that the PA should be connected to the following full-scale programme. The latter was also supported by Peter Collins (ASD DRT) who addressed industry as an underpinning element of Europe's defence and security. Regarding the PA, he emphasized that the PA should be defence specific, half of the budget should be based on demonstrators and results to be achieved within 18 months. Other important aspects were: the focus on supply chains with SME participation and increasing the involvement of young researchers.

The panel discussion further outlined the role of industry, supply chains and SME involvement, especially the question whether the PA should be purely focused on defence or also on dual-use technologies. The panel agreed that the PA should have a strong defence orientation and built on defence requirements. But the PA also needs to take into account what the industry is interested in. Furthermore during the process some relevant civilian technologies might be picked up. In the context of a limited budget envelope for competing PAs, it is paramount to convince policy-makers to allocate a substantial budget to the Defence Research PA to ensure its success. Europe's future defence research must aim at preparing the ground for future capability development programmes needed to cope with new threats and, ultimately, safeguard the security of all European citizens. This can only be achieved through the joint involvement of all stakeholders (Commission, EDA, Member States, RTOs and industry) to overcome counterproductive duplications of efforts or absence of needed actions.

EDA Deputy Chief Executive Rini Goos, in the conference closing remarks, commended the conference for reconfirming the importance of R&T for defence. The key takeaway was that R&T underpinned future capabilities and needed adequate funding. Insufficient investment would lead



to capability gaps and erosion of the EDTIB. In technology development, the first panel showed that we need **technology watch and foresight but we also need to innovate more**. European defence forces have to be better, smarter, and quicker and this can only be achieved by **cooperation**. The second panel illustrated the case for more involvement of **decision-makers** and a higher level of **trust** in Europe. The third panel underscored the importance of a **successful PA** as a catalyst for defence R&T. On this point, he stressed that **political visibility**, both at European and national level, is essential in order to receive **substantial budgets for the PA and the follow-on programme**. **EDA's R&T experience and competences are key instruments** available to MS, which indicate its **essential role** in furthering the EU Defence R&T Agenda. He concluded that R&T underpins safety, security and freedom of action in Europe and requires political will, but more importantly **political commitment**.