Conference Report
The CD&E Journey – A Roadmap to the Future
2014 INTERNATIONAL CONCEPT DEVELOPMENT AND EXPERIMENTATION CONFERENCE

Budapest, Hungary 4-6 November 2014

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EXECUTIVE SUMMARY

This was the fourteenth year the annual conference was held and cosponsored by the North Atlantic Treaty Organization (NATO) [Headquarters Supreme Allied Command Transformation (HQ SACT)] and the United States [Joint Staff (JS) J7]. The Hungarian Defence Staff (HDS) hosted this year’s event. A total of 181 delegates attended, representing 23 nations and organizations.

The conference theme was “The CD&E Journey – A Roadmap to the Future.”
Conference objectives were:

- Obtain international perspectives on ideas, discuss relevant problems and challenges and explore potential solutions in workshops and seminars to provide a return on our (J7, HQ SACT and HDS) investment.
- Create an environment conducive to information sharing and relationship building while highlighting the benefits of CD&E methodologies and practical applications to include collaborative experimentation tools.

Ambassador Dr. Réka Szemerkényi, Chief Security Advisor to the Hungarian Prime Minister provided the keynote. Her main point was to discuss different approaches to defining and understanding future conflicts from both political and military perspectives. From a political view, she addressed what is required during tumultuous and dynamic periods of change. Militarily, Dr. Szemerkényi encouraged partner nations to work together to adopt the complex skills and tools required to be flexible and adaptive to new developments and future challenges.

Panellists of Leveraging Industry, Academia and Defence Entities for CD&E provided differing perspectives with reoccurring themes. When interacting and working with academia and industry, clearly define the role – we (the military) are the customer. Not everything produced is materiel, and there is room for smaller partners; sometimes their size makes them more agile and niche focused. NATO and the European Defence Agency need to look for common interest items to work on. Find a way to bring in new partners and know when to say the product or research is complete.

Collaborative CD&E in Action – led by the HDS
- Nations with trust, common goals, and in similar situations have a vested interest in collaborative capability development.
- There needs to be a “clearinghouse” mechanism to merge similar CD&E initiatives (e.g., Centres of Excellence)

C2 with Mission Partners: Enhancing Federated Mission Networking (FMN) Workshop - led by US JS J6 and supported by J7:
- Strategic Communications needs to be improved to facilitate FMN implementation.
- Leverage exercises as a cost effective means to facilitate FMN implementation and experimentation.
- Captured information from the participants that will facilitate continued alignment between FMN and its US equivalent (known as Mission Partner Environment (MPE)).
- Identified potential FMN and MPE enhancements that will be further developed in a Multinational Capability Development Campaign (MCDC) project proposal.
Shaping CD&E for the Future – led by HQ SACT:
  • Develop and promote collaborative CD&E tools.
  • Enhance the NATO CD&E process for greater efficiency and coordination with partners.

MCDC Update – provided by JS J7.
  • All attendees were provided with an overview of the outcomes and products developed over the last two year cycle.
  • The next strategic six-year campaign theme of “Interoperability for Future Combined Joint Operations” was announced, and the first two year operational cycle’s anticipated focus areas were advertised towards “Building and Maintaining Regional Security.”
  • An invitation to explore joining MCDC was extended to those nations in attendance who are not already participating.

Brigadier Ian Rigden, GBR Army, Head of Land and Research, United Kingdom Development Concepts and Doctrine Centre provided the first endnote presentation in the conference’s history. He stressed the following:
  • All CD&E is about the future, but the answer may come from the past.
  • We can’t predict the future accurately, but we can identify plausible themes from which to learn and adapt when the future becomes the present.
Ambassador Dr. Réka Szemerkényi, HUN Civilian, Chief Security Policy Advisor to the Prime Minister of Hungary gave the keynote address emphasizing the sharing of strategic insights from partner nations at both the political and military level to help adapt to a continuously evolving world dynamic.

The Ambassador set the stage by discussing the opportunities and challenges that increasing interconnectedness presents and how recent economic crisis burdens have made it more difficult for nations to prepare and adapt to the world. Some key global trends the world faces include: Global economic shift to Asia, decreasing energy resources, diffusion of power to non-state actors, the United States military shift to the Pacific, declining defence budgets, and demographic shifts across regions.

All of the recent global trends have led to tumultuous times for the North Atlantic Treaty Organization (NATO) members and its partners. History has shown that rapid change and tumultuous times almost always lead to crisis and confrontation which often result in a large scale conflict. The Ambassador also noted that conflict and crisis do not last forever and an important consideration is what happens after crisis and conflict and what will the post crisis environment entail. Partners need to understand what they want to see after this major conflict, and they need to be ready from a capability standpoint. We are in a historic moment right now with North Korea, India, China, Russia and Ukraine.

The Ambassador spoke of what is needed and required during dramatic times of change. The need for leadership in NATO has traditionally been filled by the United States. However, in the last few years the U.S. has shown a distinct trend that is not willing to take the lead on global issues. It is questionable who will take the lead next. International institutions are also unlikely to take on this challenge to lead. A lack of international leadership will likely create a power vacuum the will be filled by something. For Hungary, the collapse of Russia in the early 1990s brought on similar questions about how the nation should relate to the European Union (EU) and NATO. These questions were answered by strong and sound leadership that took advantage of the small window of opportunity for Central Europe to integrate their economies and security frameworks to Western Europe. In this case, the window of opportunity only lasted for 15-20 years.

Today tensions with the Soviet Union are increasing, despite NATO’s effort to build cooperation. NATO must rethink its European strategic landscape and what are European priorities based on two key influencers: the Ukrainian crisis and the rapid rise and effect of the Muslim population in Europe.
The NATO Alliance remains critically important and needs to be re-strengthened in light of the Ukraine crisis. The perception of a weakening Alliance is not just at the national level, but voiced among the general public of Europe. If public support for the Alliance continues to decline then NATO’s capability will also be weakened, and NATO is at a critical point in its lifetime to reverse this trend.

Q: Two years ago at the CD&E conference, energy security was discussed. It is a complex issue with sensitivities. What is the NATO approach to energy?
A: Regional concept on energy started 10 years ago, but the energy infrastructure today is almost the same as the Warsaw Pact timeframe. Current construct is modelled after Soviet central control of pipelines to satellite states. There is need for North-South interconnections and the development of new market instead of just East-West. This never happened because of fiscal constraints and lack of strong desire from leadership. A liquefied natural gas (LNG) terminal in Croatia could have started years ago, but didn’t because of leadership and energy market. Europe needs to rethink energy policy.

Q: Leadership is important but what is the role of the international rule of law?
A: An international legal structure has been in place for some time that has provided a basic understanding when there was cooperation among nations. It is not clear today how certain developments will impact the international legal structure when nations disregard it, but it is crucial to maintain the framework to keep moving forward.

Q: Most of Europe was surprised at Russia’s actions in Ukraine. Is Russia really overacting with its actions in Ukraine or is Russia just indicating that NATO/West has pushed too far east and Russia is acting as any other country would in setting influence boundaries?
A: The fundamental question, “What are Russia’s intentions?” No one really knows. Russia saw a lack of leadership on the International stage and acted using one of three schools of thought: 1) Russia wants to maintain good relationship with western Europe for economic reasons, 2) Overall relations were good but Russia would remind central European nations who has the gas and power, 3) Confrontation with US on energy and other issues in order to be seen as a global actor.

Q: What was the outcome of 2014 NATO Summit?
A: It was different from other years, with much of the discussion on Ukraine and Islamic State in Iraq and Syria. Nations agreed there is a need to increase their defence budgets.

ENDNOTE ADDRESS

Brigadier Ian Rigden, GBR Army, Head of Land and Research, United Kingdom Development Concepts and Doctrine Centre provided the first endnote presentation in the conference’s history. His well-received address brought a unique and sometimes light hearted perspective of CD&E.

Why CDE is critically important for the military and NATO? We need to maintain the initiative in any operating environment. CD&E is not done in isolation from doctrine. Ideas are cheap, but implementing them may not be.

CD&E is about the future, but the answer may come from the past. We cannot predict the future accurately, but we can identify plausible themes from which to learn and adapt when the future becomes the present. Specifically, CD&E enables us to better live, survive, operate, communicate and prevail in the contemporary operating environment. Key to this is understanding our operating environment, and the fact that it is based on a single information space, the world around us. From our individual concept development
work by our respective Nations, we have already identified the main themes for change: climate change, globalization, demography, the rapid pace of changing technologies, resources, our reliance on space and the global commons, urbanization, and the increasing importance of the littoral. We also know that it will be more congested, more cluttered, more contested, more connected, and more constrained and rely more on the need for coalitions to solve problems.

CD&E enables us to get to the parameters of how we can solve problems. It is not definitive but a guiderail. He affirmed that the creed of CD&E at the national or multi-national level is, “Do not go where the path may lead, instead go where there is no trail at all and make one.” He reemphasized that CD&E is an extension of the normal military planning process and that provides the greatest return on investment for military. While military planning is particularly important to an officer’s professional development, it must be done with the perspectives of service members at all levels of rank. He encouraged members to continue to challenge existing perceptions and the status quo. Cyber is the elephant in the room, the “Pandora’s box.” It is the only man-made environment over which we have no real control. Cyberspace is neutral - the internet is the enemy’s J2 and their strategic communications tools as much as it is ours. Both Hezbollah and al-Qaeda read our doctrine. We must therefore always assume that we are potentially operating behind enemy lines.

Q: Many times we can learn from failure. Can you provide examples of failures we have learned from?
A: The Canadian Dieppe Raid was a failure but the raid provided valuable lessons for subsequent Allied amphibious assaults. Another example is the Chindits in Burma, which were the precursor to today's helicopter-delivered airmobile troops, long-range communications and re-supply by air.

LEVERAGING INDUSTRY, ACADEMIA AND DEFENCE ENTITIES FOR CD&E PANEL
Moderated by Colonel Christoph Pliet, DEU Air Force, Branch Head, Concept Development, HQ SACT
- Dr. Michelle Atchison, USA Civilian, Associate Vice Chancellor for Federal Relations, The University of Texas
- Mr. Attila Zsintyányi, HUN Civilian, President of the Hungarian Defence Association
- Air Cdre (Ret) Peter Round, GBR Civilian, Director Capability, Armament and Technology, European Defence Agency
- Prof. Dr. Harald Schaub, DEU Civilian, Head of Systemic Analysis and Human Factors, IABG mbH
Air Cdre Peter Round (Ret), Director Capability Armament and Technology, European Defence Agency discusses leveraging industry, academia and defence entitlements for Concept, Development and Experimentation (CD&E) during the 2014 International CD&E Conference. (Photo by Senior Chief Mass Communication Specialist Hendrick L. Dickson.)

Dr. Michelle Atchison – Academia
Academia and military and national security have shared interest in history and the future. Military, industry, and academia all must have an understanding of each other’s missions in order to be more efficient and have successful collaborations. Creation and application of knowledge is critical to support the nations and military.

Academic research institutions are affected by declining defense and industry budgets. More players are competing for limited resources in advanced and applied research. There is an increased need to match academic competencies with military priorities more precisely when working with reduced resources. As a result, new partnerships and investment models have emerged as research and partnership strategy change. Examples of academic collaboration with CD&E for military need: autonomous systems, cyber defense, energy security, center for integration energy and environmental policy.

For Academia, CD&E enables them to better understand the military environment, warfighter’s tactics, techniques, and procedures as well as how weapons are employed. Academia must understand an organization and its mission in order to translate research and technical language into a mission driven focus and application for the end user in the military. This may include both hard and soft sciences designed for a “dual use” application in both civilian and military environments. The best way for CD&E organizations to engage with academia is to use a clear set of parameters describing academics partner roles and objectives in activities. Academic partners can be a rich source of CD&E planning and analysis information by providing alternative perspectives. Other outcomes for academic involvement in CD&E activities include: greater understanding of how to align campus objectives and competencies with national security priorities (e.g. cyber, energy, and information awareness), stronger description of the return on investment in research for military, and designating staff for military outreach.

CD&E provides repeatable analysis, risk of investment, and an environment to mix industry and academia through a structured framework leveraged by multiple staffs and agencies and alternative perspectives. Today’s CD&E budgets and manpower may compete with constrained fiscal climate, demands for current operations and desires for reduced bureaucracy. Practitioners and planners must move away from stovepipe conversations to open dialogue and not blur long term visions with more timely demands. It is critical for CD&E sustainment to evolve a strong value proposition and advocate network among NATO leadership and civilian affiliates. Academics provide the context for future vision based on realistic capabilities in science. It is important to remember Moore’s Law doesn’t apply to all areas of science. CD&E must allow room for organizations to absorb change at different rates, especially in a multinational environment based on each nation’s doctrine and resources as well as leave room for failure in test analysis. CD&E activities are a valuable integration opportunity for NATO countries and
potential organizations that have limited resources and defined focuses.

Collaboration mechanisms should have clear vision of objectives and outcomes, a definition of the end goal, plus an exit and/or transition plan. Finding ways to bring in new partners and key contributions need to be identified for each party, and recognize when the project is complete. Consider leveraging and partnering on existing partnerships or multiple members to find out if there are mirroring projects already in the works to build synergy and avoid duplication of effort.

**Mr. Attila Zsitnyanyi – Hungarian Defence Association**

In a time of declining budgets, collaboration of all groups is the best way to maximize return on investment.

Traditional roles can be viewed as:

- Academy for Military: Scientific research, doctrines, validation.
- Academy for Industry: Scientific research, validation.

Recently, though, the roles have become less clear. The bodies become more of competitors than partners by assuming new roles. Academia, being the catalyst for research and development, sometimes acts more like Industry, providing more financial and human resources. The University of Texas’ budget, for example, is larger than some nations’ defence budgets for development. Industry and academia tend to be responsive to the current challenges, but they need to look more long term as collaborators, not competitors.

Small nations are often more open to collaboration and quicker to respond to the crisis while larger nations may be the opposite. When faced with shrinking budgets, projects might be cancelled from a budget perspective; however, rebuilding or restarting alliances might prove to be more difficult.

CD&E should not work in the framework of NATO exclusively. National CD&E is very important for the domestic industries. Percentage-wise, losing €1M from the yearly budget hurts a small nation/industry/academy more than a “big one.” For a small nation/industry, quantity is as important as quality. It is more difficult to send two engineers from an organization that only has five to a conference or common project than from an organization that has 500 engineers; even if those two from a smaller organization have the same or better qualifications than the two from the larger organizations. From a smaller nation’s perspective, NATO CD&E projects are too big, resources are too large, and Academy/Industry/Military capacities are not equal. Despite all of this, if a smaller nation was able to invest in these developments, the manufacture order potential is almost zero, because every member state tries to protect their national industry. Small nations need non-financial support from large nations to be successful; they need to be invited to collaborate and cooperate.

What works for a large nation may not work in a smaller nation. It is difficult to understand from a U.S. or German perspective when it comes to a small nation like Hungary.

The “pool it and share it” ideology at the EU or NATO level is fine. Unfortunately, it might also be viewed as pool it or lose it. If pressured by a larger nation, a smaller nation may be able to pool something if they are also allowed to use it as to not adversely affect that nation’s military capability. These things are not just black and white, but it certainly highlights some questions or problems.
Air Cdre Peter Round (Ret) – European Defence Agency
Defence Institutions are intended to support the European Council and EU member states in their effort to improve the EU’s defence capabilities for the common security and defence policy. Each institution has four functions: 1) Develop defences capabilities, 2) Promote defence research and technology, 3) Promote armament to co-operation, and 4) Create a competitive European defence equipment market and strengthen the European defence, technological and industrial base. Member state requirements include: In house analysis and studies – introduce innovative solutions, launches new initiatives, promote cost-effective co-operation, and investing more together. Development cycle and speed of activity is not same in all countries for development. Countries are refraining from joining because of a lack of resources. Capabilities endorsed and put forward by heads of state and governments are: Air-to-Air Refuelling, Remotely piloted systems, Governmental Satellite Communications, and Cyber. The activities of the agency are not duplicative of NATO.

Professor Dr. Harald Schaub – Industry
Critical thinking is the core of CD&E in that it is a scientific process to develop understanding, methodology and eventually new concepts. A variety of organizations do critical thinking daily. When those different organizations collectively provide their experiences and perspectives, this provides a greater understanding to the existing and future environment. Groupthink is a major risk to critical thinking. It must be avoided and NATO must be mindful that our CD&E results are not biased by groupthink. There are eight main symptoms of group think that hinder creativity and critical thinking: 1) Illusion of invulnerability, 2) Collective rationalization, 3) Illusion of morality, 4) Excessive stereotyping, 5) Pressure for conformity, 6) Self-censorship, 7) Illusion of unanimity, and 8) mindguards.

The moderator, Colonel Pliet, summed up the panels main ideas:
• When we want to interact with academia, define their role—we are the customer
• European Defence Agency and NATO need to work together on items of common interest
• Not everything is materiel and there is a place for smaller partners—it is brainpower, not just the capability to produce high tech items

Q: Are the military officers the right people to set the military requirements? Does our experience really prepare us to ask the right questions to industry and academia?
A: Military and academia experts are good at looking at the past but not the future. You cannot prepare the solution for tomorrow, but rather prepare the problem-solver for tomorrow.

COLLABORATIVE CD&E IN ACTION SEMINAR
- LTC Zoltán Lakó, HUN Army, Force Development and Transformation Branch, Deputy Chief, Hungarian Defence Staff

Seminar Objectives and Overview
The overall focus of the seminar was on ways to highlight and improve collaboration within the CD&E community. In particular the seminar listed the following objectives:
1. Enhance understanding of the future operating environment along with the challenges that NATO may be facing and the impact it will have on defence capabilities.
2. Create better insight in what is needed to enhance the effectiveness of capability building.
3. Enhance the understanding of the challenges that strategic and tactical level planners and policy advisors face.
4. Create community of interest/stakeholder group that facilitates sharing of knowledge and expertise.
5. Providing ideas on possible ways ahead in current and future capability and concept development on national and international level based on the experience from the Collaborative CD&E presentations.

**Problem Statement**

Multinational partners with different capability levels and limited resources are challenged in their ability to collectively address capability gaps and to develop new capabilities. In order to address this challenge nations must collaboratively plan, synchronize and execute on concept and capability development. Additionally, the pressure on NATO and EU defence budgets has driven the need for NATO and partner nations to develop capabilities in a cost effective manner. Through collaboration and coordination NATO and its partners can develop capabilities and fill capability gaps through the effective sharing of limited resources. There are numerous challenges (political, military and economic) to the effective implementation of CD&E collaboration and coordination that need to be overcome to execute on collaboration and coordination.

**Seminar Process and Facilitation**

The seminar was a series of briefings highlighting collaborative concepts that have been developed to enhance collaboration. The Hungarian Defence Force (HDF) staff structured the workshop so that it provided an HDF perspective on current NATO concept and initiatives. Facilitating the audience’s understanding of the HDF perspective, the briefs approached the subject from a global view by introducing NATO Smart Defence, then went through the slightly smaller initiatives like EU Pooling and Sharing (P&S), zooming in to regional cooperation and collaboration and finally elaborated three national concepts and capability development projects. The specific experiments and efforts that were highlighted as examples of these collaborative and sharing concepts were Weapons Intelligence Team (WIT) Counter-Improvised Explosive Device (C-IED) support, Coordination of Medical efforts, and Strategic Airlift Capability. The Hungarian briefers facilitated an effective forum for generating discussion and sharing perspectives from the participants. The two day seminar was conducted with a combination of briefs and brainstorming activities that base-lined the audience on NATO collaborative CD&E efforts. Question and answer discussion sessions assisted in generating further ideas and perspectives.

**Summary of Discussions and Issues**

**NATO Smart Defence**

The first brief gave background on the objectives and plans of NATO Smart Defence. Smart Defence was developed as concept to develop cost effective means of capability development in order to adapt to the changing fiscal environment and constrained resources across the Alliance. There was data presented on NATO’s members’ defence spending as a percentage of Gross Domestic Product and also the negative impacts of the financial crisis that began in 2008. Discussions on how the impacts of budget cuts and differences between members defence spending leads to gaps in technology and capability between members. Smart Defence currently involves different initiatives at different levels of maturity, with Tier 1 being the most mature and Tier 3 being the least mature. Smart Defence can involve multiple partners or be bilateral in nature as well. The main thrust of Tier 1 Smart Defence initiatives are centred on training, logistics and education with such examples as pilot training and logistics support. There was general group agreement that Smart Defence is a way of cost-effectively coordinating capabilities and resources to address gaps and is needed for moving forward.

**European Union Pooling and Sharing**

The European Union Defence Agency has an initiative called Pooling and Sharing that was initiated by white paper from Sweden and Germany a few years ago. P&S is about
increasing military cooperation among EU nations to preserve and enhance military capabilities. P&S is similar to Smart Defence in many ways and there was much discussion on the desire and need for overlapping initiatives. Like Smart Defence, the initiatives that have gained the most traction revolve around training and logistics since those are less complicated to initiate and implement. The operational warfighting activities are more challenging due to political and resource constrained considerations. The general consensus was that there are inefficiencies associated with overlapping initiatives but that the EU and NATO have different objectives in regards to security cooperation, so there is value in having both.

**Regional Capability Development**

This briefing and discussion focused on Regional Capability Development (RCD) initiatives and efforts that are currently underway within NATO with particular emphasis on the Visegrad (V4) group of nations that include Poland, Hungary, Czech Republic, and Slovakia. RCD is similar to Smart Defence and P&S but at a lower regional level where nations have closer geographical and cultural ties. The Central European Defence Cooperation was also discussed and how it has overlapping initiatives as the V4 group. This brief generated lengthy discussion of the challenges of the mechanics of getting bilateral and regional cooperative initiatives started and sustained. These challenges are well known and include:

- Limited military resources to commit to numerous cooperative activities
- Each nation’s own strategic goals and interests, organization stovepipes within national organizations and between nations
- Focus on short term activities vs. long term planning
- Sovereignty concerns that are involved in cooperative efforts.

All three of these briefs had a similar finding that a leader for each functional area is necessary to make progress on initiatives.

**National Capability Development projects – success stories – Case Studies**

Three projects were introduced, namely: Weapons Intelligence Team Counter – Improvised Explosive Device support, Coordination of Medical efforts and Strategic Airlift Capability. Hungary assesses these projects as great success, good value for money and exemplary to other nations similar by size and economy to Hungary.

The **WIT capability building** has reached a milestone, where the funding mechanism has to be re-examined. The project in its first phase was based on an immediate and clear need well supported by a NATO Voluntary National Contribution Fund (VNCF), but as the funding willingness is fading, it is time to develop new funding concepts and look for new collaborating partners. During the seminar, the attendees agreed that the IED threat is not going away and have a high probability that will be menacing our homeland more heavily than ever. This obviously will require a more coordinated effort from any alliance such as NATO, where alliance members should follow the NATO C-IED Capability Building Plan. The participants agreed that WIT C-IED related Weapons Intelligence Team, from Level 0 to 3...
capability, can support homeland security and law enforcement agencies, as it already does in some countries.

The audience agreed that VNCF proved to be extremely effective when quick action is required for the common interest. It is a real force multiplier (from outsourcing to military) and good at institutionalization, cost effectiveness and adaptability (e.g. preparation for missions other than International Security Assistance Force (ISAF)), therefore it may be, or even should be used for other capability development projects.

Trust is a required element for multinational collaboration and cooperation. Training and education might prove to be the easiest first step actions to begin and build this multinational collaboration and cooperation which can lead to more complex common initiatives.

The NATO VNCF 2013-14 WIT project has greatly contributed to training and capability development, which encourages countries take part in the next iteration or to create similar initiatives.

_The Medical Capability Building_ brief presented the roadmap Hungary has used for identifying capability gaps, the concepts developed to close these gaps, the roadmap of concept testing, national capability building and the series of redirection and fine-tuning. The participants clearly stated that medical capabilities are crucial to the success of any military mission; all nations need to maintain and further develop it.

This project is a good example how a nation with scarce resources can use a combination of NATO, EU, regional and bilateral cooperation in favour of building national capabilities. The attendees stated that national rather than multinational or coalition medical capability initiatives can be built and implemented in the _shortest period of time_. However, if _effectiveness_ is concerned, it is the other way around; multinational (alliance level) and regional cooperation are seen as the best solution.

The participants agreed; although finance is always important, human resources and training play a substantial role in medical capabilities, while legal and cultural issues have a lesser effect. The discussion touched upon the importance of field intelligence, but it was a common understanding that when there are lifesaving situations, patients are less likely to be concerned about protecting their own personal data (e.g. biometric).

The role of a “Lead Nation” (LN) in capability building was also mentioned. This raised the attention of “agreed to” definitions of Lead vs. Framework Nation (FN), which became a recurring theme of later discussions.

The third case study aimed at providing another success story as exemplary of a lasting concept and capability development on the national level via usage of a combination of international cooperation efforts. The Heavy Airlift Wing (HAW) at Pépa Air Base in western Hungary built a _Strategic Airlift Capability_ because many countries were lacking this essential capability.

The briefing went through the entire history of the project from the birth of the need to the current status of the HAW. The audience brainstormed possible seeds of concepts on how to evolve future requirements.

The attendees agreed that this project needs to grow and involve more co-partners, cover more types of missions and should be highlighted as model for other projects (e.g. air policing).
Conclusions

Cooperation and collaboration are still proven ways to develop new capabilities. However, they both need strong political will, common goals, shared values and well coordinated short- and long-term planning processes.

The discussions raised the question: Is it really necessary/inevitable to have parallel cooperation/collaboration initiatives for NATO and the EU? Some say yes, because there are different member states, while others argued an independent agency would not be able to leverage different requirements and resource sets. Perhaps something like a Centre of Excellence (CoE), if the term is not limited to NATO CoEs, could fulfil this responsibility. The agency could provide clearinghouse functions to eliminate duplications, discrepancies and inefficiencies.

It was also understood that harnessing capabilities while maintaining diversity may provide more capabilities and capacities, but the “size of the umbrella” (NATO, EU, UN) can define the design of the framework.

When a framework is mentioned, the role of a FN or LN seems to be a discussion item. Although the definitions and responsibilities depend on the format and the direct goal, they often describe the obligation to provide missing or gapped capabilities. The participants commonly agreed that sometimes drawing the first curve on a sheet of blank paper is the most important, because it provides a starting point for further discussions. One could argue the curve is not curved enough or it is too straight, but most importantly the drawing initiates the discussion. Since the actual interpretation of the definitions puts a very heavy burden on the nations undertaking this responsibility, this sometimes is a stumbling block that impedes cooperation. The seminar attendees found that a revision of the definitions might be beneficial, because even the smallest financially and least militarily capable nation still could be able to play the role of the facilitating role and draw that “first curve.”

Finally, national sovereignty is key for every nation and is sometimes a showstopper. Cooperation and collaboration in areas such as training, education and logistics builds trust and cohesiveness. Specialization of capabilities is an effective method of collaboration while mitigating fears about losing the most precious treasure of every nation—sovereignty.

COMMAND AND CONTROL WITH MISSION PARTNERS: ENHANCING FEDERATED MISSION NETWORKING (FMN) WORKSHOP
- Mr. Scott Shephard, Chief, Multinational Branch, Command, Control, Communications and Computers (C4)/Cyber Directorate, The USA Joint Staff (JS J6)
- Mr. John “Nano” Nankervis, Multinational Branch, JS J6

Workshop Overview: Allied and coalition operations during ISAF and Operations ODYSSEY DAWN / UNIFIED PROTECTOR presented challenges for commanders at all levels to employ effective Command and Control (C2) with mission partners. Policy, training and education, technology implementation, and operational practices all constrained the
commander’s ability to communicate intent, build unity of effort, achieve speed of command, and foster trust with all participating mission partners. Based on lessons learned from these and other operations, the NATO Federated Mission Networking (FMN) and U.S. Mission Partner Environment (MPE) initiatives seek to provide a coordinated and complementary response to address current C2 system interoperability shortfalls during operations with mission partners. Using the current FMN and MPE implementation efforts as a baseline, this workshop further identified and explored concepts, emerging requirements, complementary efforts and enabling capabilities that could enhance C2 during future mission partnered operations.

**Problem Statement:** Future commanders need the ability to rapidly establish C2 with mission partners and take full advantage of the unique and varied capabilities partners contribute to resolve a crisis.

**Workshop Objectives:**
- Identify ways to leverage the power of the Concept Development and Experimentation community to support the evolution of FMN.
- Determine potential partner support for a Multinational Capability Development Campaign (MCDC) FMN-related project.
- Complement ongoing NATO and national FMN implementation by identifying and evaluating long-term challenges and solutions.
- Inform NATO and national Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities – Policy (DOTMLPF-P) capability development to better support C2 of future mission partnered operations.
- Discuss options to enhance future alliance and coalition C2 capability interoperability and effectiveness.

**Main Takeaways:**
- Workshop discussions confirmed many previously identified challenges to FMN and MPE implementation:
  - Forces currently are not able to establish an FMN capability quickly enough to meet a crisis timeline. Commanders must be aware of the time required to establish an FMN capability, and that time must be factored into mission planning.
  - Since nations will bring their own individual networks and C2 capabilities, minimum standards/services must be established.
  - The current NATO exercise program does not facilitate training within an FMN framework.
- The current broad range of capabilities in any FMN or MPE instantiation must be scoped appropriately to facilitate development of an MCDC project that will be able to achieve realistic goals.
- FMN and MPE have primarily focused on military-to-military information exchange and multinational command and control capabilities on classified networks. However, FMN and MPE must also address coordination between military and civilian organizations.
- There was significant interest among the workshop participants in developing an MCDC project that will focus on civilian-military coordination and cooperation challenges.
Seminar Overview: The seminar was attended by 72 CD&E practitioners and Subject Matter Experts from various NATO organisations and nations. The seminar explored potential new ways to shape and enhance NATO CD&E for future security challenges. This was undertaken through the application of Alternative Analysis (AltA) techniques, addressing three areas of discussion:

1. Building our CD&E community
2. What if... a world without NATO CD&E?
3. Creating impact with CD&E – the implementation process

The seven syndicates were facilitated and guided through each of the three sessions by AltA trained facilitators from Allied Command Operations and Allied Command Transformation. The sessions were designed to purposefully stimulate, challenge and encourage delegates to think critically, to identify potential future problems for NATO CD&E and explore novel options for solutions or improvement.

Problem Statement: After more than ten years of existence, the NATO CD&E process has reached maturity. In order for it to remain relevant and continue to contribute to NATO and the Nation’s capability development requirements, the CD&E process and its implementation will need to be adapted to face the challenges of the new security environment.

Seminar Objectives:

- Enhance CD&E Community of Interest common understanding of the future challenges.
- Lay a framework for solution identification and implementation for a refined CD&E process.
- Identify opportunities for increasing relationships and synergies between NATO, CoEs, Nations, Partners and non NATO nations in the CD&E Community.
- Identify opportunities to create the desired impact with CD&E and the implementation process

Initial Findings:

Seminar products and key takeaways are currently under further analysis and evaluation by NATO ACT. The conclusions of this work will inform a White Paper, to be published in March 2015, and be presented during the NATO CD&E Working Group in May 2015. This White Paper will in turn inform the upcoming periodic review of CD&E doctrinal documentation, in particular the CD&E Handbook.
Seminar discussions confirmed many previously identified challenges and opportunities CD&E faces. Not all problems, opportunities and proposals that were identified at the seminar are described here, however an initial analysis elicited two critical lines of action: Firstly, the need to further develop and enhance the CD&E process, and secondly, the need to enhance awareness and understanding of CD&E within a wider community.

Develop and Enhance the CD&E process

- **NATO CD&E process improvement:** The NATO CD&E process currently includes well recognized and endorsed methods. Nevertheless, the results from the seminar identified room for improvement to ensure the process remains a fast & flexible methodology. The use of more transparent methodologies, such as red teaming and AltA techniques were mentioned as possible options. The main threat to CD&E would be to become a bureaucratic process; as one of the main opportunity for an enhanced process would be to become more proactive than reactive (i.e. propose solutions for questions that have not been formally asked yet).

- **Information sharing:** The current situation seems to be sub-optimal when it comes to information sharing and knowledge management systems. Due to a non-standardised CD&E language and taxonomies, exchange of knowledge, lessons learned and best practices is somehow cumbersome and heavily dependent on ad-hoc procedures. The development of collaboration tools/website/wiki, easily accessible to all in the community, could be one of the possible solutions, in parallel with the existing venues (e.g. CD&E conferences, WG, expert teams visit to nations).

- **Collaboration network:** The CD&E community today is composed of recognised experts. As mentioned above, they struggle to find the right counterpart when building a team and working on a specific project. There is a need for an organisational enhancement within the CD&E community. This could include the creation of a “champion for CD&E “ who will act as a senior leader for CD&E within NATO and will facilitate the creation of comprehensive partnership with industry, non-governmental organisations, academia, as well as Partners and non NATO nations CD&E entities. This extended network will also be an instrument in the second line of action detailed below.

- **Practitioners:** CD&E Experts are key to the success of the Process. Recruitment and selection of the right Staff Officers to man CD&E posts in NATO as well as Nations CD&E entities is paramount. The “professionalization” of the community should be one major objective of an enhanced CD&E. Opportunities for training and education (i.e. easy access to right level of training like NATO CD&E Course). Relevant and proactive use of experienced CD&E Staff Officers will prove to be invaluable for both NATO and Nations entities in an enhanced CD&E process.

Improve awareness and understanding of CD&E

- **Communication & information strategy:** CD&E suffers from a lack of acceptance and understanding in the wider community. The need to “market and sell” each success story and results is seen as paramount. Under tightening budgets, the prejudice about CD&E process being too expensive needs to be fought on the line that the scientific and pragmatic approach inherent to the process saves nations’ money in the long term and reduces risk.

- **Support of leadership & stakeholders:** There is a greater need of stakeholders who buy-in to CD&E projects and support the implementation of the results; the promotion of CD&E to a wider audience has been recurrently expressed. Increasing awareness and acceptance of CD&E to a wider stakeholder community (including nations that do not have CD&E capability, non NATO partners, political
level, industry and academia) will make CD&E more visible and will also extend the network of expertise for potential collaboration. This action should also be performed in direction of senior leadership (in both CD&E and operational entities) in order to gain strong support to CD&E projects from the inception.

BREAKOUT – INTRODUCTION TO CD&E
- Wing Commander Gordon Pendleton, GBR Air Force, Deputy Branch Head for Concept Development, HQ SACT
- Commander Henning Rathke, German Navy, Operational Experimentation Branch, HQ SACT
- Mr. Han de Nijs, NATO Civilian, Branch Head Operational Analysis, HQ SACT

NATO CD&E drives NATO transformation. CD&E is comprised of three major phases: Analysis of the Problem, Concept Development, and Experimentation. It is a process to reduce risk among NATO nations, deliver solutions usable by all NATO nations, identify early deficiencies using the DOTMLPF-I (Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities – Interoperability) framework, and matures ideas into workable solutions.

NATO benefits from continuous analysis, concept development and experimentation which drive the formation of collaborative multinational teams, yielding critical analysis of concept development and robust experimentation design, thereby lowering risks for the enterprise.

Change requires ambition and a vision. Henry Ford did not ask the people what they wanted. He started with a vision. Evolution of change starts with concept development (the idea), then experimentation (trial and error), then analysis (reflection) and the cycle repeats itself. Innovation is not invention, not improvement; innovation is doing something differently. CD&E drives NATO to the development of creative ideas.

Experimentation is not just one test, but requires multiple iterations, for example space exploration. Urgent operational requirements are often plagued with problems, because the opportunity for experimentation is absent.

CD&E can be expensive, which makes it challenging to compete with other requirements during periods of financial constraints. Investment in CD&E is prudent because it reduces operational risks, identifies deficiencies early, uses a holistic approach across DOTMLPF-I, and matures processes to ultimately deliver solutions and doctrine for all nations to utilize.

It is important to remember that ideas can come from every level and at all ranks. It first starts with identifying a problem. Tactical level problems can have strategic level impacts. Solutions require critical thinking at all levels to develop a holistic solution.
We need to do concept development and experimentation, by utilizing collaborative multinational teams and avoid stove-piping from individual national CD&E organisations. Often innovative thoughts come from unlikely sources that are realistic about cost and have a strategic outlook.

**Q:** How are concepts shared among NATO and member nations militaries?
**A:** Outreach by ACT. ACT has an active CD&E Engagement programme with the Nations, and welcomes nations to share their concepts with NATO.

**Q:** Is there a comprehensive database of existing concept work so as to not duplicate new starts?
**A:** Yes, it is called CDEMS [CD&E Management System] and is available on the NS WAN [NATO Secret Wide Area Network]. Collaboration is hard to do amongst all stakeholders, many of them not connected to NS WAN while 98% of the CDEMS information is unclassified. We are working on moving the core documents as Concept (Drafts), Experiment Design Documents and Final Experimentation Reports to an internet-accessible SharePoint platform on TRANSNET2. The planned timeline to have that transfer process completed is Mar/Apr 2015 and to be presented to the CD&E Community of Interest during the 2015 CD&E Working Group in Virginia Beach.

**BREAKOUT –BEST PRACTICES OF MODELLING AND SIMULATION IN THE CD&E ENVIRONMENT**
- Captain Vicenzo Milano, ITA Navy, NATO Modelling and Simulation Centre of Excellence
- Mr. Angel San Jose Martin, NATO Civilian, Future Solutions Branch, HQ SACT

Modelling and Simulation (M&S) should be considered a tool at the National and NATO levels for CD&E. It can increase efficiency, enhance effectiveness while reducing risk. It is important for the CD&E community to share information with industry, academia and other military institutions to enhance the capabilities and uses for M&S. It can also help development requirements for future acquisition contracts. The M&S Centre of Excellence is closely evaluating the many applications for M&S.

**Q:** The M&S project seems focused only on NATO. Do you think it can help at the national level?
**A:** M&S can deal with a wide range of problems. The Modelling and Simulation Centre of Excellence is leveraging industry and academia to optimize M&S to deal with any military problem.

**Q:** Is it fair to say that models are easier to reconfigure from one task to the next? Can non-modelling experts run models on their own?
**A:** It depends. Some models are getting easier, but simulation world is stuck with legacy models which require subject matter experts. There will always be a need for some type of administrative support.

**Q:** Can you give a percentage of experiments that are done with the help of modelling and simulation in ACT?
**A:** It is 10% across NATO. More than 50% in CD&E development. It is easier to do on a National level due to resources. Nations do much more, so NATO can leverage national simulators.
MULTINATIONAL CAPABILITY DEVELOPMENT CAMPAIGN UPDATE
- Mr. Eric Copeland, USA Civilian, Branch Head, Multinational Capability Development, JS J7

Background on the MCDC’s organization, purpose and current priorities was presented. MCDC’s current campaign focus areas include: Combined Operational Fires; Combined Operations from the Sea through the Littoral; Cyber Implications and Complications for Access; Maritime Approach to Combined Operational Access; Autonomous Systems in gaining Operational Access; Strategic Communications; and Understand to Prevent. Each is led by a different member country of MCDC.

A six-year strategic roadmap to the future has been established for 2015-2020 with a focus of interoperability with different priorities in multi-year durations. Additional information can be obtained by contacting the MCDC Secretariat at (mcdcsecretariat@apan.org).

Q: Are you also looking at autonomous systems?
A: Yes, we expect at least one project.

Q: Can a nation modify proposals? Can they switch projects?
A: There is an annual review of the roadmap; if there is need to change it can be done semi-annually. Regarding participation change, it depends based on the priority and where it is at in maturity. We hope most will go from one short project into another.