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## DESIGNING A NATO THAT THINKS DIFFERENTLY FOR 21<sup>ST</sup> CENTURY COMPLEX CHALLENGES

*„Allied Command Transformation is the only NATO headquarters on American soil. Not only does it play a crucial role in maintaining a strong transatlantic linkage between North America and Europe, its core business is to transform the military capacity of the Alliance. To do this, innovation is key.”*

General Denis Mercier, NATO-ACT Commander<sup>2</sup>

**ABSTRACT:** *The 21st century presents novel and increasingly complex security challenges for the international defense community and NATO in particular. Western armed forces as well as intergovernmental military alliances, such as NATO, appear increasingly unable to deal with these problems using traditional planning and organizing methodologies alone; what used to work effectively no longer seems to possess the same precision and control. Traditional military decision-making and problem-solving methodologies are insufficient tools for what is increasingly seen as a postmodern era of conflict and security challenges. The authors promote the relatively new and organizationally disruptive theory and practice known as ‘military design’ as an important area for NATO educational development and implementation into practice as well as doctrine. Many nations within the NATO alliance have already implemented their own unique military design methodologies, and eventually as a force for complex security challenges NATO will need to consider design within a NATO formation. The authors establish the distinctions between military design and military planning, how NATO can implement design in practice and education, and why NATO requires design and traditional planning together in the context of emergent 21st century challenges. The window for rapid innovation and organizational transformation using military design is now, with the call for a design framework that is flexible towards unique NATO requirements and possessing essential qualities indicative of appreciating and addressing many emergent and novel challenges confronting the alliance.*

**KEYWORDS:** *Design Thinking, Change, Adaptation, Transformation, Military Design, Planning, Education, NATO, Complexity*

In the 21<sup>st</sup> Century, the international defense community has largely struggled with how to organize, strategize, and act effectively in increasingly complex and emergent contexts where the previous distinctions between war and peace have blurred beyond comprehension.<sup>3</sup>

<sup>1</sup> The views of the authors are their own and do not represent the positions of the United States military, U.S. Special Operations Command, the Hungarian Defense Forces, or NATO.

<sup>2</sup> General Denis Mercier opening remarks at Industry engages NATO Symposium, Norfolk, 27 Apr 2017.

<sup>3</sup> Bousquet, A. “Chaoplex Warfare or the Future of Military Organization”. *International Affairs (Royal Institute of International Affairs 1944-)* 84/5. 2008. 915–929.; Bousquet, A. *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*. London: HURST Publishers Ltd., 2009.

Governments and their militaries continue to experience radical and entirely unforeseen calamities that defy historical patterns and essentially rewrite the rulebooks. Popularly termed ‘black swan events,’<sup>4</sup> they continue to shatter any illusion of stability or extension of normalcy in foreign affairs.

Western Armed Forces as well as intergovernmental military alliances, such as NATO, appear increasingly unable to deal with these problems using traditional planning and organizing methodologies alone.<sup>5</sup> What had worked well previously no longer appears to possess the same precision and control. The formal operational-level military planning process, initially developed to cope with Cold War Era large-scale military activities in “a conventional, industrialised state vs industrialised state setting”<sup>6</sup> now is seemingly incapable of providing sufficient means of getting the organization unstuck.

Within this new and increasingly chaotic context, NATO has to fulfill all three core tasks at the same time, which requires new and noble approaches from policymakers, and military personnel alike. While Russia’s ‘little green men’ are not necessarily different from earlier applications in unconventional warfare, their inclusion in multiple domains supported by expansive technology, social media, propaganda, and the malicious activity in the cyberspace<sup>7</sup> provides a far more complex canvas upon which rivals can create never-before-seen complex problem-sets that defy previously accepted definitions for conflict and war.

Complex contexts require different ways of thinking and decision-making<sup>8</sup> and require a different awareness and appreciation. In simplistic settings, organizations see things they have previously experienced,<sup>9</sup> and for NATO, an organization with so much success in the past, these experiences can be an obstacle to change in today’s VUCA world.<sup>10</sup> Complex contexts often have only one repeating and predictable process: an organization

<sup>4</sup> The black swan event is referring to a phrase used in a book by the essayist, scholar, philosopher, and statistician Nassim Nicholas Taleb released on April 17, 2007. The book focuses on the extreme impact of certain kinds of rare and unpredictable events (outliers) and humans’ tendency to find simplistic explanations for these events retrospectively. This theory has since become known as the black swan theory. Taleb, N. N. *The Black Swan: The Impact of the Highly Improbable*. New York: Random House, 2007.

<sup>5</sup> Kupchan, C. “Is NATO Getting Too Big to Succeed?”. *The New York Times*, 25 May 2017.; Freedberg, S. Jr. “Fear of Russia Drives Sweden Closer to NATO”. *Breaking Defense*, 13 September 2016.

<sup>6</sup> Jackson, A. “Innovative within the Paradigm: The Evolution of the Australian Defence Force’s Joint Operational Art”. *Security Challenges* 13/1. 2017. 67–68.

<sup>7</sup> Cyber has been declared as a domain at NATO’s Warsaw Summit in July 2016.

<sup>8</sup> “Joint Doctrine Publication 04: Understanding and Decision-Making”. Second edition. 2016. 38. United Kingdom Ministry of Defence. <https://www.gov.uk/government/publications/jdp-04-understanding>, Accessed on 31 May 2017.

<sup>9</sup> Papparone, C. R. and Topic, G. L. Jr. “Training Is Déjà Vu; Education Is Vu Jade”. *Army Sustainment*, 2017. 15.

<sup>10</sup> VUCA is short for *volatility, uncertainty, complexity, and ambiguity*. It is meant to describe the highly dynamic chaotic environment. VUCA also conflates four distinct types of challenges that demand four distinct types of responses. The notion of VUCA was introduced by the U.S. Army War College in the 1990s. The deeper meaning of each element of VUCA: (1) Volatility. The nature and dynamics of change, and the nature and speed of change forces and change catalysts. (2) Uncertainty. The lack of predictability, the prospects for surprise, and the sense of awareness and understanding of issues and events. (3) Complexity (or variety) is measured by the number of distinguishable states it is capable of having and is beyond the control of any individual. The multiplex of forces, the confounding of issues, no cause-and-effect chain and confusion that surround an organization creates and entangled web of complexity. (4) Ambiguity occurs when there is no clear interpretation of a phenomenon or set of events. It can never be eliminated altogether and the haziness of reality, the potential for misreads, and the mixed meanings of conditions always cause-and-effect confusion. For a better understanding see: Berinato, S. “A Framework for Understanding VUCA”. *Harvard Business Review*

will continue to experience things they have never seen before that marginalize or defeat all established practices and favored tools.<sup>11</sup>

When an organization encounters things they have experienced previously in some format or context, they can reapply common terms and approved processes to solve these problems, often in an analytic and optimization-fixated approach to reducing risk and increasing stability.<sup>12</sup> Yet what does an organization do when it experiences something it has never seen before and lacks the language, processes, and history to make sense of?

In this article the authors suggest that as part of the response to the changes in a complex environment NATO should introduce ‘defense applied design thinking’ and use this approach to look for solutions to wicked problems. To prove our point we will look into NATO adaptation, will present a brief history of the evolution of defense applied thinking, and answer the question where NATO Allied Command Transformation should move concerning design application and education.

## NATO ADAPTATION FROM 2001 TO 2017: AN EVOLUTION OF CHANGE AND COLLABORATION

Today’s environment is inherently complex with an increase of key stakeholders as well as the exponential increase in the connections between these players. With the rise in technology and information exchange, NATO’s operational areas are increasingly complex and potentially chaotic. In some regions NATO is facing a broad range of threats simultaneously.<sup>13</sup> The Alliance has come to realize that what it was designed and optimized for, is no longer applicable to today’s VUCA battlefield. Complexity and uncertainty seems to be the norm<sup>14</sup> and for an international organization with much history, legacy and past success like NATO, it is a very difficult moment, which requires organizational transformation and adaptation.

Adaptation is certainly not new to the Alliance, which has a long history, and undergone several focus shifts before. In fact the Warsaw Summit acknowledged the fourth phase in NATO history, where “there is an arc of insecurity and instability along NATO’s periphery and beyond...Today, faced with an increasingly diverse, unpredictable, and demanding security environment, we have taken further action to defend our territory and protect our

<sup>10</sup> (cont.) 59/9. 2014. <https://hbr.org/2014/09/a-framework-for-understanding-vuca>, Accessed on 31 May 2017; Bennett, N. and Lemoine, G. J. “What VUCA Really means for You”. *Harvard Business Review* 59/1. 2014. <https://hbr.org/2014/01/what-vuca-really-means-for-you>, Accessed on 31 May 2017.

<sup>11</sup> Bousquet, A. and Curtis, S. “Beyond Models and Metaphors: Complexity Theory, Systems Thinking and International Relations”. *Cambridge Review of International Affairs* 24/1. 2011. 43–62.; Tsoukas, H. *Complex Knowledge: Studies in Organizational Epistemology*. New York: Oxford University Press. 2005.

<sup>12</sup> Ackoff, R. “Science in the Systems Age: Beyond IE, OR, and MS”. *Operations Research* 21/3. 1973. 661–671. Ackoff discusses the goals of analytic optimization for one approach to ‘solving’ particular problems, and the dangers of misapplication when dealing with complexity.

<sup>13</sup> The Balkans, for example, face political pressure from Russia, the rise of radical Islamic groups, but also organized crime and refugee flows – and all these challenges are interrelated. Eastern European states are also threatened by Russia’s rise, and also under internal pressures concerning refugee migration flows, organized crime, and cultural challenges for integrating with Western Europe within the EU as well as NATO.

<sup>14</sup> Pondy and Mitroff reminded organizational scientists 25 years ago that organizations have characteristics typical of level 8 on Boulding’s 9-level scale of system complexity. Boulding concluded that organizations are among the most complex systems imaginable. Boulding, K. E. “General Systems Theory: The skeleton of science”. *Management Science* 2/3. 1956. 197–208.; Pondy, L. R. and Mirtoff, I. I. “Beyond open systems models of organizations”. In Staw, B. M. (ed), *Research in organizational behavior*. Greenwich, Conn.: JAI Press, 1979. 3–39.

populations.”<sup>15</sup> This modern context of uncertainty and emergent developments places NATO within a new world where many of the traditional “tools” in the Alliance toolkit no longer work, or produce bizarre outcomes.

The Alliance since its creation in 1949 has mainly focused on collective defense, but after the fall of the Berlin Wall an era of cooperation began in 1991, where enlargement (especially from the former Warsaw Pact countries) and the development of partnerships (including Russia) became the primary focus. In 2001, NATO’s focus shifted again towards expeditionary operations and crisis management with a strong emphasis on Afghanistan after the terror attack on the United States.

Therefore, adaptation is not new; NATO has been doing this throughout its existence.<sup>16</sup> Yet the tempo and thrust of change have changed the game recently and since 2014, a new strategic focus has come into view.<sup>17</sup> Marked by the past two NATO summits as important milestones along the path for NATO’s future, the Alliance embarked on a journey of organizational transformation of an unprecedented pace. While NATO’s essential mission remains unchanged, goals in increased adaptation, ability to anticipate change, and increasing both efficiency and transparency were noted as new benchmarks in the Summit communiqués.<sup>18</sup>

Three years ago at the NATO Summit in Wales in 2014, NATO leaders were clear about the security challenges on the Alliance’s borders. In the East, Russia’s actions threatened Europe, while on the Alliance’s southeastern border the ISIL<sup>19</sup> terror campaign posed a threat. Across the Mediterranean, Libya was becoming increasingly unstable. The Alliance’s leadership took decisive steps to address these challenges and reaffirmed the central mission: *the shared responsibility of collective defense*.<sup>20</sup> Continuing this adaptive trend, the Allies agreed to an increase of NATO’s presence in Central and Eastern Europe with additional equipment, training, exercises,<sup>21</sup> and troop rotations.

Following the Wales Summit, at the *NATO Summit in Warsaw* in July 2016, the Alliance had even more emergent problems and challenges to grapple with.<sup>22</sup> At this time NATO was engaged in all areas of its core tasks simultaneously, and often in overlapping and confusing ways. To counter these challenges the United States quadrupled its funding for the European

<sup>15</sup> “Warsaw Summit Communiqué”. North Atlantic Treaty Organization. 9 July 2016. [http://www.nato.int/cps/en/natohq/official\\_texts\\_133169.htm](http://www.nato.int/cps/en/natohq/official_texts_133169.htm), Accessed on 12 June 2017.

<sup>16</sup> NATO Secretary General Jens Stoltenberg said that „one of our greatest strengths is our ability to adapt.” North Atlantic Treaty Organization. Stoltenberg, J. “Keynote speech by NATO Secretary General Jens Stoltenberg at the opening of the NATO Transformation Seminar”. NATO. 25 March 2015. [http://www.nato.int/cps/en/natohq/opinions\\_118435.htm](http://www.nato.int/cps/en/natohq/opinions_118435.htm), Accessed on 12 June 2017.

<sup>17</sup> Dunford, J. Jr. “From the Chairman: The Pace of Change”. *Joint Force Quarterly* 84/1. 2017. <http://ndupress.ndu.edu/JFQ/Joint-Force-Quarterly-84.aspx>, Accessed on 12 June 2017.

<sup>18</sup> “Warsaw Summit Communiqué”.

<sup>19</sup> Also referring to the Islamic State, or ISIS as used by various organizations, governments, and media outlets.

<sup>20</sup> “Wales Summit Declaration”. NATO. 5 September 2014. [http://www.europarl.europa.eu/meetdocs/2014\\_2019/documents/sede/dv/sede240914walessummit\\_/sede240914walessummit\\_en.pdf](http://www.europarl.europa.eu/meetdocs/2014_2019/documents/sede/dv/sede240914walessummit_/sede240914walessummit_en.pdf), Accessed on 12 June 2017.

<sup>21</sup> One of the most significant one of these exercises have been Trident Juncture 2015.

<sup>22</sup> The current political and security environment created in the wake of military and humanitarian crises in Syria, massive refugee influx to Europe, DAESH’s terror attacks, and the frozen conflicts in eastern Ukraine and the Caucasus, and cyber security challenges are all shape-shifting wicked-problems, which require constant transformation from the Alliance.

Reassurance Initiative<sup>23</sup> (ERI) and sent more troops to Europe, who were accompanied by other NATO Allies to serve as a deterrent force along NATO's eastern border.

NATO is moving ahead at a rapid pace for a large multinational bureaucratic organization, however, adaptation and transformation is never an easy process. Preparing for the future, and building *strategic foresight*, is becoming increasingly difficult. There are no blueprints, rules or best practices anymore, and frequently an organization's successful tools from yesterday actually work against it in discovering tomorrow's challenges. Today, when security challenges demand a different kind of force, agility is essential. Thus, *speed* is another problem that can be addressed through increasing operational agility and flexible thinking; NATO's adaptation measures introduced above have partially addressed this problem. A third issue is recognition of the fact that a major cornerstone of many of today's emergent security challenges is the pattern of power shifts toward networks. Since the number of key stakeholders in any operational setting has increased, *the Alliance has to think and act like a network as well*, and this requires institutional adaptation beyond what had previously been sufficient in education, professionalization, and organizational transformation.

NATO clearly has a high potential for adaptation and transformation but right now the Alliance leadership feels that they must choose between tackling complex challenges (adapting) or responding as a traditional bureaucratic organization and trying to give adequate responses to emerging challenges in an age of constant disruptions (operating). Many large military organizations face the same challenge; a tension between operational mindset and adaptive experimentation. The reality is that NATO is quite capable to do both at the same time. Allied Command Transformation has the potential to contribute to NATO's overall adaptation, while Allied Command Operations can focus on the more traditional (operational) end of the spectrum while also receiving facilitation and transformative abilities from ACT's adaptive efforts. NATO's command structure with the two strategic commands (and their different functions) enables the Alliance to operate and adapt at the same time, the question is how?

In order to thrive in a VUCA environment, when challenges are increasingly complex and interrelated, NATO *needs to use defense applied design thinking on an everyday basis* to engineer new solutions. Design is needed when the organization "needs what does not yet exist" so that it can gain or maintain relevance as well as advantage in emergent futures.<sup>24</sup>

## A BRIEF HISTORY OF DEFENSE APPLIED DESIGN IN VARIOUS ARMED FORCES

Over the past generation of international military professional developments in innovation and decision-making, the previously popular mechanistic methods that originated in the Industrial Era<sup>25</sup> have been challenged by new ways of thinking. A small community of theorists and practitioners have developed various versions of what is termed 'defense applied design' in order to encompass an expanding variety of international military design

<sup>23</sup> From \$800 million to \$3.4 billion and deploying an additional Brigade Combat Team to Europe in January 2017.

<sup>24</sup> Nelson, H. and Stolterman, E. *The Design Way*. Second ed. Cambridge, Massachusetts: The MIT Press, 2014. 12.

<sup>25</sup> Bousquet. *The Scientific...*; Gharajedaghi, J. and Ackoff, R. "Mechanisms, Organisms, and Social Systems". In Tsoukas, H. (ed), *New Thinking in Organizational Behaviour*. Oxford, United Kingdom: Butterworth-Heinemann Ltd, 1994. 25–49.

models.<sup>26</sup> While the first formal military design methodology came from the Israeli Defense Force at the turn of the 21<sup>st</sup> Century, the Israeli ‘Systemic Operational Design’ (SOD) model quickly inspired other variants across the globe.<sup>27</sup> Since the late 1990s, military design has quickly expanded into American, Australian, Canadian and other western militaries in various forms and applications.<sup>28</sup> Broadly, military design draws from multiple disciplines including Systems Theory, Complexity Theory, Postmodernism, Eastern Philosophy, and civilian design methodologies developed through the late 20<sup>th</sup> Century in multiple design programs across the fields of science, arts and humanities.

The Australian Army incorporated Systems Theory as well as some influences of the Israeli SOD into their planning doctrine, professional education and practice in the first decade of this century<sup>29</sup> and some design entered their doctrine by 2011-2012.<sup>30</sup> Simultaneously, the American Army devoted extensive intellectual emphasis on taking Israeli SOD elements and appropriating parts of it into what they would call ‘Army Design Methodology’ by 2010 in both doctrine and practice.<sup>31</sup> The Canadian Army first explored design concepts in 2008, and subsequently revisited it in 2013 by developing mixed design methods for education in

<sup>26</sup> Beaulieu-Brossard, P. and Dufort, P. “Introduction to the Conference: The Rise of Reflective Military Practitioners”. Paper presented at Hybrid Warfare: New Ontologies and Epistemologies in Armed Forces, Canadian Forces College, Toronto, Canada: University of Ottawa and the Canadian Forces College. 2016.; Zweibelson, B. “An Application of Theory: Second Generation Military Design on the Horizon”. *Small Wars Journal*. 19 February 2017. <http://smallwarsjournal.com/jrnl/art/an-application-of-theory-second-generation-military-design-on-the-horizon>. Accessed on 10 March 2017.

<sup>27</sup> “Interview with BG (Ret.) Shinom Naveh”. Digital transcript. 1 November 2007.; Ryan, A. “A Personal Reflection on Introducing Design to the U.S. Army”. Medium: The Overlap. 2016. <https://medium.com/the-overlap/a-personal-reflection-on-introducing-design-to-the-u-s-army-3f8bd76adcb2#.xhax76luo>, Accessed on 2 March 2016.; Gracier, O. “Self Disruption- Beyond the Stable State of SOD”. *Journal of Military and Strategic Studies* 17/4. 2017. <http://jmss.org/jmss/index.php/jmss/article/view/697/656>, Accessed on 12 June 2017.; Zweibelson, B. “An Application of Theory...”. All in Beaulieu-Brossard and Dufort. “Introduction to the Conference...”.

<sup>28</sup> Ryan, A. “A Personal Reflection...”; Naveh, S. “The Australian SOD Expedition: A Report on Operational Learning”. Manuscript. 2011.; Ryan, A. “The Foundation for an Adaptive Approach”. *Australian Army Journal for the Profession of Arms* 6/3. 2009. 69.; Lauder, M. “Systemic Operational Design: Freeing Operational Planning From the Shackles of Linearity”. *Canadian Military Journal, Operational Planning* 9/4. 2009. 41–49.; Mitchell, P. “Stumbling into Design: Teaching Operational Warfare for Small Militaries in Senior Professional Military Education”. Poster of the Canadian Forces College. Toronto, Canada. 2015. [https://www.doria.fi/bitstream/handle/10024/117634/MITCHELL%20Paul\\_poster\\_Designing%20Design,%20Teaching%20Strategy%20and%20Operations%20for%20Small%20Militaries.pdf?sequence=2](https://www.doria.fi/bitstream/handle/10024/117634/MITCHELL%20Paul_poster_Designing%20Design,%20Teaching%20Strategy%20and%20Operations%20for%20Small%20Militaries.pdf?sequence=2), Accessed on 12 June 2017.; Pazdziorek, P. *Wojskowa myśl operacyjna w konfliktach zbrojnych przełomu XX i XXI wieku*. Warsaw: Adam Marshal, 2016. \u00221} \i Australian Army Journal for the Profession of Arms\i0} 6, no. 3 (2009

<sup>29</sup> Jackson. “Innovative within the Paradigm...”. 63–64.

<sup>30</sup> Jackson, A. “A Tale of Two Designs: Developing the Australian Defence Force’s Latest Iteration of its Joint Operations Planning Doctrine”. *Journal of Military and Strategic Studies* 17/4. 2017. 179–180. <http://jmss.journalhosting.ucalgary.ca/jmss/index.php/jmss/article/view/705>, Accessed on 12 June 2017.; See also: Jackson. “Innovative within the Paradigm...”. 63–64.

<sup>31</sup> Ryan. “A Personal Reflection...”; Butler-Smith, A. “Operational Art to Systemic Thought: Unity of Military Thought”. Paper presented at Hybrid Warfare: New Ontologies and Epistemologies in Armed Forces, Canadian Forces College, Toronto, Canada: University of Ottawa and the Canadian Forces College. 2016. 1–5.; Banach, S. and Ryan, A. “The Art of Design: A Design Methodology”. *Military Review* 89/2. 2009. 105–15.; *Art of Design: Student Text*, Version 2.0. Fort Leavenworth, Kansas: U.S. Army School of Advanced Military Studies, 2010.



the Canadian Forces College's curriculum<sup>32</sup> including their Advanced Joint Warfighting Studies and the Joint Command and Staff Programme.<sup>33</sup>

Both within NATO and across the Anglosphere, western militaries quickly seized upon design thinking in largely service-specific interpretations as well as some limited Joint applications. Design became a battle of individual tribes with distinct disagreements on language, scale, scope, and content.

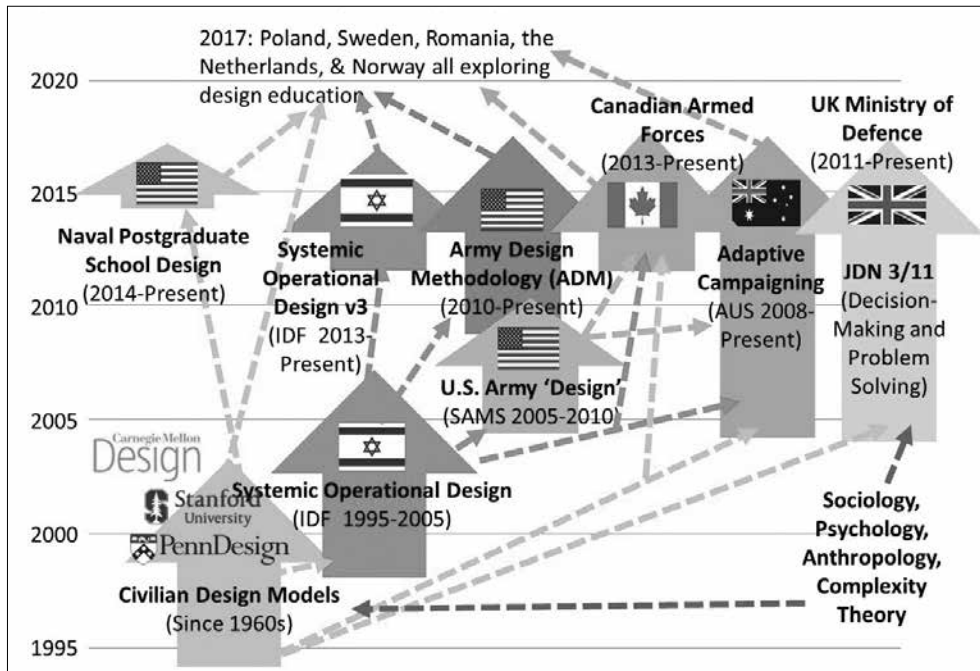


Figure 1: Broad Overview of Major Military Design Movements and Influences

In the last decade of persistent conflict and security challenges for NATO as well as individual American and European states, design developments have initiated across multiple Armed Forces. The Polish Army in 2016 initiated design education at their War Studies University in Warsaw (Akademia Sztuki Wojennej)<sup>34</sup> by partnering with the US Special Operations Command's (USSOCOM) Joint Special Operations University (JSOU) through their military design program. The Royal Netherlands Army incorporated design based largely on U.S. Army design methodology in 2013 for their field grade officer education and at their Land Warfare Centre.<sup>35</sup> In keeping with their typically subtle approach towards doctrine and training, the British Ministry of Defence published "Joint Doctrine Note 3/11,

<sup>32</sup> "Canadian Forces College 2013–2014 Joint Command and Staff Programme DS/CF 548 Lesson Plan: Advanced Joint Warfighting Studies". Unpublished internal document. March 2014. This document was provided to the authors in 2015 through personal correspondence with CFC faculty.

<sup>33</sup> Mitchell, P. "Stumbling into Design...".

<sup>34</sup> Pazdziorek. *Wojskowa myśl...*

<sup>35</sup> Zweibelson, B. "'Design' Goes Dutch: Royal Netherlands Army Consideration for Unconventional Planning and Sensemaking". *Atlantisch Perspectief* 29/6. 2015. 31–35.

Decision-Making and Problem Solving: Human and Organisational Factors” in 2013 that without using the term ‘design’ nonetheless bridged some elements of design thinking into core British doctrine and practice.<sup>36</sup> By 2016, the Ministry of Defence had archived JDN 3/11 and incorporated much of it into an updated “Joint Doctrine Publication 04: Understanding and Decision Making”.<sup>37</sup>

A pattern of Anglo-Saxon design development does seem to be leading the Armed Forces venture into synthetic thinking and systemic framing of complex, emergent problems. However, multiple design developments in Sweden, Colombia, Romania, and elsewhere demonstrate that many armed forces are keen to explore different ways of fostering organizational transformation, innovation, and synthetic thinking for ill-structured, emergent problems.<sup>38</sup> Meanwhile, clear indications exist that rivals, such as Russia, China, and Iran, in these emergent complex environments continue to apply ‘design-like’ methodologies in their published theory as well as practice.<sup>39</sup>

## A CONTEXT OF CHAOS: HOW DEFENSE APPLIED DESIGN ENABLES ARMED FORCES

There are multiple design methodologies that all tend to share several characteristics. Figure 2 illustrates some core patterns across most military design models including all of those illustrated in Figure 1. As this article frames all military design models and does not subscribe to any particular methodology, the term ‘defense applied design’ is used to promote an overarching and non-denominational perspective on existing military design methodologies.

Although different military applications for design rely on distinct terms as well as their own unique sequences of doing design, all of them start with vague guidance and a complex or ill-structured (even wicked) problem. Frequently the previously successful actions no longer work. If any of these conditions do not apply, the military organization would launch into the detailed planning process centered on analytic (rational) decision-making and problem-solving oriented towards optimization and greater efficiency of existing knowledge and practice.<sup>40</sup>

<sup>36</sup> “Joint Doctrine Note 3/11: Decision-Making and Problem Solving: Human and Organisational Factors”. United Kingdom Ministry of Defence. 18 January 2013. <https://www.gov.uk/government/publications/joint-doctrine-note-3-11-decision-making-and-problem-solving-human-and-organisational-factors>, Accessed on 31 May 2017.

<sup>37</sup> “Joint Doctrine Publication 04...”.

<sup>38</sup> Both authors have personally been involved in multiple design discussions, consultations, and program developments with these nations as well as others.

<sup>39</sup> For an example of recent Chinese military theory that reflects some design qualities, see: Liang, Q. and Xiangsui, W. *Unrestricted Warfare*. Beijing: People’s Liberation Army Literature and Arts Publishing House, 1999; Additional study of Eastern vs. Western military concepts can be found in Jullien, F. *A Treatise on Efficacy Between Western and Chinese Thinking*. Honolulu, Hawaii: University of Hawai’i Press, 2004.; See also: Lai, D. *Learning from the Stones: A GO Approach to Mastering China’s Strategic Concept, SHI*. Carlisle: Strategic Studies Institute, U.S. Army War College Press, May 2004. <https://ssi.armywarcollege.edu/pubs/display.cfm?pubID=378>, Accessed on 31 May 2017. For an example of novel Russian strategy concerning Cyber and Information, see: Ignatius, D. “Russia’s radical new strategy for information warfare”. *The Washington Post*, 18 January 2017.

<sup>40</sup> For examples of formal military efficiency-based planning, see: Reilly, J. *Operational Design: Shaping Decision Analysis through Cognitive Vision*. Second ed. Maxwell Air Force Base, Alabama: Department of Joint Warfare Studies, Air Command and Staff College, 2009.; Kem, J. *Campaign Planning: Tools of the Trade*. Third ed. Fort Leavenworth, Kansas: Department of Joint, Interagency, and Multinational Operations, 2009.



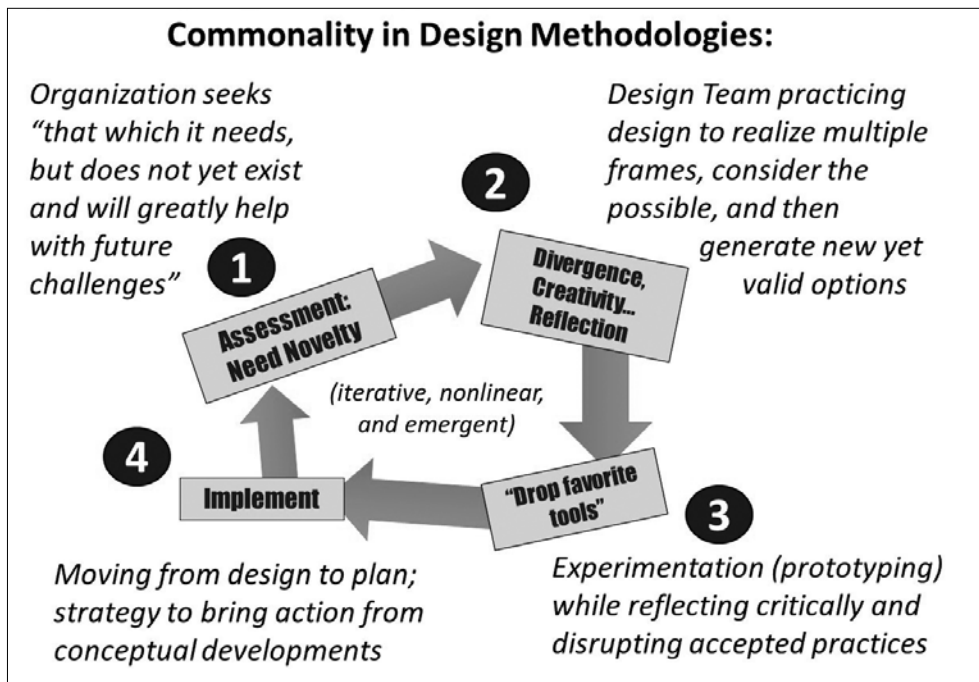


Figure 2: Framing Divergent and Convergent Organizational Processes

In Figure 2, the organization must “drop their favorite tools” as sociologist Karl Weick describes in studies of organizational change and innovation.<sup>41</sup> Militaries are quite famous for this behavior, where an organization tends to attempt to win the previous war in their preparation for the next one, much as France did in the Interwar period with the Maginot Line, or how the U.S. expected the second invasion of Iraq in 2003 to be similar to the Gulf War of 1990-1991. For an organization to critically think about their own thinking (reflection, critical inquiry),<sup>42</sup> they usually experience failure or outside pressure from the government or population to transform.

Thus, all design methodologies establish the design team as well as the designing context to be quite different from traditional military planning and routine problem-solving.<sup>43</sup> Designers are confronting not what an organization has seen before, but something unlike anything experienced and thus requiring divergent thinking as well as innovation.

As this article does not advocate any particular design methodology, all design models in general provide potential pathways toward divergent thinking and innovation for an or-

<sup>41</sup> Weick, K. “Drop Your Tools: An Allegory for Organizational Studies”. *Administrative Science Quarterly* 41. 1996. 301–313.

<sup>42</sup> Visser, W. “Schön: Design as a Reflective Practice”. *Collection, Art+Design & Psychology* 2. 2010. 21–25.; Beaulieu-Brossard and Dufort, “Introduction to the Conference...”; Schön, D. and Rein, M. *Frame Reflection: Towards the Resolution of Intractable Policy Controversies*. New York: Basic Books, 1994.

<sup>43</sup> Zweibelson, B. “An Awkward Tango: Pairing Traditional Military Planning to Design and Why It Currently Fails to Work”. *The Journal of Military and Strategic Studies* 16/1. 2015. 11–41.; Paparone, C. R. “Design and the Prospects for Deviant Leadership”. *Small Wars Journal*. 8 September 2010. 1–9. <http://smallwarsjournal.com/blog/journal/docs-temp/530-paparone.pdf>, Accessed on 31 May 2017.; Naveh, S., Schneider, J., and Challengans, T. *The Structure of Operational Revolution: A Prolegomena*. Leavenworth: Booz Allen Hamilton. 2009.

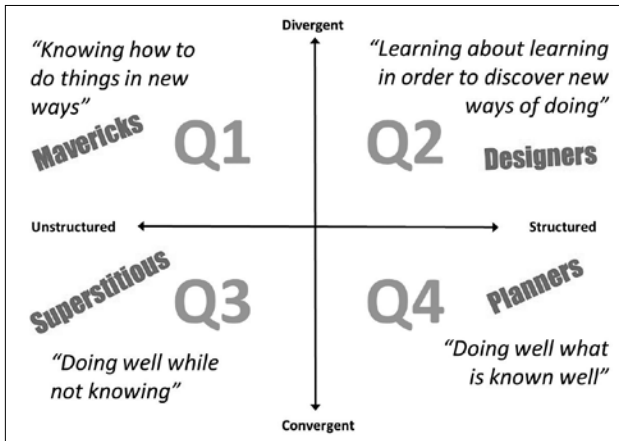


Figure 3: *Framing Divergent and Convergent Organizational Processes*

organization confronting complexity and something “never seen before” that requires entirely new tools. However, seeking divergence and innovation alone is insufficient to articulate how NATO would benefit from adapting design. There already are plenty of wildly creative and innovative professionals within the various armed forces comprising the NATO partnership. Usually, these forward thinkers and revolutionaries are considered mavericks and often are not recognized in their own times for how they move the profession forward.<sup>44</sup>

Yet, most of these maverick thinkers tend to be quite unstructured in how they go about transforming a military organization or producing exceptional insights into complexity. Many senior leaders today inquire whether “we have always done design” in that past creative military leaders must have been doing the essence of design thinking. In an unstructured manner, they likely were. If one were to visualize the tensions between ‘divergent thinking’ and ‘convergent thinking’ as well as ‘structured’ and ‘unstructured’ processes, we might consider how Figure 3 frames these into useful quadrants.

In Figure 3, the quadrant provides a heuristic aid for conceptualizing how an organization such as NATO likely has multiple ways of conceptualizing decisions and actions within conflict environments.<sup>45</sup> The quadrants are divided by a horizontal and vertical axis. The vertical axis reflects the distinction between convergent and divergent thinking. Convergent thinking provides the fundamental pillars of organizational uniformity, reliability, and predictability through analytic decision-making and problem solving within highly objective and stable conditions. Without convergence, an armed force could not train, organize or

<sup>44</sup> Visionaries such as Billy Mitchell, father of the U.S. Air Force, had to battle his own organization to promote the development of aircraft carriers, paratroop operations, and how airpower would sink battleships that were considered invulnerable to aircraft in the 1920s. T. E. Lawrence was an archeologist cast in what was otherwise a low-level military assignment where his initial recommendations were ignored or opposed (especially by the French) during WWI.

<sup>45</sup> This graphic was first drawn on a whiteboard at a design executive session between Zweibelson on behalf of Joint Special Operations University and the NATO-ACT in Norfolk, Virginia in May 2017. This three hour design discussion was between senior NATO-ACT leadership and Mr. Zweibelson.

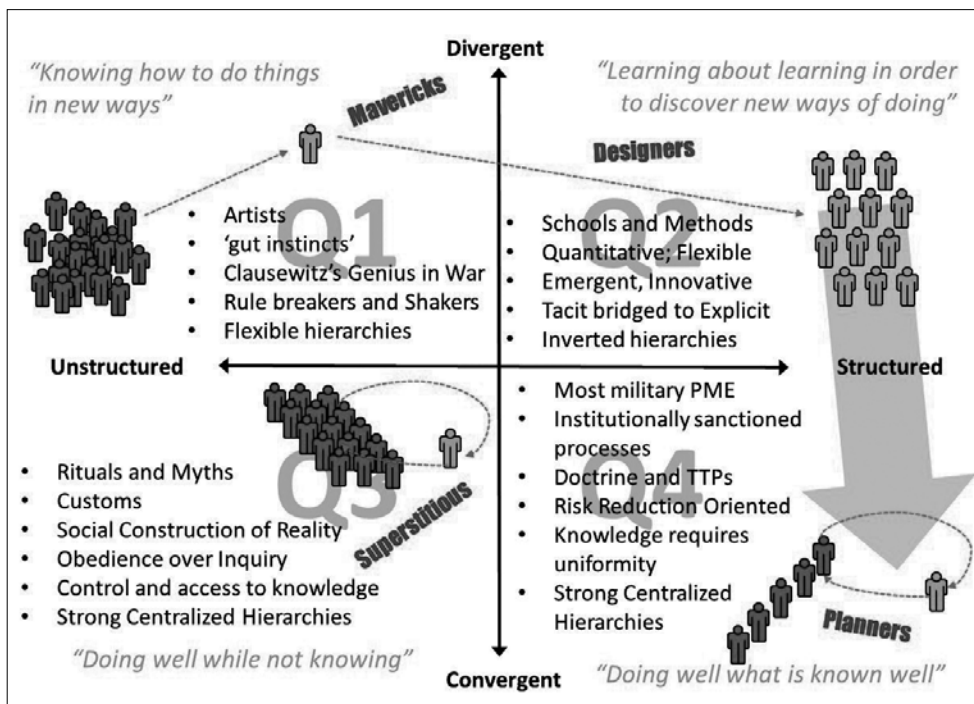


Figure 4: Filling NATO's design thinking gap' for Complex Security Contexts

equip for many of the simple<sup>46</sup> and complicated contexts associated with military missions. Divergence emphasizes subjectivity over objectivity, and contextualism (in the moment and non-repeating) where innovation and creativity make for novel discoveries.

Together the quadrants in Figure 3 provide a conceptual framework for NATO to consider how design thinking fills an essential organizational gap and it also provides several examples of what a military organization expects to find in each quadrant. Divergent thinkers that innovate using unstructured means are often the mavericks and rule-breakers that challenge the institution and pave the way for radical developments. Clausewitz refers to the state of 'genius' as those who can defy all of the principles of war that others must follow. Military planners follow a structured and convergent path where formal, analytic and rational processes help the organization reduce risk, gain predictability and control, and converge towards mission goals in a repeatable and reliable manner. Superstitious groups that attempt actions while basing it upon unstructured logic are frequently in complex military environments but are misunderstood or misinterpreted by most western militaries.

<sup>46</sup> 'Simple contexts' in military environments are not necessarily easy to understand and manage. They respond best to established practices and optimized solutions such as checklists, drills, and memorized solutions. However, a 'simple context' might be highly demanding despite being entirely managed by simple components. An Infantry Company sorting ammunition casings after a large training operation has many 'simple' tasks to clear the range, however the leadership must extensively manage these individual simple tasks in order to accomplish the mission.

Currently, NATO possesses a collection of maverick leaders and innovators that have previously been able to create and direct the organization through largely unstructured means. NATO also possesses substantial populations of effective military planners that work in the structured-convergent context and draw upon formal military schooling and practice to solve problems and manage decision-making for campaigns and operations. Critical thinking for these convergent planners is further enabled by the NATO 'Alternative Analysis' education and practice. However, NATO lacks formalized design education and implementation.

Therefore Figure 4 present the essential bridge that NATO must establish and nourish between formal designers and military planners. The design-planning bridge (illustrated in gold) is where NATO can apply defense applied design in formal education and practice.

By doing this, maverick leaders and innovators can continue to influence NATO in unstructured ways, yet within the organization a formal and school-educated group of designers can build and maintain an essential bridge for design deliverables to transfer to planning teams. This bridge also draws planning observations and feedback from the field back to the designers to enable design re-frames and new iterations.

Rituals, customs and myths will continue (including within NATO and all military organizations) while each of these groups of planners, designers and mavericks might reflect upon their own cognitive biases and tendencies. NATO already has manifestation of Q1, Q3, and Q4 in their organizations, decision-making, and reflection. Incorporating design education provides NATO with an enhanced organizational ability by introducing Q2. Bridging convergent planning practices with well-structured design education will provide NATO advantages over relying solely upon maverick leadership that manifests sporadically and only at senior leadership levels. Design education delivers an institution-wide transformation in how NATO thinks, as well as how NATO '*thinks about thinking*' in complex conflict environments.

## NATO'S BATTLE CRY FOR ORGANIZATIONAL TRANSFORMATION: DEFENSE APPLIED DESIGN

In the contemporary security environment those, who can get the latest technology to the war fighter faster tend to enjoy comparative advantage, unless that technology in turn blinds the organization to alternatives. There is a need to increase operational agility, the ability to sense, and to build a network, but it must be supported by a new design.

Building a platform, which is the goal of multiple technological solutions<sup>47</sup> a technological fix is only one side of the coin. There is a need for an organizational one as well which connects the different components together, hence the need for design application and education,

<sup>47</sup> Some examples are the *JICSPOC* experiment – a horizontal integration concept in operation, which helps us better understand how to stitch all of our stakeholders together horizontally as an enterprise to better defend and create effects in and from space. See: "New Joint Interagency Combined Space Operations Center to be established". U. S. Department of Defense. 11 September 2015. <http://www.defense.gov/News/News-Releases/News-Release-View/Article/616969/new-joint-interagency-combined-space-operations-center-to-be-established>, Accessed on 12 June 2017. Another one is the "*Combat Cloud*" *Data to decision experiment*, which aims to bridge the gap between different types of data and how that data is communicated across multiple platforms. Welsh, P. "Looking to a cloud to share data faster". U. S. Air Forces Central Command. 16 Nov 2016. <http://www.afcent.af.mil/News/tabid/4768/Article/1006428/looking-to-a-cloud-to-share-data-faster.aspx>, Accessed on 12 June 2017.

which is aimed at speeding up organizational learning while identifying and contemplating organizational rituals, patterns and socially constructed processes that have become harmful.

Practicing design requires a structured design education as well as a deliberate management of NATO designers within the organization. Design also requires extraordinary tolerance to critical reflection, where essentially nothing is off limits and disruptive thinking may radically alter some extremely rigid and cherished mind-sets.

Although it may seem counterintuitive, the investment in design education may require that selected NATO professionals go through a structured design schooling before their assignment begins. An approach like this can provide a significant return on NATO investment in the long-run.

Since NATO professionals typically rotate through assignments and back into their nation's armed forces, ACT has the opportunity to enable design development within selected individuals, who (upon returning to their nations) can be the backbone of the national design thinking cadre, thus NATO as an organization gains additional design depth.

Further, if NATO were to develop internal design education programs for the organization, such an enterprise could be used both within NATO as well as for collaboration and development activities across the various partnered and allied nations. As multiple NATO partner nations are already implementing and running design programs at national defense universities, COEs, service schools and other military programs, NATO already has some design networking and collaboration capabilities within the Alliance to leverage.<sup>48</sup>

Were NATO ACT to establish a formal design education program, it would likely require the ability to conduct courses at NATO ACT, as well as at the NATO School in Oberammergau as well as project design modules (through Mobile Education Teams) to overseas and even remote locations. Design education itself might take one of several forms, including a series of 5-day packages,<sup>49</sup> a more robust multi-week model,<sup>50</sup> or potentially some combination of distance learning and on-site design practical exercises.<sup>51</sup>

Additionally, as NATO gradually builds up a larger population of design educated professionals, the organization would subsequently be able to conduct internal real-world design inquiries that would address NATO challenges in unclassified as well as classified contexts. These inquiries as well as the educational modules will require access to design educational experts, subject matter experts for consultation, and select NATO professionals that might be utilized for select design inquiries based on skills, qualifications, or experience.

For design to be inculcated formally across the NATO organization, leaders will need to invest in the future. The upfront costs of establishing a design program are minimal when

<sup>48</sup> The Polish, Dutch, American, Canadian, and Australian militaries all have some sort of design or design-like education within their services or at a military university. This potentially offers a rich network of design educators, facilitators, and practitioners to draw upon.

<sup>49</sup> For example, the Joint Special Operations University offers several 5-day design education courses as part of the U.S. Special Operations Command.

<sup>50</sup> The Canadian Forces College, U.S. Air War College, and the U.S. Army School of Advanced Military Studies Program all feature multi-week design courses within their year-long programs. See: Mitchell. "Stumbling into Design..."; "Canadian Forces College ..."; *Art of Design...*

<sup>51</sup> The Royal Netherlands Land Warfare Centre and various Think Tanks such as the Hague Centre for Strategic Studies conduct design in non-standard applications. See: Zweibelson. "'Design' Goes Dutch..."; Spiegeleire, S. D. *Designing Future Stabilization Efforts*. The Hague: Hague Centre for Strategic Studies, 2014. [http://hcss.nl/sites/default/files/files/reports/HCSS\\_Designing\\_Future\\_Stabilisation\\_Efforts.pdf](http://hcss.nl/sites/default/files/files/reports/HCSS_Designing_Future_Stabilisation_Efforts.pdf), Accessed on 12 June 2017.

compared to the more costly programs involving new hardware, technology and other deep skillsets. NATO will need to make key design educational decisions on when to begin and advance design education within their organization.

## CONCLUSION: ENABLING TRANSFORMATION IN NATO THROUGH DESIGN

NATO has been adapting throughout its history, but the tempo and speed that is required to deal with potentially disruptive challenges pushes the Alliance to the edges of its capabilities. In this context organizational learning must be speeded up, and the mindset and culture must be changed. Alternative options and their rapid implementation throughout the organization is the way to maintain competitive advantage in today's complex context.

Design thinking has been developed within the international military community over the past generation in a variety of ways. Armed forces are adapting civilian design methodologies into defense applied ones in some instances, while other militaries are innovating with alternative methodologies that position design thinking within an armed forces and human conflict frame. While NATO as an organization has already executed design activities within various locations and for a variety of missions, those efforts were individually inspired and local with respect to the entire enterprise. As multiple nations now incorporate design in formal military education within services, war colleges,<sup>52</sup> as well as at universities,<sup>53</sup> NATO should do no different.

Design challenges an organization, and through disruptive and innovative thinking helps generate organizational development as well as potential transformation within complex contexts. Organizations utilizing design thinking are able to think divergently as well as reflectively in highly chaotic environments, particularly where an organization's preferred tools and methods no longer seem effective.

Today NATO faces the most complex challenges in its storied history, and as increased technology, information, and the impacts of globalization potentially drive more frequent and emergent conflicts across the globe, design thinking is even more needed. Analytic-based military planning alone is insufficient, and campaign plans continue to seem as relevant as annual rain dance rituals for the organization; action without critical reflection and novel creation appear inadequate. A change in how NATO thinks, and *thinks about thinking* is needed.

Yet, militaries appear to be more traditional and resistant-to-change centralized hierarchies. NATO is perhaps even less flexible in some ways, in that as a composition of military partnerships, and the Alliance cannot focus on developing and educating a single service or national defense force. Since any design education endeavor will reach across multiple militaries, and require significant consideration as well as collaboration within and across NATO, ACT have a leadership role to develop and grow the defense applied thinking cadre for NATO, supported by a deliberate education design.

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<sup>52</sup> The Canadian War College has provided design education in some form since 2013, while the U.S. Air War College began offering design education to their Grand Strategy cohorts in 2016. See: Mitchell. "Stumbling into Design...": 84–102.

<sup>53</sup> The National Defense University in Washington, DC has renewed interest in design as of 2017, while the Polish War Studies Academy in Warsaw is incorporating design into its 2017-2018 courses. The Swedish NDU is following suit for 2018, while the Marine Corps University and several other military universities have explored design for future education implementation.



In a recent speech at the NATO Transformation Seminar in Budapest, Hungary, General Mercier challenged NATO by stating that the greatest challenge to NATO is that we need to operate and adapt at the same time and it requires innovative approaches.<sup>54</sup> This reflects the ACT's understanding that NATO must act now, and incorporate formal design education as well as subsequent design practices for the highly complex challenges awaiting the organization today, tomorrow, and just beyond the horizon.

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<sup>54</sup> Mercier, D. "SACT's opening remarks at NATO Transformation Seminar 2017 <<Improving Today, Shaping Tomorrow, Keeping the Edge by Bridging the Two>> Budapest, 22 March 2017". 2017. [http://www.act.nato.int/images/stories/media/speeches/170322\\_nts2.pdf](http://www.act.nato.int/images/stories/media/speeches/170322_nts2.pdf), Accessed on 12 June 2017.

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