Innovation Hub Warfighting 2040
Project Report

HOW WILL NATO HAVE TO COMPETE IN THE FUTURE?

March 2020
The views and opinions expressed in this publication strictly reflect the discussions held on the Innovation Hub forums. They do not reflect those of Supreme Allied Command of Transformation (SACT) or its member Nations and none of them can be quoted as an official statement of those entities.
Contents

Contents 3
Executive Summary 4
Methodology 5
The global strategic context 8
The Strategic Idea of Warfare 12
Implications For NATO 18
Recommendations 19
Executive Summary

2040 will be marked by a deregulated world where a wide number of actors will vie for power. Many factors have changed the world, such as climate change, and caused a lasting disorder, particularly in terms of security. In this disorder, new actors have emerged and consolidated their power at the expense of states and international institutions that have become impotent while the world has become de-Westernized, paving the way for the sinicisation of the world.

The character of warfare also has changed. The majority of conflicts remain below the traditional threshold of the commonly accepted definition of warfare, but new forms of warfare have emerged such as information and cognitive warfare, while the human mind is being a new domain of war.

Purpose

The Innovation Hub Warfighting 2040 Project seeks to conduct an independent future analysis of the operating environment. This independent analysis will inform concept development writers with an alternative assessment of the future informed by non-traditional NATO sources and will result in a more robust and complete capstone concept.
Methodology

Objective: Study questions

In order to inform SACT on how to develop capabilities and prepare for future operations, this study addressed three main questions.

- What will be different in 2040?
- How will this impact NATO operations?
- What should NATO do to prepare for this?

Approach

No one can predict the future, but everyone tries to shape it. Consciously or not, everyone builds a vision of the future that is heavily biased by one’s culture and current situation. While it is impossible to remove the individual biases, the careful design of this study method allows to mitigate their effects and come to more rationale findings.

A first goal was to mitigate group think. The fact that people tend to conform to the opinion develop by the group. This was achieved through:

- Conducting individual expert consultations in which each participant would have no knowledge of other participants’ insights.
- Conducting discussions and confrontations between ideas anonymously; which allowed everyone to disagree without being identified and face group judgement.

The other goal was to avoid western/NATO/military cultural bias. This was achieved through:

- Engaging with a worldwide audience through an open online platform.
- Select experts not directly related with Defense and from different cultures and locations.
- Involve the younger generations and students from various universities.

Insights collection

Crowdsourcing

The NATO Operations 2040, Open Online Exercise ran from February 18, 2020 through March 1, 2020. Anyone could participate.
- Interface: The context and NATO operations were very briefly explained with the intent to keep the contributions in scope without directing them. Each participant was asked to post as many individual ideas as they wanted about 2040. They were required to explain how the idea would impact NATO operations. All participants could comment, elaborate, counter, ask about any idea. All participants were asked to invest (rate) others’ ideas.

• Demographics: Significant efforts were made to involve participants outside of the traditional NATO echo chamber (western military); principally through social media engagement. As a result two thirds of the participants are considered to be from outside of the traditional NATO environment, from other nations, continents and demographics?

• The online platform was provided by the University of South California, that previously supported the US Army with similar crowdsourcing initiatives.

**Expert consultations**

16 experts participated individually in the study. They were selected for their expertise in diverse relevant topics and for their specific angles of approach and culture of origin. Their areas of expertise included: Politics, Economy, Sociology, Climate Change, Finance, Criminology, Cyber security, Quantum computing, Virtual Reality, Psychology, Neuro Science, Intelligence, Information, Forecast, Science Fiction, China and Pacific, Middle East, Russia, Latin America, Middle East etc.

They were asked to provide their insights through an essay or an interview. Some of their ideas were fed back into the open online platform in order to generate an open debate about them.

**Student focus groups**

Student working groups were organised in NATO Nations to discuss the study questions, bibliography, blogs, podcasts

The analysis of alternative sources such as various blogs, podcasts and articles was also part of the study.

**Analysis**

Innovation Branch staff analysed the information from these sources and sought to take into account the full range of political and societal factors, as well as technological advances, to describe the policy environment in 2040. An analysis of the strategic idea of
warfare followed, where the staff compared the traditional Western way of warfare with the futuristic way of warfare. Finally, implications and recommendations for NATO are included to ensure that NATO is ready to wield strategic power and compete in the 2040 strategic environment.
The global strategic context

Evidence suggests that the strategic landscape in 2040 will be a multipolar one, with multiple States, organizations, and non-State actors vying for strategic or regional influence.

The global strategic context in 2040 will undoubtedly be marked by the following main challenges:
- A deregulated globalization,
- The impact of climate change,
- The growing threat of human engineering.

The current context shows a political world undergoing major changes:

A deregulated globalisation

The end of liberalism?

The liberal democracy long seen as triumphant over the great ideological quarrels of the twentieth century is today seen as being in peril for not having been able to satisfy the people. The dominant liberal narrative\(^1\) since the end of WWII is losing ground and many countries and leaders reject the liberal system as a danger.

Democracy in particular is no longer seen as the ultimate form of government while at the same time order and authoritarianism is deemed to better cope with the dangers of a deregulated world.

While authoritarians are on the rise, electorates turned by extremes in democracies. Authoritarian systems are seen as a “viable alternative” due to proven successes; they keep a tight grip on society through social control, while democracies are thought weak by design.

Nation-states might become more authoritarian in the future.

The loss of institutional credibility

The strategic landscape in 2040 may see global organizations face tough challenges to their effectiveness and existence.

---

\(^1\) Liberalism is a movement aimed at freeing people from the social and political obstacles that frequently constrained and exploited them. It started to spread across the Nations after the French Revolution.
The lack of trust in the efficiency of international institutions is characterised by the global loss of credibility in the current institutions, by a decreasing faith in the world order and its system, by eventually a loss of public confidence in international/multinational institutions.

Populations will question the purpose and existence of international organisations if those organizations are perceived to be ineffective. The decline of international organisations and stress on them may lead to transformations of alliances and organisations.

**New actors and the weakening of States**

New actors have already emerged (such as global corporations, criminal organisations, Non-governmental organisations, world forums, anonymous and global cyber networks able to irreparably harm states and infrastructures…), some of them being already more powerful than the majority of the world’s states, leading necessarily to a redistribution of power that could increasingly defy the power of the states on the one hand and replace the states given their lack of efficiency on different matters.

While sovereign states are still major players in international relations, the changing international context as mentioned above has led to an erosion of their power on the international scene, but also internally. Paradoxically, the loss of confidence in international institutions does not seem to benefit states but rather a multitude of new actors, particularly in the economic field (e.g. the GAFA- Google/Amazon/Facebook/Apple). The State faces many challenges to its power, whether from populist and autocratic movements, or from corruption at the highest levels of business and political leadership, and this power erosion will likely continue through 2040.

This inescapable process is all the more remarkable that it goes along with a return to the nation.

While the state is challenged, the nation is seen as a refuge from the challenges of globalization in particular in Western countries where more and more phenomena of rejection of international institutions and return to the nation are observed.

The manifestations of this phenomenon range from the rise of nationalists, the indictment of multinational institutions, the refusal of leadership and even the downturn of states into themselves by building walls, rejection of multiculturalism, etc…

The real question is whether power is still desired today by the states in a world where the major challenges represented by climate changes, pandemic etc…require more than ever a globalised response.
The world order established after World War 2 is dying, states are receding turning the world into a long lasting disorder. This could end up in the collapse of the Westphalian order where States will no longer hold a monopoly on the use of legitimate international force and where multiple actors will defend, violently if necessary, their own interests.

The world disorder

The study describes a highly deregulated strategic environment with two main superpowers - USA and China- constantly challenged by regional powers.

The macro-economic environment is undergoing transformation. The shifting economic power from North America and Europe towards Asia is under way. Additionally, the shift of economic power from West to East may lead to what is called “a multipolar world of reserve currencies” noting that dollar dominance is uncertain for the next 20 years, and that alternatives to the U.S. Dollar exist that could replace the global reserve currency.

While the United States and China lead a multipolar world, others will emerge as strategic or regional influencers.

The general weakening of states, the de-Westernization of the world and the lack of global leadership should naturally lead China to assume the world leadership according to its own rules.

Climate Change and resource competition

While climate change is commonly regarded as a main driver of change for the world order there is no agreement on its potential consequences.

Climate change threatens the very survival of the human species, and in political terms, it could also be used by governments to fuel fears and undermine political regimes, notably by weaponising migrations.

Besides the human consequences on health and migrations that are hard to predict, climate change will exacerbate the risk of violent conflicts, and conflicts over natural resources could have catastrophic consequences. If humanity fails to adapt to climate change intra-state or even ethnic conflicts, which were thought to have definitively disappeared, could resurface, undermining the internal balance of nation-states.

With so many people competing within limited areas, environmental stresses becomes a concern for the future. Topics such as bio-economy, bio-risk from agriculture, food security, climate manipulation, and even weaponisation of climate change are threats or challenges that may be drivers of conflict.
Densely populated urban areas near coasts and environmental stressors such as climate change and resource competition will therefore most likely describe the future strategic environment.

The combination of climate change and a deregulated globalisation, especially the process of the weakening of states may be devastating since it requires more than any other threat a global and coordinated response.

The new Promethean Myth of hacking the human

Technology is also seen as a major driver of the future. The combination of booming new technologies (AI, computer science, nanotechnologies, biotechnologies in particular) suggests an infinite field of new threats and opportunities.

Among those technologies, the convergence of bio-engineering and computer science may have a strategic impact in 2040.

In particular, it gives humanity the opportunity to fundamentally rethink and reorganize the notion of human life.

Future technologies hold out the possibility of fundamentally changing the human nature, opening the door to technological advances that are even more dangerous than they are imperceptible. These technologies could eventually lead to human control and to transhumanism.

While the future environment will continue to be oversaturated with information, society must parse through to find “truth.” Society will be vulnerable to manipulation with information, and as adversaries try to fracture societies, the social fabric will be tested.
THE STRATEGIC IDEA OF WARFARE
Conflicts of 2040 will be non-conventional, frequently interrupted, highly asymmetrical and strategically poised. Information and Cognitive Warfare will play a major role.

The Way of the West
For the most part of its existence, NATO has faced one adversary in a Cold War where strategy was dominated by deterrence through nuclear threat and a conventional war strategy, or what was called“grand tactics” by Antoine-Henri Jomini. To this day, many believe that NATO nations are “stuck” in the Cold War era.

The post-Cold-War mindset of Western militaries could be construed as one of prioritising speed and risk management in warfare. John Boyd and his OODA loop\(^2\) are thought to have facilitated a movement into thinking about accelerating warfare tempo and speed, while risk management use of the military instrument of power began when pre-emption of adversary actions took center stage. Warfare is slowing down at the operational and strategic levels due to the threats expanding reach and preference for warfare in the “grey zone.”

Some would argue that the global information age is “driving war into the shadows,” and making conventional war obsolete. Conventional war theory in the West leaves the military instruments of power with large, expensive, and hard to replace systems while the State spends money on “newer versions of old platforms.” Additionally, the acquisition of these systems is predicated on antiquated assumptions that the Western militaries will be able to move freely without detection in permissive environments during a future war.

As shown on Figure 1, the warfare model depicts time across the horizontal axis and escalation along the vertical axis. Western States use the risk management philosophy during a crisis and if conflict escalates above the threshold of war, the militaries are prepared to cross the threshold of war and win with overwhelming firepower from a

---

2 Observe/Orient/Decide/Act or OODA loop is a decision-making concept developed by the US Air Force.
conventional force. Following hostilities, escalation falls below the threshold of war and post-conflict activities dominate the military strategy.

In an ideal world, the military would expect to handle a crisis, or two, and maintain readiness to either deter adversaries from escalating across the threshold of war or decisively defeat the adversary should they escalate across the threshold.

The New Era of Warfare

Adversaries are increasingly turning to war without crossing the threshold of war. To describe this phenomenon and new way to wage war, the Innovation Branch developed a graphic (Figure 2). Again, time is represented by the horizontal axis and escalation is represented by the vertical axis. In this model, there is a constant state of crisis and adversaries practice brinkmanship to “test” the threshold of war and reveal “acceptable behavior” that NATO is willing to accept before invocation of Article 5. Consequently, allowing this type of adversary action may enable their behavior and inadvertently raise the threshold of war. This type of warfare resembles to “shadow wars” and requires a whole-of-government approach to warfare.

Domains and Geo-strategy

This new type of warfare occurs in multiple domains and redefines geo-strategy. Warfare will include the use of social networks, lend/lease programs to build militaries, offensive information campaigns exploiting conspiracy theories, and soft power instruments and influence within NATO operations. Additionally, warfare might extend to new areas such as the ocean floor as nations vie for resources in neutral territory and build advanced basing, or underground warfare. The futurist version of warfare taking place in multiple domains and outside of the traditional North Atlantic sphere of influence suggests that the threat has global reach when practicing this new way of warfare in domains like cyber, undersea, and space.
A need to redefine war
Actions "below the threshold of violence" are made possible because there is a reluctance to counter them directly, which would imply dealing with real military capabilities.
Non-state actors can range from **techno-guerrillas to quasi-regular armies with the full range of capabilities**. Those potential adversaries may be capable to contest the domains that NATO and Western States historically dominated (i.e. in every domain: air, sea, land, space and cyber). In addition to these rising threats, regimes that operate well in ‘grey zones’ have a broader concept of war and are better able to harness political warfare in a more controlled way than the West, which will require a renewed and broader definition of war.

Privatization of Violence
Non-state entities of the 21st Century operate in extremely blurred situations where the frontiers are difficult to separate. The new security industry of private companies/mercenaries provides services for military operations recruiting former militaries as civilians to carry out passive or defensive security.

There are many factors at play that lead to the privatization of violence. As the State weakens, non-State actors seek to fill the role. Actors such as corporations, cartels, and wealthy or powerful individuals that turn to mercenaries or contractors to build their private armies or insure their own security.
For States the benefit is threefold:
* A lower cost than regular armed forces
* A lower impact on public opinion in case of casualties
* The use of plausible deniability when fighting in the new era of warfare.
For NATO with regards to the future warfare, the privatisation of war should be seen as a major threat since:
* Mercenaries do not fight conventionally, and traditional war strategies used against them may backfire (**asymmetry of ethics**)
* Terrorists/humanitarians/nations/multinational companies may hire high-motivated mercenaries (**asymmetry of will**)
* Money is a higher motivation than nationalism/patriotism (**asymmetry of will**)
* They can operate in all domain including cyber with the full range of capabilities.

The “low entry price to high tech war,” leads to the proliferation of advanced weapons and warfighting technologies available to the masses. As these technologies proliferate throughout the world, the ability to wage war increases for the non-State actors and
their private armies could potentially match the warfighting capability of conventional forces.

**War and Technology**

Future war will inevitably be permeated by technology and in particular digital technology.

We have to start from the assumption that technology is sufficiently shared that we will not have a full and uncontested supremacy on the technological field. In addition, some very basic and very affordable technologies may durably cancel out the effects of complex technology and our adversaries will oppose their will to our presumable technology dominance. In other words, it would be a mistake to over-rely on our presumable technology dominance.

But since we will share technologies, opportunities and vulnerabilities will be shared too.

Automation and AI represent the major risk, yet the combined use of robotics and autonomous systems and artificial intelligence without human interaction, regardless of the degree of technological advancement, cannot be strategically decisive.

The only decisive force in warfare during 2040 combat will be “boots on the ground” while technology will only be a force multiplier.

**Information and Cognitive Warfare**

The leveraging of the cyber domain (and information environment) to deliver non-kinetic and non-lethal effects has transformed warfare and shifted the center of gravity to a battle of narratives among the population from conventional violent conflict.

Western dominance of these two domains is no longer a strategic premise, which means that adversaries can match, or outmatch, the State on a global scale using these domains.

Information warfare involves the use of information overload or manipulation of information to create plausible deception and political discord. The purpose of these methods of distorting the information sphere is to create an environment where it is difficult to determine "the truth". Information warfare is not radically new (cf. Sun Tzu) but the new capabilities offered by the cyberspace and information technologies make it possible to reach out to a very wide audience with messages that are tailored and almost personalised to the chosen target.

It could be a decisive instrument of national power - it is a military problem without a military solution that requires governments to control the narrative through coordinated messaging between nations, which requires military liaison with other government departments and organizations throughout the nation.
In other words, information warfare is the number one threat and requires a whole-of-government effort that suits authoritarian regimes more than Western governments.

Cognitive warfare, very similar to information warfare, is a new way to wage war in the new era of warfare. This type of warfare primarily attacks the beliefs and opinions of the population with the aim of destabilising the cohesion, security and prosperity of a nation. It is about influencing the population, because technology facilitates a further reach into the population.

Cognitive warfare uses disinformation campaigns and steady streams of AI-generated fake news in an effort to undermine democratic foundations and weaken States through eroding trust in institutions and seeding doubt and indecisiveness in society at large. To demonstrate what the future of cognitive warfare could look like, scenarios describe cybercriminals mastering behavioral psychology and spreading disinformation, conspiracy theories, and online memes anonymously to create a chaotic information environment. The use of AI fakes and identity theft is also envisioned to facilitate this type of new warfare. It gives adversaries the ability to blur the lines between war and peace in their quest to put an enemy on the verge of defeat prior to hostilities by disrupting control of the country and armed forces. In a near future anonymous groups (maybe backed up by some hostile states) may seek to defeat governments prior to hostilities by undermining governments through cognitive warfare designed to enable popular movements of self-determination.

Cognitive warfare, much like information warfare, requires the whole-of-government approach to successfully defeat an adversary short of hostilities. As said before, liberal democracies are less equipped to fight in this cognitive warfare than authoritarian regimes.

To successfully exploit the information domain in the new era of warfare, competitors will have to take advantage of data that permeates throughout the domain. Several participants in the Innovation Hub online exercise explored the use of strategic analysis in the information domain. Data collection efforts in the information domain could include collecting data from smartphones/SIGINT, behavior observation, Chinese business investments, and influential people throughout society. Data could be used to help predict adversary behaviors or crises. Additionally, data could be used to simulate the global environment to test strategic decisions and military operations. These ideas represent just a few of the possibilities that could shape how information and cognitive warfare develop in future warfighting.

**Weaponisation of neurosciences**
Broad and rapid advancements in neuroscience and its technologies have prompted renewed and growing interest in the use of these tools and methods to exert influence and power on the global stage. While it has been said that *everything could be weaponized*, neurosciences and, more broadly speaking, Nanotechnology, Biotechnology, Information Technology and Cognitive Sciences (NBIC) are clearly providing state and non-state actors some true game changers.

The increasing use of neuroscience by our opponents poses the problem of a graduated and proportionate response to a non-kinetic attack in this area.
IMPLICATIONS FOR NATO

Instruments of Power

Fighting in the new era of warfare requires a whole-of-government approach using all instruments of power. Western States need to think differently than they do now, they need to up their “strategic IQ” to fight an adversary using all instruments of power in harmony. This new way of thinking, a revolution in thinking, must transform how the military fights and not what it fights with. All instruments of power must be available to fight in the new era of warfare, and NATO as an organization only has access to the military instrument of power and limited diplomatic power. Matejic believes that “NATO is absent from the affairs of State and indeed the public consciousness of nations on the cusp of informational segmentation,” and this constrains NATO in fighting the new way of warfare. In order to increase the “strategic IQ” in NATO, the organization must gain expertise on new challenges like China and become familiar with foreign direct investment and global value chains, as opposed to just areas like defence investment. The new era of warfare poses a problem without a military solution, and a revolution in thinking is needed to compete in this era.

Traditional adversaries of the West are more suited for the new era of warfare due to being less transparent and more controlling over the economy and society. These authoritarian regimes can wage a war in the shadows using nanotechnology, biotechnology, information technology, and cognitive science (NBIC) better than the West. There are multiple reasons why the West is vulnerable when it comes to capability to wage this type of war. Asymmetry of ethics hamstrings actions in the west when it comes to the ethics of using NBIC in warfare. Additionally, the structure of the Western State government leads to lagging policies, laws, and regulations while debate carries not only for NBIC topics, but also for AI.

Speed of Irrelevance

NATO as a political-military alliance is in a strategic dilemma when it comes to waging war in the new era of warfare. The new era calls for accelerated decision-making, yet NATO is governed by consensus and organized with layers of bureaucracy. NATO members need to realize that there are adversaries that aim to degrade NATO’s capability to act by influencing decision-makers through information and cognitive warfare. These adversaries will target and try to divide society to hamper decision-making in the West, which will buy time for adversaries. This means that NATO nations must focus on maintaining political and social coherence for Western democratic ideals.

Looking at the opposite spectrum of time, the speed of technology development poses difficulty for interoperability through procurement and life-cycle management.
processes. Interoperability is critical for NATO forces to defend the Alliance, and uneven modernization between member nations threatens interoperability of forces. Additionally, uncoordinated policies from the member nations regarding disruptive and emerging technologies affects interoperability. Given that interoperability is paramount to the Alliance, measures must be taken to ensure that all nations can take advantage of emerging technologies and that nations coordinate policies on those technologies.

**Recommendations**

**Human mind as the sixth domain of operation**
The reality of the Human mind hacking threat is undeniable and NATO must react in a concrete manner.
With the human mind being a warfare domain, NATO should develop capabilities to distort the flow of information to adversaries. Additionally, NATO should be prepared to use the information and cognitive domains both defensively and offensively.
This will start with an exhaustive state of the art study addressing the nature, plausibility, development of that threat, together with an impact assessment of attacks already perpetrated. Evidence gathering, structuration of the study do not raise any particular issue and can be distributed among several military and non-military international partners, but particular attention must be given to the quality of the deliverables so that they lend themselves well to the two next steps of NATO response.

**A whole-of-government approach to fight the new type of war**
Warfighting will transition to a battle for the human mind below the threshold of war. The modern concept of war is not about weapons but about influence. To shape perceptions and control the narrative during this new type of war, battle will have to be fought in the cognitive domain.
In order to effectively fight in the information and cognitive domains, NATO needs to emphasize a whole-of-government approach in order to address adversaries exploiting NBIC in future warfare. This will require “improved coordination between the use of force and the other levers of power across government,” which could mean changes to how defence is resourced, equipped, and organized in order to offer military options below the threshold of armed conflict and improve the military contribution to resilience.
Of course the likelihood of a low-intensity conflict developing into a high-intensity conflict should not be excluded.

---

3 Nano-Bio-Information Technology and Cognitive Science
Human Capital

Beyond improving coordination with other levers of power and capability development in cognitive warfare, NATO must look at how strategists are educated and recruited/retained in the military. NATO needs to focus on upping the “strategic IQ” of the organization by recruiting and educating its strategists that can coordinate whole-of-government solutions. Additionally, NATO needs to think about the human potential in ranks and how technology and the HUMAN will operate in harmony when fighting the new way of war.

Information is key

Information is key. The routes used by information should be considered and secured as supply routes. More generally, information warfare which in itself is not radically new, is benefiting from the extension of connected networks that present a wide range of actions ranging from shaping human motivations, group dynamics and social movements, sapping the enemy’s will to fight without fighting by information and cognition distortion to more purely military actions. Our competitive edge will come from better leveraging the tools we have:

• quickly deriving information from data;
• more efficiently and securely delivering information, guidance and authorities to the nodes that are able to act.

NATO Intelligence

To enhance interoperability and resilience, NATO must consider an inter-service intelligence capability, or Open Source Agency (OSA) that exploits open source intelligence (OSINT). Generally, users of data operate on 1-2 percent of relevant information, and an OSA would provide a radical improvement for NATO capability in collection, processing, and analysis of data. This organization could assist with warfare in the cyber domain, using big data and effective partnering to properly attribute attacks in a domain where anonymity makes attribution difficult. An inter-service OSA could bring nations together to exploit OSINT (Open Source Intelligence) and enhance interoperability and resilience.
Agility and adaptiveness

With the advent of hypersonic capabilities and automation in warfare, NATO will require quicker decision-making. Current processes, organization and bureaucracy in NATO hinder the potential adoption and exploitation of machine-speed warfare. The competitive edge in this new era of warfare will come from having the ability to quickly derive information from data and being able to deliver that information and guidance efficiently and securely throughout the network. To remain agile enough to fight the new type of war, NATO must not only excel at information warfare, but flatten its organizational structure, or there is a threat that NATO will not exist in 2040.

Furthermore, to prevent strategic paralysis when faced with the speed of emerging weapon systems, NATO must consider pre-delegation of authority to military commanders. Lastly, transitioning from a risk management to a defence and deterrence mindset will assist NATO to become adaptive in this new environment.

Rapidly integrate Innovation

Innovation has shifted from the public sector to the private sector, and the military must learn how to work with technology companies rather than the defence companies. This includes considering perception sensitivities in the public and being transparent to avoid employee protests like the Project Maven Google employee protest. Specifically, NATO struggles with the idea of forming relationships with non-defence companies. Additionally, the procurement process is too complex and too long, which means that the process lacks the speed at which technology companies like to work with and reduces profit margins below what startups are comfortable with. The excessive red tape associated with the procurement process creates an environment where specialization in navigating through red tape is necessary for companies and “builds walls around innovation.”

In contrast, China enjoys an advantageous military-civil fusion due to the nature of their government structure. The government is far more integrated into the economy and can essentially dictate economic conditions and actions. Although China has an advantage with military-civil fusion, the country still has the same challenges as NATO in speed of innovation. When it comes to integrating technology in warfare, the challenge is not inventing the technology, but in figuring out how to apply the technology to warfighting.