

Contribution of the Innovation Hub To NATO Strategic Foresight Analysis

February-July 2015



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INTRODUCTION

Strategic Foresight Workshop and Forums Report

April-July 2015

At the request of the Strategic Plans and Policy Directorate, the Future Solutions Branch led a workshop, leveraging crowdsourcing, the social media, online collaboration tools and videoconferencing.

The first phase, April-June, of this effort focused on building a broad community of subject matter experts and involved them in online discussions forums.

The second phase, the Exploitation Videoconference, had the objective to elaborate on and synthesize the forums discussions. It was conducted on 24-26 June 2015 at the Innovation Hub, and brought experts from academia, industry and think-tank from all over the world, both onsite and online.

In the third phase, July 2015, all the gathered inputs were collated for reporting.

This report provides a summary of the main points expressed during the workshop and constitutes the bulk of the response to SPP's request.



BACKGROUND

In support of its NATO military transformation mission, Allied Command Transformation is conducting persistent foresight and future studies. The initial part of this effort, the Strategic Foresight Analysis, identifies trends that shape the future strategic context and derive defense and security implication for the Alliance to 2030 and beyond.

The online workshop organized by the Future Solutions Branch at the Innovation Hub supported and complemented the traditional approach to developing the Strategic Foresight Analysis (SFA) by way of leveraging crowdsourcing and online collaboration, hence offering a series of unique benefits:

- A community of experts recruited online adding to and complementing the one traditionally available;
- The ability to collaborate remotely and deliver informed products beyond time and space at reduced cost;
- The opportunity to involve participants and contributors who cannot travel;
- The collection and development of original and out-of-the-box inputs;
- The recording and archiving of all inputs, including the conference, which allows full traceability, better analysis and further exploitation.

OBJECTIVES AND SCOPE

The objective of the workshop was built upon the latest SFA and the products and findings from the Vienna workshop with out-of-the-box inputs. As a side benefit, it built a strong community of online experts who is eager to continue support to the next SFA steps.

DESCRIPTION OF THE APPROACH

Tools and Techniques

The workshop leveraged the two Innovation Hub sets of techniques:

1. Asynchronous techniques:
 - Announcement and marketing of the workshop through social media, leveraging text, still image and video;
 - Presentation of the project through a website;
 - Identification of experts through online open sources and social media;
 - Gathering of the community on the Innovation Hub Collaborative Platform;
 - Community discussion of the topics on the Innovation Hub Collaborative Platform forums;
 - Community discussion of the topics in the social media;
 - Information sharing with experts by all available online means;
 - Online interview of identified experts.

2. Synchronous techniques:
 - Exploitation videoconference (Live debates, chats and presentations)

Strategic Insights

Politics

In a context of globalization and of restructuration of the world order characterized notably by the end of the Western predominance, states and institutions will be increasingly questioned and confronted to global challenges that they will be unable to face alone.

Key Insights

- **Institutions will be seriously tested and questioned**
- **Non-state actors will continue to rise**
- **Traditional western governance poorly adapts to information age**
- **Russia is not a threat in the long term**
- **Building bridges with China will help bringing a world balance**

Over the next fifteen years, international relations will undergo a profound change in the distribution of global power, marked on the one hand by the end of the Western domination and the end of the American monopoly, inaugurated at the end of the Cold War, and, on the other hand, the emergence of new powers with global ambitions (e.g. China, India) or even regional dimension (e.g. South Africa, Indonesia), and the shift of geostrategic and geopolitical and geo-economic balances to the East (and to a lesser extent the South). It is questionable though whether these new powers will be able, willing or reluctant to undertake costly or risky international commitments and share global responsibilities, which may lead to major changes in international governance.

If the U.S., Japan, and the EU are allowed to make alliances on a case-by-case basis with BRICs and especially with China; and if the U.S. remains aware of how it balances interests, both economic and political stability should be maintained. The opposite would have detrimental consequences to all parties.

The Western political structures will be increasingly challenged and loose relevance. A coherent, multinational, multiagency, multidisciplinary, multi-domain approach may prove efficient in tackling world issues.

The rapid pace of globalization will continue to mine national political institutions as well as national identities.

States will be increasingly attacked 'from above' by speculators, tax-haven lawyers, multinational companies, and libertarian activists who try to escape from

the grip of states or to mitigate their power; and 'from below', by interconnected mafias and criminals of some sorts that have a well-understood interest in escaping the rules established by states.

This will challenge the 'Westphalian' order and require taking into consideration the growing indirect impact of these new non-state actors on International Relations. On the other hand, globalization will compel every organization, to increase its agility and capacity.

It is not unlikely that Russia's multiple structural weaknesses will progressively erode its impact, relevance and threat. However, it would become a serious issue if Russia would fall into a failing state situation allowing non-state actors to divert the local resources towards destabilizing the region.



Human

In the thirty upcoming years, humanity will experience significant demographic shifts ranging from population increase of over 25 %, aging, deepening imbalance male/female, fast growing urbanization and regional and transcontinental migrations that may threaten territories.

Key Insights

- **Significant increase of population growth, demographic shifts and migration.**
- **Tremendous strains on resources and institutions.**
- **Challenges to the existing social contract by a disillusioned, mobilized citizenry**
- **The defense and security efforts prioritize non-kinetic actions over war fighting**
- **The impactful structures and institutions will be those that will be organized into dynamic, flexible, innovative and problem solving networks.**

Demography

Whatever the assumptions, the world population is expected to reach 9 billion people by 2040. However, this strong increase hides very strong regional disparities: Africa and Asia are likely to increase their population dramatically faster than everywhere else, what could be a new source of tensions and imbalances. In addition, the world population is aging, and this phenomenon affects all continents. This could, in particular in developed countries, dig the demographic deficits, increase government spending, and ultimately have a significant impact on social systems. In other countries, particularly China, this trend could curb economic development or weaken social balances.

One significant change over the next 15 years in public health with respect to naturally occurring processes (e.g. excluding biological weaponization) is the increasing threat of antibiotic resistance in human pathogens. The spreading of infections and diseases that has been accelerated by the globalization and migrations could be a important challenge for humanity.

One has only to consider the recent Ebola outbreak to understand the consequences of ignoring diseases that are not currently first world problems.

Migration and Society Resilience

Migration is connected with economy, education, family, health, justice, society and climate change. The threats of poverty, infectious disease, and environmental degradation, inter-state conflict, civil war, genocide, and other atrocities will continue to be the main drivers for migration.

Management of international borders has changed radically during the past years both in terms of the demographic challenges posed by mass movements of asylum seekers and their exploitation by ruthless traffickers. In an ever more complex world this mix is expected to increase both numerically and in complexity during the coming years.

National resilience reflects society's sustainability referring to the ability to maintain national social fabric and cohesion when confronted by any kind of threat. It is closely related with vision and values shared at the level of the nation. As today a nation cannot be easily defined geographically, unifying people or communities will require systematic effort.

Having an impact on what values citizens are willing to stand for, with whom they see themselves to be connected and what they believe to be the essence of society and nation, comprehensive nation-building projects will have important consequences in terms of national security, and also in terms of social welfare and national culture.

On the other hand, immigrant newcomers may feel pushed into tight sub-communities of shared fate, cultural beliefs and customs. However, the set of such resilient communities do not equal automatically to a resilient nation. Excluded or un-integrated sub-communities may prove to be very resilient for themselves but not for the nation.

Instead, there will always be a hidden potential to social unrest in expanded societies where ethnic-, religion- or culture-based fragmentation has appeared, especially in the Western societies where identities and cultures may coexist as long as there is a will of sharing values and causes.

People's increasing Influence

Online networking and communication is continuously increasing people's regional and global impact. No product, initiative, structure or policy will achieve full success without the support of people. This drives a shift in focus for all

relevant actor towards engaging with, adapting to and getting support from the populace. This will significantly affect industry, commerce, business, politics and security.



Technology

Given the exponential acceleration of technical progress, it is difficult to anticipate upcoming disruptions. However, should this rate continue to increase, a real upheaval in the world can be expected impacting quality of life, social and international relations.

Key Insights

- **Unprecedented technological innovation and change unlocking possibilities for sustainable development**
- **Cyber security is the priority**
- **Overreliance on systems will likely generate major vulnerabilities**
- **It is likely to expect an emergence of alternative and innovative ways in technology development and industrial production, which will likely increase the mismatch of legacy defense procurement processes.**

While the accelerating pace of science and technology-based innovation unlocks much needed possibilities for sustainable development, it also makes it difficult to identify the game-changing technologies that will impact security. Furthermore, the increasing affordability of dual use technologies (civil and military) lends significantly damaging power to any ill-intentioned non-state actor, while the slow and over-expensive defense technology exploitation and procurement processes struggle with keeping pace with progress.

Autonomous Systems

The advances in Artificial Intelligence and Autonomous Systems have significant impact on societies. More policies and regulations will be packaged in computerized systems so computers can administer them. Machines will carry out more cognitive task while humans take on the responsibility of making sure that the policies are appropriate for mankind. Efficiency will be reached through the optimization of the human-machine synergy. While failing to give to the human the most important role in a system will generate inefficiencies and weaknesses.

Socially this will mean that there will be a need for major reform, as machines will be doing many of the tasks that have been performed by humans. It is eventually questionable whether this could lead to a new model of society, which includes more leisure time, more education and a new economics. In the other hand, one can ask the question of the control of the technologies and may bring

to the return of the power of states that may want to regulate the technological domain.

Cyber security

The cyberspace is now the “fifth battle space” or domain on the agenda of security experts. Cyber attacks will increasingly affect governments, businesses and individuals, demonstrating not only the connection vulnerabilities, but also their relative ease of implementation and the great difficulty to identify and punish the perpetrators.

In a fast growing interconnectedness, the need for cyber security will become a crucial issue for the functioning of states, organizations and businesses.

The field of cyber security has not yet been codified into legal terms while it will clearly represent a major threat to institutions, businesses and individuals.

The importance of the cyber environment is likely to increase exponentially. It will continue to be both an opportunity and a threat to be addressed in priority.

NATO and Technology

When it comes to technology, it's not just the individual breakthroughs and capabilities that matter. One of the key things that NATO should be mindful of is creating the tools and business processes that will allow NATO and its members to adapt to the rapidly changing technology landscape. The proliferation of technologies fueled by the commercial marketplace will continue to produce military-relevant systems like UAVs, micro-satellites, advanced computation and sensing capabilities at faster and faster rates. NATO will have an important role to play in helping its members identify and capitalize on commercial technology opportunities ahead of the threat.

Economics and Resources

The world evolves within an economic transition period where the Western neoliberal model is challenged by increasing systemic risks (including among others resource scarcity and decrease of defense expenditures) that could lead to the obsolescence of the existing international regulation tools.

Key insights

- **Emergence of a alternative/non-western economic models**
- **Technology could solve the energy and resource issues...**
- **...But protectionism in policies and markets might smother the technological benefits.**

Global Trends in Economics

The world has entered in 2008 a period of great uncertainty and economic and financial instability that still has tremendous consequences.

It is becoming more and more obvious that the global economy growth is unstable, mostly due to the economic growth in the U.S, but also to the uncertainty of the Eurozone and China. In addition, the Greek crisis suggests a marked slowdown in growth in the still unpredictable consequences for the security of the world.

The relative decline of the United States is also reflected in the rise in power of new actors such as BRICs seeking to impose a new economic order whereas their own economy may not be as valid as it seems.

This may lead to an acceleration of the transition away from the current economic and financial paradigm and eventually would amount to questioning the global economic and financial regulation bodies.

In the end, despite a sustainable slowdown, the global economic growth will probably reduce poverty but also could lead to an increase in inequality - between countries and within countries - and resulting social unrest.

Resource scarcity

Global warming, potentially generating more frequent and more extensive natural disasters, seems inevitable despite the awareness and mobilization of countries at the international level. These issues will probably remain highly politicized and sources of cleavage, particularly between developed and developing countries.

Under the combined effect of the increase in demand and environmental degradation, access to natural resources along with natural resource scarcity will be a major challenge facing humanity.

The global demand for agricultural and food a product is likely to increase drastically in the coming years, while at the same time natural resources are dwindling. Global food security should depend increasingly on the ability of states to engage in cooperative strategies. Food crises and water could contribute to exacerbate crises shifting to conflicts between or within states.

In terms of industrial and environmental issues, the changes in lifestyle and consumption will become a crucial issue for the future of the planet and the security of states. As a matter of fact, energy transition is never "soft": geopolitical tensions appear along with natural resource scarcity: water, energy, food.

Even if the accelerated advances in science and technology will bring efficient solutions to global issues such as resource scarcity, the political and economic relations, based on self-benefits instead of global interest, will limit their positive impact.

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True Cost Economics

When evaluating any specific strategy, policy, acquisition, or operational plan, it is helpful to think in terms of total true cost. True cost includes not only the financial cost, but also the ecological cost and the social cost. Specific operations, especially those that fail, create huge social costs including illegal refugees.

Defense expenditures

Public opinions in the Western countries are not prepared to accept an increase in defense budgets in a context of latent economic crisis.

Meanwhile, the military expenditures are steadily growing in Asia, in Africa and in the Middle East.

This trend will continue in the future, thus not only compromising the military capabilities, but also increasing the military gap between the Western countries and emerging countries, but also among NATO Nations.



Environment

The degradation of the environment is expected to continue at a relatively high pace in parallel with industrialization and urbanization. Societies adaptation to the new environment has a significant cost.

Key Insights

- **Difficulty to predict where climate change related disasters will hit**
- **Consequences are exponential**
- **NATO plays an increasing role in responding to environmental disasters and in addressing their causes.**

Global warming is a long-term phenomenon difficult to address for political and economic reasons. It is clear that it will generate more frequent natural disasters and of greater magnitude. The phenomenon seems inevitable but the extent of its environmental impact, health and economic policy will probably depend on the mobilization at the international level.

These issues remain highly politicized and sources of crises, particularly between developed and developing countries. Under the combined effect of the increasing demand and environmental degradation, access to natural resources will be a major challenges facing humanity.

The inability of states to cope with a situation that endangers the survival of the human species needs awareness at the individual, national or even international level that could lead to an emergence of a new kind of citizenship and new forms of global governance.

The consequences of climate change are:

- Environmental (degradation of arable area, deforestation, increasing of sea water level...)
- Economic (resource scarcity, food prizes, reduction of cultivable areas...)
- Health (pollution peak, natural disasters, spread of diseases...)
- Strategic (competition for rare earth elements, migration, opening of new trade routes...)

In the long term, climate change and its consequences on environment could lead to three types of threats to the stability of the world:

- Internal riots (like the 2008 food riots)
- Tensions related to the appropriation of resources
- Direct confrontations between states.

Societies will have to adapt the consequences of environmental change. The cost for it will be significant but unequally distributed. It is expected that the poor, areas and populations, will be the more challenged.

This will also require an adaptation of military assets. It is expected that NATO would play an increasing role in response to environmental disasters and their causes.



The Future

In a period of accelerated change increasing uncertainty, only the agile and responsive structures prevail and collaboratively contribute to the development of a new world balance.

Key Insights

- **Increasing change rate, uncertainty and resulting instability**
- **Populations living conditions degrade while their influence increases**
- **Impact of and adaptation to the cyber/information age is key to efficiency and resilience**
- **Alternative and innovative groups, structures and relationships rise within and outside existing organizations with an impact on world and regional dynamics.**
- **Collaboration and agility of some main actors from the fields of economy and politics through a coherent comprehensive approach allow to efficiently address critical world issues.**

The world accelerating transformation and increasing uncertainty is challenging existing structures, and affecting the global and regional balance, while lending many new opportunities to old and emerging actors.

Among the many drivers for this, two need to be highlighted as outstanding: Cyber and Information

The power of the ubiquitous and unregulated cyber assets is leveraged by everyone, from individual to global companies, for good, and for bad. The cyber space has also become vulnerability and the main security concern. Keeping up with its fast evolution is a daily challenge.

Each individual is both a provider and a consumer of universally accessible information. While transparency is expected from every organization, their main focus is to conduct efficient influence activities in support of their goals.

Traditional multinational and national structures are slow to follow these transformations and continue to lose relative relevance while new actors and systems arise.

The political, military, and legal systems to address the resulting issues and threats have yet to be developed.

Even if a new balance should be struck at some point, before getting there, society and organizational resilience in an unstable environment will depend on the ability to respond and adapt to change. In addition, the magnitude of the issues to solve requires a collaborative approach. As a consequence, those who will adapt and collaborate will shape the characteristics of the new balance.

**Have an Idea about
What will change in the future?**

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