BRIEFING NOTES

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EMERGING TECHNOLOGY TRENDS DUE TO COVID-19 PANDEMIC AND POSSIBLE CONSEQUENCES ON SOCIETY AND NATIONAL SECURITY

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- Objectives: This briefing note (BN) aims to provide background knowledge, information
  and analysis on trends of emerging technologies due to COVID-19 pandemic. It will address
  in general terms the issues that are associated with it, and more specifically as they pertain
  to the national security.
- Scope: This BN will focus on emerging technology trends and possible pandemic scenarios that may occur in future.
- Target audiences: The outcome of research would be a general technical discussion on the subject matter and hence would be appropriate for general audience of DND/CAF, while the analysis and final outcomes would also be useful for DND/CAF senior leadership.

CONTEXT

- The devasting impact of COVID-19 on economy and human life is yet to be fully evaluated and studied. However, without a doubt the consequences of this pandemic and breakout will change our life style for many years to come.

- What can be said for sure is that, COVID-19 is not the first pandemic and will not be the last one. Decades of scientific research points out that recent pandemics were direct consequences of human activities [1], and these sort of pandemic with even worst consequences, will be inevitable to occur in future [1], [2].

- In 2004 the Canadian government recognized the public health threat as a national security issue [3].

- In 2012, the Canadian government issued a joint plan with U.S. and Mexico on Animal and Pandemic influenza in North America [4]. However, the recent COVID-19 pandemic and failure of early warning for Canada [5], [6], can be a justification and confirmation that much stronger and more organized preparedness will be required in future.

- COVID-19 pandemic was not limited to only health related issues. It has impacted the world economy through supply chain disruptions, work force reductions and significant unemployment, and in general a significant slowdown of the world economy.

- However, the disruptions in economic activity has not been uniformly impacted all businesses. Specifically, some companies and technology innovators have taken advantage of the current situation as an opportunity to further grow their businesses. It turns out that majority of these businesses are among the emerging technologies.

- Technology fields that have taken advantage of COVID-19 are mostly digital technologies. There has been interests on virtual reality/augmented reality (VR/AR) technologies for remote training, and autonomous vehicles to overcome shortage of drivers and improve the supply chain network.
- 3D printing, AI, robotics and 5G are also be added to this list.[7], [8]. Digital Health and Innovation department of World Health Organization (WHO) during the COVID-19 fight has received significant amount of demand on digital health technology solutions [9].
- UN is also promoting remote psychological services known as Tele-psychiatry and Tele-counselling [10].
- COVID-19 pandemic can accelerate the digitization of society in all aspects from health care systems to employing robots and autonomous vehicles for grocery, medicine, and other goods delivery.
- However, vulnerabilities in digital systems are inevitable. The Canadian Chief of the Defence Staff (CDS), recently warned on intention of adversaries to exploit anxieties about the pandemic, and the Communications Security Establishment has reported that they have already taken down a number of sites that were sending scam and phishing emails to the Canadians [11].
- Unfortunately, many vulnerabilities may remain undetected and unknown in computer systems for years. Only recently Blackberry researchers have reported that for a decade Chinese sponsored hackers had access to Linux systems [12]. Linux is an operating system (OS) for most of the internet and cloud servers and run on all of the top 500 supercomputers in the world [13].
- A recent report unveiled that Germany BND and U.S. CIA were controlling a Switzerland-based encryption company for many years [14].
- Emerging, and specifically digital technologies can bring significant improvements to the economy and life, while they will also introduce new risks and threats to society and national security. New technologies are potentially more prone to misuse, and risks will be much higher in situations such as pandemics where tensions and anxieties are high.
- Emerging technologies do also introduce many potentials for vulnerabilities to national security. For example, in 2018 U.S. banned Broadcom proposal to takeover Qualcomm due to national security concerns [15]. If in a future pandemic, either by natural causes or deliberately, is combined with caber-attacks or cyber-terrorism could result in catastrophic circumstances. COVID-19 can actually threaten the world peace and security, as stated by the UN Secretary General, due to lack of preparedness and delays in responding by many countries [16, p. 19].

CONSIDERATIONS

- It is estimated that in wealthy nations approximately 27% of workers can work remotely [17].

- Remote working can potentially diminish the dignity and social value of work, and could blur the boundaries between work and personal life that could loosen individual privacy of employees. This itself can lead to mental problems for s segment of the society [17].
- Vulnerabilities in digital emerging technologies are inevitable and cyber security will remain a top challenge for the foreseeable future.

NEXT STEPS (If applicable)

- Due to the COVID-19 pandemic and emergence of new technologies now would require that more efforts be devoted to investigating and analyzing these novel trends. Governments and policy makers should be able to anticipate how these technologies can affect the society and the national security in order to be more prepared for future pandemic situations.
- More study has to be devoted to all the possible changes of citizens' behaviour through use of these technologies. The resulting consequences due to the pandemic and all the possible resulting outcomes and ramifications for the future have to be formally investigated and evaluated.
- New capabilities and functionalities need to be developed for the DND/CAF in order to be able to monitor, identify, and to take prompt and appropriate actions for managing and regulating possible damages due to misuse of emerging technologies on national security and society, and specifically during the pandemics and/or cyberattacks by malicious actors.
- New opportunities and risks associated with adoption of emerging technologies need to be identified and singled out and the role that DND/CAF can have in unprecedented critical situations should be clearly formalized and institutionalized.

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