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INNOVATING DND'S INNOVATION PROGRAM

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INNOVATING DND'S INNOVATION PROGRAM

AIM

1. This Service Paper shall summarize the numerous Department of National Defense (DND) innovation programs in Canada, how they relate to one another, and highlight the areas that require to be improved. The aim of this Service Paper is to understand the current state of the innovation programs in Canada so that a Directed Research Paper can be written to provide recommendations on improving Force Development efforts to deliver innovative technologies and solutions to the Canadian Armed Forces (CAF).

INTRODUCTION

2. One of the common themes from CAF/DND organizations for JCSP 46 research topics was innovation and the improvement of the procurement process. Strong, Secure, Engaged (SSE)¹ led to the creation of numerous innovation programs in Canada such as Innovation for Defence Excellence and Security (IDEaS)² and built upon existing programs such as Innovative Solutions Canada (ISC)³ and Build in Canada Innovation Program (BCIP)⁴. All of these programs are or were managed by various government organizations with different mandates. Moreover, individual military elemental or organizational innovation programs exist such as the Naval Technical Innovation

¹ Canada and Ministère de la défense nationale, *Strong, Secure, Engaged - Canada's Defence Policy*, 2017, http://epe.lac-bac.gc.ca/100/201/301/weekly_acquisitions_list-ef/2017/17-23/publications.gc.ca/collections/collection_2017/mdn-dnd/D2-386-2017-eng.pdf.

² National Defence, "Innovation for Defence Excellence and Security (IDEaS)," program descriptions, aem, September 25, 2017, <https://www.canada.ca/en/department-national-defence/programs/defence-ideas.html>.

³ Innovation Government of Canada, "Innovative Solutions Canada - Home," home page, accessed October 21, 2019, <https://www.ic.gc.ca/eic/site/101.nsf/eng/home>.

⁴ "Build in Canada Innovation Program (BCIP): Commercialization Support," *Mentor Works Ltd.* (blog), accessed October 21, 2019, <https://www.mentorworks.ca/what-we-offer/government-funding/business-expansion/bcip/>.

Program (NTIP)⁵ and the Material Acquisition and Support (MA&S) Innovation program. DND's innovation platform is saturated with programs and they are administratively intense and confusing, which limits the innovation capacity of the programs.⁶

3. The implementation of the government of Canada's innovation programs for DND primarily falls under one of three organizations: Assistant Deputy Minister (ADM) of Data, Innovation, and Analytics (ADM(DIA)), ADM of Science and Technology (ADM(S&T)), or Innovation, Science and Economic Development (ISED) Canada. Other organizations who have DND innovation programs are outside of the scope of this paper. This Service Paper shall briefly discuss the roles of the three main innovation organizations, their mandates, and how their programs overlap. The discussion will also focus on areas requiring to be improved in the overall innovation program while highlighting some steps that organizations have already taken to fix some of their issues such as the Defence Innovation Exchange (Innovation Ex) program.⁷

DISCUSSION

4. The three main organizations that have DND innovation programs: ISED, ADM(S&T), and ADM(DIA) all have different mandates, diverse submission processes, and dissimilar requirements with different examination and acceptance criteria. These differences make it extremely difficult for someone with an innovative idea outside of

⁵ National Defence Government of Canada, "RCN Innovation | About | Royal Canadian Navy," April 19, 2013, <http://www.navy-marine.forces.gc.ca/en/innovation/innovation.page>.

⁶ MaryAnne M. Gobble, "The Importance of Management Innovation," *Research-Technology Management* 61, no. 6 (November 2, 2018): 54–58, <https://doi.org/10.1080/08956308.2018.1516932>.

⁷ "Introducing the Defence Innovation Exchange: Innovation Ex – The Maple Leaf," accessed October 17, 2019, <https://ml-fd.caf-fac.ca/en/2019/09/33715>.

DND to apply with a submission. Not having a central agency for innovation with common practices and guidelines for an innovation program is one of the main hindrances that will need to be overcome in order for innovative technologies to be delivered to the CAF.

5. ISED reports to four different ministers, but only two are of primary interest for the topic of this service paper: the Minister of Innovation, Science and Economic Development and the Minister of Science and Sport. ISED focuses on the investment of Canadian tax dollars in the economy across the country to improve conditions for investment, enhance innovation, and to ensure a fair and competitive marketplace. They are also the federal institution that leads the Innovation, Science and Economic Development portfolio for Canada.⁸ DND has a close working relationship with ISED as they work with ISED to obtain project approval and funding through Treasury Board or justifying costs for sustainment through the Sustainment Business Case Analysis (SBCA) process.

6. ISED is responsible for several of Canada's innovation programs, which span many governmental departments, including DND. For the purposes of this service paper, only ISED managed innovation programs that affect DND will be discussed. Innovation Solutions Canada is the program within ISED that is responsible for posting innovative challenges to their Innovation - Open Challenges website⁹; however, it is not well advertised on the ISED homepage. Its inaccessibility is one of the main issues with it as a

⁸ Innovation Government of Canada, "Innovation, Science and Economic Development Canada - Home," home page; Home Pages, accessed October 21, 2019, <https://www.ic.gc.ca/eic/site/icgc.nsf/eng/home>.

⁹ Innovation Government of Canada, "Challenges," accessed October 21, 2019, <https://www.ic.gc.ca/eic/site/101.nsf/eng/00001.html>.

potential innovator requires to click through three different menus in order to access the webpage. Innovation Solutions Canada has several innovation challenges sponsored by DND such as the Advanced Decision Support for First Responder Command and Control and Up Hands Free Firefighting, both of which closed on Feb 7, 2019. Innovation Solutions Canada also absorbed BCIP.

7. BCIP predates the innovation programs under SSE as it launched in 2010. It has now been absorbed under Innovation Solutions Canada and is no longer accepting new proposals, but it will serve as a testbed for Innovation Solution Canada moving forward. Since 2010, it has awarded over 240 government contracts totaling over \$100M.¹⁰ The last awards for BCIP for DND were in to PRE Labs Inc. in Aug 2018 for \$210K to develop a modular hard body armour system and to Lumiant Corporation in Sept 2018 for \$884K for end-user testing of their titanium ceramic composite material. Status of BCIP innovations could not be found through internal DWAN or external websites.

8. IDEaS is an innovation program that is managed by ADM(S&T) through the Minister of National Defence. ADM(S&T) reports directly to both the Deputy Minister (DM) of National Defence and to the Chief of Defence Staff (CDS) of the CAF. ADM(S&T) provides strategic knowledge and technology advantage through Defence Research and Development Canada (DRDC).¹¹ IDEaS was mandated in SSE with a budget of \$1.6B over the next 20 years to establish research groups to stimulate collaboration and the free flow of ideas for innovation. The vision of IDEaS is to bring

¹⁰ “Build in Canada Innovation Program (BCIP).”

¹¹ Defence Research and Development Canada, “Defence Research and Development Canada Mission and Impact,” organizational descriptions, aem, July 3, 2013, <https://www.canada.ca/en/defence-research-development/corporate/mandate.html>.

together academics, industry and other partners to form collaborative innovation networks.¹² Areas for advanced research and development included surveillance, cyber tools for defence, space, alternative fuels, remotely piloted systems, data analytics, and counter-improvised explosive device solutions. The IDEaS website has open, closed, and future DND challenges on their website, all of which differ from the DND sponsored challenges for Innovation Solutions Canada.

9. IDEaS and Innovation Solutions Canada both use different government services to apply for and assess the eligibility of an innovation challenge. IDEaS utilizes Public Services and Procurement Canada's (PSPC) buy and sell website to post and apply for innovation challenges¹³ whereas Innovation Solutions Canada uses the Shared Services Canada's GC Key¹⁴ for innovation submissions, but also posts information on PSPC's website. Innovation Solutions Canada requires a potential innovator to fill out an ISDE3732 application form whereas ISED applications use a DND 4597 form in addition to any other requirements listed under the tender notice of PSPC's website. IDEaS has submitted large call for proposals through PSPC whereas Innovation Solutions Canada posts innovation challenges directly to their website, but they also refer potential innovators to PSPC's website. Having multiple innovation programs with diverse application criteria, different review processes, information posted on multiple websites

¹² Canada and Ministère de la défense nationale, *Strong, Secure, Engaged - Canada's Defence Policy*, p. 78.

¹³ Public Works and Government Services Canada Government of Canada, "Buyandsell.Gc.Ca," July 9, 2012, <https://buyandsell.gc.ca/>.

¹⁴ Shared Services Canada Government of Canada, "GC Key FAQs," May 7, 2012, <https://clegc-gckey.gc.ca/j/eng/FQ-02?ReqID=s2ab4bbc459dd6160f02398c7df3266f625f407b36>.

and separate logins is an administrative burden and does not properly promote DND's innovation programs.

10. Two recent annual reports have been published related to DND's innovation programs: the IDEaS 2018-2019 annual report¹⁵ and the report on Building a Nation of Innovators¹⁶ from the Minister of Innovation, Science and Economic Development. Both reports share a common theme on focusing on money spent on their programs rather than discussing any significant results or progress on their innovation challenges. IDEaS released 27 innovation challenges in 2018-2019 where they reported receiving over 750 proposals and committed close to \$45M in funding to successful candidates. Beyond reporting on financial metrics and some future goals, the annual report does not provide updates on the progress of innovations. Moreover, progress reports on sponsored innovation challenges are not published or accessible through ADM(S&T)'s internal or external websites. DND personnel working in Force Development requires to have access to innovation updates to help shape future procurement requirements.

11. The report on Building a Nation of Innovators discusses Canada's Innovation and Skills plan, which was announced in the Budget of 2017. Canada's Innovation and Skills plan's goal is to make Canada a world-leading in innovation and to create well-paying jobs. The report is an overarching strategic document that compares Canada's innovation program with other nations, discusses areas requiring improvement, highlights the need

¹⁵ National Defence, "2018-2019 Annual Report for the Innovation for Defence Excellence and Security Program," navigation page, aem, July 12, 2019, <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/ideas-2018-2019-annual-report.html>.

¹⁶ Innovation Government of Canada, "Building a Nation of Innovators - Innovation for a Better Canada," Strategies and Plans; Reports, accessed October 21, 2019, https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00105.html.

for collaboration, and provides an overview of some successes. It is unclear if this report is Canada's strategic vision for innovation across all governmental departments as accountability and responsibilities are not defined; however, it is written in a way that can be interpreted as strategic guidance. Defence is mentioned in the report briefly and is not the primary focus; however, if DND wants to have a successful innovation program, the goals of Canada's Innovation and Skills plan should be embraced, even if it is not clear if this report should be followed.

12. ADM(DIA) reports to the DM of National Defence. ADM(DIA) has an internal DWAN website and does not have a website for the general public, which implies that most of their services and programs are meant for organizations who have access to the DWAN. They provide DND and the CAF with necessary expertise to make decisions based on analytics and data analysis while also serving as a hub for innovation. Most of ADM(DIA)'s mission and vision is focused on transitioning DND to a data-driven organization to improve decision making processes using innovative approaches; however, they are responsible for leading innovation support for DND/CAF. This responsibility conflicts with ISED's mandate for being Canada's lead on innovation.

13. The Director General – Data, Strategy and Innovation (DG DSI) within ADM(DIA) is responsible for two initiatives of interest: Blueprint 2020 and Innovation Ex. Blueprint 2020 (now Beyond 2020) began focusing on innovation in July 2017 with a goal to ignite innovation and to stimulate innovative ideas within DND, specifically the public service, in a collaborative manner. In Nov 2018, Blueprint 2020 awarded its winner for its Defence Team Innovation Challenge to the Defence Renewable Energy Autonomous and Modular System (DREAMS) to develop scalable portable renewal

energy.¹⁷ As this was an internal competition to DND, it followed a completely different application process compared to IDEaS or Innovation Solutions Canada. Furthermore, many of the runner-ups of the competition did not receive formal feedback on their submissions and are pursuing funding through other means outside of the competition. While it is great to pursue innovation, there should be a structured approach so that innovative initiatives don't fizzle out after a posting cycle.

14. DG DSI's Innovation Ex program is meant to serve as a central hub for innovation to coordinate efforts and approaches within DND. This initiative appears to have been stood up in an attempt to consolidate the numerous innovation programs related to DND in one area; however, there is no mandate for other innovation programs to join the collaborative environment that DG DSI is attempting to setup. Once organizations begin to collaborate, it is unclear how they will work together, share funding or resources, or ultimately get innovative products to the CAF.

15. Innovation Ex is setup for information sharing and collaboration, not for finding efficiencies in managing and integrating a collaborative DND innovation program. It will not be successful because individual organizations continue to manage their own innovation programs with independent visions and they are not required to join. Under Innovation Ex's construct, the infrastructure behind individual innovation programs are able to follow their own system for innovation applications and acceptances. Furthermore, for a DND organization to sign up for Innovation Ex, a 15 to 20 minute survey is required to be completed. For Innovation Ex to be successful it requires to push

¹⁷ The Maple Leaf, "Beyond 2020 SITREP – Defence Team Innovation Challenge," The Maple Leaf, July 11, 2019, <https://ml-fd.caf-fac.ca/en/2019/07/31763>.

regulations out to programs, require them to become centralized under one organization, and for all innovation programs to follow the same criteria for applications.

CONCLUSION

16. A prospective innovator should not have to visit multiple websites, create numerous logins or review numerous application requirements. A younger generation will usually only spend less than 15 seconds on a website before moving on to another website.¹⁸ DND's innovation programs need to capture the imagination of younger audiences with fresh ideas in a very short time. The bureaucracy surrounding DND's innovation programs is hindering the innovative process and limits its potential. The United States' Defence Advanced Research Projects Agency (DARPA) serves as an excellent example of how a centralized center for innovation and defence research can be successful. For initiatives such as Innovation Ex to be successful in managing DND's innovation program, it requires the necessary authority, which will require policy and direction from the ministerial level.

17. Canada has taken the initial steps through many great innovation initiatives to create and foster an innovation program. It is clear that government workers and Canadian businesses have a lot of enthusiasm for innovation given the numerous programs that have been stood up. However, with this enthusiasm comes the need for collaboration, but more importantly regulations and structure. Organizations such as ISED, ADM(S&T), and ADM(DIA) all have different criteria for innovation and the fact

¹⁸ "What You Think You Know About the Web Is Wrong," Time, accessed October 21, 2019, <https://time.com/12933/what-you-think-you-know-about-the-web-is-wrong/>.

that all of these organizations have programs that effect DND leads to accountability and responsibility being blurred. If the government of Canada is serious about embracing innovation and delivering the latest technologies to the CAF, then a new, perhaps even an innovative, approach is required in managing DND's innovative programs.

RECOMMENDATION

18. The Minister of National Defence should engage the Minister of Innovation, Science and Economic Development and the Minister of Science and Sport to develop a cohesive and collaborative innovation program. Innovation programs from other nations such as the United States' DARPA should be studied through a Directed Research Paper so that best practices from other programs can be used to improve DND's innovation program. Lastly, the Directed Research Paper should also investigate how DND's innovation programs should begin to integrate into the procurement process to deliver innovative technologies and solutions to the CAF in a timely manner.

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