



CANADIAN ARMY AND ESTABLISHING A CULTURE OF DIGITIZATION AND DATA LITERACY

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Service Paper

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AIM

1. This service paper aims to examine the most significant obstacle to the Canadian Army's (CA) Digital Transformation, the lack of a digital culture and data literacy. This service paper will identify methods the CA should use to increase the rate of its culture change to embrace digitization and data literacy.

INTRODUCTION

2. The Canadian Armed Forces (CAF) published a new operating concept called the "Pan-domain Force Employment Concept" (PFEC), which identifies the complexity of the current operating environment and explicitly identifies artificial intelligence (AI) enhancement as one of its key elements, and it implicates AI and the digitization of data in the majority of other elements.¹ In parallel with the development of the CAF's PFEC doctrine, the CA identified the necessity for Digital Transformation to enable CA effectiveness in the "emerging joint, pan-domain fight" and published a CA Digital Strategy.² Within this strategy, the CA identified four obstacles to digital transformation success, the most significant of which is the CA's lack of a "Digital Culture and Literacy".³

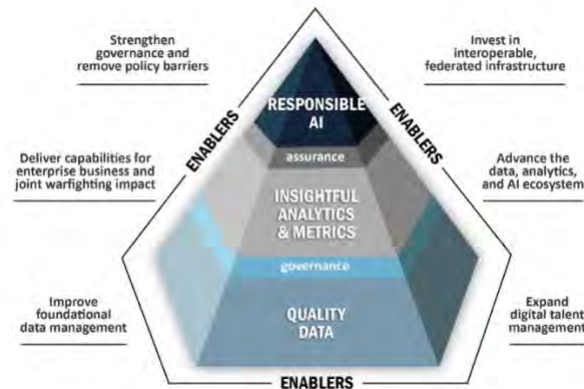


Fig. 1 DoD AI Hierarchy of Needs

¹ Canadian Armed Forces, "Pan-Domain Force Employment Concept," 17–34.

² Canadian Army, "Modernization Vital Ground: Digital Strategy," 1.

³ Canadian Army, 11.

3. The significance of that lack of culture is made clear when we look at the US Department of Defence's (DoD) AI hierarchy of needs (see Figure 1). As the CAF AI strategy is not yet published, and the USA is Canada's closest ally and the ally with which Canada strives most to achieve interoperability, it is reasonable to look at the DoD as an example until the CAF strategy is published. The AI Hierarchy of Needs is a pyramid that illustrates what is required to achieve employment of AI.⁴ Each level depends on the level below it, with operating AI at the top of the pyramid and quality data at the bottom of the pyramid – in other words, quality data is the foundation for enabling AI. Without a culture that embraces digitization and digital literacy, it will be impossible to build the prerequisite foundation of “quality data” that will enable the use of AI as envisioned in the PFEC.

DISCUSSION

4. The famous quote attributed to the management guru, Peter Drucker, “Culture eats strategy for breakfast”, refers to the idea that no matter how great an organization's strategy is, if the people in the organization resist or ignore the strategy, it will fail.⁵ The CAF and the CA together have well-thought-out, clear modernization strategies that address both the technological and human aspects of this transformation and this paper will focus on the human aspect. According to the CA, its current culture does not widely embrace digitization and data literacy. This means the people who make up the CA are more likely to resist or ignore a strategy to fundamentally change how the CA operates, such as Digital Transformation. What is needed is the active support of the people who make up the CA, which means the culture must be changed and the way that military culture is changed is through the behaviour of leaders over time. In *CAF Culture Change in 2021*, the CAF identified that leaders, especially at the small group and team level, strongly influence culture through their behaviour which is defined as “...what they do, say, reward, or punish – but more strongly what they don't do, say, reward, or punish”.⁶ Thus, if the CA wants to change its culture to one that embraces digitization and data literacy, the CA must change the behaviour of its leaders and the next part of this paper will examine those two aspects of the culture individually.

5. The first to be addressed is inculcating a culture of digitization. According to the CA, “A digital culture is one where individuals and teams are encouraged to question the status-quo and re-evaluate, from first principles, everything they do and every problem they face with a digital

⁴ Department of Defense, *Data, Analytics, and Artificial Intelligence Adoption Strategy: Accelerating Decision Advantage*, 7.

⁵ Journal, “Culture Eats Strategy for Breakfast and Transformation for Lunch.”

⁶ Chief Military Personnel, “CAF Culture Change in 2021: “Getting to Where We Need to Be,” 13.

lens”.⁷ This translates into encouraging soldiers to leverage digital technology to radically change or simply augment how army business is done. This does not translate into using PowerPoint to brief unit orders during a field exercise. In the CA, a major contributing factor slowing down the digital transformation is the improper use of current digital technology. This refers to the propensity of officers and NCOs across the CA to use digital applications exactly how they would use paper or analog products. Examples of this are using Excel spreadsheets or PowerPoint slides as status trackers where the data is manually entered and updated constantly by a human user and, even worse, the tracker is maintained on a computer desktop that others cannot readily access. Another example familiar to many soldiers in the CA would be sending situation reports (SITREPS). Most sub-units send a SITREP to their higher headquarters as raw text, whether that is an email or an attached text-based document. Then a soldier at the higher headquarters copies and pastes this raw data into another document, combining the reports from multiple sub-units to create the SITREP, with context and detail being reduced at each echelon. If the report was structured as data, as a form to be filled out with structured sections tagged appropriately, this report would become useable data and all the data would be available for analysis as required, not just the data selected to be copied and pasted into the report from each sub-unit. The CA has made recent strides in addressing the accessibility and sharing of products through applications such as Microsoft Teams, but the core issue of using digital products the same way paper or analog products were used remains and needs to be addressed. The focus of efforts should be on changing the behaviour of commanders and senior leadership in the CA to demand data in this type of format instead of the status quo.

6. The second aspect to be addressed is building a culture of data literacy. Leaders do not have to be expert data analysts or software engineers, but they need to be data literate to excel in the modern world. The generally accepted definition is data literacy includes the ability to read, work with, analyze and argue with data.⁸ Reading data refers to the ability to know what data is and be able to read it. An example from the CA would be a commander or an NCO reading the unit’s personnel state. Working with data refers to creating, acquiring, cleaning, and managing data. In the example of the personnel state, one example is the NCOs acquiring the personnel data, such as currently assigned tasks and entering it into the database of record. Analyzing data refers to the filtering, sorting, and comparing of the data. Referring again to the unit personnel state, an example would be the filtering of the data to that of two sub-units and then comparing the data sets for something as simple as which sub-unit has more personnel available at a certain moment in time. Arguing data refers to using data to support decision-making or a narrative to communicate to a particular audience. In the unit personnel state example, this would be the

⁷ Canadian Army, “Modernization Vital Ground: Digital Strategy,” 11.

⁸ D’Ignazio and Bhargava, “Approaches to Building Big Data Literacy,” 2.

commander tasking the sub-unit with the most available personnel and explaining why to the sub-unit leadership. This is an overly simplistic example of data literacy, but it is intended to set a baseline example of data literacy which scales up in more complex situations.

7. To explain why data literacy is important in CA leadership, the US Army once again provides an example. As the US Army undergoes its version of digital transformation, the role of the commander has been pointed out as critical for inculcating the right kind of culture, “Leaders set the schedules, priorities, and work-life balance of their organizations. If a commander thinks running is important, so will their formation. The way a leader processes information is just as impactful. It sets the standards for how a team uses and organizes its data”.⁹ If leaders are not comfortable with data there are two negative side effects. First, their subordinates will spend countless hours of their valuable time attempting to transfer information from a database through “screen grabs” onto a PowerPoint slide. Second, leadership can be misled by data presented to them in a way that suits the narrative the commander wishes for, not reality. This second, more insidious side effect can be prevented if leaders at each level increase their data literacy, which increases their capacity for critical thinking when analyzing information. When leaders are data literate, they will know which questions to ask to ensure the quality of the data and the analysis, resulting in better decision-making. Additionally, this will set the example for the culture needed to support digital transformation.

8. To overcome the cultural obstacle, the CA needs to both encourage and force digitization within training, and create and institutionalize a data literacy training program for its senior officers and NCOs. Building a culture promoting digitization will be addressed first. There are many examples of the CA culture abstaining from digitizing their operations, and the most blatant can be found in the command posts (CPs) of units deployed in the field. Whether it is due to a fear of electronic warfare disrupting the digital means being used, or the difficulty of establishing networks in the field, there is a definite lag in digitization. Army leadership slowing the pace of adopting digitization has also been observed in the US Army.¹⁰ An example in the CA is the insistence on analog maps first with digital mapping as a secondary, if time allows. Supporting this trend, in recent years, the Army Operations Course (AOC) has intentionally moved away from digital planning tools in the classroom. This is the course that Captains complete to prepare themselves to be staff officers and leaders at the unit and formation level. One of the key responsibilities of staff officers is to collect and analyze data to support the decision-making of commanders, and it is being trained in an analog environment. This trend needs to be reversed immediately and with extreme prejudice. The CA needs to leverage its

⁹ Davis, “The Need to Train Data-Literate U.S. Army Commanders.”

¹⁰ Davis.

ability to apply brute force to a situation and institute a policy that orders courses like AOC to use solely digital planning tools to force future staff officers to accept digitization and establish a stringent requirement for CA units to use digital systems in CPs during field exercises. To temper the resentment this would likely cause and enable innovation, the students and units should be encouraged to use a multitude of digital planning tools. Supporting the effective implementation of this would require the creation of a training database for students and units to use during their training exercises, but this could create efficiency as a single training database could be used for each exercise, for courses of all levels, across Canada. This would further reinforce both digitization and data literacy across the CA.

9. Regarding creating and institutionalizing a data literacy training program, the CA has to only look towards Statistics Canada for an example of where to start. Statistics Canada has developed an educational program to increase the data literacy of the Canadian population to make sense of information in the modern world and in turn become better stewards of data.¹¹ The CA should immediately create a requirement for senior officers and NCOs to complete the Statistics Canada training program, prioritizing the most senior ranks of the CA such as flag officers. At the same time, the CA develops a more targeted training package for members of the CA. The most senior ranks should be prioritized over more junior ranks for two main reasons. First, the most senior ranks are in the positions that make or influence decisions and policy highly dependent on large amounts of data and affecting the largest amount of people and resources. Second, the senior ranks are less likely to have completed a degree or training involving a high degree of data literacy or have lived the longest in an Army culture that never emphasized data literacy in its leadership. That does not mean the more junior officers and NCOs should not complete data literacy training, it means that if resources need to be prioritized for this task, they should be at the highest levels of rank and responsibility in the CA. To institutionalize data literacy training, this type of package should be included in the individual training required for advancement by all soldiers in the CA. For example, a data literacy package could be included in the developmental period two (DP2) training for officers, the preferable option being before AOC.

10. Although this service paper focused primarily on leadership already in the CA, the future of the CAF as a whole cannot be ignored. Data literacy must be part of CAF recruitment and recruit training, for both enlisted and officers, to ensure its institutionalization. It is reasonable to assume a general increase in data literacy in the newest generation joining the CAF, but redundancy and insurance are to be applied in this situation. First, data literacy should become part of what recruiters are looking for and testing. Second, data literacy training should become

¹¹ "Data Literacy Training."

part of recruit training from the beginning, tailored appropriately for the level of requirement. Basic recruit training keeps the data literacy training at a basic level, with the next trade-specific level of training increasing the required level of data literacy. Though the CA does not control recruitment and recruit training, the CA can influence it by communicating its specific data literacy requirements to the Military Personnel Command, which does.

CONCLUSION

11. To summarize, the CA has established that digitization and AI are vital necessities to generate and maintain combat power in the current and future OE and has published a strategy to this end. To execute this strategy and attain these goals, the CA must overcome several obstacles, the most significant being the obstacle representing the human aspect. This obstacle is the current CA culture, which does not support digitization and data literacy. As the CA is a hierarchical, military organization, the most certain way to change a culture is to target the leadership and change the behaviour of leaders, which trickles down to each level. To create a culture that fosters digitization and data literacy, these leaders must be pushed to accept and promote digitization, and must increase their data literacy. This paper makes three recommendations on how to do this:

- a. The CA should create a data literacy training program that is required to be completed by each officer and NCO in the CA, prioritizing the most senior ranks if resources are short. Statistics Canada has a program that would be an excellent start.
- b. The CA should force the use of digital planning tools as much as possible. Specifically, exercises on AOC should be solely conducted with digital planning tools and field exercises should be strongly encouraged to leverage digital systems whenever possible.
- c. A single digital training database should be created that includes the type of data needed for digital planning tools used in exercises on each CA course across Canada. This would support the previous recommendation and the digital literacy training, and it would also reduce the amount of work done by soldiers and contractors in creating scenarios and digital environments for each training exercise conducted across Canada.
- d. The CA needs to update its recruitment requirements and recruit training requirements to incorporate data literacy.

BIBLIOGRAPHY

- Canadian Armed Forces. “Pan-Domain Force Employment Concept.” Department of National Defence, 2023.
- Canadian Army. “Modernization Vital Ground: Digital Strategy.” Department of National Defence, June 2022. https://www.canada.ca/content/dam/army-armee/migration/assets/army_internet/docs/en/digit-strag/Digital_Strategy.pdf.
- Chief Military Personnel. “CAF Culture Change in 2021: "Getting to Where We Need to Be," April 2021. https://mars.cfc.forces.gc.ca/CFCLearn/pluginfile.php/50661/mod_folder/content/0/English/CAF%20Culture%20Change.pdf?forcedownload=1.
- “Data Literacy Training.” Accessed February 19, 2024. <https://www.statcan.gc.ca/en/wtc/data-literacy>.
- Davis, Erik. “The Need to Train Data-Literate U.S. Army Commanders.” War on the Rocks, October 17, 2023. <https://warontherocks.com/2023/10/the-need-to-train-data-literate-u-s-army-commanders/>.
- Department of Defense. *Data, Analytics, and Artificial Intelligence Adoption Strategy: Accelerating Decision Advantage*. Washington D.C.: Department of Defense, 2023.
- D’Ignazio, Catherine, and Rahul Bhargava. “Approaches to Building Big Data Literacy,” Sep 28, 2015
- Journal, Jabian. “Culture Eats Strategy for Breakfast and Transformation for Lunch.” *The Jabian Journal* (blog), September 18, 2019. <https://journal.jabian.com/culture-eats-strategy-for-breakfast-and-transformation-for-lunch/>.