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COMMAND SUPPORT CAPABILITY EVOLUTION: THE CHALLENGE FACING THE CANADIAN ARMY

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AIM

1. The aim of this service paper is to recommend to the Chief of Staff Army Strategy (COS A Strat) and Commander Canadian Army Doctrine and Training Center (CADTC) a way forward to properly sustain the evolution changes of the Canadian Army's Command Support (CS) capabilities.

INTRODUCTION

2. Since the deployment of Task Force (TF) 3-07 in Afghanistan, the first digitized Canadian Armed Forces (CAF) overseas operation,¹ “the Canadian Army (CA) has been challenged to develop, field and [institutionalize] CS capabilities.”² Some of the CS capabilities delivered during that operation included digitized headquarters (HQ) tools to plan operations and monitor the battlespace, in addition to specialized targeting applications such as the Indirect Fire Control Computer Software (IFCCS). The system also included new communications bearers such as the High Capacity Line of Sight (HCLOS) and the Tactical Satellite Link (TSL). As advancements in technology marched on, CS capabilities have seen tremendous growth. Functionality was increased to include not only new applications but also the integration of new Intelligence, Surveillance, and Reconnaissance (ISR) systems along with their respective databases.

3. The CS capabilities have seen several major enhancements since 2007. Soon, between 2024 and 2028, the CA will invest up to \$4B³ in modernizing its land-based command, control, communication, computers, and ISR (C4ISR) system as part of Strong, Secure and Engage priority 42 (SSE 42).⁴ Such a major investment will require synchronization across the CA to properly deliver, train, and operate the new CS capability. The CA faces the challenge of training its users on a capability that continually evolves with the changing pace of technology. The constant changes in technology make it difficult for the CA to not only adjust the Qualification Standard (QS) and Training Plan (TP) but to also develop the courseware in time to match with the evolution. This paper will first analyze how CS capabilities are identified and show that

¹ Robert T. Fowler, *Combat Mission Kandahar: The Canadian Experience in Afghanistan*. Toronto, Dundurn, 2016: 172, <https://ebookcentral.proquest.com/lib/cfvlibrary-ebooks/reader.action?docID=5104543>.

² Director Land Requirements, *Information Briefing Note for Primer: Agile Development and Iterative Fielding of Land C4I Systems*, Ottawa, 13 June 2019. The term Command Support (CS) is defined as an integrated system of resources that enables command, Defence Terminology Bank.

³ Director Land Command and Information, *Information Briefing Note to Director Land Command Support Project Management – Command Support Training Integration Revitalization*, Ottawa, 9 April 2019.

⁴ National Defence, *Strong, Secure, Engaged – Canada's Defence Policy*, Ottawa, Minister of National Defence, 2017. 37.

user input is a critical enabler for good capability development processes. It will then analyze how the CS capability is trained and implemented to the field force. Throughout the paper, recommendations are brought forth to improve the sustainment of CS capability in the CA.

DISCUSSION

CS Capability Identification

4. Identification for CS capability change or change requests come from four different sources.⁵ The first source is from the users, requesting system enhancements, new software to be added, or even new system to be bought. The second source comes from other system development projects, such as ISR and vehicle projects. Systems are increasingly integrated, and a change in one system can impact another directly. The third source comes from underlying software or network change forced by industry. For example, to be forced to upgrade to Windows 10 when Microsoft ends its support to Windows 7. These changes are very challenging since they could affect the graphic user interface (GUI) and also affect the way application interacts with the operating system. The last source of change requests, in the context of the CAF, comes from major capital projects focused solely on CS capabilities. The digitization of TF 3-07 and the SSE 42 capital project investments are examples of this type of change request.

5. It is industry best practice and normal procedure that once change requests are identified, they get reviewed and prioritized by a change committee.⁶ In the CA, this committee is the configuration control board (CCB), chaired by Director Land Command and Information (DLCI) and Canadian Joint Operations Command (CJOC) who are the Operational Authorities (OA) for the LCSS network for force generation (FG) and force employment (FE). The CCB also includes the Director Land Command System Program Manager (DLCSPM) Chief System Engineer, the Technical Authority (TA) for LCSS, as well as various project directors from Director Land Requirements (DLR) and subject matter experts (SME) for security and information management. Upon review, validation, and prioritization, the change requests are then given to the System Engineers to analyze and design solutions. Once a solution is developed and verified by the OAs, the CCB approves it for implementation into the CS capability systems baseline and prepares it for delivery to the CA.

6. Assisting this entire process is functional centers of excellence (FCoE). In June 2014, Canadian Army Orders (CAO) 21-07 assigned the FCoE authority and responsibilities to organizations and units across the CA. Annex A of CAO 21-07

⁵ Alan Dennis, Barbara Haley Wixon, Roberta M. Roth, *System Analysis & Design 5th Edition*, USA, John Wiley & Sons, Inc., 2012. 494-495. Although the authors identify five sources, the changes for bug fixes do not represent a capability change.

⁶ *Ibid.*, 493.

includes the list of each capability assigned to a FCoE, which is typically associated with CA schools. FCoEs are to:

“lead, coordinate and maintain intellectual foundation, skill-oriented proficiency and authoritative body of knowledge necessary for input to capability development, doctrine, training development and lessons learned processes related to its assigned area of expertise.”⁷

In the current CCB change request process, users can request changes to the CCB directly, skipping the FCoEs completely, who are critical to the requirements validation. The CCB participants are mainly technical personnel, and from the Signals Corps, it is not the appropriate body to evaluate combat arms specific requirements as an example. The CCB does not have the expertise and is not the SME on most of the requests. The process lacks the involvement of the FCoEs to collect feedback and validate the requirements from their user community. As owner and holder of the tactics, techniques, and procedures (TTP) pubs, training plans, and field manuals for their respective capabilities, they must take part in the CCB process. The FCoEs would be in a much better position, compared to the CCB, to regulate, validate, recommend, or deny the requests based on the impacts to training and TTP. They would also be able to initiate critical components of the Personnel; Research & Development; Infrastructure, Environment and Organization; Concepts and Doctrine; Information Management and Technology; Equipment and Support; and Generate (PRICIE+G) analysis. In a review of the FCoE assignments, it was noticed that no FCoE is assigned to Battle Group (BG) operations, which is the building block unit for the CA. An FCoE needs to be assigned the task of BG operations to represent this requirement in future CS capabilities.

7. The \$4B's worth of capital projects coming with SSE 42 are significant and will most likely impact how the CA fights using the new CS capabilities. The FCoEs must be intimately involved in the projects so they can influence the Options Analysis phase of the project and shape decisions in conjunction with the project staff throughout the project cycle. To enable the FCoEs to inform project staff on future capabilities, the CA is currently looking at revitalizing the Command Support Training Integration (CSTI) Directive issued in April 2012.⁸ The CSTI Directive objective was to “institutionalize the process for integrating new and enhanced ... CS capabilities into training and force generation”.⁹ The directive established three Command Support Battle Labs (CSBL) and six Command Support Training Centres (CSTCs), under the Division Simulation Centres. They were organized as per Table 1 below:

⁷ National Defense, Chief of Staff Army Training Authority, *CAO 21-07 – FCoE Policies and Procedures*, Kingston, June 2014.

⁸ Director Land Command and Information, *Information Briefing Note to Director Land Command Support Project Management – Command Support Training Integration Revitalization*, Ottawa, 9 April 2019.

⁹ 2700-1 (Comd), *Command Support Training Integration (CSTI) Implementation Directive*, National Defence Headquarters, Ottawa, 11 April 2012.

Table 1 – CSTC/CSBL Organization

Organization	Parent Unit
CSTC Kingston	Army Simulation Centre
CSTC Edmonton	Division Simulation Centre Edmonton (DSC-E)
CSTC Shilo	
CSTC Valcartier	
CSTC Petawawa	Division Simulation Centre Valcartier (DSC-V)
CSTC Petawawa	Division Simulation Centre Petawawa (DSC-P)
CSTC Gagetown	Division Simulation Centre Gagetown (DSC-G)
CSBL (Tactical BL)	
CSBL (SM BL)	Canadian Forces School of Communications and Electronics (CFSCE)
CSBL (IM BL)	Canadian Army Command and Staff College (CACSC)

Source: 2700-1 (Comd), “Command Support Training Integration (CSTI) Implementation Directive”, National Defence Headquarters, Ottawa, 11 April 2012.

8. The CSBLs were the hub between DLR and the FCoEs, looking at future requirements and shaping DLR projects. The CSTCs had the role of training CS capabilities once the projects delivered them. Two problems arose from the initial directive. The first was CSBLs, and CSTCs were not fully manned, and CS equipment was not delivered to them. Except for a few organizations, the CSBLs and CSTCs were never fully able to accomplish their mandate as per the CSTI directive. In the refresh of the directive, the CA must ensure that the CSBLs and CSTCs are enabled to properly accomplish their mission and tasks with the appropriate personnel and equipment. The CA must also investigate the establishment of another CSBL specializing in Combat Service Support (CSS) and linked to the FCoE for Sustainment capability, which is currently lacking in the CSTI directive.

9. Although the CSTI implementation had some issues, the employment of the CSBL-Gagetown was very successful during the development of the Tactical Battle Management System (TBMS) as part of the Capability Pack TOPAZ. During the development of TBMS, monthly working groups (WG) were held between software engineers from Thales, DLR, DLCSPM, CSBL-Gagetown, and the members of the FCoEs. The WGs not only helped design the TBMS graphic user interface (GUI) but also informed specific workflow of Combat Team operations and helped develop use case scenarios during the User Trials. Their input was instrumental in developing a user-friendly application. From initial concept ideas to delivery of TBMS, the CSBL-Gagetown was an enabler to link the OEM software engineers directly with users of the

FCoEs in Gagetown.¹⁰ The TBMS use case should be an example to showcase the success that can be achieved with the development of other CS capabilities.

CS Capability Training and Implementation

10. Impacts on training are inevitable with any new CS capability. Surprisingly and especially in software development projects in the CA, “[OEMs and] project managers simply expect [users] to find the system easy to learn ... it is taken for granted that [users] should be able to learn with little effort”.¹¹ Project staffs underestimate the training needed, which affects the proper implementation of the CS capability. In other cases, software and hardware improvements are completed and funded under Life Cycle Material Management (LCMM) activities, not under a capital project. Under a capital project, the program oversight offers proper checks and balances to prevent gaps between technology and training delivery. It is not the case under LCMM activities where funds are restricted, and conversion training is often not developed for the CA. Whether the CS capability is under a capital project or LCMM activities, the role of the project director in DLR should be to hold project managers in DLCSPM accountable for the proper documentation of the CS capability to enable conversion training completed by the CA.

11. To structure and manage delivery of new CS capability, DLR has instituted annual Fielding Implementation Orders (FIO). With the current 12-month MRP, each Divisions are committed for either High Readiness (HR), training for HR, or supporting CA tasks.¹² The perfect time to introduce changes in the current MRP structure is when a Division enters their training for HR phase. The changes would be incorporated into their Division training cycle with minimum impact throughout the 12-month. The worst time to introduce changes is when the Division is on its HR phase or when they are deployed. By introducing changes during the HR phase, the Division is forced to undergo additional conversion training to be familiar with the changes, causing unnecessary stress on the Division personnel.

12. Based on the FIO for LCSS HQ Domain Release 2018, the delivery of the software baseline 2.7.2.1 was planned for the 3rd Canadian Division (3 Cdn Div) in June 2019, at the end of their HR phase.¹³ To aggravate the situation, the planned delivery of the new software baseline did not include initial cadre training (ICT). It stated in the

¹⁰ Author was the Project Director for TBMS from 2012 to 2016. This paragraph summarize the approach taken for developing the user interface for TBMS.

¹¹ Alan Dennis, Barbara Haley Wixon, Roberta M. Roth, *System Analysis & Design 5th Edition*, USA, John Wiley & Sons, Inc., 2012. 488.

¹² 3350-1 (G35 Intl), *Updated Products – CA Managed Readiness Plan Fiscal Year 2019-2020*, Ottawa, June 2019.

¹³ 2705-1 (DLR 4-4-3), *LCSS HQ Domain Release 2018 Implementation Order*, Ottawa, 27 August 2018. Appendix 1 to Annex B.

Implementation Order, “a capacity to conduct formal Conversion Training [via the CSTCs] is not in place.”¹⁴ The only limited training offered was by DLCSPM transition team, which “provided guidance and mentoring (on-site) to local Signals personnel.”¹⁵ The delivery of the 2.7.2.1 software baseline started in July-September 2018 timeframe, but 3 Cdn Div only received it one year later, as they were ending their HR phase. 3 Cdn Div should have been the first ones to receive the update in light of them entering HR training phase in June 2018.¹⁶ Even if the ICT was not being offered, the CSTCs could have mitigated the risk if they would have been manned and if they had the proper equipment, but that was not the case. The delivery of the 2.7.2.1 baseline was bound to have sustainment issues from the beginning.

13. As part of SSE 42 capital projects, DLR proposed to the CA a different concept to field CS capabilities. The concept is “Agile Development and Iterative Fielding of Land Command, Control, Communications, Computer and Information (C4I) Systems”.¹⁷ The concept is to evolve CS capabilities in smaller increments every year. This concept has been adopted by the industry as best practices and provides technology systems that are relevant promptly. The biggest constraint will be the ability of the FCoEs and CSTCs to develop training and the courseware in concert with the approach. Currently, it takes on average 120 days to create a pilot course.¹⁸ If the approach delivers a new CS capability every year, the FCoE will need to find efficiency in their courseware development model. If they are not able to adapt, the agile development approach is bound to fail. For the agile approach concept to work, there will need to be a full synchronization between OEMs, DLCSPM, DLR, CSBLs, FCoEs, and lastly CSTCs.

CONCLUSION

14. For proper sustainment of CS capabilities, the CA will require force development (FD) and FG organizations to be fully integrated, along with active engagement with FCoE to validate and verify requirements. This statement is true whether the CA decides to stay with the current approach or looks at the agile development and iterative approach in the future. This paper analyzed how CS capabilities are initially conceived and how they are trained and implemented in the CA once they are ready for delivery. The analysis found improvements and made recommendations to gain efficiency and relevancy throughout each stage of the capability. It is critically important for the CA to enforce the FCoEs involvement in the CS capability development and to invest in the CSTI directive, especially before the development of SSE 42 capital projects.

¹⁴ *Ibid.*, Paragraph 2.

¹⁵ *Ibid.*, Paragraph 9(b).

¹⁶ *Ibid.*, Appendix 1 to Annex B.

¹⁷ Director Land Requirements, *Information Briefing Note for Primer: Agile Development and Iterative Fielding of Land C4I Systems*, Ottawa, 13 June 2019.

¹⁸ Canadian Forces School of Communications and Electronics Training Development Officer, *Training Update Brief for LCSS Baseline Institutionalisation Event 2018*, Kingston, 2018. 17.

RECOMMENDATIONS

15. The following is a summary of the proposed recommendations.
 - a. FCoEs must be an integral part of the CS capability development. Personnel from the FCoEs should be identified to be capability representatives at the CCB.
 - b. An FCoE needs to be assigned the authority and responsibilities of BG operations capability to represent the capability requirements in future CS capabilities.
 - c. The CSTI Directive must be reviewed and revitalized.
 - d. Investigate the establishment of a CSBL to inform CSS capabilities in future CS capabilities.

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