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An Analysis of Lessons Learned Relevant for Agility in Military Operations

Topic 4 (Primary)
Experimentation, Metrics, and Analysis

Topic 1
Concepts, Theory, and Policy

Topic 2
Organizational Concepts and Approaches

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Abstract

As a result of the increased pace of the information environment and complexity of modern operations, command and control (C2) requirements have evolved significantly in recent years. Military organizations, including the Canadian Armed Forces (CAF), must be efficient and agile to succeed in an often volatile and unpredictable operating environment. Agility is defined as the capability to successfully effect, cope with and/or exploit changes in circumstances (SAS-065, 2010; SAS-085, 2013). To better understand C2 challenges and the requirements for agility in the context of current and future security environments, we analyzed unclassified lessons learned from various CAF domestic and expeditionary operations over the last five years. The analysis sought to highlight instances of manifested or potential agility, focusing on understanding the impediments to and enablers of C2 agility. Throughout the operations examined, recurrent themes related to agility emerged, including C2 processes, communication, comprehensive approach, and training/preparation. The implications of these findings for supporting and enabling the commander and staff to perform critical functions (e.g., lead, coordinate, plan, organize, direct, and control) are discussed. The results of this analysis can help identifying key enablers that could be integrated in the development of future capabilities for defence and security organizations to become more efficient and agile. This work also signals avenues for supporting and enabling C2 and C2 agility in the wide spectrum of missions that the CAF and other military organizations face.

Introduction

As a result of the increased pace of the information environment and complexity of modern operations, command and control (C2) requirements have evolved significantly in recent years. To succeed, commanders must have integrated capabilities that meet their leadership and knowledge needs in a joint environment at the operational and strategic levels, in a wide spectrum of missions. In Canada, one of the objectives of the creation of the Canadian Joint Operations Command (CJOC) was to obtain a more efficient and agile organization to answer these needs. CJOC is responsible for conducting full-spectrum Canadian Armed Forces (CAF) operations at home, on the continent of North America, and around the world. With its integrated C2 structure, CJOC directs these operations from their earliest planning stages through to mission closeout, and ensures that national strategic goals are achieved. Such organization requires being efficient and agile in order to be responsive to government and military priorities in an unpredictable operating environment (CJOC, 2012).

C2 can be defined as the "exercise of authority and direction by a commander over assigned, allocated and attached forces" (CFJP 3.0, p. GL-2). Various organizations use different definitions (e.g., CAF, NATO, US DOD) but most definitions share commonalities by including notions of authority, direction, focus of efforts and resources towards accomplishing goals, and the establishment of common intent to achieve coordinated action. These notions are reflected in the command team functions (VCDS C2 Operating Concept, 2012): leading, planning, organizing, coordinating, directing, and controlling. Therefore, C2 is not an end in itself but an enabler to achieve mission objectives and mission success. The C2 structure and processes contribute to shaping decision making, behaviours and information flows, and the conditions under which sensemaking and execution take place throughout an operation (SAS-104, 2014; SAS-085, 2013). C2 is a capability that encompasses people, processes, and technology, as well as the interactions between these elements. The Canadian C2 operating concept (VCDS, June 2012) aims to create a C2 capability that is more adaptable and flexible, and more efficient, in response to the complex nature of the current and future operational environment. Concepts such as mission command and the comprehensive approach are increasingly integrated in the military domain to both take into account the complexity of the operational environment, and enable the military's response to it.

Mission command corresponds to the "philosophy of command that promotes unity of effort, the duty and authority to act, and initiative to subordinate commanders" (Canadian Defence Terminology Bank, 2015). The capability to adopt a decentralized approach to command such as mission command enables forces to adapt their activities in response to situation evolution and exploit opportunities in a timely manner (Stewart, 2006). The tempo afforded by mission command is not necessarily meant to be the fastest, but more critically to support the ability to operate at the pace of the situation (Dempsey, 2012), maximizing the ability of the forces to respond, effect, and exploit circumstances in the operational environment. At the core of mission command are the principles of commander's intent, shared situation awareness, and an organizational culture (including appropriate delegation of authority) that allows responsible initiatives by subordinates. As such, the application of mission command requires a clear dissemination and understanding of intent, trust, appropriate capabilities (allocated resources,

training and preparation) and delegated freedom of action within established boundaries (Dempsey, 2012; Stewart, 2006; VCDS, 2012).

Nowadays, CAF operations are rarely, if ever, conducted in isolation, a situation that is not unique to Canada. Military operations typically involve interactions and coordination with other government departments, non-government organizations, as well as military and civilian bodies from allied nations. At the domestic level, this approach is often referred to as a whole of government or comprehensive approach. While the former appears to be restricted to government organizations, the latter is more inclusive of all types of partners or actors involved in an operation, including allied military organizations, other government departments (OGDs) and non-government organizations (NGOs). The comprehensive approach refers to "the application of commonly understood principles and collaborative processes that enhance the likelihood of favourable and enduring outcomes within a particular situation. The Comprehensive Approach brings together all the elements of power and other agencies needed to create enduring solutions to a campaign." (CFJP 3.0). These actors may include the military (joint and multinational forces), government departments and agencies (whole of government aspect), foreign governments, international organizations (e.g., NATO and UN), and NGOs (e.g., Médecins Sans Frontières). In this context, unity of effort (i.e., unity of understanding of the environment and problem faced, and unity of purpose in achieving mission goals) is paramount and mission success requires open communication and collaboration (VCDS, 2012).

Agility

As emphasized above, military organizations must be efficient and agile to succeed in complex, often volatile, and uncertain operating environments. Concepts such as mission command and the comprehensive approach aim to address this complexity and create more adaptive, agile, and efficient forces. The concept of agility may be associated with various entities, including the individual, a collection of individuals, organizations, as well as processes and technologies. Force agility has been analyzed in different works over the last decade (e.g., Alberts & Hayes, 2003; Atkinson & Moffat, 2005). This concept mainly refers to the capacity of maintaining an acceptable level of effectiveness in the face of changing circumstances. Work under NATO RTO has led to defining agility as the "capability to successfully effect, cope with and/or exploit changes in circumstances" (SAS-065, 2010; SAS-085, 2013). Although a force behaving as an agile organization during a mission does not ensure overall success, agility can be a key contributing factor to mission success.

Agility-related concepts (e.g., adaptation, responsiveness, timeliness) have been present in the C2 domain for a long time (Dodd & Hilton, 2011) and instances of agility can be found in most military operations, old and recent. However, in the context of more challenging, complex, and asymmetric operational environments, there appears to be an increased resolve today to institutionalize and enable agility. The underlying objective of agility is to help military forces gain and maintain decision superiority and operational advantage by enabling an improved capability to respond, anticipate, and take advantage of events or circumstances.

Objective

To better understand C2 challenges and the requirements for agility in the context of current and future operational environments, we analyzed unclassified lessons learned from various CAF domestic and expeditionary operations over the last five years. The analysis sought to highlight instances of manifested or potential agility, focusing on understanding the impediments to and enablers of C2 agility. This analysis is part of a larger research effort that aims to support the CAF in developing and employing an improved C2 capability that will contribute to improved operational response and effectiveness through the agility required by the operational environment in order to conduct full-spectrum operations domestically and abroad.

Method

For this work, unclassified lessons learned documents pertaining to six operations in which the CAF were involved were reviewed (Adams & Eldershorst, 2014). Three of these six operations were domestic, and three (including an exercise) were expeditionary in nature. The operations reviewed covered a range of types of missions, including major events, disaster relief, and combat operations.

The operations reviewed were selected based on the advice of military subject matter experts (SME) in order to identify operations/exercises that might provide valuable lessons about agility, based on the nature of the operation and on the events that occurred during the operation/exercise. This yielded several operations (e.g., Operation Podium) for which lessons learned documentation was available. This included some recurring operations for which focus was placed on the more recent iterations of these operations.

For each operation, relevant lessons learned documents were retrieved from the CAF lessons learned database and collated. The research team scanned through all of the documents for each operation one at a time looking for lessons learned pertaining to agility. Two scans were necessary. The first scan determined whether the document contained usable lessons and aimed to get an initial view of the types of lessons found within the document. This initial scan involved all of the documents for a given operation and helped to show some of the common themes seemingly reflected within the lessons learned. The next scan was conducted in more detail using the same process and included highlighting possible lessons learned for use in the next phase of the process.

The highlighted passages were then assembled into an Excel spreadsheet and were cross-referenced with the article and the page number. Having all passages aggregated side-by-side helped identifying common themes and patterns within the lessons learned. To facilitate analysis, the lessons learned were then divided into several categories reflecting the broad areas of concern within the available documents. The categories reflected categorization terms identified within some of the documents and were in accordance with concepts related to agility in the military domain (e.g., C2, communication). Each operation had lessons reflecting a unique combination of the identified categories.

Once categorized, the meaning of the lessons learned within each broad category was analyzed. The purpose here was to provide examples of some of the most important and interpretable lessons learned within each category and to the extent possible, to provide some insights about evidence of agility within the documents reviewed.

Results

Throughout the operations examined, recurrent themes related to agility emerged. These themes were: C2, communication, comprehensive approach, training/preparation, doctrine, and relationships. It should be noted that the lessons identified under the various themes are not mutually exclusive; that is, a lesson could be relevant for more than one theme (e.g., comprehensive approach and communication). The findings are presented below for each theme, combined across all the operations reviewed. The implications of these findings for supporting and enabling the commander and staff to perform critical functions (e.g., lead, coordinate, plan, organize, direct, and control) are discussed in the next section.

Comprehensive Approach

Analysis of the lessons learned for the different operations revealed several elements that can potentially have impact on operational agility with regards to the comprehensive approach, and which include both actions beneficial in strengthening the comprehensive approach as well as best practices that enable it:

- The importance of prior training and education among mission partners (e.g., about the comprehensive approach and each other) to help improve effectiveness on the ground. This is key not only at the organizational level, but at the individual level as well. Adequate exposure to comprehensive approach concepts and context will foster personnel ability of how to best work in this context. This will enable, for instance, better mutual understanding, shared knowledge of mutual capabilities, expectations management, and coordination.

- The need to promote more systematically, and to institutionalize, the liaison function within the entire comprehensive approach context. Liaison officers (LOs) are very valuable in a comprehensive approach context and a key enabler of agility. Overall, LOs contribute to improved communication and assist with developing a mutual understanding among mission partners.

- For organizations that may have to work together on regular occasions or for planned events, building relationships prior to the mission (or capitalizing on ongoing, pre-established relationships) can be very beneficial.

- The importance of personnel stability on developing and maintaining relationships (i.e., limiting turnover as much as possible).

- The need for more coordination among and with OGDs, especially in emergency situations.

- The need to synchronize the operational planning process among all mission partners, and to integrate mission partners early in the planning cycle.

- The need for coordinated messaging that show instances of efficient coordination and achievements among the mission partners, contributing among other things to the communication of best practices.

- The importance of clearly delineated and understood C2 structure, as well as clear definitions of the roles and responsibilities of the various mission partners, in order to enable effective leadership and accomplishment of mission goals.

- In order to better coordinate response and positively impact on agility, it is important that situational awareness is maintained at all times through appropriate and effective communication.

- The comprehensive approach needs to be enabled by shared access to appropriate information and communication networks.

C2

The review of the operations lessons learned provided a number of elements relevant for agility with regards to C2, and emphasizes a strong link between C2 and operational agility. The findings include:

- The need for clear and collectively understood command structure, concepts of operations, role definitions, and mission orders.

- The importance of matching the operational level plans with the availability of resources.

- The beneficial presence of LOs, who should be incorporated in mission definition and planning as early as possible.

- The need for the right person in the right job, and for personnel to receive training to ensure common SOPs.

- The importance of an adequate balance of top-down and bottom-up communication (e.g., situation reports, orders, intent).

- The importance of mission command in operations, allowing personnel to take initiatives to achieve mission goals within the boundaries of commander's intent and rules of engagement (ROEs). This can be very effective, particularly in fluid situations.

- It is critical that the lines of authority be circulated and clearly understood. Also important for agility is an appropriate and well-understood delegation of authority structure.

- Regular coordination and communication between command in theatre and higher-level command (e.g., CJOC) supports better synchronized efforts, shared situation awareness, and enables agility and responsiveness.

- Synchronization, as much as possible, of battle rhythm and operational tempo can be beneficial to efficient C2 and agility.

- A clear shared understanding of the ROEs and SOPs, as well as of the known and potential legal aspects of a mission, contribute positively to C2 and battlespace management, and can enable agility.

- Clear and unequivocal taskings need to be in place to maximize the effectiveness of resources.
- Operating within a joint context requires a means of communication that enables coordination among all the distributed elements.

Communication

A number of communication-related elements that could contribute to agility emerged from the lessons learned document. An underlying theme among these elements is the importance of shared situation awareness and understanding among mission partners (both from a combined/joint perspective and comprehensive approach). These lessons learned highlight the criticality of good communications among all members of an operation as well as within the public domain as an important correlate of agility. These include:

- Ensuring common communication protocols or SOPs among all partners (e.g., making sure contact lists are up-to-date, that partners have similar understanding of SOPs, and that lines of communication are clearly understood). This can help in disseminating information quickly and efficiently. It is also important to be careful about ensuring that communication protocols are not a burden that limits the time and resources available for other mission-critical tasks.
- The importance of common or interoperable communication tools and systems to support accessible and efficient communication.
- Regular communication and coordination among different elements or mission partners (including face-to-face meetings) is valuable, as well as between the mission partners and the public. Among other things, this allows the communication of challenges and accomplishments.
- The need for operational HQ to be in the loop about strategic messaging and better coordination of media requests – in an increasingly linked world, coordinated management of strategic messaging can be critical to operational success.
- Use of quick and responsive updates (e.g., frag orders) is beneficial in enabling agility.
- Importance of a match between communication needs, processes, and means (e.g., communication infrastructure; access to appropriate classified and/or unclassified networks balanced with appropriate information security).
- The resilience of communication (e.g., infrastructure) and contingency planning (in both infrastructure and processes) is important. Also, transparent and well-articulated security protocols need to be in play for effective communication.
- Integration and use, as appropriate, of means of communications such as texting and social media. They can greatly assist communication, especially in the context of disaster relief, but it is important to be aware that they might hamper the ability to create a common operating picture as the information may be distributed but not aggregated. Also, guidelines need to be clear about what can and cannot be posted on social media.
- Consistency of information circulated is key, as is ensuring that critical information is

shared amongst everyone to maintain situational awareness.

- Good communication processes and infrastructure are critical in situations of reachback and distributed operations.
- Communication is key not only during operation but in the planning/preparation phases as well.

Training and Preparation

Training and preparation refer to the process of getting ready for a mission, both by imparting required knowledge and skills (training) and by making the necessary arrangements (preparation). The analysis of lessons learned suggests a beneficial link between training/preparation and agility:

- Training personnel so that they are able to accomplish their tasks (and fulfill their roles and responsibilities) efficiently can foster agility; training can be impacted by different factors, such as short notice given for deployment.
- When preparing for a planned event, preparing well in advance prior to the operation can greatly aid in the success of the operation.
- Developing contingency plans prior to deploying to theatre and having a formal training plan in place is valuable. The continuity of planning staff is also very important.
- Adequate training and preparation to develop and maintain competency relevant for an operation can have a positive impact on potential agility.

Doctrine

Fewer lessons learned potentially relevant for agility were identified with regards to doctrine than other themes. However, the findings were consistent throughout operations for which evidence was found, and strongly point to the value of a good doctrinal foundation in promoting agility. Indeed, doctrine contributes to the other themes identified (C2, communication, comprehensive approach, training/preparation, etc.) and gives a cadre within which to operate and be agile.

Relationships

While relationships can be difficult to build and maintain during operations, they are also very beneficial in the accomplishment of the mission and can enable agility. The importance of building relationships applies at different levels, from individuals (e.g., learning to work together as a team and building trust) to organizations. The analysis of lessons learned allowed identifying the following key aspects of relationships with regards to agility:

- LOs are very helpful in building and maintaining relationships among the various actors and organizations involved in an operation.
- When possible, the ability to plan for several months before the start of an operation and a continuity of personnel can facilitate relationship building.

- Differences in culture (e.g., organizational culture between security partners, or between defence/security organizations and NGOs) need to be acknowledged and taken into consideration. Good communication is helpful in maintaining relationships and decreasing the potential negative impact of cultural differences.

- Training alongside mission partners can be very valuable, as is the opportunity of fostering relationships before the start of an operation.

Discussion

The review of lessons learned has demonstrated that there is a link between operational agility and the dimensions of comprehensive approach, C2, doctrine, communications, training and preparation, and relationships. Throughout all operations, the most common lessons learned were related to C2. This is perhaps not surprising, as C2 is a large category that encompasses many concepts and the C2 structure is critical to the success of all missions. Communications and comprehensive approach were the next most common themes emerging from the lessons identified across operations. This was likely largely due to the same reasons that C2 was the most common category, and both communications and the comprehensive approach have a strong association with C2. In order for operations to be successful, an efficient and organized C2 structure needs to be in place and communication and relationships with other partners need to be strong and efficient.

Each of these themes is omnipresent in the preparation and the conduct of operations. However, further refinement of these findings is required in order to identify realistic ways to institutionalize operational agility enablers. The understanding of how the identified issues and solutions relate to the different command team functions can facilitate the operationalization of enablers to operational agility. The Canadian C2 Operating Concept (VCDS, Command and Control Operating Concept, 2012) identifies the command team functions as:

- Leading
- Planning
- Organizing
- Coordinating
- Directing
- Controlling

Communications, and training and preparation are key enablers for all command team functions. Training and preparation can be conducted to enable the development of relationships amongst individuals of different organizations, as well as a better understanding of different organizational cultures and processes. Both can help foster the level of trust required to facilitate information sharing, leading to the development of shared situation awareness, and the harmonization and synchronization of efforts. Adequate use and exploitation of diverse communication protocols, tools and infrastructure ensuring timely exchange of information amongst all the partners need to be understood by everyone.

Following is the result of mapping the analyzed lessons learned to the command team functions, which can be considered as potential enablers for each function.

Leading

In a command team, leading can be defined as the ability of the commander to achieve common intent, inspire, motivate, build relationships and trust at all levels, engage when and where needed, balance risks and opportunities, and make rapid, effective decisions with a comprehensive understanding of mission assurance (VCDS, Command and Control Operating Concept, 2012). Many findings related to comprehensive approach, C2, doctrine and relationships are directly relevant to the leading function. Accordingly, it is expected that operational agility may be enabled by the implementation of:

- Relationship built prior to the mission
- Appropriate exposure to partners' organizational context and culture
- Personnel stability (limited rotation and replacement of personnel)
- Liaison function
- Mission command philosophy
- Command presence
- Facilitation of OGDs' integration in the military team

Coordinating

The coordination function refers to the ability of commander and staff to manage and integrate information within a complex JIMP battlespace, across a full spectrum of missions, and of establishing rules and constraints (VCDS, Command and Control Operating Concept, 2012). It involves aspects such as managing the battlespace with enhanced visualization and collaboration tools; building and maintaining information advantage; simplifying the complexity through enhanced information fusion and predictive analysis; exploiting mission architecture; and leveraging information sources through reachback. Some of the findings related to comprehensive approach, C2, doctrine and relationships are directly relevant to the coordinating function. Accordingly, it is expected that operational agility may be enabled by the implementation of:

- Good and regular interactions among all contributors of an operation (which include the different levels of command (strategic, operational and tactical), the varying command elements as well as OGD and public domain)
- More coordination among and with OGD
- Appropriate exploitation of social media
- Continuous shared situation awareness for all partners

Planning

Planning is related to the ability of the commander and staff to use information advantage to develop, evaluate and select COAs, and to identify key decision points and possible contingencies (VCDS, Command and Control Operating Concept, 2012). It is all about determining what, why, where, when and by whom an action is to be taken. Some of the findings related to comprehensive approach, C2, doctrine and relationships are directly relevant to the coordinating function. Accordingly, it is expected that operational agility may be enabled by the implementation of:

- Harmonization of priorities between the different levels of command (e.g. between the operational level and the tactical level)
- Integration of mission partners early in the planning cycle
- Operational planning process synchronization amongst all mission partners
- Contingency planning
- Matching the availability of resources with the operational (level) plans

Organizing

In the command team, organizing refers to providing a structure that establishes relationships between personnel and materiel grouped together for a common purpose, determining roles and responsibilities and the provisions (VCDS, Command and Control Operating Concept, 2012). Some of the findings related to comprehensive approach, C2, doctrine and relationships are directly relevant to the organizing function. Accordingly, it is expected that operational agility may be enabled by the implementation of:

- Collectively clear delineated and understanding of command structures of the various partners
- Collectively clear definitions of concepts of operations, SOPs, and roles and responsibilities of the various partners
- Collectively clear understanding of lines of authority
- Assignment of the right person in the right job
- Integration of military LO within WoG operation centre

Directing

Directing is the function that includes the ability of the commander to issue orders and instructions to those with a role in mission accomplishment (VCDS, Command and Control Operating Concept, 2012). Some of the findings related to comprehensive approach, C2, doctrine and relationships are directly relevant to the directing function. Accordingly, it is expected that operational agility may be enabled by the implementation of:

- Adequate balance of top-down and bottom-up communication

- Production of clear and unequivocal taskings
- Timely dissemination of orders and frag orders
- Dissemination of mission-type orders and warnings

Controlling

The control function corresponds to the ability to continuously monitor, assess the situation and progress, and orchestrate and deconflict the battlespace (including joint fires, and kinetic and non-kinetic effects and manoeuvres) to achieve desired effects (VCDS, Command and Control Operating Concept, 2012). Some of the findings related to comprehensive approach, C2, doctrine and relationships are directly relevant to the coordinating function. Accordingly, it is expected that operational agility may be enabled by the implementation of:

- Good synchronisation of battle rhythm and operational tempo
- Continuous assessment of the levels of effort/resources required for the conduct the operation as well as for the conduct of the organization

Conclusion

Various factors are required to enable and promote agility. Indeed, for people to be agile, they need to feel comfortable and confident in their roles and responsibilities (fostered through training and preparation), know the boundaries within which they can operate (e.g., doctrine, ROEs), have an understanding of mission partners and an opportunity to establish relationships with them, have a clear sense of the direction and goal of the mission (commander's intent), and be enabled and supported in the opportunity to be agile, among other aspects through a mission command philosophy, a climate of trust, and a clear C2 structure with appropriate delegation of authority.

Agility has often been considered as implicit in military operational contexts, an assumption that is supported by several instances of agility by various military organizations throughout the years. However, reviewing lessons learned of different operations suggests that instances of situations when displaying agility proved more challenging can also be found. Therefore, it is an area of potential improvement that would directly support mission success. The analysis of lessons learned is a good first step towards documenting the rationale behind the concept of operational agility as well as the identification of potential agility enablers.

References

Adams, B. D., & Eldershorst, E. (2014). Analysis of lessons learned relevant to agility. Contract Report to DRDC Toronto C14-0513-1513.

Alberts, D. S., & Hayes, R. E. (2003). *Power to the edge: Command and control in the information age*. Washington, DC: CCRP Publications.

Atkinson, S. R., & Moffat, J. (2005). *The agile organization: From informal networks to complex effects and agility*. Washington, DC: CCRP Publications.

Canadian Forces Joint Publication (2010). *CFJP 3.0 – Operation*. B-GJ-005-300/FP-001. Canadian Forces Warfare Centre, Ottawa, Canada.

Canadian Joint Operations Command (CJOC) (2012). BG– 12.021. 11 May 2012, Ottawa, Canada.

Dempsey, M. E. (2012). *Mission Command: White Paper*. US Joint Chiefs of Staff.

Dodd, L., & Hilton, J. (2011). *C2 agility: Academic literature review* (working paper). Cranfield University – Defence Academy of UK, Cranfield, UK.

SAS-065. (2010). *NATO NEC C2 maturity model overview*. Paris: NATO RTO. CCRP Publication Series.

SAS-085 (2013). *C2 Agility - Task Group SAS-085 Final Report*. STO-TR-SAS-085, http://dodccrp.org/html4/sas-085.html, January 2015.

Stewart, K. G. (2006). *Mission command: Elasticity, equilibrium, culture, and intent*. DRDC Toronto TR 2006-254.

Vice Chief of the Defence Staff (2012). *Command and control operating concept*. Ottawa, Canada.