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ADOPTING A COLLABORATIVE COMMUNITY OF PRACTICE APPROACH IN THE CANADIAN ARMED FORCES TO IMPROVE INSTITUTIONAL KNOWLEDGE MANAGEMENT

Maj E.M. Esselaar

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Exercise Solo Flight

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EXERCISE *SOLO FLIGHT* – EXERCICE *SOLO FLIGHT*

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ADOPTING A COLLABORATIVE COMMUNITY OF PRACTICE APPROACH IN THE CANADIAN ARMED FORCES TO IMPROVE INSTITUTIONAL KNOWLEDGE MANAGEMENT

Know the enemy and know yourself; in a hundred battles you will never be in peril.

– Sun Tzu, *The Art of War*, Translated by Samuel Griffith, 84.

INTRODUCTION

In one of his classic quotations on war, Sun Tzu speaks to two facets of military knowledge – to be successful in battle, one must know the enemy¹: their tactics, motivations, as well as their current dispositions and capabilities. Sun Tzu also says that one must “know yourself”²: our own capabilities, tactics, and current dispositions. Knowledge of both the real-time operational environment, as well as knowledge of the organization is required to be successful in battle.

The cost of not knowing can be immense. One infamous example of not adequately sharing knowledge through an organization is that of the plight of the space shuttle *Challenger*. While engineers at the National Aeronautics and Space Administration (NASA) did know that O-rings would not hold at low temperatures, this knowledge was not shared through the organization, with those who decided to launch the shuttle³. The cost of not adequately knowing the real-time operational environment had deadly consequences for four Canadian Armed Forces (CAF) soldiers, where a U.S.

¹ Sun Tzu, *The Art of War*, Translated by Samuel B. Griffith, (London: Oxford University Press, 1971): 84

² *Ibid.*

³ Roger Vandomme, and Department of National Defence. From Lessons Identified to Lessons Learned: A Proposition for Integration of Lessons Learned into Canadian Forces Professional Development (Kingston, ON: Canadian Defence Academy, 2010.): 53.

pilot mistook a friendly range exercise for enemy fire⁴. In both these cases, ineffective knowledge management practices had catastrophic consequences.

This leads to the question of how can the CAF and Department of National Defence (DND) have a more effective knowledge management (KM) programme that better connects personnel on operations to institutional organizations, allies, and key partners? This paper will show that the CAF and DND can improve mobilization of knowledge into practice by applying a Community of Practice (CoP) approach through more collaborative information services.

This paper begins by a review of the salient KM literature, introducing key terms and relevant concepts. It will then be shown that key enablers of effective KM include technology and culture – but that they can also be challenges if not addressed adequately. Relevant examples of KM in the civilian sector are given, setting the foundation for deeper investigation of KM in the military. Military KM is described, firstly by looking at the requirement to share, then looking at KM practices with key allies, and then giving an overview of KM in the DND/CAF. KM challenges in the DND/CAF are highlighted, with key elements of the solution as well as recommendations are finally made.

What follows next is a review of relevant knowledge theory, as well as civilian applications that will serve as a foundation for a further study of military KM.

⁴ Tarnak Farm Board of Inquiry, *Final Report*, (Ottawa: 19 June 2002), last accessed 03 May 2017, <http://publications.gc.ca/collections/Collection/D2-138-2002E.pdf>: 4.

KNOWLEDGE IN THEORY AND APPLICATION

*In effect, the profession [of arms] must adopt the fundamental features of a **learning organization, one that moves knowledge horizontally as much as vertically** [emphasis added], values looking outside its own boundaries for information and knowledge, and dedicates effort to the generation, consideration and dissemination of new concepts within. Moving the profession as a whole to higher planes of effectiveness depends on this principle.*

– *Duty With Honour: The Profession of Arms in Canada*, 68

Context

As our doctrine clearly articulates, the Canadian Armed Forces (CAF) are a *profession of arms* with the expectation from its members, our government, and moreover society that one of the aspects of being a profession is that the CAF must be a learning organization⁵, especially when lives are at stake. However the desire to be an effective learning organization and capable knowledge managers is not unique to the profession of arms. What follows is a look “outside [DND/CAF’s] own boundaries and knowledge”⁶, from which parallels that will apply to military KM will later be drawn.

Applying Key Learning and Knowledge Concepts

The landscape of knowledge-related disciplines is vast and interconnected⁷. Knowledge-related literature views this landscape from diverse perspectives, depending on the challenges encountered. There is even research that looks at the inconsistencies

⁵ Department of National Defence, A-PA-005-000/AP-001, *Duty With Honour: The Profession of Arms in Canada*, (Kingston, ON: Canadian Defence Academy — Canadian Forces Leadership Institute, 2009): 68.

⁶ *Ibid.*

⁷ Ben Levin, *Thinking About Knowledge Mobilization: A discussion paper prepared at the request of the Canadian Council on Learning and the Social Sciences and Humanities Research Council*, (Canadian Council on Learning: 2008), last accessed 03 May 2017, http://www.sshrc-crsh.gc.ca/about-au_sujet/publications/KMb_-_LevinDiscussionPaper_-_E.pdf: 4.

and similarities between the knowledge-related terms⁸. What follows is a review of some of the key terms and concepts that will be used through this paper.

Learning Organizations, Effective Discourse and Systems Thinking

The Fifth Discipline, Peter Senge's seminal work on systems thinking approaches to a learning organization, details how one of the components of a learning organization is the requirement to practice team learning⁹. To promote collective learning, teams must strive to have effective discourse within and between teams¹⁰. From this it can be deduced that to be an effective learning organizations, teams within the organization need to have effective communications and sharing of knowledge to promote overall organizational learning.

Furthermore, the notion that learning organizations need to strike balance between competing forces is a repeating theme. The Fifth Discipline's eleventh law of "There is no blame" details how a systems thinking approach is required to realize that organizations are systems and that "there is no separate 'other'; that you and the someone else are part of a single system. The cure lies in your relationship with your 'enemy.'"¹¹ The second law of the Fifth Discipline "The harder you push, the harder the system

⁸ Ben Levin, *Thinking About Knowledge Mobilization: A discussion paper prepared at the request of the Canadian Council on Learning and the Social Sciences and Humanities Research Council*, (Canadian Council on Learning: 2008), last accessed 03 May 2017, http://www.sshrc-crsh.gc.ca/about-au_sujet/publications/KMb_-_LevinDiscussionPaper_-_E.pdf: 4; Jennifer Rowley, "The Wisdom Hierarchy: Representations of the DIKW Hierarchy," *Journal of Information Science* 33, no. 2 (2007): 165.

⁹ Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 1st ed, (New York; Toronto: Currency/Doubleday, 1994): 12, 221.

¹⁰ *Ibid.*, 223.

¹¹ *Ibid.*, 67.

pushes back”¹² speaks to the systemic nature of an organization and that you cannot solely pursue one organizational dimension aggressively – goals need to be taken in the context of a complex multi-dimensional system¹³. Seeing an organization as a complex system, where one needs to seek balance between competing values is further supported by Quinn’s Competing Values Model¹⁴. Quinn postulates that if one aggressively pursues one facet of a problem, a “strange inversion can also result. Good things can mysteriously become bad things.”¹⁵ In the military context, the *need to know* versus the *need to share* is exactly such an example of balancing conflicting priorities.

Collaboration, Teams and Communities

A key part of KM is the interaction between people, where “knowledge is socially constructed”¹⁶. Whether in the context of organizations, teams, or communities, interaction and sharing knowledge between people is common¹⁷.

With evolution in communications and information technology (IT), collaboration between disperse team members is more becoming the norm, where vast increase in connectivity is forcing organizations to re-evaluate how they collaborate¹⁸.

¹² *Ibid.*, 58-59.

¹³ *Ibid.*

¹⁴ Department of National Defence, A-PA-005-000/AP-004, *Leadership in the Canadian Forces: Conceptual Foundations*, (Kingston, ON: Canadian Defence Academy — Canadian Forces Leadership Institute, 2005): 25.

¹⁵ *Ibid.*, 33.

¹⁶ Levin, *Thinking About Knowledge Mobilization...*, 7.

¹⁷ Senge, *The Fifth Discipline...*, 223; Stanley A. McChrystal, Tantum Collins, David Silverman, and Chris Fussell, *Team of Teams: New Rules of Engagement for a Complex World*, (New York, NY: Portfolio/Penguin, 2015): 154. Both Senge and McChrystal repeatedly reference the notion of teams, seeing the organization as a system, and the importance of effective communications.

¹⁸ Verdon, John. *The Wealth of People – Collaboration and Knowledge Governance – A Strategic Discussion Paper: How the Digital Environment Re-Frames the Future of Knowledge and Work – From*

Wenger's notion of a Community of Practice (CoP) has grown in popularity, with much study on how to best leverage CoPs, and even adapt them to the modern global information environment¹⁹. Virtual online CoPs have evolved to incorporate a myriad of tools, and connect community members from across the world²⁰. Collaborative CoPs have evolved to become an important part for sharing tacit and explicit knowledge, building a body of knowledge (BoK), collaboratively²¹.

Redefining Knowledge Management

The notion of knowledge mobilization has come forward as a concept for improving application of knowledge into practice, where the focus is to get “the right information to the right people in the right format at the right time, so as to influence decision-making”²². This paper will adapt the accepted Government of Canada (GC) definition of KM by including the key element of mobilizing knowledge into practice, and that it should be done through collaborative communities of practice, effectively

Knowledge Management to Social Computing. Technical Memorandum. Ottawa, ON: Defence Research and Development Canada, 2012, 1.

¹⁹ Etienne Wenger, Richard A. McDermott, and William Snyder, *Cultivating Communities of Practice: A Guide to Managing Knowledge*, (Boston, Mass: Harvard Business School Press, 2002): 4, 196-198. Wenger et al define CoPs as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.”

²⁰ Line Dube, Anne Bourhis, and Real Jacob, "Towards a Typology of Virtual Communities of Practice," *Interdisciplinary Journal of Information, Knowledge and Management 1*, (2006): 69. Online forums or discussion boards that have a question-and-answer type focus can be complemented with knowledge repositories that have document libraries, wikis, guides, and other resources.

²¹ Wenger et al, *Cultivating Communities of Practice...*, 197. Wenger et al detail specific service requirements for online CoPs, which are used later in this paper.

²² Levin, *Thinking About Knowledge Mobilization...*, 12. Knowledge mobilization, like the term knowledge translation, has its roots in the health care sector, where it is emphasized to bring knowledge from research into practice.

absorbing the notion of knowledge mobilization into its definition. The following revised definition of KM is suggested²³:

An integrated, systematic approach to identifying, managing, and sharing all of an enterprise's information assets, including databases, documents, policies and procedures, as well as previously unarticulated expertise and experience held by individual workers. This approach is taken with the intent of mobilizing knowledge effectively into practice through collaborative communities of practice.

The Knowledge Pyramid

Making information useful is a challenge simplified by Ackoff's Knowledge Pyramid²⁴ - a version of which is represented in Figure 1. This pyramid describes the relationship between Data, Information, Knowledge, Understanding and Wisdom, demonstrating the hierarchy of these terms, where Data is considered the least of value, and ultimately wisdom is sought out as the ultimate benefit to an individual²⁵.

Adaptations to this model have been made in order to incorporate related concepts, such as the relationship to Technology and Culture as underpinnings required to support an organization²⁶. The different types of knowledge, tacit and explicit, have different spheres of utility: "tacit knowledge is embedded in the individual, whilst explicit knowledge is codified and recorded, and as such is designed for sharing"²⁷.

²³ This definition simply adds the doing or action aspects to the GC definition in Termium (insert link)

²⁴ Jennifer Rowley, "The Wisdom Hierarchy: Representations of the DIKW Hierarchy," *Journal of Information Science* 33, no. 2 (2007): 167.

²⁵ *Ibid.*

²⁶ John Girard, "Canadian Defence Knowledge Management" Chapter 8 in *The Public Management of Defence*, edited by J.C. Stone, (Toronto: Breakout Education, 2009): 203.

²⁷ *Ibid.*, 173.

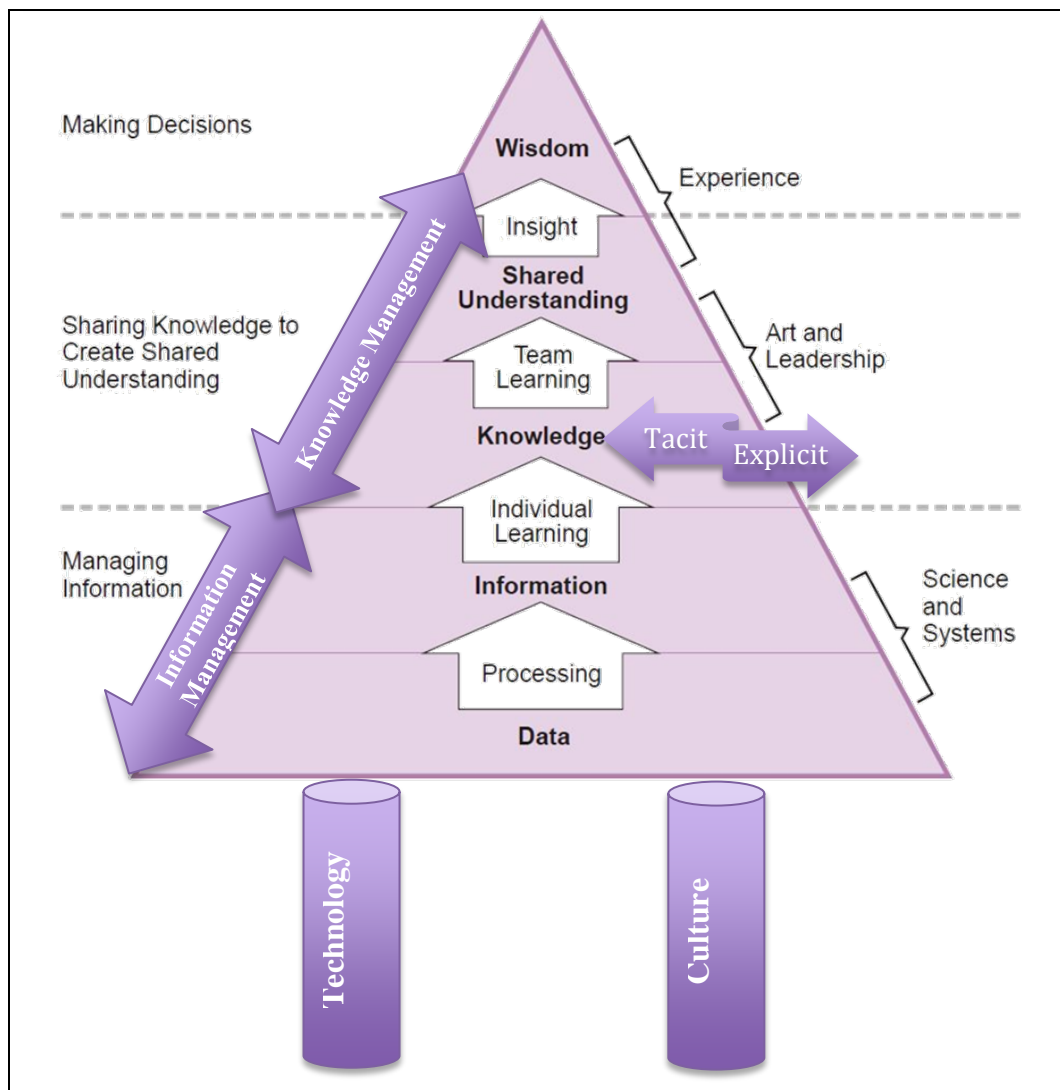


Figure 1 – Knowledge Pyramid

Adapted from: Draft CFJP 3-19, 1-6, Rowley 167-168, Girard 197, 203, 205

Figure 1 synthesizes various concepts with Ackoff's pyramid, building upon the model used in the draft Information Knowledge Management Joint publication, and integrating concepts from Girard and Rowley²⁸. Girard details the importance of

²⁸ Department of National Defence, *Draft Canadian Forces Joint Publication 3-19 Information Knowledge Management*, (Ottawa: Canadian Forces Warfare Centre, April 2017), last accessed 09 May 2017, <http://collaboration-cjoc.forces.mil.ca/sites/JDoc/IM/20170425-U-3020-CFWC-IM-CFJP3-19.docx>:

technology and culture within an effective KM system, and that they are both required but are not solutions in and of themselves²⁹. As such, they are represented as pillars in Figure 1. Additionally, there is a requirement to share both tacit knowledge through interactions, as well as explicit knowledge through documentation³⁰, which is also represented in Figure 1. Figure 1 can therefore serve as an overview of some of the key knowledge concepts.

Obstacles and Foundational Enablers: Culture and Technology

While the literature is rich with various perspectives on the requirement to effectively create, share and use knowledge, and there is also considerable detail on challenges to being effective knowledge managers. Effective KM may seem like an ideal every organization and the people within it would strive for, however there are some key factors that make it difficult to implement and sustain an effective KM programme. Levin details key barriers to mobilizing knowledge including “lack of infrastructure [...] strong inertial forces around existing practices”³¹, which points to two key enablers, or obstacles to effective KM: technology and culture.

It has been noted the “we’re different” or “we’re too busy” internal cultural barriers can prevent organizations from effectively transferring knowledge³². As a result, organizations, the teams and individuals within it can suffer if individual expertise and

1-6; Girard, *Defence Knowledge Management...*, 197, 203, 205; Rowley, *The Wisdom Hierarchy...*, 167-168.

²⁹ Girard, *Defence Knowledge Management...*, 203.

³⁰ Wenger et al, *Cultivating Communities of Practice...*, 9.

³¹ Levin, *Thinking About Knowledge Mobilization...*, 9.

³² Vandomme, *From Lessons Identified...*, 51.

knowledge is valued over sharing knowledge widely. Fostering a learning culture that values sharing knowledge and incorporating information from other sources is a key tenet of effective KM³³.

A second key enabler of KM – or obstacle to it – is technology. It has been widely noted that KM and technology have a close relationship, but technology is not a panacea to solve all KM challenges³⁴ and even the best technology systems can fail if they are not adapted to how an organization works³⁵. Advances in IT have enabled organizations and communities to better connect with its members, and they are increasingly dependent upon IT to connect, collaborate and share their knowledge³⁶. Designing IT for effective use in KM requires that leaders of KM initiatives ensure that the needs of the members of the community or organization are kept at the forefront, and that services provided are not overly cumbersome and impose more restrictions and obstacles, rather than facilitating the translation of knowledge between people.

Civilian Applications of Knowledge Management (500)

Knowledge Management in Government

Looking outside the military, in both the public and private sectors one can find many examples of KM initiatives and practices at work. Adapting from critical failures of

³³ Another important cultural barrier that is typical of the defence community shall be discussed later when focusing on KM in defence: the cultural battle between information security and the “need to know” versus the “need to share” espoused within KM practices.

³⁴ Andrew B. Godefroy, and Department of National Defence, *Lessons Learned about Lessons Learned: An Analysis of Policies, Organizations, and Processes in the Department of National Defence and the Canadian Forces*, (Kingston, ON: Canadian Defence Academy, 2009): 46; Girard, *Defence Knowledge Management...*, 203.

³⁵ Wenger et al, *Cultivating Communities of Practice...*, 197.

³⁶ *Ibid.*

the past, the National Aeronautics and Space Administration (NASA) has appointed a Chief Knowledge Officer, and enables various specialist centres to connect to one another online³⁷. Noting strength in KM in the private sector, Riege et al noted that:

Some governments are at risk of falling behind practices of leading private sector firms unless they start becoming conscious of the benefits of setting KM goals and strategies³⁸.

Governments as well as the private sector have improved KM by implementing solutions that incorporate the notion of communities, enabled by collaboration technology. One example is where the Government of Canada (GC) has outlined its goals to better harness and share knowledge between public servants in its future vision of the Public Service, encapsulated in BluePrint 2020³⁹. The follow up reporting within Destination 2020 specifies goals for further developing their online platforms – GCConnex and GCPedia for members of the GC⁴⁰. GCConnex encompasses a set of online discussion forums⁴¹, whereas GCPedia is built upon a similar platform to that of Wikipedia, in that it is a community-updated knowledge base, designed to share best practices throughout the GC, promoting vertical and horizontal knowledge sharing⁴².

³⁷ National Aeronautics and Space Administration, *What is KM?* Office of the Chief Knowledge Officer, last accessed 03 May 2017, <https://km.nasa.gov/what-is-km/>.

³⁸ Riege et al, *Knowledge Management in the Public Sector...*, 26.

³⁹ Privy Council Office, *Blueprint 2020*, last accessed 03 May 2017, http://www.clerk.gc.ca/local_grfx/bp2020/bp2020-eng.pdf: 4.

⁴⁰ GCConnex, last accessed 03 May 2017, <https://gconnex.gc.ca>; GCPedia, last accessed 03 May 2017, <http://www.gcpedia.gc.ca/wiki>; Privy Council Office, *Destination 2020*, last accessed 03 May 2017, http://www.clerk.gc.ca/local_grfx/d2020/Destination2020-eng.pdf: 6.

⁴¹ GCConnex, last accessed 03 May 2017, <https://gconnex.gc.ca>.

⁴² GCPedia, last accessed 03 May 2017, <http://www.gcpedia.gc.ca/wiki>.

The GC expresses its ambition to better connect with key stakeholders across Canada, inside and outside the government⁴³. The “Central Innovation Hub” from the Privy Council Office (PCO) is the embodiment of this ambition, and focuses on “...measurable outcomes, experimentation and evidence-based decision-making” through measurement and the documenting solutions that work in experimentation⁴⁴. The measured successes of the PCO’s Innovation Hub include involvement with three countries, collaborating with seven provinces and the involvement of 20 GC departments and agencies⁴⁵.

The GC’s motivation for such collaborative engagements is to be more efficient and effective, better value for public money⁴⁶, which are key parts to being an effective learning organization that manages knowledge effectively.

Knowledge Management Outside the Public Sector

Within the Health Care community where lives are truly at stake, the sharing of knowledge focuses on the translation of research and implementing it into practice through the study of *Implementation Sciences*. Within the *Implementation Sciences*, the terms knowledge translation, knowledge transfer, knowledge-to-action, and evidence-based decision-making are prominent, focusing on bridging the gap between research and

⁴³ Privy Council Office, *Destination 2020...*, 44.

⁴⁴ Privy Council Office, *The Innovation Hub: What We Do*, last accessed 03 May 2017, <http://www.pco-bcp.gc.ca/index.asp?lang=eng&page=innovation&doc=1-eng.htm>.

⁴⁵ *Ibid.*

⁴⁶ Privy Council Office, *Destination 2020...*, 3.

practice and moving knowledge into practice⁴⁷. The important thing to note from the health care community is that they have research and practices focused on moving knowledge to the practitioners and policy makers who are making decisions, and that those decisions are based on evidence gathered through credible research⁴⁸, and that interactions are collaborative⁴⁹. Generalizing these approaches, one can deduce that it is important to move knowledge into action, or mobilize it for use by key practitioners. Furthermore, collaboration underpins these knowledge processes so that peer-reviewed evidence can be shared effectively, and decisions can be made upon evidence, not solely on instinct.

When one speaks of collaboration, and sharing of knowledge, one of the top platforms that comes to mind is Wikipedia. Wikipedia is the most popular KM system “on the internet and is ranked among the ten most popular websites”⁵⁰. It has over 68 million registered users, with an active community of almost 300,000 users⁵¹. The case of Wikipedia gives an extreme example of distributed and collaborative KM, where millions of people across the globe have come together to create millions of articles⁵².

Collaboration across communities in the private sector has increased with globalization, and organizations and firms becoming increasingly multinational. Brickey

⁴⁷ Ian D. Graham, Jo Logan, Margaret B. Harrison, Sharon E. Straus, Jacqueline Tetroe, Wenda Caswell, and Nicole Robinson, "Lost in Knowledge Translation: Time for a Map?" *The Journal of Continuing Education in the Health Professions*, 26 (2006): 13.

⁴⁸ Ian D. Graham, Jacqueline Tetroe, and the KT Theories Research Group, "Some Theoretical Underpinnings of Knowledge Translation," *Society for Academic Emergency Medicine* 14 (2007): 936.

⁴⁹ Graham et al, *Lost in Knowledge Translation...*, 16.

⁵⁰ Wikipedia, *History*, last accessed 03 May 2017, <https://en.wikipedia.org/wiki/Wikipedia>.

⁵¹ *Ibid.*

⁵² Coincidentally, GC's GCPedia uses the same Wikimedia platform that was developed for Wikipedia (GCPedia).

and Walczak looked at five different communities of practice (CoPs) in the private sector including Siemens, Hewlett-Packard and Caterpillar, and compared the CoPs strengths, challenges, and similarities to United States Army professional forums⁵³. The key point for consideration here, is that they noted that civilian organizations have changed their business practices to incorporate CoPs for better global collaboration⁵⁴.

Section Summary

This section distilled the broad study of KM and related disciplines towards a useful definition of KM, and related concepts including the notions of collaborating as communities of practice (CoPs), which co-create and evolve a body of knowledge (BoK) together. From the literature the key obstacles (yet enablers) of technology and culture were noted as important in implementing effective KM. Finally some examples of KM initiatives in government and the private sector were identified, highlighting how collaboration, technology, and connecting communities is emphasized throughout.

Next, this paper will build on these concepts, delving into the application of KM within the military, and specifically towards the problems and potential solutions regarding KM in the DND/CAF.

⁵³ Jon Brickey and Steven Walczak, *A Comparative Analysis of Professional Forums in the United States Army and Hybrid Communities of Practice in the Civilian Sector*, Proceedings of the 43rd Hawaii International Conference on System Sciences (Hawaii: 2010): 6.

⁵⁴ *Ibid.*, 1. Key deductions on what Brickey and Walczak discovered within the U.S. Army will be discussed later.

MILITARY KNOWLEDGE MANAGEMENT

*Information is only of value if you give it to people who have the ability to do something with it. [...] What we did was we changed the idea of information, instead of knowledge is power, to one where **sharing is power** [emphasis added]. It was the fundamental shift, not new tactics, not new weapons, not new anything else. It was the idea that we were now part of a team in which information became the essential link between us, not a block between us.*

– General (Retired) Stanley McChrystal, *The military case for sharing knowledge*, TED Talk Video at TED2014, March 2014

The Requirement to Share Military Knowledge Now and in the Future

Common to Information and Knowledge: Need to Share

Western militaries often speak to the value of sharing information and knowledge between its constituent elements, and even between allies. General (Retired) Stanley McChrystal has cited his operational experiences in war, and the benefit of sharing information across organizational and national boundaries, where “instead of knowledge is power, to where sharing is power”⁵⁵. Both in this talk, as with his work in Team of Teams, McChrystal is speaking primarily to sharing operational and often time-sensitive mission information⁵⁶, so as to synthesize into actionable intelligence.

The requirement to disseminate and collaborate on operational information between organizations has certain characteristics in common with the earlier section’s discussion of collaboration and knowledge management – the notion of sharing between teams or communities of practice (CoPs). In the earlier section, a given CoP’s body of knowledge (BoK) may encompass best practices, standards and other explicit knowledge.

⁵⁵ Stanley A. McChrystal, *The military case for sharing knowledge*, TED Talk Video, TED 2014: March 2014, last accessed 03 May 2017, https://www.ted.com/talks/stanley_mcchrystal_the_military_case_for_sharing_knowledge.

⁵⁶ Stanley A. McChrystal, Tantum Collins, David Silverman, and Chris Fussell, *Team of Teams: New Rules of Engagement for a Complex World*, (New York, NY: Portfolio/Penguin, 2015): 154.

Outside the *explicit knowledge* stored in a BoK, a CoP requires means to collaborate and communicate, so as to share information and *tacit knowledge*. The common element between sharing information, tacit and explicit knowledge is that there needs to be a culture of sharing, and technologies that support them both.

Collaborating and Connected Systems Now and in the Future

Another view of changing the culture of sharing knowledge and information can be found in Alberts and Hayes where information should be “translated into actionable knowledge”⁵⁷ (Alberts and Hayes, 4), and they postulate how information age processes are meant to leverage organizational knowledge through collaboration⁵⁸. Alberts and Hayes detail the power in information, and who possesses it,⁵⁹ going so far as to say implementing network-centric practices including broad information sharing, collaboration, and distributed decision-making is “absolutely necessary if we are to maintain our military superiority in the 21st century.”⁶⁰

When looking at foresight publications such as the Future Security Environment (FSE), there are additional indications as to what the future may hold with regards to the importance of organizational learning and KM. One of the key insights include that defence learning will remain critical – particularly at the tactical level, however noting

⁵⁷ David S. Alberts and Richard E. Hayes, *Power to the Edge: Command and Control in the Information Age*, Command and Control Research Publication Series, 2005: 4.

⁵⁸ *Ibid.*, 89.

⁵⁹ *Ibid.*, 73.

⁶⁰ *Ibid.*, 6; McChrystal et al, *Team of Teams...*, 154. It should be noted that using a systems approach is not only used by Senge, but also by Alberts and Hayes as well as McChrystal. McChrystal notes that taking a systems approach to operations, whereby distributed team members from different organizations were required to collaborate, connect, and share information in order to solve complex problems

that at the strategic level “lessons identification and analysis is, over the long-term, more important because of the much larger implications of actions at those levels”⁶¹.

Furthermore, it explicitly states⁶²:

The CAF must integrate the lessons learned from operations, exercises, and experiments at the tactical, operational and strategic levels in order remain ready, effective, and adaptive.

In other words, this highlights the requirement for the CAF to effectively translate operational lessons into knowledge, and that it must do this at the tactical, operational and strategic levels.

Connecting people so that they can share the knowledge that they embody, leveraging emerging technologies (such as social media) is a concept that spans multiple sources. Verdon notes trends in the unparalleled connectivity associated with social media, and argues that organizations must be able to leverage new modes of knowledge creation in order to be innovative⁶³. He further notes that organizations must shift towards allowing organizations to incorporate tacit knowledge, and the social interactions between people⁶⁴. In Pathak’s work on virtual teams, he notes how there is a rise in virtual teams due to enabling information and communications technology⁶⁵.

Furthermore, more organizations are choosing to connect geographically dispersed team members with through capable IT, so that they can collaborate in new ways⁶⁶.

⁶¹ Department of National Defence, A-FD-005-001/AF-003, *The Future Security Environment 2013-2040* (Ottawa: DND Canada, 2014): 91.

⁶² *Ibid.*, 92.

⁶³ Verdon, *The Wealth of People...*, 1.

⁶⁴ *Ibid.*, 28.

⁶⁵ Atul Arun Pathak, "Effective Knowledge Management Boosts Virtual Teams," *Human Resource Management International Digest* 23, no. 3 (2015): 26.

⁶⁶ *Ibid.*

The common thread from these diverse sources is that organizations are increasingly required to work with other organizations, across vast distances and organizational boundaries. As such, they will be dependent upon systems that enable them to connect and collaborate with diverse team members both within and outside their organization, to effectively share knowledge, both tacit and explicit.

Noting these trends, it behooves us to look at how Canada's key allies are managing military knowledge, collaborating and sharing, and adapting to these trends of increased connectivity and collaboration.

Allied Military Knowledge Sharing Practices and Systems

The United States (US) Army has embodied many of its KM practices within its Lessons Learned (LL) processes that are managed through its Center for Army Lessons Learned, and a network of Centers of Excellence (CoEs) that are mandated to be focal points of knowledge within particular subject matter areas⁶⁷. Members of the US Army can collaborate with one another, and access key BOKs that are shepherded through the CoEs through a system of collaborative tools. This includes the milSuite toolkit with a professional networking, expertise locator and discussion forums (milBook), a collaborative online encyclopedia (milWiki), video sharing (milTube), and a news aggregator (milWire)⁶⁸. In addition, the US Army hosts a dedicated KM suite based off

⁶⁷ United States Army, *Combined Arms Center, Center for Army Lessons Learned*, last accessed 03 May 2017, <http://usacac.army.mil/organizations/mccoe/call>.

⁶⁸ United States Army Program Executive Office Command Control Communications-Tactical, *Military Technical Solutions*, last accessed 03 May 2017, <http://peoc3t.army.mil/nete/miltech.php>.

of Microsoft SharePoint⁶⁹. Within these powerful tool suites, the US Army has further sought to learn from civilian innovations by implementing professional forums⁷⁰. As mentioned earlier, Brickey and Walczak evaluated US Army use of CoPs, and it found that it benefited from professional forums for their CoPs and its approach converged with that of private sector businesses⁷¹. The US Army has put in place various people, processes and technology to support a KM enterprise that is truly collaborative, connected and global. The system in place leverages key organizations (e.g. CoEs) to be KM managers as well as facilitate discussion in professional forums – fostering sharing of both tacit and explicit knowledge.

Within the multinational context, the North Atlantic Treaty Organization (NATO) also manages explicit knowledge through numerous centres of excellence, as well as the NATO Joint Analysis and Lessons Learned Centre⁷². The CoEs are designed to be multinational “knowledge hubs”⁷³ (NATO 2017 Catalogue, 3). The programme of NATO CoEs has an active cadre of nations participating – 25 of 28 NATO nations participate in

⁶⁹ *Ibid.*

⁷⁰ Brickey and Walczak, *A Comparative Analysis of Professional Forums...*, 1.

⁷¹ *Ibid.*, 9; Will B. Freds, "Knowledge Management: Communities of Practice as Key Aspects in Future US Army Leader Development," Master's of Defence Studies Thesis, Canadian Forces College, 2011: 44.

⁷² North Atlantic Treaty Organization, NATO Joint Analysis and Lessons Learned Centre, *NATO Lessons Learned Portal*, last accessed 03 May 2017, <http://www.jallc.nato.int/products/nllp.asp>.

⁷³ North Atlantic Treaty Organization, *NATO Centre of Excellence Catalogue 2017*, last accessed 30 Apr 2017, http://www.act.nato.int/images/stories/structure/coe_catalogue_2017.pdf: 3.

CoEs⁷⁴. NATO's CoEs and the NATO JALLC make use of a number of collaborative systems to share tacit and explicit knowledge⁷⁵.

Both with the example of the US Army, as with NATO, our key allies use the terms “lessons learned” which is an integral part of their KM programme. CoEs are tasked and resourced to manage LL and KM, and they are supported through a variety of collaboration technologies that connect their members globally.

Knowledge Management in the Canadian Armed Forces

By design, the CAF KM enterprise is mostly aligned with both the GC, as well as with key allies, in terms of some of its terminology and the overall intent. CAF KM is managed through its Lessons Learned (LL) programme, which is established in policy within Defence Administrative Orders and Directives (DAOD) 8010-0 Lessons Learned (LL)⁷⁶. The actual details of the LL program are set out in Canadian Forces Joint Publication A2 – Lessons Learned, where the notion of “adding of value to an existing body of knowledge”⁷⁷ is integral to the LL program⁷⁸. Of note, it is a linear, command-

⁷⁴ *Ibid.*, 4. The Canadian Armed Forces is only a Sponsoring Nation of three NATO COEs – Combined Joint Operations from the Sea (CJOS, US), Joint Air Power Competence Centre (JAPCC, Germany), and Military Engineering (MILENG, Germany), whereas Canada is not a framework nation hosting any COE.

⁷⁵ NATO, *NATO Lessons Learned Portal*; North Atlantic Treaty Organization, *NATO JALLC Knowledge Enterprise: Implementing Knowledge Management as an Enterprise Function in Allied Command Operations*, (25 Nov 2016), last accessed 03 May 2017, http://www.jallc.nato.int/products/docs/2017JAN31_Knowledge_Enterprise.pdf: 1. Of note, the NATO Lessons Learned portal is also based off of Microsoft SharePoint.

⁷⁶ Department of National Defence, Defence Administrative Orders and Directives 8010-0, *Lessons Learned*, last accessed 03 May 2017, <http://www.forces.gc.ca/en/about-policies-standards-defence-admin-orders-directives-8000/8010-0.page>.

⁷⁷ *Ibid.*

⁷⁸ Department of National Defence, *B-GL-025-0A2/FP-001, Canadian Forces Joint Publication A2 Lessons Learned, 1st Edition*, (Ottawa: Canadian Forces Warfare Centre, 2015): 2-1.

driven process that must result in an act of change for a lesson to actually be considered a “lesson learned”⁷⁹. Since LL are a fundamental part of the CAF’s KM programme, the CAF LL system is duly named KMS, or “Knowledge Management System”⁸⁰.

Each service manages their LL program, building upon the departmental-level directive and joint-level doctrine, mostly focusing at tactical lessons learned within their service. Both at the service- and joint-level, collection of lessons learned have begun to use more collaborative technologies⁸¹.

Additionally, the notion of CoEs is present within the CAF. At the institutional level, DAOD 5032-1 brings forward the concept of CoEs in the CAF, denoting them instead as Functional Centres of Expertise (FCoEs). Their purpose is described as follows:

Within its assigned areas of expertise, a functional centre of expertise provides support across the CAF, including within the systems approach to IT&E, capability development, doctrine development, the military employment structure, collective training and *lessons learned*. [emphasis added]

This further solidifies the link between KM, LL, and FCoEs in the CAF. The role of FCoEs is fully embedded in the Canadian Army’s doctrine and training system, through its Canadian Army Order 21-07 Functional Centres of Excellence Policies and Procedures⁸². Designated FCoEs are responsible for maintaining their community’s BoK,

⁷⁹ *Ibid.*, 2-5.

⁸⁰ Department of National Defence, *Knowledge Management System*, last accessed 03 May 2017, <http://kms.mil.ca>.

⁸¹ Matthew McDonald, "SharePoint Lessons Learned Collection Tool (SPLLCT)", email dated 08 May 2017. SharePoint is used as the platform for both the Canadian Forces Warfare Centre’s SPLLCT, as well as the Canadian Army’s Lessons Learned Centre.

⁸² Department of National Defence, *Canadian Army Order 21-07 Functional Centres of Excellence Policies and Procedures* (Kingston: June 2014): 1.

which is comprised of authoritative field manuals and detailed Tactics, Techniques and Procedures (TTP) documents⁸³. This prescriptive approach gives sufficient detail to outline a wholesome KM system that should be able to effectively manage a comprehensive BOK of explicit knowledge. The order also details which specific training establishments have been assigned which specific areas of expertise.

At the institutional level, the CAF Campus Operational Framework highlights the roles that FCoEs are to “lead, coordinate and maintain the intellectual foundation and authoritative body of knowledge within their assigned area of expertise...”⁸⁴. The functioning of FCoEs is further detailed in the draft FCoEs concept of operations document from Military Personnel Generation⁸⁵. One of the proposed functions within FCoEs’ mandate to support analysis and lessons learned is in “establishing and maintaining communities of practice”⁸⁶. Once this document is further developed and promulgated as institutional policy, it will formalize the intent of linking KM with LL, FCoEs, and communities of practice.

CAF Knowledge Management Challenges

CAF KM Cultural Challenge: The Need to Know Battling the Need to Share

One of the key challenges for KM in the CAF is the tension between the notions of “need to know” and “need to share”. Finding a balance between these two opposing

⁸³ *Ibid.*, 2.

⁸⁴ CAF Campus 7, 19.

⁸⁵ Department of National Defence, *Draft Functional Centres of Expertise Concept of Operations*, v8.1, (Kingston: Military Personnel Generation, March 2016): 3-5.

⁸⁶ *Ibid.*, 4.

notions is not unique to the CAF – as noted earlier, General (Retired) Stanley McChrystal criticized over-classification of information, and the requirement to shift from the concept where “knowledge is power to where sharing is power”⁸⁷. Girard also calls for a paradigm shift away from excesses in information security, towards the concept of “need to share”⁸⁸. At the alliance level there are indicators of a push to share more. One indicator is NATO’s Federated Mission Networking (FMN) being designed to have common applications and services between nations, where sharing is engrained through its architecture and represented by the FMN motto is “Federate – Share – Win”⁸⁹.

Understanding the tension in these concepts and how to find a balance can be found in Quinn’s Competing Values Model, applied to CAF organizational effectiveness⁹⁰. In the competing values model diagram, the diagonal tensions between the *Open Systems Model* and the *Internal Process Model*⁹¹ can be mapped to the CF effectiveness framework dimensions of *External Adaptability* and *Internal Integration* respectively⁹². Furthermore, the notions of *Need-To-Share* versus *Need-To-Know* can respectively be mapped to the *Open Systems Model / External Adaptability* and *Internal Process Model / Internal Integration*, as shown in Figure L below. Viewing the problem

⁸⁷ Stanley A. McChrystal, *The military case for sharing knowledge*, TED Talk Video, TED 2014: March 2014, last accessed 03 May 2017, https://www.ted.com/talks/stanley_mcchrystal_the_military_case_for_sharing_knowledge.

⁸⁸ John Girard, "Canadian Defence Knowledge Management" Chapter 8 in *The Public Management of Defence*, edited by J.C. Stone, (Toronto: Breakout Education, 2009): 204.

⁸⁹ North Atlantic Treaty Organization, *NATO Federated Mission Networking*, last accessed 03 May 2017, <http://www.act.nato.int/fmn>.

⁹⁰ Department of National Defence, A-PA-005-000/AP-004, *Leadership in the Canadian Forces: Conceptual Foundations*, (Kingston, ON: Canadian Defence Academy — Canadian Forces Leadership Institute, 2005): 33. Figure 2A-1 Competing Values Model of organizational effectiveness.

⁹¹ *Ibid.*

⁹² *Ibid.*, 34.

space using Quinn's model can teach us that the answer lies not in exclusively supporting fully-open *Need-to-Share* approach and disregarding information security, but rather finding a balance where these competing values can both be satisfied to a degree.

CAF KM Cultural Challenge: Linear Hierarchical Processes vs. Open Networking

The CAF Lesson Learned process does succeed in having crucial command-driven issues evaluated, whether in an operational or training environment. However the CAF LL process is too linear and time consuming to be the sole method of harvesting tacit knowledge and distilling into explicit knowledge. Godefroy noted some of the deficiencies in past LL and KM practices, whereby the "LL community existed to distil what they would need to know" and translate into doctrine and training, further exasperating his observation that the LL community were the primary users of KM applications, and not the general military community⁹³. Currently the CAF KMS application resides on both unclassified and classified networks, both as an application as well as websites⁹⁴. It has open access to anyone on defence networks, and has a search engine that permits the search and retrieval of documents. While KMS serves as a key CAF BoK with a capable search engine, it does not provide any collaborative tools to enable members to connect with one another, nor collaborate on building knowledge similar to popular online encyclopaedias⁹⁵. Furthermore, it remains little used by those

⁹³ Godefroy, *Lessons Learned about Lessons Learned...*, 49.

⁹⁴ Department of National Defence, *Knowledge Management System...*

⁹⁵ Godefroy, *Lessons Learned about Lessons Learned...*, 47.

outside of the LL community⁹⁶. While KMS does adequately support a command-driven linear LL process, it does not account for modern information age networking where tacit knowledge is shared between members of a community of practice, and open peer-to-peer exchange is facilitated by a network-centric environment, as envisioned by Alberts and Hayes.

DND/CAF KM Technological Challenge: Dispersed Ad Hoc DND/CAF BoKs

While there are many CoPs that have been established through the CAF, some with established governance structures, some more informal, there are no standardized forums for CAF CoPs to collaborate and share best practices. Some FCoEs within the Canadian Army have established their own BOKs to complement or compete with the CAF KMS. This results in a situation where some best practices are stored within KMS, while others are held at the individual or unit level, or within a given FCoE's collaborative workspace⁹⁷.

Additionally, there is an over-dependency on email, and person-person handovers to share knowledge, which leaves out the greater community⁹⁸. As many members of the CAF are still getting used to collaborative platforms such as Microsoft SharePoint, as well as the discussion forums, online encyclopaedias, many tend to continue to rely on emailing their personal networks of colleagues, rather than sharing knowledge more

⁹⁶ Godefroy, *Lessons Learned about Lessons Learned...*, 47, 49.

⁹⁷ Department of National Defence, "Communications and Electronics Centre of Excellence", last accessed 03 May 2017, <http://acims.mil.ca/trgdev/CandECoE/>. The Communications and Electronics Centre of Excellence (C&E CoE) site on the defence unclassified network is a prime example of an FCoE building up a BOK for the Community of Practice.

⁹⁸ Based on the author's personal experiences over various deployments, as well as working for several years in a CAF school and FCoE.

widely. This creates the situation where there is an overall ad hoc approach to how knowledge is made available to personnel across the CAF, where it truly depends what you are looking for – there is no such one-stop-shop for knowledge and collaboration with SMEs within the CAF.

CAF KM Cultural and Technological Challenge: The Joint, Operational, Strategic and Community Gap

While there are many FCoEs, training establishments, and other effective concentrations of subject matter expertise throughout the CAF that possess a lot of tactical knowledge, there is a general gap in knowledge sharing at the joint, operational and strategic level⁹⁹. For example, there is no formally established FCoE on Joint communications and information systems, where the Canadian Forces School of Communications and Electronics (CFSCCE) is not tasked (nor resourced) to fulfill that FCoE function¹⁰⁰, even though it does formally teach Joint CIS courses, and has established an informal Joint CIS CoP¹⁰¹.

Even though collaboration outside organizational boundaries is alluded to in Duty With Honour¹⁰², there is a fundamental gap in both established programs of collaboration, as well as systems to connect the CAF FCoEs with industry, academia, and

⁹⁹ KMS SOCD

¹⁰⁰ Department of National Defence, *Canadian Army Order 21-07 Functional Centres of Excellence Policies and Procedures* (Kingston: June 2014): Annex A.

¹⁰¹ Department of National Defence, "Communications and Electronics Centre of Excellence", last accessed 03 May 2017, <http://acims.mil.ca/trgdev/CandECoE/>. Joint CIS Discussion Forum on C&E CoE Site.

¹⁰² Department of National Defence, A-PA-005-000/AP-001, *Duty With Honour: The Profession of Arms in Canada*, (Kingston, ON: Canadian Defence Academy — Canadian Forces Leadership Institute, 2009): 68.

allies. This gap can be seen as both a cultural and a technological challenge, in that the necessary processes and structures are not yet fully in place to task all relevant CAF units with FCoE tasks (and then resource them appropriately to fulfill that task), and the technologies have not been provisioned to enable CAF FCoEs to effectively collaborate outside of the CAF and GC.

The Evolving CAF KM Solution Space – Requirements and Recommendations

Looking at the earlier sections, and specifically at the CAF's allies, as well as outside the military milieu, there are some solutions to the challenges that face KM in the CAF. We will begin by looking at some technological services and requirements that may address some of the challenges, and summarize them in a table. Next, recommendations are offered that are of a technological nature, followed by recommendations that address some of the cultural challenges regarding KM.

Community of Practice Service Requirements

Wenger et al detailed some key services that enable CoPs¹⁰³. Some of these key services are listed as “General CoP Requirements” in Table Y below, whereas additional requirements discussed above with regards to accessibility to other communities are listed as “Specific CAF CoP Requirements”. These requirements are listed on the left,

¹⁰³ Wenger, et al, *Cultivating Communities of Practice...*, 197-198.

and then some of the key KM and LL systems are then evaluated as to which services they provide at present¹⁰⁴.

Table 1 – CoP Service Requirements and LL / KM Platforms

Element	Purpose	KMS	Learning Portal	C&E CoE (SharePoint)	GPCedia	GCConnex	SPLLCT (SharePoint)	US JLLIS
General CoP Requirements¹⁰⁵								
Home Page	Assert existence, describe domain and activities	X	X	X	X	X	X	X
Discussion Forums	A conversation space for online discussions		X	X		X	X	X
Shared Document Repository	Key part of knowledge base [body of knowledge] to store documents including research reports, best practices, standards	X	X	X	X		X	X
Search Engine	Ability to find things throughout the entire knowledge base	X	X	X	X	X	X	X
Member Directory	Information about member's areas of expertise in the domain		X	X		X	X	X
Shared Workspace Collaboration	For synchronous electronic collaboration, or to enhance teleconferences with visuals			X			X	
Community Management Tools	For the coordinator, or the community at large. Ability to see who is participating actively,	X	X	X	X	X	X	X

¹⁰⁴ Matthew McDonald, "SharePoint Lessons Learned Collection Tool (SPLLCT)", email dated 08 May 2017. SPLCCT is a SharePoint-based tool that has been developed by the Canadian Forces Warfare Centre, meant to complement KMS. Of note, the US JLLIS system is being contemplated as an option to replace KMS in the future.

¹⁰⁵ Adapted from Wenger et al, 197-198.

	what documents are downloaded, how much traffic there is, which documents are in need of updating.							
Additional / Specific CAF Requirements								
GC-Wide Access	For selected CoPs, where cross-departmental or agency collaboration would be beneficial.				X	X		
Internet-Accessible	For CoPs that need to interact with industry, academia, IOs, NGOs, etc.							
Access at Multiple Security Levels	In order to ensure information security requirements for sensitive information or knowledge	X					X	X
Multi-National	In order to facilitate knowledge sharing between allies						X	X
Automated Access / Login	In order to simplify access / reduce barriers			X			X	

Technical Recommendations

Based on the previous technical requirements, as well as the deficiencies noted, it is recommended that the CAF build upon one of the extant collaborative CoP, LL or KM platforms. Due consideration and priority should be given to a platform that users prefer the most, through user trials. Strong consideration should be given to SharePoint-based platforms, due to the overwhelming international community use of the platform¹⁰⁶, the

¹⁰⁶ The Canadian Army's use of SharePoint is prevalent as its information management system of record both on unclassified networks (the ACIMS system), as well as its presence on classified networks (the TIMS system on LCSS and CDMN). Additionally, the US Army, NATO, as well as the evolving Joint

ease of automated access control and login¹⁰⁷, and ability to scale to other networks, both on the Internet, as well as national and multinational classified networks. The balance between information security (need to know) and knowledge sharing (need to share) should be facilitated through simplified login and access control, such as what is offered by Microsoft SharePoint where a network login is automatically used to grant or restrict to content.

The CAF should consider aligning itself with the US' systems, or NATO's, and avoid building CAF-unique platforms, which may difficult to maintain and evolve. The US Army's MilTech¹⁰⁸ approach benefited by integrating off-the-shelf software to improve interoperability, and users' ease of use due to familiarity with other applications.

Cultural Recommendations

There are a few key recommendations that should be pursued which are intended to address cultural issues at the policy level in CAF. The first and most important recommendation is for the current Military Personnel Generation efforts with regards to knowledge mobilization and FCoEs be accelerated, and aggregate efforts within the services. A singular list of FCoEs should be compiled, where CAF organizations are mandated (and resourced) to have an online presence for their assigned areas of expertise, in order to serve a given CoP with the requisite tools for explicit knowledge sharing

SharePoint Lessons Learned Collection Tool – SPLLCT – use SharePoint as the platform for collaboration, information and knowledge management.

¹⁰⁷ Microsoft SharePoint makes use of a windows network user's credentials to automatically grant access, or deny it, to its content, as determined as SharePoint administrator's policies. This simplifies access for users, where they do not have to request a separate account and password, but it is . Using such an automated access system removes yet another barrier, making collaboration easier.

¹⁰⁸ United States Army, *Military Technical Solutions*.

(through centralized CoP BOKs) as well as tacit knowledge sharing through informal interaction as well as formal training and education¹⁰⁹. This could complement the existing lessons learned program of work, or subsume it.

Collaboration programs that are already established with partners outside DND/CAF, such as those collaborative initiatives led through Defence Research and Development Canada (DRDC) should be explicitly leveraged for knowledge sharing due to established programs and technologies that DRDC utilizes¹¹⁰.

Lastly, it is recommended that more incentives and measurement efforts be implemented so as to incentivize CAF personnel to invest in and collaborate with CoPs. As detailed by Pathak, Girard and Vandomme, establishing a measurement framework is important in order to determine that KM goals are being achieved.¹¹¹

¹⁰⁹ Online FCoEs should have collaborative tools to support their CoPs, with the requisite technical services of an online, searchable BOK, discussion forums, and subject matter expert locator. This online CoP should be on at least one operational network for every operational mission, so that knowledge can be shared at every classification level.

¹¹⁰ DRDC Partners Collaborative SharePoint Portal, <https://partners.drdc-rddc.gc.ca>, last accessed 03 May 2017. DRDC's internet-accessible SharePoint collaboration platform should be leveraged (if possible) to enable CAF CoPs to work with DRDC, as well as partners in industry, academia, and other relevant groups.

¹¹¹ Vandomme 2010, 46-53 details the importance of measurement of KM efforts, as does Girard (206). Pathak details how HR programs should measure employee's use of KM, and it should be reviewed in their personnel appraisal evaluations (Pathak, 28).

Section Summary

This section built on KM theory and applications in the civilian sector, and focused in on the structure, challenges and potential solutions for KM in the military sector, specifically in the CAF. A number of recommendations were given in order to address some of the key technological and cultural barriers to effective KM, with a view to improving KM in the CAF.

CONCLUSION

This paper showed that the CAF and DND can improve mobilization of knowledge into practice by applying a CoP approach through more collaborative information services.

A broad survey of the relevant knowledge literature was done, incorporating key knowledge concepts, offering a revised definition of KM. Building upon examples of KM practices in the civilian sector, an analysis of military KM was done, highlighting some of the key challenges for KM in the CAF.

Key deductions from this work included some suggested CoP service requirements, and an assessment of key collaborative platforms against these requirements. Recommendations were made with regards to key technological issues that should be addressed, including the need to build upon one of the extant collaborative CoP, LL or KM platforms, and extend to all DND and CAF personnel.

The key recommendation from a cultural perspective was that the policy work on FCoEs and knowledge mobilization should continue. This will assist in an improved CoP approach through the CAF and DND, where both tacit and explicit knowledge sharing is improved.

In order for DND/CAF to truly be a learning organization, the necessary technologies and culture need to be in place to improve organizational effectiveness.

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GLOSSARY OF KEY TERMS

Terms	Definitions	Source
Community of Practice (CoP)	Communities of Practices are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.	Wenger et al, 4.
Explicit Knowledge	Explicit knowledge is codified and recorded, and as such is designed for sharing	Rowley, 173
Functional Centre of Excellence	A Functional Centre of Excellence (FCoE) is an institutional organization that is assigned the authority and responsibility to lead, coordinate and maintain the 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	Canadian Army Order 21-07, dated June 2014
Functional Centre of Expertise	Within its assigned areas of expertise, a functional centre of expertise provides support across the CAF, including within the systems approach to IT&E, capability development, doctrine development, the military employment structure, collective training and lessons learned.	Defence Administrative Orders and Directives 5031-2, Individual Training and Education System Strategic Framework, dated October 2016.
Knowledge Management (KM)	<p>Knowledge Management involves creating, securing, coordinating, combining, retrieving and distributing knowledge.</p> <p>An integrated, systematic approach to identifying, managing, and sharing all of an enterprise's information assets, including databases, documents, policies and procedures, as well as previously unarticulated expertise and experience held by individual workers.</p> <p>An integrated, systematic approach to identifying, managing, and sharing all of an enterprise's</p>	<p>Levin, 12</p> <p>Termium Plus</p> <p>Modified</p>

	information assets, including databases, documents, policies and procedures, as well as previously unarticulated expertise and experience held by individual workers. This approach is taken with the intent of mobilizing knowledge effectively into practice through collaborative communities of practice.	definition used in this paper, absorbing the concept of knowledge mobilization, and linking to communities of practice.
Knowledge Mobilization (KMb)	Knowledge Mobilization is ... getting the right information to the right people in the right format at the right time, so as to influence decision-making. Knowledge Mobilization includes dissemination, knowledge transfer and knowledge translation	Levin, 12.
Lesson	Knowledge generated from the analysis of an issue to determine underlying cause	Key Definitions, Canadian Forces Joint Publication A2, Lessons Learned, 2-1.
Lessons Learned	<p>A lesson identified for which validated remedial action has been implemented, resulting in a tangible improvement in performance or capability.</p> <p>The adding of value to an existing body of knowledge, or seeking to correct deficiencies in areas of concepts, policy, doctrine, training, equipment or organizations, by providing feedback and follow-on action. Normally, an issue would be considered progressed to a LL after the implemented change has been validated.</p>	Key Definitions, Canadian Forces Joint Publication A2, Lessons Learned, 2-1.
Tacit Knowledge	tacit knowledge is embedded in the individual	Rowley, 173