

SPRING EDITION
2021

FEATURE ARTICLE

Leadership in a Practical Sense

Enabling Successful Leadership within the Logistics Corps
At The Forefront Of Tomorrow
How Military Logistics Changed Canada's Destiny

INTERVIEW

with Alma Arzate

& MUCH MORE

PRAEFECTUS
ANNONAE





PRAEFECTUS ANNONAE

- i. A Leader in sustainment.
- ii. One who stands in front and supports.
- iii. An organizer of provisions.
- iv. A permanent, distinguished, superior, and distinct support leader.
- v. The name of the Royal Canadian Logistics Service journal.



During the development of this journal, members of the Canadian Forces Logistics Training Centre were invited to propose names for it. Submissions included French, English, Esperanto, and Latin names. Submissions often related to memorabilia, symbolism, history, and cap badges.

These elements were taken into account with an emphasis on both sustainment and leadership. Dean of Humanities and Latin professor Dr. Hugh Elton of Trent University was consulted in order to discuss the various submissions. From this process, Praefectus Annonae was selected as the term that captures the spirit of both sustainment and leadership. We thank Dr. Elton for his expert advice and encouragement as well as all those who submitted suggestions.

The views expressed in this journal are those of the authors and not those of their organizations, DND, or the CAF.



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CONTENTS

About the Journal	02 - 03
Table of Contents	04
Introduction	05
News	06 - 07
FEATURE ARTICLE	
Leadership in a Practical Sense	08 - 10
ARTICLES	
Enabling Successful Leadership within the Logistics Corps	11 - 15
Loving Your Troops	16 - 19
At the Forefront of Tomorrow	20 - 26
Four Short Years	27 - 31
How Military Logistics Changed Canada's Destiny	32 - 36
Defence Supply Chain Management	37 - 39
The Switch to Natural Plastic Replacements	40 - 41
Future Directions	42 - 47
Shaken and Stirred by Design	48 - 49
History and Doctrine of the Royal Canadian Logistics Service	50 - 54
Servitium Nulli Secundus	55 - 59
Managing Communication In Virtual Teams	60 - 63
3pl Benefits for the Canadian Armed Forces	64 - 66
Canadian Armed Forces Supply Chain Modernization	67 - 70
The CAF Needs to put Their Heads in the "Cloud"	71 - 75
CFLTC X Div Production Cell	76 - 77
A Technological Divide	79 - 83
INTERVIEW	
Developing Careers for Women in Logistics with Alma Arzate	84 - 88



Lieutenant Colonel Bennett, Commandant of the Canadian Forces Logistics Training Centre.

At the Canadian Forces Logistics Training Centre, we have incorporated more leadership elements into training in order to help cultivate better leaders. The recent publication of the land logistics textbook *The Logistics Practitioner: Leadership and Fundamentals of Army Sustainment*, and the reading program for officers that forms part of their training, are two steps towards additional leadership and skill development. The principles are then practiced in field training. This model is working well and is beginning to be included in other courses, thus helping to expose the next generation of leaders to various leadership perspectives, practices, and skill development - all within a logistics realm. To that end, we have incorporated several articles on leadership in this edition to help the wider logistics community learn more about this vital topic.

This edition of the Logistics Journal is unique. It is the first edition where papers from the Advanced Logistics Officer Course and the General Leech Essay competition are being published. There are a lot of great ideas from junior and senior leaders, all seeking to contribute to the advancement and professionalism of logistics within the

Canadian Armed Forces. *Praefectus Annonae* (translated as a "Sustainment Leader") now provides all of us with an opportunity to see what others are thinking and doing. Our personal leadership skills improve when we are able to draw on different perspectives, backgrounds, and ideas, which is what we aim to do with this edition. When our leadership improves, so does our institution.

I would encourage all our readers to distribute copies of the journal to members inside and outside your units. We've received a lot of positive feedback on the journal, indicating that more people want to see it - so let's give it a wider distribution.

Leadership is the keystone
that holds everything else
we do together.



IN THE NEWS

FIRST LOGISTICS TEXTBOOK IS HOT OFF THE PRESS

Drawing on three years of work from the Canadian Army Centre of Excellence, the first edition of *The Logistics Practitioner: Leadership and Fundamentals of Army Sustainment* has now been published by the University of Toronto Press.

The book was written by members of the Centre of Excellence and 1 Canadian Division. It captures about 80% of what a junior army officer needs to know to be successful in a first posting. Key topics in the 20 chapter textbook include the logistics estimate, the history of military logistics, leadership, heavy haul movements, sitings, and recces. Topics that are not covered due to other existing training tools or the need for hands-on teaching include: voice procedure, map symbols, unit fitness and fitness safety, and field exercises.

Draft copies were produced and prototyped in 2020 with the Logistics Officer Course—Land and combined with additional training resources to deliver distance learning training, culminating with a three week field exercise in Borden. Coordination with graphic arts work, contracting, and publishing were done with the assistance of graphic arts staff from the RCAF, Canadian Defence Academy, and the University of Toronto Press. The writing of the book was done primarily during evenings and weekends by the authors over a 27-month period. Editing, layout, and printing took approximately nine additional months.

Lieutenant Colonel Bennett with the first edition of *The Logistics Practitioner: Leadership and Fundamentals of Army Sustainment*

DYNAMIC CASE STUDIES AND SIMULATION

A new instructional method has been successfully trialed at the Canadian Forces Logistics Training Centre. Traditional learning has normally centred on lectures, readings, and exams. A move to case studies was done several years ago to enable practical application of the principles taught on courses.

The new generation of case studies now includes dynamic examples which are based on real life, real time situations. For learning purposes, these case studies are enhanced with additional information which can include orders, intelligence summaries, and live actors (played by school staff), to simulate certain aspects of logistics operations. In one example, the students conducted an interview with a “defence attaché” only to realize two weeks later that that role was actually fictitious and played by a CFLTC instructor who had recently returned from an overseas tour. The advantages of these dynamic case studies include the ability to source live data, provide realism, and make the training really relevant.

As part of the case study approach, which later ties to field training, a heavy emphasis is applied to principles as opposed to situations. Teaching principles, such as the principles of sustainment, provides the ability for students to be placed in various circumstances and still generate sound solutions. This is a deviation from teaching, for example, how to support a domestic operation or how to support a deployed operation. A principle-based approach using both traditional and dynamic case studies is helping to produce better graduates.

“Using principles and applying them to a dynamic situation was also done. We used a covid case simulation exercise. When we taught using these principles, we were able to change the scenarios to improve the training offered,” added Course Director Major John Haylock.

TRIAL OF A NEW KITCHEN SCRAP DIGESTER SYSTEM

SJS Foods has provided funding for a new composting system for food scraps. The first trial took place at the Canadian Forces Logistics Training Centre Food Services Cadre over the past few months. Other Bases have now received and are using the new units.

The new system breaks down up to 50kg of food scraps at a time using natural enzymes in a process similar to an animal’s digestive system. The composting process reduces the methane off-gassing typically seen with landfill burial. The intent of the system is to divert food waste and kitchen scraps from traditional landfills, enabling rich compost to be returned to nature, where it will be used by plants as a rich source of nutrients.

The new system is more complex than a household composting system, enabling it to break down animal products as well as plant-based materials. It has a digital monitoring system that can monitor the process remotely and collect data on food waste, which can contribute to targeting areas of high wastage, thereby saving money in the long term and creating benchmarks for minimizing waste.



LEADERSHIP IN A PRACTICAL SENSE

PHOTO: CORPORAL DJALMA VUONG-DE RAMOS,
CANADIAN ARMED FORCES PHOTO

OVER THE LAST FEW MONTHS I'VE BEEN CONTEMPLATING leadership and why troops will follow leaders into difficult situations. Why would someone follow you into a dangerous situation? Why would they follow you at all? This is a question I have posed to over 90 CAF officers and several hundred students over the last four years. The majority of them were logistics officers whose responses I then compared against the combat arms officers' responses. I was curious to see how logisticians view themselves in the realm of leadership and determine if there was anything that was missing in training.

The responses varied in number and depth but generally centred around three themes: Because of legal authority, because the troops trust or respect the leader, and due to an automatic response. These answers are valid, but they do not fully capture the reasons why subordinates would follow a leader into a perilous situation. This article will discuss various motivations subordinates have to follow a leader. Most of these are based on Colonel (Ret'd) Dandridge Malone's book *Small Unit Leadership: A Common-sense Approach*¹. Although Colonel Malone has since passed, the principles he taught based on the battlefields of the past are still relevant today.

The basis for developing leadership characteristics is found in the principles of leadership and CAF values and ethics as taught in basic officer training and the primary leadership qualification.

At the top of my list of responses from those surveyed was the idea that subordinates follow because they trust and respect the leader. Trust and respect take a long time to create and can be destroyed in seconds by foolhardy decisions or inappropriate or unprofessional conduct. Trust is built from integrity, professional competence, clear and open communication, fair treatment of subordinates, standing up for what is right in the face of criticism, and exemplifying military ethos. There was one trust-developing principle that stood out from the responses: professional competence.

In a world of quickly changing technology, globalization, communication, and opportunities for learning, it is critical that effective leaders develop themselves. Waiting for career courses to fill in the professional competency checkbox is insufficient for today's modern, enlightened leader. Professional competency means not only becoming a master of one's trade but also being able to rapidly identify and solve problems in ways that are fair and effective. Having lateral thinking skills will contribute to solving problems. As I tell my subordinates and students at the Canadian Forces Logistics Training Centre, an officer has two main responsibilities. The first is to lead and the second is to solve problems in order to support the commander's intent. Both of these traits can be improved through training and education. However, tools and activities such as regular reading programs, post graduate education, professional courses, filling

instructional roles, knowing doctrine, and even free online training, such as is offered by Coursera, all contribute to enhanced professional competence. The result is building trust in subordinates. This competence is exhibited when communicating with subordinates, developing well-laid plans, appropriately reacting to adverse conditions, and balancing the needs of troops with those of the mission. An underdeveloped officer who has neglected to improve oneself has not earned the privilege of leading troops.

The second most common comment was that subordinates will follow because the leader has legal authority. This is true. Should it be the primary motivation for following? It need not be if trust in the leader is present. Legal authority works well when there are unsavoury tasks to be done. However, those who motivate subordinates to follow them using only this method should expand their leadership style to include the incorporation of additional motivating techniques. Leadership through an automatic response is needed in many fast-paced situations and for simple tasks. We use the performance of repetitive drills to develop automatic responses. However, competent leadership needs to trigger more than an automatic response.

Malone notes that subordinates will follow a leader because they don't want to "let their buddies down." In the social construct of armed forces, teamwork and the support of others represent the fabric of military

service. In most instances, following the leader enables individuals to support their teammates. Not following the leader, therefore, demonstrates a lack of support for the team. He further notes that failing to follow a leader when the rest of the team does, results in social ostracism from the rest of the team. This causes a loss of team cohesion. Obedience to the leader is manifested through support to the team.

Related to this concept is the factor of unknown outcomes. If a soldier is left alone as the team advances, they may face repercussions that are worse than not following along. Being alone on a battlefield can be much scarier than remaining with the team by following the leader.

Some personnel will follow out of fear of repercussions. Fear-based leadership is a weak form of leading, particularly if the fear is generated by the leader. Fear of punishment (administrative or disciplinary measures) is one form of fear. However, fear is also caused when the individual realizes that not following the leader can result in repercussions outside the leader's mandate. Such instances include fear of capture, fear of being left alone, fear of being killed by the enemy, or psychological regret.

Some subordinates wish to please their leader and find purpose in doing so. This may also result in personal awards or recognition. In either case, the subordinate receives intrinsic or extrinsic rewards or satisfaction in following the leader.

Belief in the mission aids in building followership. It is much easier to follow a leader when the follower believes in the cause and said cause is on the moral high ground. This also suggests that leaders must maintain such ground so as to activate this motivation to the fullest extent. While there are many historical examples of belief in a mission that did not exhibit high ethical standards, when the leader takes the moral high ground and encourages following through belief in the mission, motivation of subordinates is much easier. A belief that we are helping a down-trodden population, securing our borders, defending the rights of Canadians, or supporting our neighbours, can be a powerful motivational tool.

Malone notes that some personnel will follow a leader



PHOTO: OP CARIBBE IMAGERY TECHNICIAN, HMCS SASKATOON, CANADIAN ARMED FORCES PHOTO

because it gives them the opportunity to showcase their courage, mettle, and competence as masters of their trade. In logistics, we see this with culinary competitions, truck rodeos, grit during sporting events, competition with other units, personal drive in difficult circumstances, and developing leadership in crucible situations. A demonstration of one's skills and mettle can be an energizing motivation for subordinates.

Some soldiers hate the enemy. Although not a widely discussed motivation for leaders, Malone states that there are those who are driven to follow the leader because it gives them an opportunity to respond to an adverse situation. Recruiting following the outset of WWII and Pearl Harbor saw enlistments increase significantly - some enlistees were motivated by this principle. Following 9/11, a modest increase in recruiting occurred until casualty counts in the media in 2005 dropped those numbers.² While using hate as a leadership tool is not encouraged, Malone indicates that it does apply to some members of a force. When considering an instance of one's family being severely harmed, as was seen in the war torn areas of WWII, it is reasonable to concur with Malone on this intrinsic motivation.

He continues that some personnel will follow because of a thirst for adventure. Following a leader's direction is seen as a way to satisfy that thirst. We often hear stories or have comrades who joined the military for that reason. Often, what was perceived as an adventure turns out to be a nightmare. For others, this is not the case. Years ago, I had a friend who was a Royal Navy WWII veteran who had joined for the prospect of adventure. Two of the ships he served on were hit by torpedoes and his own

ship sank many enemy vessels. Fifty years later, he still spoke with enthusiasm about those adventures.

Soldier's whose personal interests are at stake may evaluate their position and determine that following the leader is the best course of action. Personal interests may be a direct threat to the security of their family, personal security in deployed operations, their career, etc. Consider those civilians who joined civil defence organizations during WWII - many of whom were declined for active military service due to age, health, or other reasons. They had a personal interest at stake and following the civil defence leadership was their way to make a contribution to the war effort.

Finally, social pressure can push individuals to follow a leader. This has existed for hundreds if not thousands of years. Social pressure to join the military was present in both WWI and WWII. Originating from one's peer group or battle buddies, it helps nudge someone off the fence in order to follow a leader. Another form comes from family - to "get a job" or carry on the family tradition of military service. This is not to say that social pressure is bad. It can be a motivating factor that is needed for indecisive individuals or to more fully bring someone on to a team.

Most soldiers, sailors, and aviators will follow the leader for a variety of reasons, which may change over time. To be an effective leader, you need to understand what methods work best for your individual soldiers. You may need to enhance your personal techniques in order to have the flexibility to adapt to differing circumstances. Knowing the motivations discussed in this article provides a good start toward being able to practice a wide variety of leadership techniques.

Lieutenant Colonel Bennett is the Commandant of the Canadian Forces Logistics Training Centre. He holds a doctorate in Global Business and Leadership.

1. D. Malone, 1981 Small Unit Leadership: A Common-sense Approach
2. Dao, J. (2011). They signed up to fight. *New York Times*. <https://www.nytimes.com/2011/09/06/us/sept-11-reckoning/troops.html>

ENABLING SUCCESSFUL LEADERSHIP WITHIN THE LOGISTICS CORPS

by Lt K.D. Sloan

BEHIND EVERY SUCCESSFUL LEADER, THERE IS A TEAM OF PEOPLE who facilitated that success. We use vision statements extensively within the military; a vision, though, is merely an idea without the hands to craft it and make it a reality - that's why effective followers are integral to success. Ineffectiveness can be determined by a number of different factors, the most detrimental being the absence of effective motivation. Identifying training requirements or moving a member to a different position to negate weaknesses is a simple equation to solve; the much more complicated question is *why* a follower has become uncommitted, without ambition or initiative, and overall ineffective. It is my supposition that too often a poorly performing follower, independent of lack of skill or knowledge, is a symptom of one or more ineffective leaders who do not have the interpersonal skills necessary to impart appropriate intrinsic and extrinsic motivators. Properly utilizing motivation is key in developing engaged and effective followers. Logisticians are, in essence, customer service trades. While the work we do is essential, we aren't always on the front end of operations; in fact, a logistician in Canada could be the lynch pin for mission success in Kuwait and never realize it. It would be a mistake to assume or demand that mission completion is adequate motivation for any member, but this is perhaps even more applicable to logisticians, who

may be one or more lines of support removed from the mission itself; thus, all leaders within the Logistics corps should have an understanding of how to provide intrinsic and extrinsic motivators.

Extrinsic, or external, motivators are rewards that are given by a person like a promotion, a short day, or an accolade; these often have limited and short-lasting appeal.

Extrinsic motivators can decrease the interest and value, making it harder to become motivated to accomplish the task or goal. The classic formula of "if you do this, then I will give you this", while seemingly effective on its face, can actually hamper intrinsic motivation, possibly snuffing it out altogether. It can destroy creativity, lower performance levels, and drive people to pursue unethical means to achieve the reward, in addition to allowing the prominence of detrimental short-term thinking.¹ Incentivizing the completion of an arduous stocktaking with a short day to allow rest and recover can have meaningful impact on morale; on the other hand, advertising PER points to convince a reluctant troop to accept the Entertainment Chair on the Junior Ranks Mess committee will likely result in resentful participation, as opposed to meaningful contribution. This is an important concept for leadership to integrate; while extrinsic rewards are useful, they need to be strategically utilized and aligned with the messaging of the leadership of our institution.

Some may argue that money is the ultimate motivator, as it is commonly perceived that if you pay a person more,



PHOTO: CORPORAL NATHAN MOULTON, OPERATION REASSURANCE LAND TASK FORCE IMAGERY TECHNICIAN

it doesn't matter how miserable the job they're doing is, they'll continue to contribute whole-heartedly. Quite often, though, the addition of monetary rewards actually *decreases* the desire to do the job. Edward Deci conducted several experiments to this end and confirmed this phenomenon. Pink (2009) surmised from this: "Rewards can deliver a short-term boost just as a jolt of caffeine can keep you cranking for a few more hours. But the effect wears off and, worse, can reduce a person's longer-term motivation to continue the project."²

The fact is extrinsic motivators have only so much appeal. Once a positive extrinsic motivator is added to a task, such as leaving early for the day, it can make that task seem even more like *work*; this effect can be compounded when it's a long-term task being extrinsically rewarded. Followers can develop resentment, become disinterested, and even resist actions that are motivated solely with extrinsic rewards. The flip side of motivation through reward is motivating with fear – common uses of fear motivation are the threat of being "jacked up" or being charged. While fear can be powerful in the short-term, and indeed is extensively used in basic training to indoctrinate members quickly, long-term use of fear to motivate can drive members of the team to leave, possibly causing the loss of talented logisticians. In addition, those people who choose to stay will often be too cautious and afraid to fully live up to their potential. While there is a place to use stress and fear as motivators in our organization, this should be done thoughtfully.

An intrinsic, or internal, motivator implies internal satisfaction – the mere process of accomplishing the task has made the person feel good because they are interested in the subject or task itself, or driven by an internal desire for approval from their parents, fellow members in arms, etc. Intrinsic motivators are intangible, and incredibly powerful, which is why, when you're thinking long term, they need to be present to encourage a person to give all of their creativity, inspiration and talents to our organization. Taking the time to achieve this will mean having a motivated, inspired and successful team that is focused on mission success. These intrinsic motivators can be provided by basic interpersonal skills: morale, trust and authenticity.



These basic interpersonal skills, which can be developed over time, bridge the gap between merely achieving results and genuinely motivating people to achieve true success. These skills include effective verbal communication, using appropriate body language, having developed listening skills (for verbal and non-verbal messages), being able to work with others to come to an agreement or solve a problem, and appropriate assertiveness – not bullying others, but championing what you believe in.

Those who take the time to develop these skills will become effective leaders, and in that respect will develop and maintain effective followers. Even simply having a positive attitude can affect subordinates in an immense way! The energy and attitude of anyone in the organization can be contagious, but the attitude of the leader has the largest effect.

Leaders need to fully recognize, embrace, and utilize their followers, allowing them to identify how to truly motivate them. A tangible demonstration of this occurred with a cook: the member was struggling, both with the chain

of command and with personal issues. Subsequently, the leadership within the kitchen changed; through deliberate engagement with the member, they discovered that this cook was deeply passionate about cooking, and exceptionally creative and skilled. The rigidity of the National Standardized Cycle Menu, combined with the inability of the member and chain of command to come together as a team, left the cook feeling stifled and focused on either remustering or releasing. The new leadership began to provide opportunities for this cook to utilize their creativity: they were made the lead cook on mess dinners; they provided cooking workshops to Wing members; and they were put into a mentorship role with junior cooks to share their skills. This member ultimately turned into the most engaged junior leader in the kitchen, providing innovative solutions to problems, improving the efficiency of systems, and becoming a very patient teacher. Had the leadership not invested the time to learn and provide this cook's motivation, it is very likely the Logistics corps would have lost a talented tradesperson and promising leader.

The imperative concept is that with proper motivation, there's nothing a person won't do to be successful. A motivated logistician is a productive member of the organization, and it's the leader's job to identify and effectively channel this motivation and positive energy toward the organization's goals and vision. This can be a very difficult task; individuals are uniquely motivated! It takes time and building genuine rapport to identify the most effective motivations, both as a group and as individuals.

One of the areas to be cognizant of for leaders is not distinguishing the role of managers and leaders. The two are so different that even if you have incredible managers, an ineffective leader can still bring down the organization. Covey (1989) wrote, "Efficient management without effective leadership is, as one individual phrased it, 'like straightening deck chairs on the Titanic.' No management success can compensate for failure in leadership."³ Delegation of tasks and responsibilities by a leader is key in the Logistics corps – however, using management skills as a way to achieve concrete and physical goals without

emphasizing integration of interpersonal skills can be a downfall. Without that personal connection, it will be almost impossible to determine what a person needs to be motivated, inspired, and committed to the requirements of the organization. Cashman (2008) illustrated this point with his research: "Research by the Saratoga Institute makes a startling case for the consequences of poor interpersonal skills. The Institute interviewed 19,700 people – exiting employees and their bosses. The results indicated that 85 percent of bosses said that their former employees left for more compensation and opportunity. On the other hand, 80 percent of the exiting employees said they left because of poor relationships, poor development, and poor coaching from the boss."⁴ While this is a statistic drawn from the corporate world, it bears relevance at a time when we are focusing on retention of our members.

While a leader's role should be to inspire, to empower, and to clarify the overall vision and goals of the organization, management – a role typically embodied by master corporals, sergeants and warrant officers – is there to ensure the tasks get done on time and the subordinates have the resources they need to complete those tasks, be that access to a computer

and supply chain programs, or the appropriate training and qualification to operate necessary equipment, etc. Managers plan, schedule, organize, and direct; it's not their first priority to inspire their subordinates, it's their priority to ensure their subordinates are working and producing output. A manager is meant to be a very different animal than a leader, and the two roles should be known to have separate markers of success. While a manager, or anyone else in the organization, *can* be a leader, a person who is meant to lead the organization should in no way be a manager. It's the leader's job to see the forest from the trees and supplement the direction that is provided by managers with inspiration, excitement, and the motivation that comes from being engaged and committed.

The imperative concept is that with proper motivation, there's nothing a person won't do to be successful.

¹ Drive: The surprising truth about what motivates us, p.317
² Drive: The surprising truth about what motivates us, p.14

³ The 7 Habits of Highly Effective People, p. 49
⁴ Leadership from the inside out: Becoming a leader for Life, p. 83



PHOTO BY MARKUS SPISKE ON UNSPLASH

Zenger and Folkman conducted a study that included the style of leader who will often put the completion of tasks over morale, a trap that is easy to fall into within the military realm. It was found that this style of leadership frequently leads to fatigued and worn-out employees who feel no higher purpose in their work and are left wondering if their salary is worth the effort. This is a common symptom of a leader who can't distinguish their role from that of management. When this happens in our world, at first glance, it may appear to an outsider that these logisticians are listless, just there for the paycheck, even lazy. In fact, this kind of hard pushing leadership stifles creativity and intellectual stimulation, two key elements to having motivated, inspired, and enthusiastic followers.⁵ Certainly there are times when an effect needs to be delivered despite the exhaustion or discomfort of the troops - the fostering of morale, though, should be considered an investment; it is the driving force for a cook with the Royal Canadian Navy to volunteer for a sail, knowing they are going to be working 18 hours a day for the next two months, or for a financial services administrator to stay an extra three hours to process outstanding claims of their own volition.

Not building an atmosphere of trust in an organization is also a misstep as a leader, and one that shouldn't be underestimated. Trust is a powerful influencer, as it's far easier to support the intent and vision of someone who is demonstrably solid and trustworthy. In this age of turbulent political landscapes, increasing military capabilities, and the inherent unknowns that come with being a member of the military, leaders within this organization need to be able to provide a beacon of light in any darkness of uncertainty. When someone that you trust asks you to take a leap of faith, you will more often than not say yes. A leader can have a grand vision for the future or direction of their section, unit, or division, but if their followers have no reason to trust them, how could they be motivated to take the risks, put in the effort, and help achieve that vision?

One aspect of trust is authenticity; by its very nature it cannot be faked, and people will often see right through inauthentic attempts to build a relationship. When someone comes across as being inauthentic it can obliterate the possibility of trust immediately with that person. Authenticity, on the other hand, can often draw people together and allow them the motivation to achieve great things. A leader needs to sincerely and genuinely take the time to understand what their troops and employees need to be successful; this not only builds their followers' trust but also cements a genuine working relationship with them, with followers wishing to provide for the leadership in the same way they have been provided for.

An effective leader, logistician or otherwise, is one who is able to combine their talent with a genuine honesty and authentic caring when dealing with their followers. Using interpersonal skills, they develop fruitful relationships with the people they're working with, both motivating and being motivated by their team, thus, bringing their team together.

A leader who chooses to ignore the interpersonal aspect of leadership risks not only alienating their troops and employees, but also stifling their innovation and creativity, two important cornerstones of success in our dynamic work arena.⁶ Both intrinsically and extrinsically satisfying motivators need to be present to drive a person to give all of their efforts to our organization. Some holding outdated perceptions of the military would argue that members join knowing they are going to be directed; certainly, there are situations where clear and concise direction will be handed down with no room for negotiation. To refuse to recognize members as human beings with unique motivations, skills and talents, though, is a mistake that effects not

⁵ *Leadership from the inside out: Becoming a leader for Life*, p. 79-80

⁶ *Drive: The surprising truth about what motivates us*, p.317

only mission success and task efficiency, but also impedes retention.

Having identified what our leadership needs to know to get the best out of our teams, how do we go about imparting this knowledge? Too often I have seen the management mentality of task over morale being embodied by our institution's leadership; a symptom of, as one person put it, "becoming an instrument of the institution". "The Institution" is inherently cold and detached - it's not the *institution* that takes care of the troops, but the *people* within it that take care of each other. To prevent this mentality, we need to embed the interpersonal skills and theoretical leadership concepts that make engaged and compassionate leaders from the beginning. These topics are touched on at the surface level on the Primary Leadership Qualification course for non-commissioned members, but this is typically at least five years into their career; junior officers are introduced to these concepts much earlier through the Canadian Armed Forces Junior Officer Development program. While both levels of our organization receive some introduction to the theoretical knowledge, invested interest and effort is needed in order to fully integrate it, and I believe the best way to cultivate our leaders is through a comprehensive mentorship program.

I began my career as a cook; this is a trade that has an unfortunate reputation for "eating their own", to use common verbiage. In fact, I would argue that logisticians as a whole have a reputation for being quite unsupportive of each other. As a private, I was fortunate to have someone see fit to mentor me. Through this essential relationship, I was able to observe and be the recipient of the benefits that are borne of compassionate and engaged leadership; this shaped my leadership style and enabled me to find success, both as a tradesperson and as a leader. Having asked several logisticians throughout my career, I realize this experience is not typical for our corps. There appears to be a distinct lack of mentorship, formal or informal, amongst all rank levels of logisticians, officers included.

The next question is who should be driving this solution? If we look at the key stakeholders of the Logistics service, we inevitably think about the Logistics Branch Integrator and the Royal Canadian Logistics Service. These two

entities drive the goals of the Logistics corps; because of this, I believe they, either independently or collaboratively, would be ideal to also drive the delivery of a mentorship program that would create and enable the framework to impart the tools for proper leadership amongst our logisticians. By the "owners" of Logistics taking ownership of the cultivation of our corps' future leaders, they could facilitate proper identification of enthusiastic, engaged and talented mentors to be paired with all rank levels, from the privates up. Through this hypothetical program, we would strengthen the Logistics corps by enhancing leadership, effectively capitalizing on succession planning, and creating leaders, vice managers, earlier in non-commissioned members' careers. This would be an incredibly impactful step towards proliferating essential interpersonal skills and leadership concepts throughout our service, benefitting not only Logistics, but the Canadian Armed Forces as a whole.

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PHOTO: MCPL STUART MACNEIL, ENHANCED FORWARD PRESENCE BATTLE GROUP - LATVIA IMAGERY TECHNICIAN, CANADIAN ARMED FORCES PHOTO

LOVING YOUR TROOPS

PRINCIPLES OF EFFECTIVE LEADERSHIP

by Padre Jonathan Wedel

“LEADERSHIP IS A RELATIONSHIP BETWEEN THOSE WHO aspire to lead and those who choose to follow. It’s the quality of this relationship that matters most when we’re engaged in getting extraordinary things done. [...] A relationship characterized by mutual respect and confidence will overcome the greatest adversities and leave a legacy of significance.”¹

The CAF is a people-driven institution that requires we learn how to lead and how to follow. Though we train to effectively use the tools of our trade and leverage technology/tactics, we will never move away from leading, following and working alongside people.

Canada’s Defence Policy: Strong, Secure, Engaged (SSE) echoes the same concept by “promoting a culture of leadership, respect and honour”² as one of its main goals with respect to its personnel. To put it bluntly, though the mission is always first we cannot succeed without exemplifying a quality of leadership that seeks the highest standard of care for one another.

A SACRED TRUST

Recent events linked to allegations of sexual misconduct and harassment at our highest levels of leadership have cast a spotlight on our failure to effectively care for many of our own within the CAF. These allegations have led us to take a closer look at our policies, how we implement them and the way we care for our members. And though I believe we need to acknowledge some of the strides we have made to care for our people in past decades, I am concerned that we are not looking deep enough to deal with some of the root causes of sexual misconduct, harassment or racism.

1. *The Leadership Challenge*, Kouzes, James M., Posner, Barry Z., (J-B Leadership Challenge: Kouzes/Posner Book), John Wiley and Sons, Inc., 2007.
2. *Strong, Secure, Engaged: Canada’s Defence Policy*, Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.

My sense is that a significant part of the leadership challenge we face relates to our underlying assumptions about our worldview and our perception of reality. So I would venture to suggest that it is our sense of “the sacred” that is really at stake. And by “sacred” I mean those behaviours and beliefs that are regarded with great respect and reverence within the CAF.

For instance, we hold to ROEs when manipulating our weapons because we believe that life is sacred and should not be treated lightly even if that life belongs to our adversary. Even our weapons are sacred. We lock them up when not in use and are taught in Basic Training to respect and care for them as though they are part of our own bodies. We use drill on the Parade Square to honour the sacred memory and actions of our fallen comrades. We hold to sacred traditions and pageantry at our ceremonies and uphold our duty to pay proper respect to the rank, our uniform and our deportment. We hold it as our sacred duty to follow lawful orders and respect our timings with sacred devotion. So it stands to reason that when we fail to hold our human relations to the same standard than other aspects of our Military Ethos, we face a leadership crisis of spiritual proportions that violates our sense of what is truly sacred.

We should be asking ourselves the following questions. Do we believe there are lines that we cannot cross or behaviours/values that are critical for us to maintain our identity and our Military Ethos? Do we believe in the sacred principles of our Defense Ethics Program (DEP) where we: 1) Respect the dignity of all persons; 2) Serve Canada before self; and 3) Obey and support lawful authority? If we answer “yes,” then I believe we need to recognize that we are dealing with a crisis of a spiritual nature. And if that is truly the case, then I believe we also need to consider how to support our leaders in caring for their spiritual health and the spiritual health of those under their command.

A PRINCIPLED APPROACH TO OUR POLICIES

Most philosophies and religions hold to the concept of something or someone being set apart for special treatment/use. Though they may disagree with the content of what is holy, they nonetheless share the belief that some things are holy, in the sense of being “set apart,”

by their very nature. Even those of us who do not identify with a specific religion have personal views on what is sacred to us. Whether it be that special place, time, object or habit we have set apart from the mundane stuff of our lives, we feel the need to give them special significance. This is the kind of stuff that gives meaning and purpose to our daily lives.

Though I approach this principle from my own Christian Faith Tradition, I sincerely believe that anyone can apply the same principle to their own spiritual/religious persuasion. There is a saying in one of the Texts of my Faith Tradition that links our sense of what is sacred to how we ought to behave towards others. In fact, it is claimed that by respecting these two sayings, I can fulfill what is required with respect to my God and my peers. They go as follows, “*You shall love the Lord your God with all your heart and with all your soul and with all your mind. This is the great and first commandment. And a second is like it: You shall love your neighbour as yourself. On these two commandments depend all the Law and the Prophets.*” (Gospel of Matthew Ch. 22 vs. 37-40) Variations of these sayings can be found in many other religions and philosophies.

So if I extract this principle from its Christian context, I could say that I need to cherish what I hold sacred in my life to the point that it determines the way I care for my peers. I could apply this principle to how I act towards people that are different than me. Because I believe that human life is sacred, then I inherently respect my peers’ dignity because I believe they are made in God’s image. We can see how connecting one’s behaviour to what they hold sacred gives meaning and intention behind their actions towards others.

This principle also forms the bedrock of a free society where citizens can be trusted to act as responsible agents that look out for one another without having to be constantly coerced or incentivized at every turn. Loving my neighbour in ways consistent with what I believe to be sacred seems to strike the proper balance between personal freedom and personal responsibility, something we cannot achieve by merely forging new policies and programs. Though good policies are always needed in a Military context, one could argue that the motivation for acting in respectful and responsible ways towards others

stems from the values we hold sacred and our ability to connect those same values to our Military Ethos.

From a leadership perspective, “loving our people” in ways that respects what we hold as sacred moves leaders away from merely thinking of their own advancement at the expense of others to considering instead how their leadership progression is tied to the success of those they serve with. In other words, one can seek personal gain by lifting themselves up on the backs of others, or they can earn their respect by lifting them to greater heights of achievement. This kind of leadership resembles more a shepherd leading sheep than acting like a cowboy herding cattle. One whips and prods from behind, while the other walks in front charting a path that is worth following.

HABIT #1: IDENTIFY WHAT IS IN THE BEST INTEREST OF YOUR TROOPS

To “love your neighbour as yourself” is not a passive exercise. And it’s much more than a kind sentiment. Loving my neighbour according to what I hold sacred goes one step farther than what is commonly known as the “Golden Rule.” We don’t simply ask ourselves about doing unto others as we would have them do unto us. Though this approach encourages our self-awareness to think of others, it is only meant to be the minimum standard by which we avoid being a self-serving leader.

For instance, someone may not always appreciate me acting towards them in a way I would want to be treated without me first getting to know what would be helpful to them. If I misconstrue the Golden Rule, I may find myself helping others in ways that are only convenient to me while not being helpful to others. Learning to “love

my neighbour” pushes us to ask the question, “what is after all in the best interest of my neighbour?”

I would suggest that a useful approach to caring for our troops is to take our shared values, beliefs and expectations of our Military Ethos to help us identify what is in the best interest of the troops under our care. Asking ourselves that question with respect to loyalty, duty, courage or integrity would be a good starting point. And when considering how to lead our troops to exemplify the beliefs and expectations of our Military Ethos, we must attend to their needs in ways that enable their fighting spirit or their sense of teamwork for example. When I identify what is in the best interest of my troops, I discover how to better care for them.

HABIT #2: GET TO KNOW YOUR TROOPS

I can lead people I don’t know. But I cannot truly care for people I don’t know. Good leaders enable their troops to achieve mission success. But great leaders care for their people in ways that inspire others to follow their example. So if I’m going to understand what my troops need, I must seize opportunities to get to know them. I need to take the initiative. I need to inquire about them; learn what motivates them and what makes them shine.

I need to find meaningful ways to spend time with them. I need to identify what makes them want to push the bounds of their own limits and excel. I need to hear their individual stories, learn about their aspirations and maybe even what led them to join the Forces in the first place.

Alexander the Great for example, was known to ask his

soldiers about the wounds they had received in battle. He would even show them his own scars. Finding that common ground of shared suffering by getting close and personal with his men created an unbreakable bond of trust that enabled him to motivate his troops to achieve great exploits under his command.

When I get to know my troops, I discover how to better motivate and lead them.

HABIT #3: EMBRACE THE DIVERSITY OF YOUR TROOPS

Learning to love my neighbour as myself motivates me to accept fellow members for who they are just as I respect myself for who I am. When I love them for who they are, I can discover aspects of their character and personality that bring depth to the quality of our interactions as a team. I learn to appreciate different perspectives and creative approaches to a challenge even if I find myself disagreeing with their point of view.

In the end, I learn to appreciate the unique ways in which they contribute to our mission success which also helps me avoid sounding hollow when I praise their success and celebrate their individual achievements. Did you ever get a birthday card with no personal note written inside? My point exactly.

As a father to two young boys, I can appreciate the different ways they contribute to our family. They are both unique. They often tackle the same problem from different angles and are concerned by different aspects of the same challenge. So when I express my appreciation for their efforts and contributions, I make the effort to praise them in ways they find meaningful and rewarding.

Embracing diversity with my wife enables us to leverage our strengths to address our individual weaknesses. Though we share the same goals for our family, we have two very different personalities with differing tastes and abilities. As a result, we have learned (and are still learning) how to complement and support one another. Her perspective gives me a clearer understanding of our needs and how we can collaborate to respond effectively. Our sense of collaboration enables each of us to remain true to ourselves while depending on one another in healthy ways to achieve our goals.

I like to think that leading and caring for our troops is similar to caring for one’s family. Though our CAF team members were chosen for us, we still respect them and value their input as fellow Canadians in the Combat Arms trade just as we would our sisters, brothers, fathers and mothers in our own families. And though some only see uniformity through our military dress, we notice and appreciate our different experiences, perspectives and tastes and we accept and support one another. As it’s been said before, though it may be *faster* to go at it alone, we can go *farther* when we learn to work together.

When I embrace the diversity of my troops, I discover how to leverage their unique abilities to better serve and represent our country.



PHOTO: CPL JAY EKIN, OPERATION REASSURANCE LAND TASK FORCE IMAGERY TECHNICIAN



AT THE FOREFRONT OF TOMORROW

DESIGNING CAF LOGISTICS DOCTRINE FOR SPACE

by Second Lieutenant Pablo R. Cardona

PHOTO BY NASA ON UNSPLASH

On a warm afternoon in September, 1962, speaking before an excited crowd at Rice University in Houston, President John F. Kennedy spoke to the very heart of America and historic sense of national exceptionalism, urging the country to embrace a national space program. Before millions of people at home and abroad, the young president, who embodied the hope and optimism of the American Century, urged his country that they must “choose to go the moon and do the other things, not because they are easy, but because by are hard.”¹ His argument, in essence, is that man is not meant to exist in stasis, nor meant to embrace mediocrity. Embodying the hope of an idealistic nation, he argued, rather, that humanity’s destiny is born in our dreams and can be found in the stars. Just seven years after the President’s rousing speech, and six after his tragic assassination, the Apollo 11 mission shattered humanity’s planetary barrier when it landed two humans on the moon, representing a giant leap for mankind.² With that, the Space Age had begun.

Recently, with the increasing pace of technological innovation in computing, robotics, and Artificial Intelligence, the prospect of mankind transcending the physical boundaries of both the human body and

geography becomes growingly tangible. Feats that were once relegated to the realm of Science of Fiction, perhaps only existing in the mind of Jules Verne or H.G. Welles, have become reality and even ubiquitous in 21st Century life. The modern smartphone carries with it more computing power than was used to land humans on the moon. Vehicles are becoming increasingly autonomous. Even companionship has been supplanted by bots or conversational AI. Clearly, this has also impacted the domain of logistics, as companies like Amazon or Walmart are able to conduct delivery and dispersion of warehoused goods within 24 hours of notice from a customer. Moreover, and perhaps more frighteningly so, warfare has been irreversibly impacted as defence contractors and military research institutes like DARPA continue conducting research into Autonomous Weapon Systems.³ In the coming years, space travel itself may become a consumer commodity, with influential billionaire like Jeff Bezos and Richard Branson pursuing commercial space tourism. Elon Musk, the CEO of SpaceX, has been even more ambitious, postulating that his company will send over a million people to Mars by 2050, creating a new economic powerhouse on the Red Planet.⁴ Yet, for all the promise of economic prosperity, scientific discovery, and

global unity that transcending Earth’s borders creates, one must not forget man’s inherent nature for violence, which has, to this day, necessitated the existence of standing militaries. In the context of space, one must heed the words of William Golding’s *Lord of the Flies*: “Maybe there is a beast. Maybe it’s only us.”⁵ Although the endless dark of the night sky and deep unknown of the cosmos may be frightening, perhaps what is more so a threat is the will of human malice. With that, and reflecting upon the professional mandate for CAF supporters to be flexible to changing circumstances, the problem question arises: How can the Canadian Armed Forces Logistics Branch adapt or design new doctrine that will allow it to thrive in the Final Frontier of Warfare?

In order to answer this question, this essay will employ historical and current events analyzes, assessment of doctrine and present conclusions based on existing literature. First, it will focus on Canada’s space

capabilities and a history of space travel in Canada. Then, it will transition to a discussion of the theory of the militarization of space. Following that, it will transition to a discussion of applying current doctrinal concepts to the new Space Race, including an assessment of training, policy, and the integration of technology. This essay will, by no means, elaborate an extensive “catch all” space doctrine for the CAF Logistics system nor will it postulate the geostrategic significance of space to the current or its relevance to any future government’s political objectives. Rather, it will seek to stimulate discussion about this future domain of warfare and inspire debate on how CAF Logisticians, as globally revered professionals, can begin to approach the new challenges of the 21st Century.

In Canada, national space programs have focused on increasing global cooperation through strategic scientific partnerships. This tradition of cooperation stems back to

¹ “John F. Kennedy Podium.” Houston Space Center. <https://spacecenter.org/exhibits-and-experiences/starship-gallery/kennedy-podium/>

² “Apollo 11 Mission Overview.” NASA. https://www.nasa.gov/mission_pages/apollo/missions/apollo11.html

³ Buehler, Martin, Karl Iagnemma, and Sanjiv Singh, eds. *The DARPA urban challenge: autonomous vehicles in city traffic*. Vol. 56. Springer, 2009.

⁴ Mosher, Dave. “SpaceX wants to impose its ‘own legal regime’ on Mars for human settlements. A space law expert says that’s dubious, but Earth should take it seriously anyway.” *Business Insider*. <https://www.businessinsider.com/spacex-elon-musk-free-mars-colony-constitution-space-law-legality-2020-10>

⁵ Golding, William. *Lord of the Flies*. 1954.

1959, when the Defence Research Board built the Alouette 1 research satellite which was launched by NASA in 1962.⁶ For the next three decades, Canada's space programs would be mostly dispersed among various federal departments with a general lack of centralized coordination. In 1962, the Royal Commission on Government Organization released the *Upper Atmosphere and Space Programs in Canada* Report, in which the Commission recommended the creation of a single Canadian space program.⁷ In the early 1980s, as construction on the International Space Station began, Canada began to screen and train astronauts through the National Research Council to fly on American missions. The first Canadian to go to space was Marc Garneau who flew on NASA's STS-41-G mission aboard the *Challenger* in 1984. In 1992, the first Canadian female in space,

Roberta Bondar, flew aboard the *Discovery*. In 1990, Parliament created the Canadian Space Agency, which was created to oversee Canada's astronaut, satellite, and international space programs.⁸ Despite the involvement of military personnel, the CSA has remained a civilian agency, mandated with the peaceful use and development of space, advancement of scientific knowledge, and to leverage space exploration for the economic benefit of Canadians.

Canada's primary contributions to space exploration has been the training and positioning of astronauts for a variety of space missions with NASA and the Russian Soyuz missions, the development of robotics like the Canadarm 2 on the International Space Station, and the development of satellites, rovers, and telescopes to NASA, ESA, IRSO and JAXA missions. Specifically, Canada's expertise in the field of robotics, which has been lauded for its excellence, has been a particularly noteworthy contribution.⁹ With an annual budget of just over \$300



PHOTO BY NASA ON UNSPLASH

million (2018), the CSA is headquartered in Longueuil, Quebec and is led by its president, Lisa Campbell.¹⁰ Despite the recent decline of national space travel, exemplified by the cancellation of NASA's moon missions, Canada has recently committed to serve as an international partner on various research and scientific mission. In February 2019, Prime Minister Trudeau committed more than \$2 billion to finance development of the Canadarm 3 in support of NASA's Lunar Gateway, a proposed space station that will orbit the moon.¹¹ Additional projects include plans to launch satellites into Canada's polar orbit for the purpose of weather tracking, in addition to furthering rocket research.¹² Generally, the CSA has remained consistent in providing auxiliary support to NASA and ESA missions while leveraging Canadian industry.

According to the Rand Corporation, the main uses of space for military forces involve surveillance and intelligence acquisition, mostly conducted from satellites in orbit. They also write that Satellites in orbit are increasingly vulnerable to threats from other nations' space assets (such as China and Russia) or from ground-based weapons systems in cross-domain warfare.¹³

Consequently, the employment of military assets in space would serve to protect vital operational and strategic assets from exploitation by enemy forces. A number of auxiliary functions, like satellite communications and even meteorology which may help determine a commander's plan, are at the mercy of a permissive space environment. Despite numerous international treaties and international customs forbidding the militarization of space, there has been a covert arms race between global powers to develop tools that would allow them to successfully deploy weaponized assets in space. According to Dr. Cassandra Steer from the Center for Ethics and the Rule of Law at the University of Pennsylvania, "international rhetoric towards a more offensive approach to defense in space" has been a growing trend in the 21st Century.¹⁴ She further writes that modern militaries, like the United States and Canada that depend on technology like GPS are particularly vulnerable if their systems are breached. Although it has not been expressed in mainstream academic publications, the security and sustainment of extra-planetary colonies may also become a significant challenge as companies and governments pursue spatial colonization.¹⁵

With the proposed scope of companies like SpaceX and perhaps assuming that governments undertake similar initiatives, militaries, with their integral logistical capabilities, scale, and rapid deployability, may be leveraged to support human space colonies.

The United States has recently fully embraced the potential of space as a new domain of warfare. In 2018,

President Donald Trump controversially announced the creation of a sixth branch of the armed forces, dubbed the Space Force.¹⁶ With this, their central aim was the creation of a centralized agency to monitor and coordinate the militarization and defence of space. This new command would also leverage and consolidate the experience of highly educated and well-trained technical experts, insofar as they would be pulled from other branches (notably the USAF) to have them develop the United States' space capabilities.¹⁷ While still in its infancy, the symbolic importance of the world's foremost military power assigning the same degree of importance to space as it does to the traditional domains of warfare is striking. As the years progress, the Space Force will no doubt become a leading force for military space innovation and the development of a new kind of warfare. With this, as a key strategic ally, Canada must adapt and assume a proper place within this time-tested alliance to fulfill key capability and doctrinal gaps that exist in the United States. This will also require addressing Canada's own doctrinal and capability shortcomings.

A significant gap in present Canadian doctrinal literature is the limited mention of space as a domain of warfare. Though courses exist detailing the basic tenets of space

⁶ Jackson, John E. "Results from Alouette 1, Explorer 20, Alouette 2, and Explorer 31." (1988).

⁷ Handberg, Roger. "Dancing with the pygmy elephant: The Canadian space program, future directions amid challenges." *Technology in Society* 51 (2017): 209-214.

⁸ *Ibid.*

⁹ Piedboeuf, Jean-Claude, and Érick Dupuis. "Recent Canadian activities in space automation and robotics—an overview." *Proceedings of the 7th International Symposium on Artificial Intelligence, Robotics, and Automation in Space: i-SAIRAS 2003*. 2003.

¹⁰ Jiménez-Narvaez, Luz Maria, and Mickaël Gardoni. "Harnessing idea management in the process of technology transfer at Canadian Space Agency." *Proceedings of the 2014 International Conference on Innovative Design and Manufacturing (ICIDM)*. IEEE, 2014.

¹¹ Home-Douglas, Pierre. "HELPING HAND." *ASEE Prism* 28.8 (2019): 12-12.

¹² *Ibid.*

¹³ Gonzeles, Daniel. *The Changing role of the US. Military in Space*. Rand Corporation.

¹⁴ Steer, Cassandra. "Why Outer Space Matters for National and International Security." *Center for Ethics and Rule of Law*. University of Pennsylvania. 2020.

¹⁵ *Ibid.*



professionals who can provide support to Canada's allies in the domain of space. Although space sustainment is not yet a common field, Canada can lead the world as the supporters and enablers of this new domain of warfare. As of when this essay was written, it will have been 57 years since the assassination of President Kennedy in Dallas. Although the world has changed significantly since his death, his exemplification of the indomitability of the human spirit and national service continues to live on. In this recent age of political uncertainty, partisanship, and deep division in Western Democracies, it is important for humanity to have a rallying cry. The era of social media and nihilistic individualism has challenged the sense of national unity in the West and robbed its people of collective pride.

While some may argue for a political solution, perhaps four more years of Liberal Party rule or four years of the Conservatives, politics has proven that it can only create division. Rather, mankind must look past the ballot box, past its wallets, and into its dreams. Perhaps through commitment to scientific advancement and exploration, mankind can find a true greater purpose and pursue a destiny not centered on election cycles or smartphones. Perhaps, mankind can finally realize its dreams. And those dreams will need support to come true.

If not us, who?
If not now, when?

- John F. Kennedy

PHOTO BY HISTORY IN HD ON UNSPLASH

FOUR SHORT YEARS

by Pte Jeana Marie Buikema

MY NAME IS JEANA BUIKEMA. I JOINED THE CANADIAN Armed Forces in July 2016, as a Supply Technician. The Supply Technician trade, now known as Materiel Management Technician, is a part of the Logistics Branch. We are responsible for all movement and management of materiel, which is why I consider it one of the most versatile trades in the Canadian Armed Forces. My career began the same way as most others do, going through St. Jean Sur Richelieu. I met some challenges at basic training, but overall it was enjoyable and I learned quite a bit. However, we don't really know or understand when it happens. It just happens. Your life as you know it changes in the blink of an eye. Everything that you thought you knew and understood, is not really as it seems. In four short years I discovered myself, lost myself and found a stronger wiser version along the way. How can I even begin to speak of a career that has only been four years thus far? I look at other members like

my aunt and uncles, who have dedicated their entire lives to the Canadian Armed Forces. Two of which are currently serving as Logisticians, and another is a retired veteran who was a Medical Technician. These people alone, have shown me strength and courage that I have rarely seen and they do it with such grace. How could I possibly compare my experiences to theirs? I can't. None of us can compare one experience to another, it took me a while to realize that. I felt quite inferior to my counterparts, when I realized that my experiences had affected me more so than others. In four short years, I had served on three Operations. One being Operation RENAISSANCE, which was a Humanitarian Assistance and Disaster Relief (HADR) mission and the other two being Operation REASSURANCE and Operation SEA GUARDIAN. These three very different experiences would change me forever. The one thing I do know, is that no matter what, no matter where and no matter how, we Logisticians need to be there. Operations cannot and do not function without our tireless determination to make sure every member has everything they need. From the food in their stomach, to protective gear on their backs and financial security for their families. I have given my blood, sweat and tears, like many of us have and will yet to come.

A CH-148 CYCLONE HELICOPTER FLIES AWAY FROM HMCS FREDERICTON DURING OPERATION REASSURANCE, MARCH 13, 2020.

PHOTO BY: CPL SIMON ARCAND, CANADIAN ARMED FORCES PHOTO

Her majesty's Canadian ship (hmcs) Charlottetown, currently deployed to the Eastern Mediterranean to increase allied maritime situational awareness as part of standing nato maritime group 1 (snmg1), steams near a Russian Federation Navy (rfn) soobrazitelnyy (531) on december 8, 2017.

PHOTO BY: CORPORAL J.W.S. HOUCK - FORMATION IMAGING SERVICES



My career thus far, has been fast and furious. It was not up until recently that it has begun to slow down. What does Logistician mean to me? It means that it doesn't matter where in the world Canada is, or what we are doing, we are there to support the mission and the troops. We are there for each other. During good and bad times no matter what, at the end of the day, you know you have a second family. At least that is what happened for me.

My first posting was to Canadian Forces Base (CFB) Halifax, Nova Scotia. I was posted to base side, at special sizes. This is where we order special sized clothing for our members. It would only be months before I was posted to a Canadian Patrol Frigate (CPF). It would be a large undertaking, as it would be 100 percent crew swap. The ship was still at sea, and we would take over upon her return. Although I was quite new, I was very excited. I was not aware that the next two and half years would be the most rewarding, scary and vulnerable times of my life. I was sent on course to complete my Naval Environmental Training Program. This consisted of learning firefighting, flood and damage repair skills and basic survival in the naval element. I quite enjoyed my course. There were a few moments where I thought *"I can't believe I'm doing this."* Unbeknownst to me, there would be many more of those moments in the near future. Once the ship returned, our jobs shifted into full gear. There was no time to really think, other than the tasking at hand, in *that* moment. Not only were we sorting out our stock and holdings, we were also learning about our new work

and home. This was our ship now and we had to take care of her. It wasn't long before we got into the swing of things. Running trials, learning our different locations on board ship and taking inventory. That on its own was a huge feat. We worked closely with the cooks to make sure that the correct food was brought on board, because any sailor knows, food is love. When you are away from home, sometimes for months at a time, good food can bring you back home.

In the fall of 2017, while training in preparation for our deployment on Operation REASSURANCE, we received orders to head down south. Hurricane Irma had hit the Caribbean Islands badly and they needed assistance. This was something, which I had wanted to do ever since I could remember. To help in a time of need, was the main reason I joined the Canadian Armed Forces. We received the call as we were out at sea. We were given direction to go home, pack and return to the ship as we were leaving post-haste. The next thirty days would be a test of my faith and will.

We began the initial stages of storing the ship of all humanitarian aid equipment, food and other supplies. This was done in record time, as we needed to head down south quickly. I will never forget the amount of items that we brought on board. From shovels to chainsaws and everything you could think of, to tear down or build a small community. That's how Canada works. It completely amazed me at how readily available these items were so

that we would use them to help in a time of crisis. As we headed down south, we tried to prepare for the unknown. How could you prepare? I've only seen these situations on television, or the internet. I did not understand the magnitude of the situation, until it was right in my face. Once we arrived at the island of Caicos, our department got very busy. We were responsible for putting together the team supplies, to ensure every team going out had everything they needed to assist on the ground.

The first day I went over to the island. As the Rigid-Hulled Inflatable Boat (RHIB) approached the island, all you could see was devastation. I had no thoughts or words, just utter and complete appreciation for everything that I had. We docked on the island and left the RHIB behind. We made our way to the Headquarters that was set up and were given direction to head to the water treatment facility. It was damaged and it was the community's main source of water. I was happy to be there and happy to see that the community spirits were still up. They were very thankful for our help. We spent the day working on the water facility. Cleaning out all of the debris and repairing the damage. It was very hot. We did not have the opportunity to acclimatize. There was no time for that. We had to work in 10-15 minute work/rest rotation. It was a long day but humbling, which was rewarding for my spirit when I was able to see the bigger picture. Each night we would reconstitute the equipment for the teams to go back out the next day. Which meant while most slept, we were up until the wee hours making sure things

were ready to go out the next morning.

The next time I went to the island, we were tasked to go to the local public school. The school had taken a hard hit from Irma and they needed help disposing of debris and cleaning it up as best as possible. It was here where I had my first transformative moment. Throughout the day, we spent time carrying debris to the garbage truck and sweeping and clearing. About halfway through the day, I saw two little girls, maybe four or five years old. They were banging two pop cans together and singing. They were seemingly happy and completely oblivious to what had just happened in their lives. I paused and took a deep breath. In the midst of this sadness and loss, they were able to still be happy and see past it. I realized that we in today's society, over complicate everything. It is the simple things in life that matter.

Shortly after this day, Hurricane Maria started to bear down on the small islands again. We were forced to leave and get out of the way. We headed to another area that was out of the direct path of Hurricane Maria. Once it had passed, we were tasked to head to the island of Dominica, which is very close to the St. Kitts and Nevis Islands. On our way, you could see the path of destruction that had been left behind. Gigantic trees floating in the ocean. Debris floating by. We approached the island and from a distance, it looked beautiful and serene. I had never witnessed anything so beautiful and enchanting. I remember seeing the mountains and the lush green beauty. However, as we approached closer, it was not difficult to see that so much had been lost. We anchored close to the island, and started working with the Air Detachment Crew and the Sea King helicopter. We prepared water and supplies and they flew them over to the island. During this time, they also assisted in the safe recovery of a Canadian couple that were stranded. I had been working in the hanger on the ship, as we were reconstituting equipment for more teams to go ashore. I received a tap on my shoulder from our Senior Materiel Management Technician. I was asked if I wanted to go to the island to assist with organizing food and supplies. I said yes, before he could finish asking. Little did I know, that this half-day experience would unequivocally change the way I saw the world on which we live. Within minutes I was receiving a safety brief on how to put my

harness on. I got in the Sea King, and we lifted off the deck and headed to the island. As we got closer, it was quite apparent that this was something I was not sure I could emotionally handle, but I knew that we had a job to do. Mission First. We landed, took off our gear, received direction and headed to our location.

While heading to our location, we walked through parts of town. I cannot properly describe the sadness and desperation that I had witnessed, nor do I want to. However, there was also a slight bit of positivity in the air. I could tell that there was so much love and thankfulness that we were there to help. Once we got to our location, I met a man named Patrick. Patrick and I spent some time working and talking. He told me about what he did on the island. He told me about his wonderful cooking and offered to make me a meal some time. Then Patrick started to speak of his young son. You could see the pain and fear in his eyes, as he spoke of him. He had been through something that would be the nightmare of any parent. Having no control over the safety of your own child. Not being able to protect them. He cried from the fear still inside of him. This was my next transformative moment. I had connected with a complete stranger on a level that I have not with some of my closest family members. It was a human connection.

Something that I feel is so special and I had the privilege to experience it. When it was time to go, I said goodbye to Patrick and promised that someday, I would be back. I often think about Patrick. After that meeting, there was a darkness and confusion that I did not understand for quite a while. We left to go home, and I left a piece of me there. I could not grasp how such terrible things could happen to such good people. I realized later on, that my purpose was to be there. To help, to work, to listen, to learn, to be human, to open my heart and to do my job. I did all of those things. We, as a team did all of those things. It does not take just one person. It takes a community. From ship to shore I saw the absolute grind of every aspect of Logistics, in a time of crises.

Once we returned from Operation RENAISSANCE, we headed directly into the Mission Work Ups. Which are a series of training exercises that we were required to complete before we headed out on our deployment for

Operation REASSURANCE. Again, preparing the ship consisted of long days and short nights. Logisticians work around the clock, in this situation as well. We have to make sure, every department has everything they need, before we leave. We also have to make sure the ship has everything she needs as well.

We left for Operation REASSURANCE, January 2018. I was able to visit some wonderful places during this time and participated in a couple of pretty interesting exercises with some of our North Atlantic Treaty Organization (NATO) allies. We also spent some time in the Mediterranean as a part of Operation SEA GUARDIAN, assisting our allies in keeping international waters safe. During my time overseas, I also received a coin from the 35th Commander of the Canadian Navy. Vice-Admiral M.F.R. Lloyd. This was for the work I had completed during our 100 percent stock verification. Which was a very proud moment for me. Every Materiel Management Technician knows, stock taking can be very tedious at times. However, I had taken an interest in materiel accountability and investigation. The following July we returned home to Halifax, Nova Scotia. I also returned with experiences that had given me memories, to last a life time.

June 26th, 2019 I was posted to CFB Cold Lake, Alberta, to be with my spouse. I am currently employed with the Supply Investigation Group for stock taking. I am now seeing the other side of what I started doing quite some time ago. I look forward to learning and continuing to grow. That is what Logistics has done for me thus far. It has given me versatility and knowing that every day will be different, challenging and rewarding.

As a Materiel Management Technician within the Logistics Branch, we have many “hats” that we wear. Yes, we are the “*getters of the stuff*,” as I like to say. However, we are so much more. We make sure *all* members have everything they need, to properly function in their day to day lives, at work and on Operation or Exercise. We are problem solvers and we are customer service. We are also firefighters and advanced first aiders. We are communications members on board ships. We are drivers and we are guides and allies to all in the Canadian Armed Forces.

We assist in helping our NATO allies, often working together with them sourcing supplies and parts when in Theatre. This experience showed me that, yes, we are a cog in the machine, but we in Logistics are so absolutely vital to our organization. We could not function without Logistics. Everything that happens is because of Logisticians. From our food to our pay. All acquired parts, supplies, movements and transportation are done through Logisticians. My experience has led me to wanting a new career path. I wish to become a Logistics Officer. I want to be a part of a bigger picture. I want to assist in greater measures. I believe we are the most versatile Branch in the Canadian Armed Forces. Some days are tough. They can be long and draining. However, when I look at the big picture, it is something that I am proud to be a part of. I truly look forward to what lays ahead. I am quite thankful for my experiences thus far, as they have taught me lessons in life. They have helped me grow further as a serving member and as a human being. I think before I speak. I speak more kindly. Logistics gave me a purpose to help. It has given me wonderful experiences. It has also given me experiences out of my comfort zone, which in turn, has helped me become a much more appreciative person. All of this, in four short years.

APPENDIX A – ABBREVIATIONS USED

- CBF - Canadian Forces Base
- CPF - Canadian Patrol Frigate
- HADR - Humanitarian Assistance and Disaster Relief
- HIMCS - Her Majesty's Canadian Ship
- NATO - North Atlantic Treaty Organization
- RHIB - Rigid-Hulled Inflatable Boat



Members of the royal new zealand air force (rnzaf) begin to unload the rnzaf nh90 helicopter from royal canadian air force cc-177 globemaster after its flight from australia back to new zealand as a part of operation renaissance 20-01 at ohakea air force base, new zealand on 3 february 2020.

PHOTO: MASTER CORPORAL TRUE-DEE MCCARTHY, CANADIAN FORCES COMBAT CAMERA

survived or retreated regrouped over the winter under the command of Francois Gaston de Lévis. They returned with vigour in April 1760 defeating the British at the Battle of Sainte-Foy in a bloodier battle than the prior fall on the Plains of Abraham. The British withdrew back into the fort and the French laid siege. The siege failed due to an inability to strategically resupply from France.⁶ The lines of communication remained cut by the British navy again in 1760 causing Montreal and all French troops downstream from Quebec City to be without resupply. By September of 1760, Montreal was turned over to the British. By 8 September, the French efforts had failed to regain losses and talks opened up resulting in the Treaty of Paris in 1763.

ANALYSIS

There are many questions surrounding the Battle of the Plains of Abraham and the seizure of French held colonial territory in what is now Quebec that tie directly to logistics. By considering these questions, the events, and timings, logistics arguably played as much of a role, if not more of a role, than the actual field tactics of either military.

In 1758, the British had water superiority over the North American waterways from the coast down the St. Lawrence. The British captured Fort Frontenac in the same year cutting off supplies to and from the Ohio Valley to the southwest. The British successes in these areas reduced French options for resupply. Continued success enabled freedom of movement into the mainland interior which led to the British attacks on Quebec in 1759.

Wolfe had initially attempted to fight the French near Quebec City in June 1759. From a logistics perspective, the British were able to be resupplied from Europe by sea and river in the summer time. In theory, the summer period could have also enabled land resupply from the American colonies to the south. The French were able to obtain one resupply run from Europe early in this year before the British naval blockade tightened its grip on the waterways even further.

Wolfe’s initial attempts to get the French to fight in

the open were failures. Wolfe attacked small towns around Quebec City. He destroyed a number of supplies presumably hoping that would encourage Montcalm to leave the fort, or at least send the message that strangulation by logistics could be a future option. British destruction and fighting continued with little success with some British forces being drawn into urban areas inhabited by occupants prepared to fight from fortified houses. Casualties on the British side were 7.5 times greater than the French forces.⁷ It appeared that the field tactics were ineffective. However, the failures of the British to advance their cause until September unwittingly played into the hands of the British and logistics.

The *Handbook of the Canadian Forces Logistics Branch* states that there were two reasons why September was critical in the Battle of the Plains of Abraham. First, the fort was largely manned by civilian militia. These personnel had to leave the fort and work on their farms to collect the harvest and prepare for winter. This meant that the fort had fewer defenders. If the farmer militiamen were unable to collect the harvest, the fort, the city, and the farmers would starve to death during the harsh winter. Likewise, the British would also starve since resupply by water would prove impossible during the winter. Therefore, although the British had failed to accomplish their aims to that point over the summer, the matter would become a do or die action if done after the harvest and the fort were resupplied from the harvest. Wolfe’s limiting factor of food would soon be apparent if he was unsuccessful before the river froze over. The only alternate options would be foraging and hunting over the winter or to depart before the river froze.

Forging from the local population would come with risk. The local population would only be able to provide a certain level of food if forced to turn it over or sell it to the British. Foraging parties would be needed and

susceptible to militia and native strikes. It should be noted that the natives in the area who aligned with the French were experts in guerilla warfare. They were also experts at living off the land. Six years before, George Washington, while acting as a militia Lieutenant Colonel for the colonial British, had experienced the native style of warfare first hand at Jumonville Glen.⁸ Wolfe was likely aware of these tactics. Wolfe probably partially understood the risks a small forging party in hostile territory would face. These factors would create a significant disadvantage if the British were unsuccessful at capturing Quebec City or its harvest stores. A failure would likely mean an embarrassing retreat to more sustainable areas such as already held British territory or accept heavy losses from a lack of cover and supplies. Wolfe’s army had already experienced significant illness setbacks in the summer and would have wanted to avoid worse illness brought on by the winter. Seizing the fort meant controlling the ability to store food for the winter, taxing the population for food, and obtaining resupply from Europe before the river froze.

The other aspect of the timing is that the fort was low on foodstuffs since it was the end of summer and before the harvest. History does not outline the food holdings of the British, but the French food stocks in the fort were at critical lows with only a half weeks’ worth of rations

being held inside the fort.⁹ It is uncertain whether Wolfe knew about the low level of stocks or not. He may very well have assumed the French still had plenty of food and ammunition so taking the fort would provide those materials to his army. He may have also assumed that the harsh conditions of colonial life and the end of summer may have meant that stocks were low but shelter for his troops would be necessary over the winter in spite of low stocks.

Montcalm knew of the limiting ration factor, the naval blockade, and the likelihood that the British could continue to receive resupply at least until freeze up. This gave him two choices. First, be under siege by the British and run out of food and starve within weeks with no chance of resupply. Or second, leave the fort and fight on the open plains and hope for a win. Logistics, therefore, drove Montcalm from the safety of the fort to fight in the open. Had the timing been after the harvest, the outcome could have been significantly different. The harvest and low food supplies answer the question: “Why didn’t Montcalm remain in the safety of the fort as he had done during the summer as the British prowled

⁹ A-LM-031-000/AG-000 A Handbook of the Canadian Forces Logistics Branch. pg 3-10 to 3-11.
¹⁰ Eccles, W. J. (1972), *France in America*, New York: Harper & Row. pg 123



The Death of General Wolfe
Original painting by Benajemin West, 1770, Oil on Canvas.

⁶ Marshal, T. (2020). *Battle of Quebec*. Britannica. Retrieved from <https://www.britannica.com/event/Battle-of-Quebec-North-America-1759>
⁷ Ried, S. (2003). *Quebec 1759: The Battle That Won Canada*, Oxford: Osprey Publishing. pg35-42
⁸ Little, B. (2020). How 22-Year-Old George Washington Inadvertently Sparked a World War. History.com. Retrieved from <https://www.history.com/news/george-washington-french-indian-war-jumonville>
⁹ A-LM-031-000/AG-000 A Handbook of the Canadian Forces Logistics Branch. pg 3-10 to 3-11.

around the countryside?”

Compounding Montcalm’s position was the Royal Navy blockade of the river. There is little doubt that Wolfe arranged the blockade to restrict French resupply and not just communication back to France. Again, logistics restricted French manoeuvrability while it enabled the British to move, communicate, and resupply if needed until at least the winter.

Another interesting logistics factor deals with the patrolling at L’Anse au Foulon. Eccles reports that the plateau above the L’Anse au Foulon landing site was normally regularly patrolled nightly by an officer on horseback.¹⁰ However, one of the officer’s horses had been stolen and two were lame. This could be likened to changing a patrol from mounted to dismounted due to a logistics failure to provide a vehicle to do the job or conduct repairs on equipment. The result failed to provide adequate support to the guards, communication to the fort, or observation over the area.

The British seized the fort after the remaining defenders surrendered. However, since the harvest was not yet collected, the British were now faced with another logistics hurdle—how to maintain the troops over the winter. It was too late to plant crops, resupply would be cut off by sea within the next 60 days due to ice-up, and the only source of food would be from the locals if the British were not resupplied. History does not talk about British resupply efforts after the seizure or throughout the winter. However, historians note that the British had hundreds of casualties that winter—primarily due to scurvy, which resulted from a lack of proper food.¹¹

The next factor to consider was the strategic impact of the destruction of the French navy by Admiral Hawke in Europe. The destruction of the French fleet and seizure of French merchant vessels meant that the French New World would be cut off from support and that the British navy now controlled the waterways up to Montreal. Had

¹¹ Marshal, T. (2020). *Battle of Quebec*. Britannica. Retrieved from <https://www.britannica.com/event/Battle-of-Quebec-North-America-1759>

Quebec fallen to the British, but strategic resupply of troops, equipment, horses, food, weapons, and munitions not been cut off, there would have been a realistic opportunity to regain lost French territory. France could not reconstitute its attrited forces due to the suffocating naval hold the British held on the waterways. They had also lost territory and manoeuvrability to the British forces and British-American militia to the south. The small villages in the remaining French held territories in Lower Canada were insufficient to provide the replacement of much needed personnel, equipment, and materiel.

CONCLUSION

The power of logistics in the form of supply chains, timing of the harvest, restricted lines of communication, and equipment failures resulted in an open battle on the Plains of Abraham and an inability to regain lost territory for the French. This paper argued that these factors played more of a role than the experimental field tactics of Wolfe during the summer of 1759. Had the French maintained control of their logistics operations from Europe to Montreal, the outcome on the Plains of Abraham would have been much different. The language, culture, future Prime Ministers, confederation, and language rights in Canada could all well have been much different had the French been able to maintain their logistics systems. Ultimately, military logistics forged Canada into the way it is today.

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DEFENCE SUPPLY CHAIN
MANAGEMENT:

HOW CAN WE BE OPERATIONALLY EFFECTIVE
IF WE ARE NOT OPERATIONAL READY?

By Major B. A. Parks

MAJOR PARKS JOINED THE CANADIAN ARMED FORCES IN 2006 with 37 Service Battalion. Following her initial training, she served with the 2nd Battalion the Royal Canadian Regiment, 8th Canadian Hussars, and the 5th Canadian Division Support Group before transferring to the Regular Force in 2013. Upon transfer, Major Parks was posted to the Directorate Materiel Policy and Processes as a policy analyst for the Supply Administration Manual. Subsequently, while employed with 33 Canadian Brigade Group as the G4 Ops and G4, Major Parks supported multiple Domestic Operations. Currently, Major Parks is employed with the Canadian Materiel Support Group as the acting J4 Supply.

AIM

The aim of this paper is to generate discussion regarding the current misalignment between materiel management policy and the priorities of the Department of National Defence (DND)/Canadian Armed Forces (CAF).

INTRODUCTION

The Defence Supply Chain (DSC) community of practice often touts the truism the right materiel, at the right place, at the right time to describe a successful supply

chain. This measure of excellence is singularly focused on operational effectiveness as one would expect of a military arm. Likewise, departmental policies should drive materiel management practices designed to optimize all factors poised to enhance operational effectiveness such as operational readiness and flexibility. Conversely, current materiel management policies prioritize the achievement of governmental mandates over all else and in some cases to the detriment of the efficiency necessary for operational readiness. With this focus, we lose sight of the higher intent of operational effectiveness and the value of an efficient supply chain, reducing our capacity to be operationally effective. Furthermore, this state of affairs is exacerbated by incentivizing actions which directly oppose efficiency such as continued retention of surplus materiel. Materiel management policy must reflect a prioritized balanced approach for optimal operational effectiveness and endeavour to incentivize actions in support of that intent.

DISCUSSION

Materiel Management Policy Focus

DND is the largest department within the Federal Government of Canada with an inventory that equates to \$9.8 billion dollars and consists of over 400,000 different stock keeping units.³ For this reason, the Government of Canada is highly invested in transparency and accountability in regards to this significant portion of taxpayer dollars. To this end, DND is subject to stringent mandates and reporting requirements centered on materiel management practices which garner maximum asset visibility and minimize risk of loss and damage to the crown. Unsatisfactory reporting in this area would

Supply Technician, Leading Seaman Samuel Kearsley tracks and logs identification numbers for supplies while sailing the Mediterranean Sea during Operation REASSURANCE on November 16, 2019.

PHOTO: CORPORAL BRADEN TRUDEAU, TRINITY - FORMATION IMAGING SERVICES

not only reflect poorly on the department, but on the government as a whole due to the scope. Accordingly, it is in DND's best interest to adhere to these strict requirements in order to foster political favor and retain public support which to some extent plays a role in defence strategy and the extent of a CAF role on the international defence stage. As such, the policy language governing materiel management across DND/CAF is aimed at meeting government mandates.

For example, Defence Administrative Orders and Directive(s) (DAOD) 3000-0 Materiel Acquisition and Support states, "DND/CAF must exercise effective materiel management practices that maximize materiel visibility and ensure the right materiel is in the right place at the right time to support operational objectives."⁴ This language fosters a risk adverse culture in regards to disposal by prioritizing having the materiel available. As the military is not a profit entity it does not measure performance with market-based metrics such as inventory holding costs versus lead time, however this comparative data could be used to leverage warehouse efficiencies and generate flexibility which supports achieving and maintaining a high state of readiness.⁵ Unfortunately, the costs associated with warehousing the materiel during the times when it is "not right" are not readily available for comparison and consequently are rarely factored when considering an item for disposal. Rather, materiel owners refer to policy which equates not having the materiel on hand with increased risk to operational effectiveness and will therefore choose retention of the item when it may be advantageous/efficient to dispose of it. Regrettably, retention of the materiel does not alleviate the risk, but rather transfers it to the materiel custodian as a risk to operational readiness in reducing flexibility at the warehouse level. To make matters worse, a materiel custodian has no mechanism to reduce or mitigate this risk. Currently materiel management policy fails to value efficiency as a force multiplier for both operational readiness and effectiveness and therefore there is no incentive to warehouse efficiently.

Counter-intuitively, DAOD 3013-0 Disposal of Materiel also generates an aversion to disposal due to risk. This administrative order does not direct like the previous order, but rather states, "DND/CAF are committed to

carrying out disposal efficiently but should also provide the best value to the crown."⁶ This direction seems to imply, although committed to efficient disposal, the higher priority of disposal activities is to ensure the best value to the crown. The value of materiel on hand is readily available in the system of record. On the other hand, total inventory holding costs for an item is not and is cumbersome if not currently impossible to calculate for comparison. The result is simplistic reasoning that places a higher value to materiel on hand as that is the only cost the materiel owner sees while the subjective value of increased warehouse capacity in support of operational readiness is overlooked. Without accurate inventory holding costs to compare to materiel value in the system of record, retention will always appear to have a smaller inherent risk over disposal. The materiel owners will always decide to retain items to ensure it is available at the right time because if the item is not in inventory our DSC loses autonomy and are dependent on industry lead time to ensure the materiel makes it to the battle space at the right time.

Effects of Not Balancing Priorities in Policy

Chief of Review Services (CRS) published a report of findings following a warehouse management audit and stated, "Controls and practises across DND warehouses range from good to inadequate"⁷ Unsurprisingly, policies tied to a governmental mandate were found in good standing, while items without governmental oversight were lacking. The CRS risk analysis identified storage functions, including disposal of surplus inventory, as the area of highest concern and highlighted that while the department had developed initiatives that should reduce time required to dispose of surplus materiel, there is little knowledge by the stakeholder of the departmental guidance on warehouse management and monitoring in this area is weak⁸

Materiel Management Culture

While current materiel management policy does nothing to highlight the requirements necessary to improve operational readiness, DND/CAF culture further reduces the importance by failing to incentivize or reward actions which promote operational readiness. "Official goals are vague and generally do not indicate the host of decisions

that must be made in achieving official goals and the priority of multiple goals."⁹ As Kerr explains in his article, "Rewarding A while hoping for B"; "most employees seek information concerning what activities are rewarded and then seek to do those things, often to the exclusion of activities not rewarded."¹⁰

Such is true for effective materiel management and efficiency within DSC. The emphasized goals of operational effectiveness and achievement of governmental mandates are well-known and reinforced by recompensing actions that support those goals. Current measures of success are designed exclusively to meet remits to governing bodies but do nothing to measure overall DSC successes. For example, professional accolades and high personnel evaluation reviews follow above average results on materiel accountability and year-end materiel attestation reporting both of which are based on governmental mandates vs operational requirements.

However the opposite is true in regards to efficient inventory management and fiscal responsibility. Key performance indicators in regards to efficient inventory management have yet to be quantified or established for quarterly/fiscal reporting. On top of this, oversight bodies are not monitoring warehousing activities which contributes to a wide range of practices across the DSC. Materiel inventory managers are generally not carrying out their responsibilities for initiating disposal of surplus materiel and face few consequences for neglecting disposal and remain focused on procurement and reprovisioning.¹¹

Outside the scope of the DSC, this issue continues to be exacerbated by rewarding actions not conducive to

efficiency such as the complete consumption of budgetary allocations. Budget forecast performance measures for operating budgets are as follows:

- Expenditures between 98% – 100% of Q3 budget forecast – an indication of strong performance;
- Expenditures between 95% - 97.9% of Q3 budget forecast – an indication of an acceptable performance; and
- Expenditures less than 95% of, or more than the Q3 budget forecast – indicates a need for improvement.¹²

The result is an organization which prioritizes procurement and acquisition as the primary mechanisms by which attain and sustain operational effectiveness through materiel readiness. However, this singular focus does not take into account the potential for significant bottlenecks across the supply chain due to limited warehousing capacities, which are critical for housing the procured/acquired materiel, thus diminishing operational readiness overall.

CONCLUSION

The significance of the expression, "the right materiel, at the right place, at the right time" is the affirmation of operational effectiveness as the measure of success for a military arm. To achieve operational effectiveness within the constraints of competing priorities, DND/CAF materiel management policies must provide a framework which balances departmental priorities for optimal operational effectiveness and endeavour to incentivize actions in support of that intent.

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THE SWITCH TO NATURAL PLASTIC REPLACEMENTS

■■■■■■■■■■ Pte Dionne 071, Pte Turnbridge

SINCE THEIR POPULARIZATION IN THE 1960s, plastics have become widely used in an astounding variety of products and services⁴. From items being packaged in plastic, to those consisting mainly of plastics, their use has become extremely common. However, the process of manufacturing them has a significant effect on the environment, as it releases toxins¹. In addition, many plastics end up in our waterways and oceans, where they cause the deaths of untold numbers of aquatic creatures⁶. This, paired with the fact that plastic can stay in the environment for hundreds of years², leads to the conclusion that their continued use is becoming unsustainable. While there have been advances in biodegradable plastics, which makes them an important step in the right direction, those currently available possess certain characteristics that prevent them from being the final solution.

The current alternatives are made from Polylactic Acids (PLAs). While they may be better in some respects than

historical plastics, they still have a negative impact on the environment. PLAs are a bioplastic which, although they are technically compostable, require the high level of heat generated in an industrial composting facility to render them so². If one is not available within easy reach, PLAs must either be shipped or simply discarded along with regular garbagem. This means that if one is not located near a composting facility, PLAs have the same impact on the environment as regular plastics.

However, there are other alternatives. One of those is an innovation developed by a company called NOTPLA (also the name of their product). It is intended to replace many single-use plastics. Used as packaging, it is an edible, biodegradable substitute for many products such as sauce cups, water bottles, fast food take out containers and others currently under development. The primary ingredient in NOTPLA is brown seaweed, which means that the product will biodegrade naturally, and it takes only four to six days with no external help. So, regardless of its location or proximity to composting facilities, it is guaranteed to degrade to harmless residue in less than a week.

In addition, the production of NOTPLA does not release the large amount of toxins that the manufacturing of

plastics does. Its extremely short degradation period, paired with the lowered environmental impact during production makes NOTPLA a much more eco-friendly product. The manufacturer currently has two products which have been released to the market, with a third in mid-development. For example, they were successful in distributing their product to runners at the Annual London marathon in 2019³.

However, in warm, humid conditions NOTPLA can start to lose its structural integrity, causing it to become soft and sticky. While the products still face a few issues such as shelf-life and stability in certain climates, NOTPLA is a brilliant innovation and a step in the right direction in terms of sustainable and eco-friendly packaging.

CONCLUSION

In order to lower our environmental impact and move away from traditional plastics, we need to invest more time and effort in developing innovations such as NOTPLA. If more research and investments were made into these sorts of products, we would be able to make a large dent in the pollution created by single-use plastics; which account for up to 50% of plastic pollution annually⁵.

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PHOTO BY ANTOINE GIRET ON UNSPLASH

FUTURE DIRECTIONS:
REPORT ON IMPERATIVE DEVELOPMENTS IN
INTER- HUMAN RESOURCES
ADMINISTRATOR NETWORKING

■■■■■■■■■■ by Corporal Henry Guzman-Diaz

**INTRODUCTION: HUMAN RESOURCES
ADMINISTRATOR PROFICIENCY AND SETBACKS**

Militaries have always mandated speed to proliferate the manifestation of itself at the highest level. Although this is readily evident in the combat trades, no less is expected from the support trades; the ability to deliver with speed from all components of the military is a veritable factor in the efficacy of the organization as a whole. Yet, combat readiness is not only produced and attained via unqualified speed, correctness in action itself plays a crucial role. The combination of these two qualities, speed and correctness, create the dominating factor of proficiency. The capability to conduct business in a proficient manner only then inaugurates readiness.

Within the military, the delivery of proficiency takes different forms as it is contingent on the unique demands put on each trade. For Human Resources Administrators (HRAs) in the Canadian Armed Forces (CAF) the delivery of proficient administration is established by the possession of administrative literacy (knowledge of administrative regulations and procedures) as well as being well sourced (knowing where and how to find sought after information).¹ That is, to deliver proficient administration an HRA must have information at hand, or if one lacks information, one must know where to seek it. These two attributes are hierarchized for the generation of administrative proficiency as they inaugurate administrative speed and accuracy.

And yet, there are times where an HRA or an Orderly Room is faced with tasks never before encountered (or tasks rarely encountered). The demands of the military are so vast, that HRAs and Orderly rooms do not immediately have all the answers to tasks they are faced with, as there are a lot of nuanced scenarios, or simply one may lack experience.² When answers are not immediate one must source for assistance. This takes the form of looking up legislation, regulations, and/or procedures,

but also, when the information isn't legislated³ (or when such legislation is not easily found), asking someone for assistance would be the correct and initial step to enable one to complete the given task. Thus, part and parcel of being well sourced is to have points of contacts (POCs), specifically, to be networked with subject matter experts (SMEs)⁴ who can assist in times of confusion or inexperience. In other words, in order to garner readiness it is an imperative administrative element for the HRA is to be well networked. Guess work falls short of proficiency as that could lead to errors. One must seek the proper procedure and/or regulation. Thus, in instances where one must ask another HRA for assistance, the mode of communication which provides the fastest turnaround time would be identified as the most proficient. Within the CAF, this outsourcing to other HRAs (networking) can take place over email, over the phone, and/or an in person visit to another orderly room or support unit. And yet, in spite of all this, there remains a prevalent use of what can be coined *para-military* or *para-CAF* networking on Facebook where HRAs solicit information and assistance from other HRAs. That is, CAF HRAs are reaching out to members within their very own organization by means that are outside the communicative mediums provided by the CAF to conduct business. Indeed, it is not entirely abnormal for business to be conducted on Facebook, but it is such for the military. The military of course is supposed to be a self-sustained system that typically sources from itself, and generates its own. The existence and prevalent use of this para-CAF network beckons an inquiry. As such, this paper intends to interrogate this peculiar phenomenon of HRA networking on Facebook.

The inclination for HRAs to utilize Facebook to network⁵ deduces that the lines for networking provided by the CAF are not sufficient for the acquisition of HRA proficiency. That is, if indeed the mediums provided by the CAF for networking were sufficient, then there

¹ This is already promoted and functional at the HRA Trade Qualification Course.
² A large amount of HRA learning occurs as on the job training (OJT) via novel tasks and problems. One must initially encounter a novel task in order to then seek how to complete it.
³ Not all administrative procedures have a codification. For example, information management systems (such as Guardian and Monitor Mass) have system quirks which have been figured out through trial and error.
⁴ Subject matter experts in this case would be HRAs who specialize or have experience in the administrative field being queried.

wouldn't be an exhibited upsurge and steady use of Facebook by HRAs for networking. Thus the CAF should address this by understanding what exactly is being sought outside the CAF to conduct business for the CAF itself. Garnering an understanding of the use of Facebook for HRA networking would then enable the CAF to bring such a system officially into their fold. Formally: a CAF HRA mandate is currently being fulfilled outside of the CAF, by maintaining an unofficial status, this mandate remains officially unfulfilled. If it wasn't for the resourcefulness of HRAs to work outside CAF lines of communication, there would be a notable drop in the speed in the entirety of HRA administrative output. By virtue of the observable amount of work related traffic that occurs on this site, it would be too easy and wrong to dismiss the use of Facebook by CAF HRAs to be superfluous. If it was indeed superfluous then there wouldn't be so much traffic nor the very existence of this HRA network. The utilization of Facebook for HRA networking should instead be considered in terms of absence; the very use of Facebook for networking signifies a demand for this particular medium of networking. Further, by virtue that this demand is fulfilled outside the CAF (and should be internal, i.e., HRA to HRA

communication), there is an added signification that this mode of networking isn't provided by the CAF (or else the style of networking that occurs on Facebook would be housed in the CAF provided medium). Lastly, the very occurrence of this networking (in the consideration that it is used for the sake of CAF business, i.e., utilized for the completion of HRA tasks), signifies that it is a requirement in the production of HRA proficiency (readiness).

THESIS AND METHOD:

The intent of this essay is to report on the use, significance, and necessity of this sort of network from a first person perspective (i.e., I, a CAF HRA reporting on developments and use of Facebook for the purposes of HRA networking). From this first person observance, an analysis of this para-CAF networking phenomenon will be offered by putting into question this mode of networking in a manner where one can learn about it and offer directions for future developments in the CAF.

⁵ Networking in this essay is specifically used to signify the solicitation of assistance relating tasks mandated by work, i.e., in the interest of the CAF. For example, gathering points of contacts, asking for assistance with information system quirks, guidance on ambiguous legislations, etc.

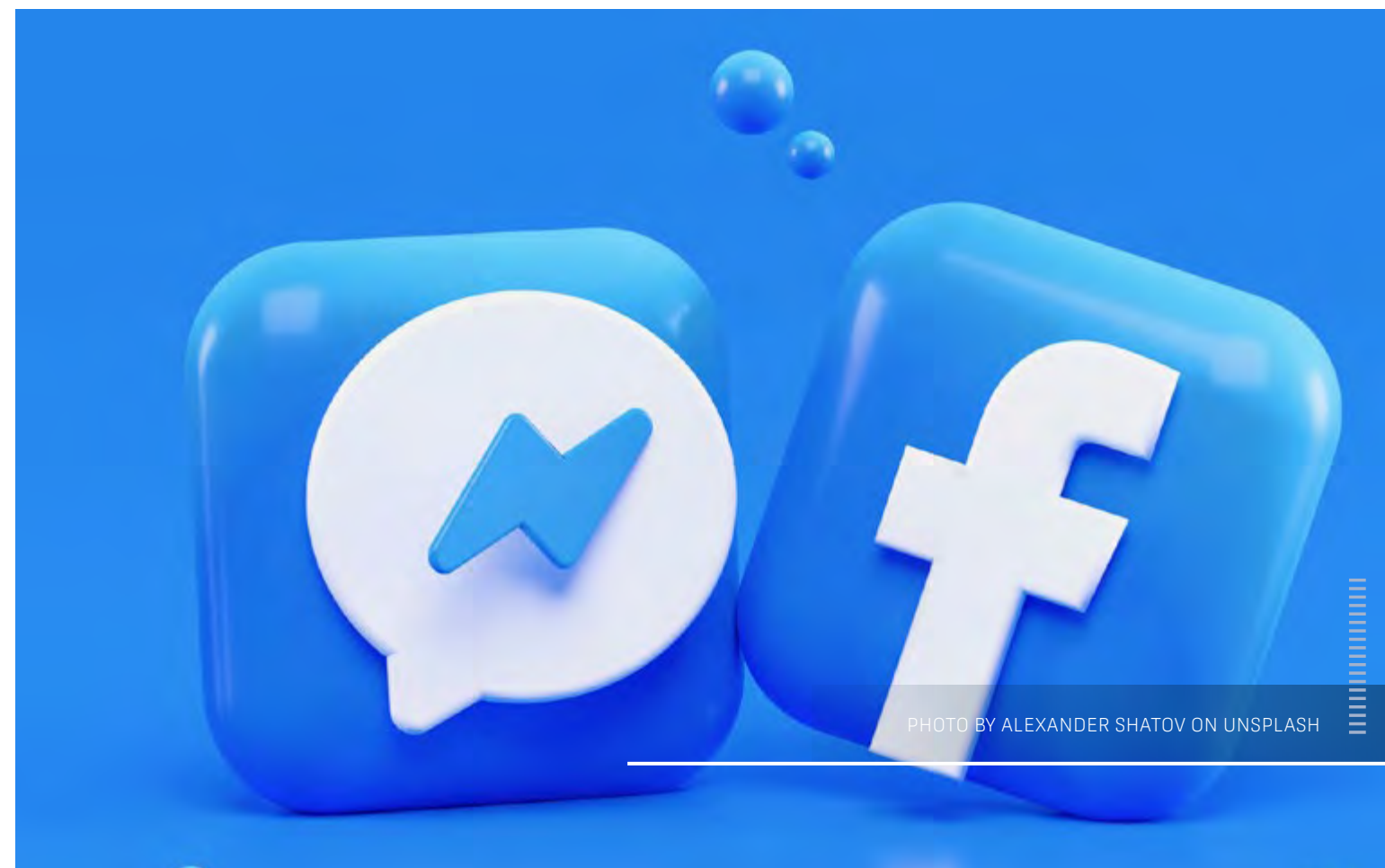


PHOTO BY ALEXANDER SHATOV ON UNSPLASH

Considering that at present this network has an immense positive output for the effective functioning of CAF HRAs, then a potential future dimension of HRA functioning would entail harnessing the structural conditions of this resource and duplicating it into official CAF communication lines. The potential of officially absorbing and disseminating a network akin to the networking temperament observed on Facebook this will be the chief direction that this paper will proffer.

PART I: STATE OF AFFAIRS

It is not a meager phenomenon that CAF Human Resource Administrators utilize para- CAF networks for assistance with HR (Human Resources) processes and procedures. This is easily made evident by the observance of these networks. In particular, there’s a group on Facebook that has over 3k members and another with 1.5k members.⁶ Within this group there is high traffic of queries (Q and A) relating to assistance with HR procedure; the group’s participants contain members all across Canada; all ranks are represented, and there are some personnel with remarkable appointments. This is not to be confused with a simple social network of CAF Human Resource Administrators -business is conducted here. To illustrate, questions are asked regarding assistance with ambiguous legislation, assistance is sought in the search for specific references, and even assistance with Information Management system⁷ quirks are sought. All of this in favor of getting HRA tasks completed within their given timeframe. It is easy to assign this use of Facebook to the resourcefulness of the HRA, but it remains to ask why this would even be necessary. There is a strong suggestion that there is something particular to this medium that other sources for networking already in place by the CAF cannot offer.

PART II: SPEED AN INDISPENSABLE QUALITY

The proliferation of such networking on Facebook signifies a lack within the CAF for the timely procurement of information and assistance required by HRAs. This manifestation can easily be attributed to be the modern iteration of a phone call. But that answer is too facile, we cannot rule this out to be the modern equivalent of a phone call since the phone is still utilized.

One must ask, why is information being sought after here? To specify the inquiry, one can pose this in terms of *what exactly is it that this medium offers that others do not?* Thus, one must seek the indispensable condition of this medium that is inimitable by means of phone and email. To understand this peculiar quality one must survey these other mediums used by CAF HRAs in order to juxtapose them to the former.

Working as an HRA it is readily observed that the phone and the email are utilized as direct lines for information. That is, when one has a point of contact (POC) for the sought after information, the phone or email would be considered the most appropriate (proficient) medium to attain information. Thus, chiefly it is speed that designates the choice to use the aforementioned lines of communication.

Regarding the Facebook HRA network, it is again speed that dictates the decision for its use. Albeit it operates

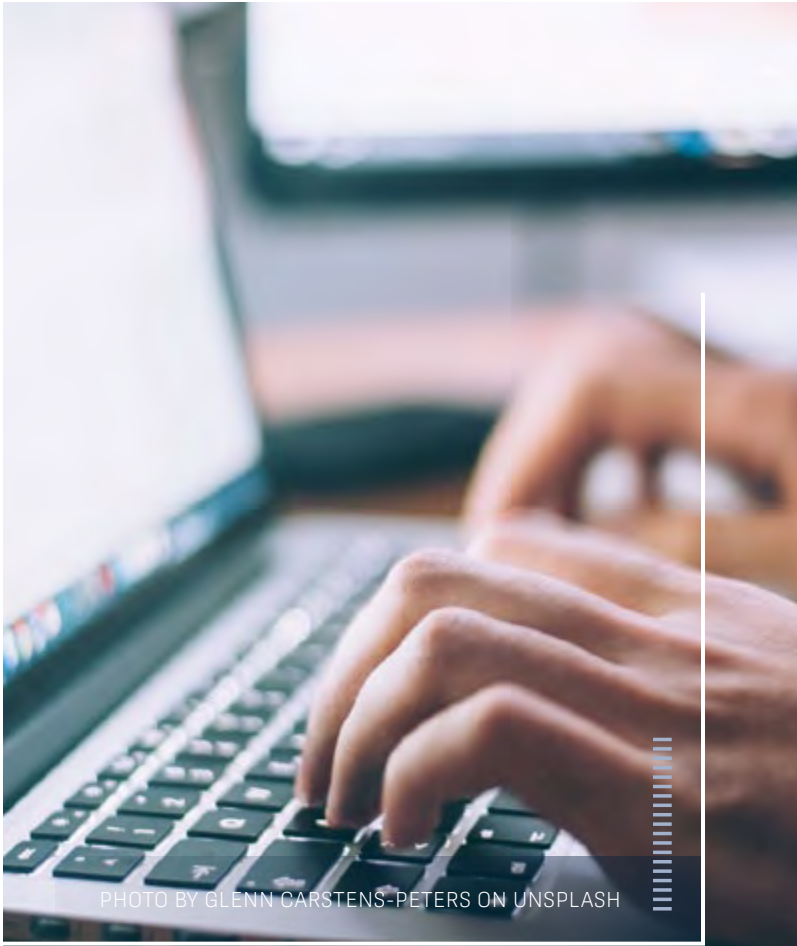


PHOTO BY GLENN CARSTENS-PETERS ON UNSPLASH

in a different manner, as opposed to a direct line, this network is an indirect line, or what can be termed open-sourcing. To be precise, using Facebook would be the fastest way to procure information when an HRA doesn't have (know) a contact who can assist them. This is not to be understood as a last line of defence but a necessary dimension for the procurement of information as dictated by the circumstances. When one does not have a POC this medium itself serves a POC. To clarify: if one has a POC, call direct, if not, source indirectly. It is this quality of providing the space for an indirect query which differentiates the use of Facebook from the phone and email (direct queries). To formally qualify it: it is an indirect call with a fast⁸ response rate. The only other medium provided by CAF that is similar to this is the Administrative Response Centre (ARC), where queries are simply sent to an email⁹.

Their mandate states that “The CMP Administrative Response Centre (ARC) is a streamlined point of access and centre of expertise for personnel policy related matters, composed of a dedicated team of analysts charged who provide comprehensive, timely clarification and responses to RFIs relating to personnel policies.”¹⁰ This is indeed a great point of contact as the ARC identifies their target audience specifically to be supporters; “The ARC supports the supporters!”¹¹ Although this is an indispensable support center for HRAs, it can lack in speed.

Although the ARC aims to respond between 2-4 business days,¹² that still may not be fast enough given the high priority of the given task at hand. That is, there are times when an HRA is tasked with an immediate turn around, i.e., an end of day deadline (EOD). Although the ARC will provide a correct answer, they don't have a monopoly on that. HRAs themselves are bodies of administrative knowledge, indeed, they do military admin for a living. As such, even with the assistance of ARC, posing a query on Facebook has a much faster response time, and the answer given on Facebook has a strong indication for correctness as it is indeed an HRA who presumes to

know the sought after information that will take up the task to answer.

Clearly, there is a need for a fast response rate to a question not posed directly. There is no reason to believe that a question posed indirectly (as opposed to directly via a phone call per se) would be deemed less of a priority, since it is the case that the question would only be posed indirectly by circumstance (i.e., not knowing someone who can assist). This is of course where the ARC serves its purpose, and yet, considering that HRAs still reach out on Facebook such an act serves as a remark about the current state of affairs: the CAF medium for indirect administrative queries is not fast enough. This manifestation of networking on Facebook in spite of the ARC, phone, and email, signifies a lacuna in the process of administration within the CAF (getting info when no there is no POC) since timely responses to indirect queries is necessary in relation to timely administration as a whole. It is indeed that case that there are scenarios where one does not have a POC for an administrative question. Whether it be due to inexperience with a particular issue, or a more nuanced problem, it remains that at some point or another HRAs will be faced with tasks they cannot immediately complete and which they will know no one who can assist. The use of Facebook by HRAs serves to document a surplus of these scenarios (indirect queries). Since this necessary administrative dimension occurs para-CAF, the implications of a potential loss are to be assessed.

PART III: IMPLICATIONS OF LOSS

Currently Facebook is allowed on the military intranet DWAN, but if this website ever becomes blocked then this would amount to a loss in proficient administration. Again, this nexus exhibits heavy utilization (in the interest of the CAF), as not only is a query answered (to the asker) but if anyone else is dealing with the same or similar issue, then they too have access to the information. Or, if an HRA recalls a Q&A they can then can return to it once they encounter the same problem. Even further, the way Facebook displays these Q&A's can

⁶ These groups are currently called *Resource Management Support Clerks (RMS) MOSID 00298* and *Human Resource Administrators in The Canadian Forces* respectively.

also serve as Professional Development (PD) to those simply interested in reading. Usually people have the same issues when it comes to CAF wide tasks in season, such as; Annual Posting Season, Promotion periods, etc. As has happened to me various times, I've had issues with system quirks or unknown administrative procedures in season, and when I look on Facebook, questions I sought answers for were already posed (I'm sure this has happened with other HRAs). The response rate on Facebook is great and is why it is so instrumental (open sourcing with fast turnaround). Further, it is common for those with expertise in these scenarios to offer further and refined assistance by giving their work email for the purposes of an elaborated discussion. At once, not only are questions asked and answered, but points of contact are also made.

If Facebook were to be taken off DWAN then HRAs would have to utilize it on their phones (which is most likely how it is utilized now). But the fact the HRAs would go to the extent to use their personal phones for networking (in spite of all that the CAF offers for networking) demonstrates the necessity for a medium like this. Considering this risk assessment, I believe CAF should officially endorse and incorporate a system like this. The CAF iteration of the Facebook HRA page, would absorb the peculiarities of this medium of correspondence in away that is more refined (i.e., business only) for the production of increased administrative speed.¹³

PART IV: INCORPORATION

It would be imperative for the CAF to offer such a platform. *Prima facie* it seems to be a great task to obtain the operational level of the current use of Facebook by HRAs. Fortunately, it seems the Department of National Defence (DND) has already offered something akin to it without noticing.

As of recent, DND has had to enhance communication due to the COVID-19 climate where many military members are working from home (remote). Their response to this was the rollout of DND O365 (Microsoft Office 365) ¹⁴ which enables members of the CAF to work remotely in a proficient manner. That is, currently O365 is being utilized in a way that simply mirrors how

business was conducted prior to COVID-19 (on-site). And yet, considering the unfulfilled need this paper addresses, it seems that O365 could very well meet it. To be sure the application within O365 called Microsoft Teams (MS Teams) would offer such a space. MS Teams is a platform specifically designated for real-time collaboration. Thus, if CAF HRAs would congregate on MS Teams (be it at a National level or smaller groupings such as Divisions and Brigades), then the use of Facebook for networking could very well be met here as MS Teams does offer what the telephone and email cannot: open/indirect sourcing (via chat and/or video) with fast response time (contingent on numbers of HRA personnel with the group/team). Endorsement of this potentiality would be in great favor for the CAF, especially for its HRAs. Thus, not only does O365 meet business continuity, but if utilized it also has the capacity to transcend an administrative rut in speed. This latter utilization of O365 remains unfilled.

Nascent instances of the use of MS Teams in the proffered manner have been broached. For example, recently¹⁵ Canadian Combat Support Brigade (CCSB) hosted an HRA PD session where a variety of important administrative functions were covered by SMEs. Precisely, what was witnessed was the force generated attendance (strongly encouraged attendance) of HRAs which amounted to a high turnout from all ranks. Again, mirroring business continuation, this was only seen and acted as a PD session, but the fact that so many HRAs were online (and the fact that they are evidently on MS Teams) signifies that a space for real time collaboration (as manifested on Facebook) can be carved out in MS Teams via mandate or strong encouragement (with the intent of increasing HRA productivity).

PART V: CONCLUSIONS AND FUTURE DIRECTIONS

The future is now, a future CAF potentiality currently exists but exists para-military. It is designated para-CAF as it is oddly the very CAF members that are involved in it. This manifestation of the para-CAF HRA network called for analysis as its upsurge occurred for a reason. Throughout the essay, it was analyzed that this manifestation signifies an absence of a networking resource that is evidently required by CAF HRAs. By virtue of the immense traffic on the studied networks, it is indeed a need, but it is not readily provided by the

CAF. It is indeed a fact that the para-CAF network is utilized for business purposes (used to obtain assistance with work required to be done by CAF, i.e., the HRA's employment tasks). Thus, the current use of the para-CAF network signifies a dimension necessitated by the CAF for the functional operation of HRAs (i.e., military administration). This need fulfilled on Facebook retains itself as officially unfulfilled, which points to something the CAF should consider endorsing. MS Teams seems to be the answer to be a readily viable solution. If nothing changes, then, at the very least due to the HRAs resourcefulness this need will be met by CAF HRAs networking outside CAF lines (as is the current affairs). Yet, due to the risk assessment, a possible collapse to accessing this network (a non-CAF network) would hinder the process of administration in a timely manner. That is, as made evident by the traffic on Facebook, such a network is needed as there are a lot of instances where an HRA does not have points of contact and thus must pose queries via what was termed an indirect-line of correspondence. With a push toward the widespread use of MS Teams mirroring the use of the Facebook HRA network, military administration from HRAs would be greatly benefited.

ANNEX A: ABBREVIATIONS

- ARC: Administrative Response Centre
- CAF: Canadian Armed Forces
- CCSB: Canadian Combat Support Brigade
- DND: Department of National Defence
- DWAN: Defence Wide Area Network
- EOD: End of Day
- HR: Human Resources
- HRA: Human Resources Administrator
- MS Teams: Microsoft teams
- OJT: On the Job Training
- O365: Microsoft Office 365
- PD: Personnel development
- POC: Point of Contact
- Q & A: Question and Answer
- SME: Subject Matter Expert

¹³ The output of HRA processes as a whole would be increased as instances where an HRA requires assistance without having a POC would no longer pose a rut in timely returns. A more refined study is called to investigate the amount of times this rut actually occurs and its relation to speed for completion.¹⁴ May 2020
¹⁵ 26-27 November 2020.



PHOTO BY MIKA BAUMEISTER ON UNSPLASH

SHAKEN AND STIRRED BY DESIGN
CFB LOGISTICS ARTICLE

by Ted Barris

TWO YEARS BEFORE HIS ISLAND NATION DECLARED WAR against Germany on Sept. 3, 1939, British aviation engineer and inventor Barnes Wallis joined a committee planning, when feasible, to strike Nazi Germany at its most vulnerable spot. The British knew Germany's military industrial complex had risen from the ashes of the Great War, and by the mid-1930s was producing U-boats, fighter and bomber aircraft and tanks to advance Hitler's territorial ambitions in Europe. In 1937, the U.K. Industrial Intelligence in Foreign Countries Committee had chosen nineteen River Ruhr power plants as potential targets in the event of another war. Wallis concluded that Germany's hydroelectric dams were the priority.

"The first thing an engineer thinks of as an effective way of stopping a war, is stopping the supply of steel," Wallis said. "Roughly a hundred tons of water is necessary to produce one ton of steel."

British logisticians calculated it would take 3,000 aircraft sorties continuously over two weeks to bring Germany's entire war production to a halt by destroying both the Möhne and Eder gravity dams. The estimated cost? As many as 176 Wellington bombers (each with six crewmen aboard) translating to well over a thousand Royal Air Force lives lost. Wallis had a different idea in mind – to drop a ten-ton bomb from 40,000 feet that would sink into the reservoir next to the dam and explode. As harebrained as that seemed in 1937, the key to his concept was not blasting the dam to bits, but creating an earthquake.

Wallis had reached this conclusion based on forensics of an incident in his own backyard. During strengthening and widening construction of the famous Waterloo Bridge in London, engineers had discovered a problem unique to concrete. As massive drop-hammers pounded concrete bridge piles into the Thames River mud, the resulting vibration in the piles had caused them to explode upward.

Analysis of the broken concrete illustrated basic physics – each hammer blow to the top of the concrete sent a shockwave down the pile, which reverberated back up the pile at 15,000 feet per second and dissipated into the air, shattering the concrete pile.

"Concrete resisted the crush of compression," the forensic report said, "but withstood the stretch of the resulting tension poorly." Thus, Wallis calculated that he needed to create tension in the masonry of the Ruhr's gravity dams and in the resulting breakdown of the concrete allow the massive water pressure behind the dam in the reservoir to punch through the weakened dam. He needed to build an earthquake bomb!

Military intelligence told Wallis that as their only defence German strategists had floated wooden booms across the dam reservoirs with anti-torpedo nets hanging from the booms. The challenge then was to skip a bomb over the booms to the target. Wallis listened closely to his cricket-playing friends, who told him by putting backspin on a cricket ball, a pitcher could skip a ball rapidly across the ground. Thus, Wallis concluded – in order to deliver his earthquake bomb – codenamed Upkeep – gently against the reservoir-side of the dam to then sink and explode hydrostatically (like a depth charge), the bomb had to be spinning backwards when delivered.

Meantime, by 1942, Avro aircraft assembly lines in the U.K. were producing Lancaster bombers capable of carrying his 10,000-pound Upkeep bomb. So, with modifications – removing bomb-bay doors and a mid-upper gun turret to make way for a bomb carriage in the bomber's belly – the Lanc could transport and deliver his earthquake bomb to the Ruhr River dam targets. While Wallis grappled with the logistics of bomb delivery, decorated RAF bomber pilot Guy Gibson chose the aircrews to man nineteen Lancasters to fly a bomb each to the targets. At the end of March 1943, S/L Gibson handpicked 133 aircrew for his as yet unnamed, unnumbered squadron (later 617 Squadron) to fly thousands of hours of cross-country training flights over flatlands and water around Britain in preparation for this one-time mission. Initially, neither Gibson nor his crews knew what the target was, just that Operation Chastise would happen on the night of May 16. And there were lots of other logistics to resolve.

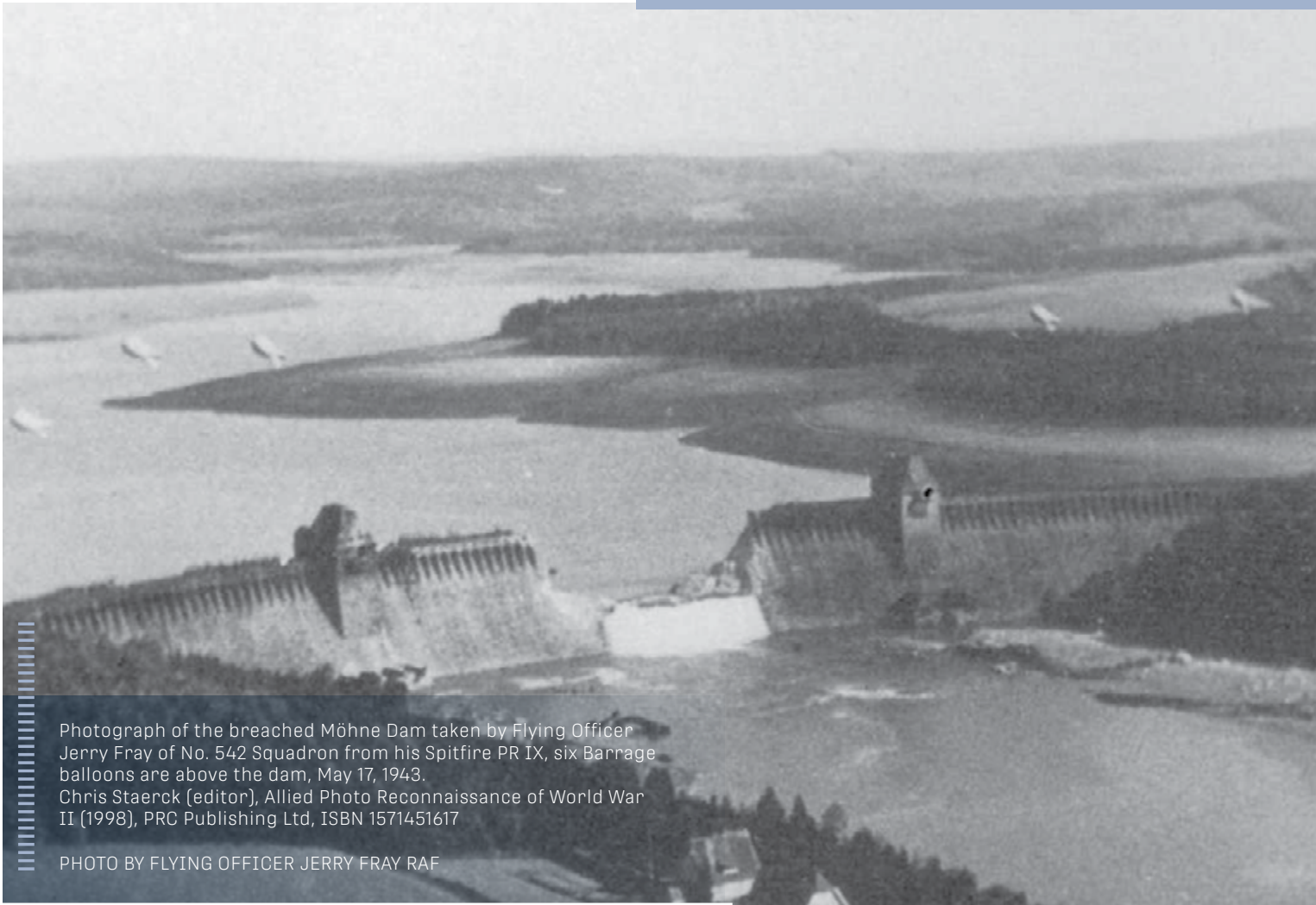
What airspeed for the drop? What altitude? How far from the dam to drop the bomb?

In one of the war's most miraculous military/civilian partnerships, scientist Wallis and tactician Gibson (and his aircrews) pulled off an audacious surprise attack. During barely seven weeks of low-level training, they came up with Aldis lamps in the Lanc's belly to calculate the required altitude of sixty feet above the dam reservoirs. They determined optimum airspeed for the drop at 235 mph. They jury-rigged a Dann range-finder for the bomb-aimer to home on the dams' towers to eyeball the appropriate dropping distance of 800 yards. But at the heart of it all was the innovative teamwork and stout courage of the Lancaster crews flying lower than 100 feet off the deck from England to the Ruhr and back (literally flying under German radar) that delivered the successful destruction of the Möhne and Eder dams and debilitating damage to the Sorpe dam.

Though it only took the Germans and thousands of slave labourers seventy-six days to rebuild the Möhne dam, it would take a full year for the reservoir to refill with spring runoff and deliver ample hydro power to the Ruhr factories. Still, the operation killed nearly half of the crews (eight of nineteen Lancasters lost). "For me the success was almost blotted out by the sense of loss of these wonderful young lives," Wallis wrote later.

But when King George VI and Queen Elizabeth visited the Dam Busters squadron on May 27 (ten days after the raid), the true value of the operation emerged. "Thank you," the Royals told them. "At last, you've given the country some hope." The Dam Busters had shaken the dams down and stirred the country to carry on the fight.

Ted Barris is author of *Dam Busters: Canadian Airmen and the Secret Attack Against Nazi Germany*, published by HarperCollins Publishers.



Photograph of the breached Möhne Dam taken by Flying Officer Jerry Fray of No. 542 Squadron from his Spitfire PR IX, six Barrage balloons are above the dam, May 17, 1943. Chris Staerck (editor), Allied Photo Reconnaissance of World War II (1998), PRC Publishing Ltd, ISBN 1571451617

PHOTO BY FLYING OFFICER JERRY FRAY RAF

HISTORY AND DOCTRINE OF THE ROYAL CANADIAN LOGISTICS SERVICE

by Corporal James Hartnett

ON OCTOBER 16TH, 2018 A PARADE WAS HELD ON Parliament Hill in order to recognize the Royal designation of the Canadian Forces Logistics Service and the immense role it plays in the day-to-day operations of Canada's military. As stated in the address by Governor General Julie Payette, without logistical support, no mission would be possible. Although Logisticians are often unrecognized for their behind the scenes actions, their hard work and dedication was paid the proper respects on this occasion.¹ Upon its inception in 1968, the Royal Canadian Logistics Service (RCLS) has had a long and detailed history, guided by its core principles of flexibility and excellence in duty and professionalism. It has evolved throughout the years to meet the demands of Canada's military and its security and peacekeeping initiatives.

Over the course of history, the requirement for the provision of logistics has developed from feudal periods where armies would be sustained from plunders of war and village contributions to large-scale conflicts which required allocation of funds, transportation, supplies and maintenance of materials. Victory was not a matter of brute force, but of the army who could continue to procure resources, accommodation and the overall well-being of troops. Early conquerors such as Napoleon recognized the need to provide food and other necessities by securing depots in resource-rich areas and organizing storage and transportation before engaging in conflict. Logistical planning as a tactical advantage was essential to many victories throughout history. Continued development through the Industrial revolution and the implementation of new weaponry and means of warfare created the need for more complex strategic planning.²

During the First and Second World War and The Korean War, the necessity for logistical support was immense due to the vast number of troops and their requirements. Critical shortcomings and delays of engagements such as D-Day could be accounted for by issues in re-supply of

materials and movement of aircraft, ships and equipment. Considerations in regards to the allocation of water, food, fuel and ammunition played a constant role in decision making. Warfare in areas lacking in resources meant armies were heavily reliant on established supply depots, maintenance facilities and shipping ports at sea. The lack of logistical resources such as supply ships and production facilities directly affected the success of both Axis and Allied forces at various times during these conflicts.³

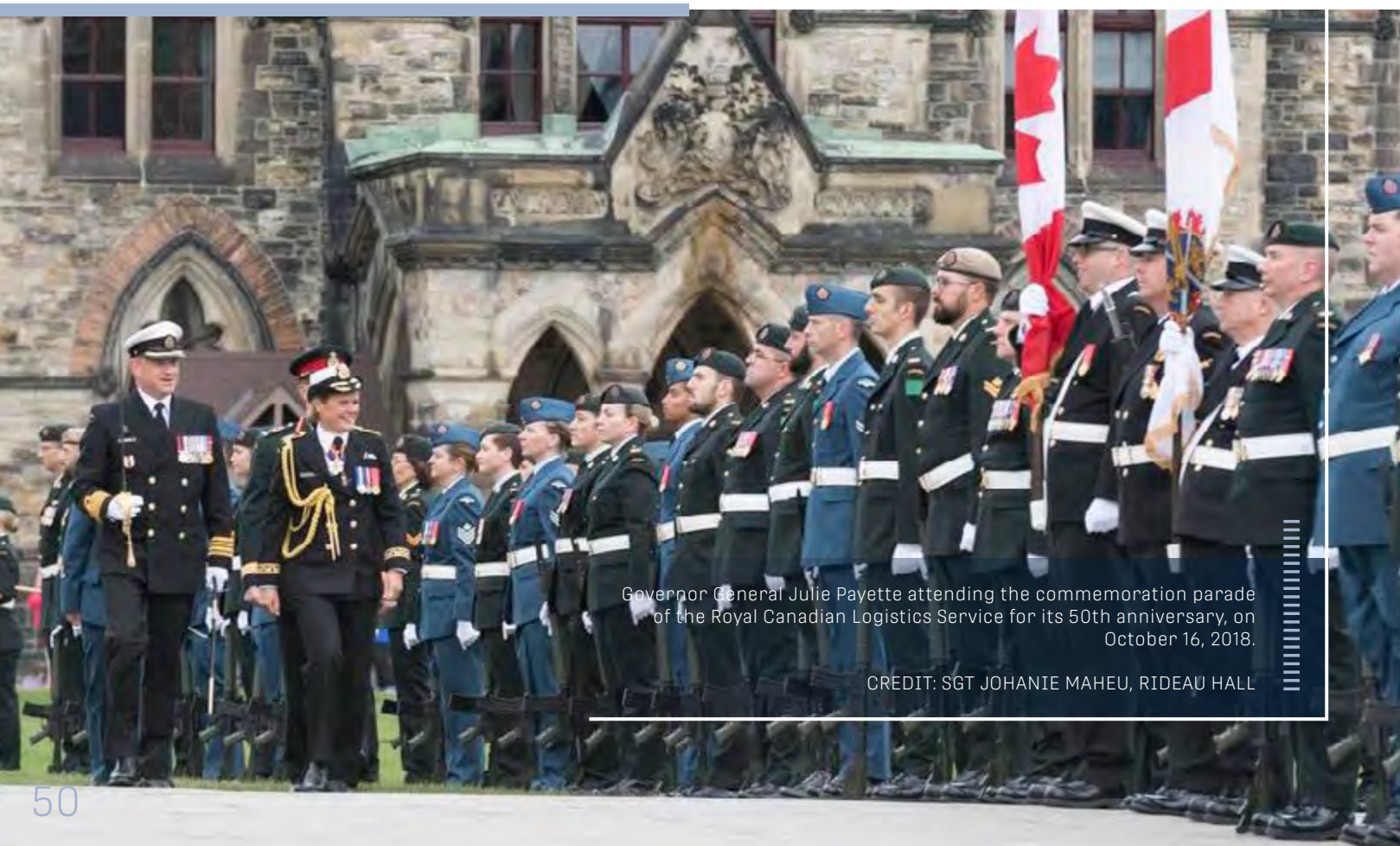
The Cold War era brought new and unprecedented challenges for the Canadian military and its capabilities. The threat of nuclear war meant that future conflicts could be far more deadly, spread across larger areas and require accelerated logistical support over long periods of time. Logistics establishments would also have to be more dispersed and not in static locations in order to allow for more rapid deployment. During this time, Canada struggled to maintain its defence spending in order to continue its peacekeeping activities in Europe. The threat of varying levels of conflict across a wide range of areas demanded more co-operation and interoperability between the three elements. Because of this, in the midst of considerable controversy and disapproval, the Canadian Forces was mobilized into one centralized command structure and integrated logistics system.⁴

Following its unification into a single service, the Canadian Armed Forces was divided into numerous personnel branches in order to fulfill operational requirements within a constrained budget. After the disbandment of many pre-unification corps of the Canadian Army, various logistics occupations were merged with those of the Navy and Air Force. The Royal Canadian Ordnance Corps amalgamated with supply, clerical, postal and transport services of Royal Canadian Army Service Corps, becoming part of the Logistics Branch. Logistics occupations in all three elements would now fall under



one centralized command. In addition to Logistics, newly formed branches included Communications and Electronics, Land Ordnance Engineering and Medical and Dental Service.⁵

Each branch was given distinct badges and accoutrements worn with their respective uniforms which would serve as identifiers. Approved by Queen Elizabeth II in 1972, the RCLS insignia displays two interconnecting chain links to signify strength, topped by a royal crown in recognition of allegiance to the British Sovereignty. The surrounding maple wreath is a common element of trades in the Canadian Forces. Also displayed on the badge is the motto: Servitium Nulli Secundus which translates to Service Second to None. The words inscribed signify logisticians' undying commitment to operations and their worldwide recognition through participation in United Nations (UN) and international taskings.⁶



Governor General Julie Payette attending the commemoration parade of the Royal Canadian Logistics Service for its 50th anniversary, on October 16, 2018.

CREDIT: SGT JOHANIE MAHEU, RIDEAU HALL

¹ The Maple Leaf- Logisticians celebrate their 50th anniversary- <https://ml-fd.caf-facca/en/2018/11/21551>

² JGMA Potvin- The Integration of The Canadian Forces Logistics System and Its Effect on The Operational Capabilities of Canada's Military 20-35

³ JGMA Potvin- The Integration of The Canadian Forces Logistics System and Its Effect on The Operational Capabilities of Canada's Military 2-30

⁴ 30-35

⁵ Canadians At Arms- History of The Canadian Army- <https://canadiansatarms.ca/history-of-the-canadian-army/>⁶ Canadian Forces Logistics Association- Logistics Symbols and Traditions- <https://www.cfla-alfc.org/stories/logistics-symbols-and-traditions/>

⁶ Canadian Forces Logistics Association- Logistics Symbols and Traditions- <https://www.cfla-alfc.org/stories/logistics-symbols-and-traditions/>

⁷ Government of Canada- Canadian Forces Logistics Training Centre <https://www.canada.ca/en/department-national-defence/services/benefits-military/education-training/establishments/canadian-forces-logistics-training-centre.html>

As a result of the unification of Canada’s military, The Canadian Forces Logistics Training Centre (CFLTC) was established in Borden, Ontario. Combining multiple single servicetraining establishments from across Canada, the CFLTC was split into three divisions to oversee the training of Logistic Officers, Non-Commissioned and civilian members. The centre continuesto function in the present day, utilizing modern technology and innovation to educate approximately 3000 operationally fit and knowledgeable professionals per year. CFLTC offers training in occupations ranging from Human Resource/ Financial Administrator, Cook, Musician, Steward and Supply, Ammunition and Mobile Support Technician. Logistics Officers are alsotrained in leadership and supply chain management.⁷

The primary objective of the newly formed Logistics Branch was to provide material and personnel support in order to sustain operational readiness and was developed from the recognition of this need as a strategic benefit. The branch would meet its objectives by adhering to its core principles of simplicity, flexibility, attainability, responsiveness, survivability and sustainability. The guiding factor in the formation of early logistics doctrine was the need to adapt to frequent changes in operational requirements and capabilities while maintaining the most economical means possible. Logistical organizations were integral to mission success and were to be sustained and protected with a high priority.⁸

An integrated system was established for supply systems across the three elements of the Canadian Forces. This allowed for a more efficient operation of data management equipment which could cut costs and increase efficiency. In an effort to meet additional demands, transport,finance, personnel and maintenance systems were integrated. Although the system proved to be overly costly and ineffective in many areas, it provided the framework for future data processingsolutions utilized today.⁹ Modern technological innovations for inventory management include the implementation of the Defence Resource Management Information System which is used to in acquisition of supplies and materials.¹⁰

The 1970’s and following years saw a change in the attitude of the general public and government towards the necessity of military spending. In the midst of the current political climate, The Canadian Forces shifted toward a more “passive and less war-like” role with its central focus becoming peacekeeping, territorial defence and maintaining defence alliances. With these changes came significant cutbacks to personnel and equipment resources. This created a great challenge for the Logistics Branch who nonetheless persevered by working jointly through cooperation among army, navy and air elements. As a lack of defence spending and reduction of personnel has continued to be an issue over the years, the Logistics Branch has had to overcome this through working mutually with UN allies and partners.¹¹

The Canadian Forces later involvement in the Gulf War displayed the significant impactlogistical support has on mission success. It also demonstrated the sheer magnitude of aircraft, land vehicles and marine vessels needed to sustain operations and the modern technological advancements of warfare. Canada was able to offer limited assistance to US forces through the deployment of CF-18 aircraft and warships and contributed to the stabilization of the Persian Guld. However, the inability for Canada to support the deployment of a Mechanized Brigade Group highlighted the need for prioritization and enhancement of logistics capabilities. During this time, coping with the demands of modern combat logistics was a challenge not only for Canadian but for other UN forces as well.¹²

In the 1990’s, the Canadian Forces presence in the Balkans, specifically in The Former Republic of Yugoslavia, solidified its role as a major security and stabilization force. The breakup of this area into independent countries resulted in ethnic violence, loss of infrastructure and

⁸ JGMA Potvin- The Integration of The Canadian Forces Logistics System and Its Effect On The OperationalCapabilities Of The Canadian Military 40-55
⁹ 86-105
¹⁰ Major SA Zima- A Canadian Revolution in Military Logistics –Improving the CF Operational Supply ChainThrough Benchmarking 26-30
¹¹ JGMA Potvin- The Integration of The Canadian Forces Logistics System And Its Effect On The OperationalCapabilities Of The Canadian Military 107-110
¹² 110-131



Medical Technicians, Master Corporal Nathan Nolet and Master Corporal Jennifer Russell demonstrate a tourniquet while teaching field casualty care to the Nepalese Forward Medical Team at the Shree Birendra Military Hospital, in Kathmandu, Nepal on 21 May, 2015.
PHOTO: MCPL CYNTHIA WILKINSON, CANADIAN FORCES JOINT IMAGERY CENTER

displacement of families. The Logistical Support Element played a major role in the formulation of a UN Protection Force and supporting the infantry battle groups and their initiatives to secure major areas and demilitarize opposing forces. Logistical efforts were also essential in establishing shelter and transportation and providing food to non-combatants affectedby the crisis.¹³

Future operations in Somalia, Haiti and Rwanda saw the continued demand for logistics personnel to aid in the prevention of human suffering and assist vulnerable populations. These early peacekeeping missions would

not be possible without thorough financial planning, flexibility and organization of logistics, especially in the midst of reductions in defence spendingand aging equipment.¹⁴ The relentless dedication of support members and their ability to work alongside civilian population and humanitarian organizations to secure resources contributed significantly to operational success. Many personnel would return home with post-traumatic stress disorder due to their exposure to violence and human brutality while others would pay the ultimate sacrifice for their service.¹⁵

Following the terrorist attacks on the World Trade Centre on September 11th, 2001, the Canadian Forces were deployed in Afghanistan with the main objective of helping to eliminate the Taliban regime and restore democracy. Personnel faced many challenges in establishing and continuing operations due in part to the rugged landscape and harsh climate.¹⁶ Logistic units encountered threats to vulnerability in regards to the ever-changing nature of modern combat and asymmetric warfare. The enemy in this environment was often one that was not immediately visible, operated in small factions, could attack from all areas and exploited the weaknesses of itsenemy.

Logistics detachments had to remain constantly vigilant of their positions and increase their combat capabilities due to the ongoing threat of attacks. In order to provide valuable resources to front line units, logistics soldiers of various occupations had to travel across dangerous stretches of land, increasing exposure to hazards. These included the threat of improvised explosive devices and enemy ambushes. Logistics personnel were at times more vulnerable than their combat arms counterparts and had to use lethal force in order to survive. Adaptation and flexibility were key components to logistical success

¹³ DM Hewitt- From Ottawa to Sarajevo Canadian Peacekeeping in the Balkans 27-75
¹⁴ JGMA Potvin- The Integration of The Canadian Forces Logistics System And Its Effect On The OperationalCapabilities of The Canadian Military 120-126
¹⁵ The Canadian Encyclopedia- Canadian Peacekeepers in Rwanda- <https://thecanadianencyclopedia.ca/en/article/canadian-peacekeepers-in-rwanda>
¹⁶ Veterans Affairs Canada- The Canadian Armed Forces in Afghanistan <https://www.veterans.gc.ca/eng/remembrance/history/canadian-armed-forces/afghanistan>
¹⁷ Major A.M McCabe- CAF Logistics Force Protection 2-19
¹⁸ Government of Canada- Operation Lentus- <https://www.canadaca/en/departement-national-defence/services/operations/military-operations/current-operations/operation-lentushtml>
¹⁹ Lieutenant Colonel G Crichard- Collaborative Efforts to Improve Logistics During Humanitarian ReliefOperations 2-71
²⁰ Master-Corporal AC Venne- The Year of The Logistician: 50 years and Counting- <https://www.army- armee.forcesgcc.ca/en/news-publications/national-news-details-no-menu.page?doc=theyear-of-the-logistician-50-years-and-counting/jeeqvqbq&wbdisable=true>

in operations in Afghanistan. Engagements in this new theatre of war further re-enforced the ‘soldier first’ principle and the need to train and procure combat ready logisticians.¹⁷

Logistics personnel continue to play an integral role in disaster relief and humanitarian efforts in Canada and abroad. Through the ongoing Operation Lentus, Logisticians can be deployed to aid in natural disaster relief efforts ranging from hurricane, wildfire, flood, snow and ice storm assistance.¹⁸ Logistical support through financial planning, transportation of materials and provision of supplies is essential to the success of these operations. The response to the ongoing threat of natural disasters has improved through cooperation with non-government organizations and local first responders.¹⁹

The RCLS is the Canadian Forces largest branch with its members serving in a wide variety of occupations. Representing the diversity of Canada’s modern workforce, the branch consists of thirty-three percent women and six to seven percent of its members are of a visible minority.²⁰ Present day Operation Reassurance in Central and Eastern Europe and Operation Impact in the Middle-East display the ongoing need for logistics personnel in Canadian Military activities.²¹ Irrespective of the area of operations, all Canadian Forces personnel, regardless of their branch, are expected to uphold its core values of duty, loyalty, integrity and courage. In order to achieve mission success, members must be dedicated to their professions and show pride not only in themselves and their peers, but through the execution of their duties.²²

From the unification of the Canadian Military, through to its Royal designation in 2018 and into the present day, the RCLS continues to play an integral role in the operations of the Canadian Forces. Throughout history, steadfast logistical support has proven to be a key component to success in any major conflict or mission. The logistics branch has met many challenges as a result of the ever-changing nature of warfare, technology, allocation of funding and the requirements of troops. The RCLS has

overcome these through co-operation among navy, army and air-force personnel and working jointly with other nations and organizations to achieve operational goals. The Logistics Branch could not function without well-trained and dedicated personnel who are able to adapt to obstacles and continue to evolve.

LIST OF ACRONYMS

- CFLTTC - Canadian Forces Logistics Training Centre
- NATO - North Atlantic Treaty Organization
- RCLS - Royal Canadian Logistics ServiceUN- United Nations

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²¹ Government of Canada- *Current Operations*- <https://www.canadaca/en/departement-national-defence/services/operations/military-operations.html>

²² Duty with Honour- Chapter 2: *The Statement of Military Ethos, Section 4 Canadian Military Values*

SERVITIUM NULLI SECUNDUS:
AN ANALYSIS OF OVERLOOKED CANADIAN
LOGISTICAL SUPPORT DURING THE

by A/SLt Karakoy, Anastasiya

INTRODUCTION

Logistics, along with strategy and tactics, forms one of the three commonly accepted components of warfare. It enables the employment of both strategy and tactics, and so is an integral aspect of military doctrine. Despite this, Logistics is the least studied component of warfare and in combat is often overlooked in the face of its more thrilling counterpart components. While Logistics in its very being exists to support both Strategy and Tactics – and so may be perceived as subservient to the latter two components – its supporting role does not lessen its importance to the success of military operations.¹

Although overlooked by many, the importance of Logistics was nonetheless very well understood by some of history’s greatest leaders. Of note, five-star U.S. Army Gen. Dwight D. Eisenhower – the Supreme Commander of the Allied Expeditionary Force during World War II then later the 34th president of the United States – is famously quoted to have said, “You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics”.² While the study of Logistics can be clearly traced back as far as 17th century France under the reign of Louis XIV, Logistics only gained recognition as its own separate military entity as recently as World War II, when the term “Logistics” was first officially employed by the U.S. military to describe the military requirement of mobilization and sustainment of personnel, supplies, and equipment in support of operations.³

In the context of Canadian military doctrine, Logistics was not clearly identified as its own entity until 1968, when the Unification movement which amalgamated the Canadian Army, the Royal Canadian Air Force, and the Royal Canadian Navy, ultimately created the Canadian



Supply technician, Private Melanie Nicole completes stock inventory onboard HMCS Regina during Operation ARTEMIS in the Arabian Sea on September 8, 2012.

PHOTO: CORPORAL RICK AYER, FORMATION IMAGING SERVICES, HALIFAX, NOVA SCOTIA

Forces Logistic Branch. In 2018, on the 50th anniversary of the branch's establishment, the Canadian Forces Logistics Branch was renamed to its current title, the Royal Canadian Logistics Service (RCLS).⁴ Spanning the Canadian Army, the Royal Canadian Air Force (RCAF), as well as the Royal Canadian Navy (RCN), Logistics is a dynamic pillar of military doctrine which must in its very essence lead innovation in order to remain adaptable to the ever-changing environments and conditions of warfare. This essay examines the often-overlooked role of Logistics in three critical moments in Canadian history during the World Wars; the Hundred Days Campaign, the Battle of Britain, and the Battle of the Atlantic. By doing so, this essay aims to highlight the imperative role Logistics plays in the success of military operations, as well as to showcase the importance of more research being conducted on this topic.

THE HUNDRED DAYS CAMPAIGN, 1918

The Hundred Days campaign was one of the greatest series of battles ever fought in Canadian military history. The Canadian Corps, commanded by Lieutenant-General Arthur Currie, fought tirelessly from 08 August 1918 until 11 November 1918 in a series of battles which would ultimately bring the Allies to victory in Europe. With the enormous losses sustained at Passchendaele in 1917 still all too fresh in their memories, the Allies began this campaign dispirited by the bloodshed observed by that point in the war. The Germans on the other hand, having recently been freed from fighting on the Eastern Front due to the Russian Revolution, began this part of the war in high spirits, believing perhaps too confidently that their victory was now close at hand.⁵ At the fall of Imperial Russia on 11 November 1917, Gen. Erich Ludendorff, Quartermaster General of the German Army at the time, had resolved to achieve a decisive victory against the Allies within the coming year. To his dismay however, Ludendorff's plans for victory far outreached his army's logistical capabilities. The Allied blockade on the Western Front was causing grave shortages of industrial raw materials. The Germans had no new weapons with which to mount an offensive, and no urgent orders for new tanks were placed until August 1918.⁶ Upon moving his troops stationed on the Eastern Front to the West, Ludendorff found that the strength his force only matched the strength of the Allied

Force; it did not overpower it. As the Hundred Days Campaign proceeded and the Allies began overpowering Ludendorff's army, the morale of German soldiers began faltering in the face of the lavishly supplied Allied Force. Despite continually being promised that their victory was close at hand, many German soldiers could not help but feel that they were fighting a war they had already lost.⁶

Unlike the German Army, the logistical capabilities of the Allied force well supported their operations, which was crucial in light of changes to their Strategy and Tactics. The Hundred Days Campaign saw the employment of a relatively new tactic at the time – the creeping barrage – which would ultimately help lead the Allied Force to victory. The military doctrine at the onset of the war called for the advancement of troops towards enemy trenches only after artillery fire had ceased. The creeping barrage however, worked by advancing troops towards enemy lines concurrently with artillery being fired at the enemy trenches. This way, by the time the German infantry could retaliate, the Allied troops were upon them storming their trenches. Once one trench was overtaken, the artillery would be advanced to fire upon the next enemy trench while Allied infantry would advance towards the trench to overtake it.⁷

While little information is readily available on the logistical requirements of sustaining a creeping barrage during the Hundred Days Campaign, it is not hard to extrapolate how complex the supply and movement of artillery and ammunition would have been in this context. A creeping barrage requires a consistently reliable stock of ammunition as well as the constant movement of artillery pieces over a decimated battleground with craters comparable to those on the moon. Had it not been for a highly efficient supply chain providing ammunition to the front, as well as the flawless movement of artillery into enemy lines, the integral creeping barrage tactic which brought the Allies to victory could not have happened. Ultimately, despite it being scarcely mentioned in accounts of the Hundred Days Campaign, Logistics

¹ Watson, 2004
² Hamilton, 2019
³ A Handbook on the Canadian Forces Logistics Branch, 2000
⁴ Douglas, 2018
⁵ Cook, et. al. 2017



CC&F Hawker Hurricane X on a test flight over Fort William, Ontario, 1940

played an integral role in securing a successful Allied victory. Had it not been for a strong supply chain and the efficient movement of equipment during the Hundred Days Campaign, an Allied victory in Europe could not be guaranteed, and geopolitical relations as we know them today could have ultimately turned out very differently.

THE BATTLE OF BRITAIN, 1940

The Battle of Britain was the first decisive battle of World War II, as well as the first battle in history to be fought exclusively in the air.⁸ From 10 July 1940 until 31 October 1940, the German Luftwaffe attacked British military and civilian targets almost daily in an attempt to demoralize British citizens, cripple military establishments, and ultimately weaken British military capabilities to allow for a German invasion of the United Kingdom.^{8,9} Over a hundred Canadians participated in the aerial combat at the Battle of Britain, both as part of the RCAF's No.1 Fighter Squadron as well as with other Royal Air Force (RAF) units. RCAF aircrew were responsible for the destruction of 70 enemy aircraft over the 4 month conflict, at a cost of 23 dead.⁹

While Canada's combat role in the Battle of Britain was considerably small in the grand scheme of the conflict, Canada played an integral role in supplying aircraft for the battle. In the early years of World War II, Allied

fighter planes were in short supply. The first Hawker Hurricane fighter plane was only produced in 1940, after which 3 to 4 of these fighter planes began being produced every week. This incredibly high speed of production in such a short amount of time was achieved by engineer Elsie MacGill of Fort William, Ontario (now Thunder Bay, Ontario). MacGill at the time was just 35-years-old, and aside from being the world's first female aeronautical engineer, she was also one of Canada's top aeronautical engineers. In Fort William, MacGill worked for the Canadian Car and Foundry Company (CanCar). In 1940, due to her experience in designing and testing training planes prior to the war, MacGill was tasked with turning CanCar into an airplane assembly line.¹⁰ At the Battle of Britain, Hawker Hurricanes played an integral role in securing an Allied victory. These planes went on to be used in more fronts throughout World War II than any other British fighter plane.¹¹ By the end of the war, every tenth Hurricane fighter plane in the British fleet (2,000 fighter planes in total) had been built at CanCar in Fort William under the direction of MacGill.¹⁰

⁶ Taylor, 1963
⁷ VAC, 2019
⁸ CBC Learning, 2001
⁹ Cook, 2017
¹⁰ CBC Learning, 2001



While little is written on the Logistics of the Hawker Hurricane project undertaken by ElsieMacGill, one could easily deduce that such a high speed of production could not have been achieved so quickly without a great amount of logistical planning and organization. Logistics bridges engineering and operations, and so works closely with both organizations to help facilitate a military objective. Producing so many aircraft so efficiently would require many logistical considerations to be established, including a highly efficient supply chain to provide CanCar the materials they needed to produce the fighter planes, as well as efficient management of CanCar employees to ensure that the required workload would be achieved in a timely manner. Seeing as the Hawker Hurricane fighter plane was so integral in securing an Allied victory at the Battle of Britain, the logistical considerations required to facilitate the high-speed production and supply of fighter planes to the Allied front, while largely overlooked, ultimately played a critical role influencing the course of Allied success during World War II.

THE BATTLE OF THE ATLANTIC, 1939-1945

This year marks the 75th anniversary of the end of the longest campaign of World War II, the Battle of the Atlantic. A source of pride for all servicepeople of the RCN as well as for Canadians as a whole, the Battle of the Atlantic was fought over a vast and dangerous ocean against an often unseen enemy – the German U-Boats. Throughout the battle, the RCN in partnership with Canada’s Merchant Navy was tasked with the transportation of food, supplies, weapons, and personnel which were all essential to the success of the Allied war effort in Europe.¹²

Canada’s Merchant Navy travelled from Canada to Europe in convoys, which despite being defended by Allied warships and aircraft, were sunk by the thousands, often being destroyed faster than they could be replaced. In order to maintain defence of the Merchant Navy convoys, the RCN’s fleet drastically expanded during World War II, from 13 warships and 3000 personnel at the beginning of the war, to 350 warships and 90,000 personnel by the end of the war. The RCN’s fleet at the time consisted largely of corvettes, which despite being intended for coastal use and being notoriously uncomfortable in rough seas, were quick to produce and thus relied on heavily in the early years of the war.¹²

The quick pace of the corvette shipbuilding program relied on the successful provision of construction items from the Department of Defence Production. Additionally, once these new ships were ready for sea, they had to be supplied with additional material to keep them operational. The success of this logistical feat came through close teamwork between Canadian logisticians with other Allied Forces to share common equipment for the ships, as well as the Canadian Engineering Branch in order to ensure that the new corvettes would be built so that U.S. Navy and Royal Navy equipment would be compatible with Canadian corvettes.¹³

The Battle of the Atlantic as a whole could be considered an example of a military logistical success, seeing as the

¹⁰ CBC Learning, 2001
¹¹ Cook et. al., 2017
¹² Cook et. al., 2017
¹³ Watson, 2004

Canadian Merchant Navy in collaboration with the RCN worked closely to maintain a constant supply line to the European Front; a supply line which was critical to the success of war efforts overseas. At the beginning of the war, this supply line was under threat not by German U-Boats, but by the mere fact that the demand for items to be sent overseas far outweighed the stock available to be sent over. Quantities of available stock were based on pre-war procedures and practices, and it was not until major changes in the complexity and accountability of the naval stores system was undertaken that RCN logisticians were able to properly equip the ever-increasing number of ships deploying to Europe. With major changes made to operation of naval stores, delivery of items to ships improved, as did accountability of inventory in warehouses. Had these changes not happened, ships deploying to Europe could not have been properly equipped to sail on time or to search for and fight enemy vessels.¹³

While the Battle of the Atlantic in and of itself provides an example of a successful supply chain and thus a military logistical feat, the often overlooked efforts of Canadian logisticians to build the RCN fleet at the time as well as their efforts to provide the necessary stock and equipment

to be shipped overseas in a timely manner played an integral role in aiding Canada’s Merchant Navy convoys in delivering much needed supplies to the front lines. This in turn was ultimately integral in securing an Allied victory in Europe. Had it not been for these often-overlooked logistical considerations, the world as we know it today might not have come to be.

CONCLUSION

Logistics is a dynamic component of warfare which must constantly adapt to the ever-changing environments and conditions of warfare. While in its very nature Logistics exists to support Strategy and Tactics, its importance to the success of military operations cannot be overlooked. The logistical implications of the conflicts discussed in this essay have often been overlooked in the face of the more thrilling strategies and tactics used in these monumental battles in Canada’s history during the World Wars. Nonetheless, these same logistical considerations

taken to ensure the success of the battles discussed were integral in determining the course of human history as a whole. Despite little information being readily available specifically pertaining to the Logistics of these battles, one can easily extrapolate just how complex the logistical considerations of these conflicts would have been. Overall, through the analysis of often-overlooked logistical considerations during the Hundred Days Campaign, the Battle of Britain, and the Battle of the Atlantic, this essay highlights the importance of logistics in the success of military operations, as well as a need for more research to be conducted on the topic overall.

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MANAGING COMMUNICATION IN VIRTUAL TEAMS

by Major Erin MacPherson

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AIM

The aim of this paper is to provide information for members of the Canadian Armed Forces (CAF) on communication considerations and their associated best practices for managing virtual teams in the COVID-19 environment.

INTRODUCTION

The decision to launch the Challenger in 1986 was made during a virtual team meeting that “broke all the rules”.¹ With no agenda and no established communications processes, the decision to launch during cold weather was made with disastrous results. While the meeting itself was not the sole contributing factor for the disaster, it highlights the risks associated with virtual teams, particularly when

those teams make decisions that impact operations, such as in the CAF.

This paper will discuss the virtual team environment in the CAF in light of the 2020 COVID-19 Pandemic. It will begin with a brief discussion to identify why the CAF has moved toward a virtual or semi-virtual team approach to conduct business in some environments. It will then provide a brief literature review of the history of virtual teams in businesses. Finally, it will analyze a large theme that has emerged in literature as a key enabler for virtual team success and will support the thesis of this paper which is that the virtual team will have a higher probability of success when communication best practices are considered and implemented.

DISCUSSION

The movement towards virtual or semi-virtual teams was not a natural cultural transition in the Canadian Armed Forces (CAF) and the Defence Team. When the COVID 19 virus arrived in Canada, it suddenly and drastically changed the way many CAF members conducted business. In a matter of days, the workforce was forced to adapt to a new reality, whereby the majority was no longer permitted entry into the workplace. Initially, the CAF took a position to prioritize the protection of the force and published guidance which directed all non-operational members to stay home. Safety was the primary consideration and only

the most essential Defence Team members were permitted in the workplace. As time went on, it became necessary to consider business resumption and find a new way to work. For some, this meant a return to the office, under very carefully monitored safety protocols. For the majority, however, the return was virtual and the development of the CAF virtual team was born.

From an operational perspective, the work of the CAF had to continue despite a worldwide pandemic. Deployed members on domestic and international operations were still employed and the members in garrison still needed to support them. Through trial and error, each team implemented different approaches toward developing their virtual teams. Guidance was published on different Government of Canada and military websites,² but ultimately it was up to each team to determine what process would work for them. Different levels of success were achieved, and what has become very clear, is that there is no single approach that will work for everyone. There are, however, best practices that can provide optimal chances of virtual team success. Adopting them will ensure the CAF and Defence Team members on these virtual teams can contribute to long term organizational success.

The literature on virtual teams first appeared in the early 1960s, but really gained momentum in the late 1970s and 1980s when computers were beginning to be integrated into business, and the concept of virtual work was introduced.³ Virtual teams can be defined as “groups of geographically and/or organizationally dispersed coworkers”.⁴ Currently in the CAF, teams are most often geographically co-located, but due to social gathering restrictions, are unable to meet in person and are reliant on technology to connect them. These teams are composed of military and defence team

members who, by virtue of their positions alone, were suddenly part of a virtual team. In ideal circumstances, virtual teams are well thought out and planned. Members who are the right fit are selected and the team is built following a virtual team lifecycle.⁵ In the case of most CAF teams in 2020, the virtual team was created reactively and with minimal planning and organization. When it became clear that these virtual teams would need to remain in place longer than a few months, it also became evident that a more thoughtful, evidence-based approach was required. There is no right way to manage a virtual team, but there are best practices and recurrent themes that should be considered in order to optimize the performance of any of them.

Communication is a theme that is consistently referenced in the literature concerning virtual teams. “Communication in virtual teams is predominantly based on electronic media such as e-mail, telephone, video-conference, etc.”⁶ When electronic resources are employed to replace the more common face-to-face interactions, there is a richness within that communication that is lost.⁷ Communication via electronic means can also be problematic in that the speaker’s message can be less clear. In virtual communication important visual cues cannot be seen and non-verbal messages do not get transmitted. “Face to face meetings offer a chance to produce a more intensive interaction in a shorter time”.⁸ To overcome limitations of communication, it is importation to ensure “careful implementation of efficient communication and collaboration processes that prevent misunderstandings and conflict escalation due to reduced visual cues”.⁹ This can be done via video conference, when possible, to enrich the communication experience. In the CAF, teams should consider this guidance to ensure interactions include a



PHOTO BY DYLAN FERREIRA ON UNSPLASH

¹ White M, “The management of virtual teams and virtual meetings,” *Business Information Review*. 2014;31(2):111-117. doi:10.1177/0266382114540979
² Government of Canada: Working Remotely – Tips for Team members, accessed 10 Nov 2020 <https://www.canada.ca/en/government/publicservice/covid-19/working-remotely.html>
³ White M, “The management of virtual teams and virtual meetings,” *Business Information Review*. 2014;31(2):111-117. doi:10.1177/0266382114540979
⁴ Snellman CaritaLilian Virtual Teams: Opportunities and Challenges for e-Leaders 2014 <https://doi.org/10.1016/j.sbspro.2013.12.972>
⁵ Hertel, Guido & Geister, Susanne & Konradt, Udo. (2005). Managing Virtual Teams: A Review of Current Empirical Research. *Human Resource Management Review*. 15. 69-95. 10.1016/j.hrmr.2005.01.002. (<https://www.sciencedirect.com/science/article/pii/S1053482205000033?via%3Dihub>)
⁶ Ibid
⁷ Ibid
⁸ Savolainen, T. (2013). Trust Building in e-Leadership – Important Skill for Technology-Mediated Management in the 21st Century. *International Conference on Management, Leadership & Governance*: 288-XI. Kidmore End: Academic Conferences International Limited.
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face-to-face means when possible, and not exclusively rely on voice or email interactions.

Communication can also become a challenge due to the technological delay in transmission. Speech is not delivered in the same, natural way as with face-to-face communication. To overcome challenges like this, as identified in a Harvard Business Review paper about making virtual teams work, the author has suggested the implementation of a communications charter,¹⁰ which sets out rules for communication and can include anything from schedules for routines or protocols to follow in meetings. Without well planned team meetings, a virtual team is very unlikely to achieve its objectives, therefore, particular care should be taken in developing guidelines for virtual meetings and for facilitating feedback.¹¹ Having a clear understanding of the group norms can significantly improve electronic communication. For CAF virtual teams, meetings should be well structured, with established processes and methods understood by all participants. While this will vary from team to team, they key best practice is to implement a process that is effective for each specific team and ensure all team members respect it.

Communication in virtual teams is often limited to formal meetings, which can have a negative impact on group dynamics. In an office environment, it is often in informal situations where important communication occurs, facilitating the passage of information as well as the fostering of relationships among team members. As demonstrated in literature, more “productive teams had more non-job-related communication topics than less productive teams.”¹² Additionally, “... members of productive teams communicated more often in informal, social ways than the less productive teams.”¹³ Applying this to the CAF, many business discussions happen after hours in the mess, when members are relaxed and having a beverage with co-workers and friends. With messes closed due to COVID-19, this physical environment no longer exists. “As physical contact is lacking in virtual communication settings, e-leaders have to develop new communication skills for creating socializing activities and developing feelings of togetherness that promote inclusion of all team members.”¹⁴ To compensate, a recommended best practice is to create a virtual water cooler,¹⁵ which simply means creating opportunities for informal conversation to occur.



How this is established will depend on the team, but some suggestions include virtual meetings over a meal with no agenda, voice chat channels that remain open throughout the day, or virtual games that promote togetherness external to a business only agenda.

For communication to be effective, it needs to be implemented and championed through e-leadership. This requires the same competencies that are seen in traditional leadership situations, however, the former is reliant on technology.¹⁶ The most effective e-leaders are “extremely effective at providing regular, detailed and prompt communication with their peers and subordinates, while also establishing clear role relationships and responsibilities among members of their teams.”¹⁷ In a virtual team it is crucial that members are provided guidance, structure and management¹⁸. The traditional approach to leadership in the CAF is based on a hierarchy. While this structure still remains in a CAF virtual team, leaders need to be more flexible¹⁹ and ensure they take on a more coaching and moderating approach which emphasizes goal setting, participation and feedback about task fulfillment²⁰. The most highly effective virtual team leaders act as mentors and motivators. They exhibit a high degree of understanding and empathy toward their team members but are also able to assert their authority without being

perceived as overbearing or inflexible.”²¹

CONCLUSION

Virtual work and virtual teams, while not always ideal, are important to maintaining operational readiness in the CAF during the COVID-19 pandemic. The lessons learned from the literature on virtual teams highlight the importance of communication in any virtual team. Specifically, it is important to enrich communication by ensuring face-to-face opportunities to communicate, and to establish

clear communication processes. Finally, it is important to provide communication opportunities for conversation outside of the standard work topics and to ensure effective implementation of e-leadership. It is unknown how long the virtual team concept will be utilized within the CAF and the Defence team, but as long as best practices are employed, virtual teams are more likely to be successful and able to overcome challenges.

¹⁰ Watkins, 2013 Making Virtual Teams Work: Ten Basic Principles, Harvard Business Review. Accessed 10 Nov 2020 : <https://hbr.org/2013/06/making-virtual-teams-work-ten?registration=success>

¹¹ White M. “The management of virtual teams and virtual meetings,” *Business Information Review*. 2014;31(2):111-117. doi:10.1177/0266382114540979

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¹⁷ Kayworth and Leidner, 2002 Kayworth, T.R., &Leidner, D. (2002). Leadership effectiveness in global virtual teams. *Journal of Management Information Systems*, 18, 7-40.

¹⁸ Hertel, Guido & Geister, Susanne & Konrad, Udo. (2005). Managing Virtual Teams: A Review of Current Empirical Research. *Human Resource Management Review*. 15. 69-95. 10.1016/j.hrmr.2005.01.002.

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²⁰ Hertel, Guido & Geister, Susanne & Konrad, Udo. (2005). Managing Virtual Teams: A Review of Current Empirical Research. *Human Resource Management Review*. 15. 69-95. 10.1016/j.hrmr.2005.01.002.

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²¹ Kayworth and Leidner, 2002 Kayworth, T.R., &Leidner, D. (2002). Leadership effectiveness in global virtual teams. *Journal of Management Information Systems*, 18, 7-40.



3PL BENEFITS FOR THE CANADIAN ARMED FORCES (CAF)

by Major Erika J. Valardo

MAJOR ERIKA VALARDO ENROLLED IN THE CANADIAN Forces as a reservist in January 2001 as a Gunner with the 3rd Field Artillery Regiment. Upon completing the Basic Military Qualification, she transferred to a Resource Management Support Clerk. In June 2006, she enrolled in the Regular Force as an Air Force Logistics Officer with a specialty in finance.

Over the years, Maj E.J. Valardo, has worked in various finance positions; currently she is the revenue and receivables officer at ADM (Fin).

Major E.J. Valardo is married to Warrant Officer Steve Valardo, an Airborne Electronic Sensor Operator. Together they have two boys.

AIM

The aim of this paper is to demonstrate that, on a global scale, the benefits of third-party logistics (3PL) outweigh the weaknesses. It will answer the question of how 3PL brings added value to the Canadian Armed Forces (CAF).

DEFINITION

3PL is defined as: ...essentially a variety of services and processes that are provided to a business by an external company for a variety of reasons such as wanting to reduce costs, improve efficiencies and expand capabilities. 3PL services are usually flexible and scalable based on the needs of the business, meaning that they can be utilized on

an as-needed basis, or as a long-term solution depending on the goals and objectives of the business.ⁱ

BACKGROUND

The official date the term 3PL was conceived is not immediately clear. According to Logistics Listⁱⁱ, the term 3PL can be traced back to the 1970s and 1980s as companies began outsourcing logistics services to third-parties. The use of 3PL began to rise when trucking regulation within the Motor Carrier Act of 1980 was alleviatedⁱⁱⁱ, which reduced trucking rates.

That notwithstanding, the use of third-party logistics within the military can be traced back more than two centuries, having been utilized as early as 1867 during the reign of Emperor Meiji when Japan requested Western Military Missions to help modernize their armed forces. This became a major contributor to Japan's industrial rise in the later 1900's^{iv}.

BENEFITS

3PL providers offer several benefits to the CAF. They include, among others, reducing costs by not having to maintain our own space for inventory.

Cost Efficient and Effective Benefits

Being the largest department within the Canadian Federal Government, the CAF accounts for approximately 73% of the total Main Estimates for Canada^v (transfer payments made to other levels of government).

One of the primary benefits when utilizing 3PL is the cost savings that outsourced services can achieve. Optimization of a limited budget enables financial resources a wider reach and allows for sound stewardship of monies.

By cutting out inefficient processes, 3PL providers can improve the military's supply chain management system. Many have a global network which allows for extremely efficient transportation of resources, thus decreasing the cost and further improving financial stewardship. 3PL offers the ability to rapidly fill temporary voids, which offers the CAF the ability to adapt to multiple environments easily and to quickly cancel those resources when the services are no longer needed. This results in additional cost savings to the CAF.

The CAF's contract with Logistik Unicorp to provide Non-Operational Clothing and Footwear (NOCF) to the CAF^{vi} is an example of how the CAF does benefit from the use of 3PL suppliers. Logistik Unicorp specializes in the management of clothing. By engaging their services, the CAF ensures that clothing is managed by one entity that includes warehousing, shipping, stocktaking etc. This generates cost savings by reducing the footprint of NOCF at CAF supply depots, freeing up space and enabling the storage in-house of other essential items that are currently being stored at offsite facilities. Furthermore, Logistik Unicorp also provides the ability for personnel to order items they need online and have them shipped to their door. This service also allows for quicker turnaround times for product improvements, reduces the risk of depleting stockpiles, and saves personnel time by avoiding lineups for kit issues.

Flexibility and Versatility

The flexibility and versatility 3PL outsourcing activities bring to military sustainment continue to grow. Depending on the logistics transformation requirements within an operating environment, 3PL can be as simple as buying one "widget" or as multifaceted as outsourcing multiple logistical capabilities for multiple operations all at one time.

The CAF, along with many other militaries, use 3PL suppliers to enhance their flexibility during operations. Within the US military, Jessica McCarthy highlights this aspect by stating: ...the US military finds itself increasingly stretched to meet an intense and broad set of demands. With an increased operations tempo and cuts to budgets and force size, military contractors have shifted from supplemental to operational necessity. Contract support in

both garrison and contingency environments is now not only common, but also expected by commanders.^{vii}

World affairs have grown more unpredictable and have created an increased need for the Canadian military's involvement on a global scale. The CAF, like our US allies, continues to find itself trying to do more with less. Using 3PL allows the CAF to focus on their core tasks and leave non-core activities to outside providers, thus freeing up military personnel for duties only they can perform.

The use of the Calian contract is an excellent example of how 3PL within the Canadian military is advantageous and increases flexibility. Calian brings a significant number of supporting components to the CAF, such as providing training services (including learning material, delivering and evaluating training), offering the military family doctor networks, designing and delivering fundamental components for light armoured vehicles, and offering many other contracted logistic options. Calian provides a turnkey solution that supports military personnel in being more agile and allows commanders the flexibility to shift their focus to ensuring our military personnel are concentrated on domestic and global operations^{viii}.

Strategic Alliances

3PL relationships are characteristically more complex than conventional ones, so building strategic alliances between the CAF and 3PLs to simplify these relationships is essential.

The CAF cannot be experts at everything. In order to continue to improve operational effectiveness and sustain military needs, strong alliances with 3PL suppliers are required when the CAF is seeking specific skillsets of capabilities, experience and innovation. The CAF can use these strategic alliances to enhance the organization's ability to meet rapidly changing conditions. 3PL alliances not only offer a foundation for improving military capabilities, but they also play a major role in-service support.

For example, the CAF is exploring the use of 3PL to provide future aircrew training. Col Pete Saunders, Director of Air Simulation and Training, stated "in the end, the foundation of the Air Force is our ability to generate qualified aviators" and for the Royal Canadian Air Force

(RCAF) to obtain this foundation, the CAF is counting on 3PL bidders to design a training system that will combine two existing training programs involving seven different platforms^{ix}. The winning bidder is expected to carry out the program for 20 years. This strategic and strong alliance with the winning provider will help the RCAF focus on core competencies by returning military personnel to the operational units where they are needed vice providing in-house instructional services.

INHERENT RISK

Focusing on the benefits of 3PL is relatively straightforward, but the risks must also be taken into consideration to determine if 3PL is a proper course of action. Ensuring that the effectiveness of, and the culture within, the CAF are not impacted negatively takes precedence over convenience.

Loss of Skills

Increasing the use of 3PL creates the significant risk that the CAF is replacing military personnel by contracted services. This replacement could result in a loss of skills and capabilities required while on operations or deployments where 3PL providers may not attend, and could have a detrimental impact on the effectiveness of an operation. As an example, 3PL staff could refuse to enter unstable regions due to security threats, thereby increasing the risk of the CAF not being logistically supported, potentially leading to mission failure. This reduces the confidence that a 3PL will provide the required services at all times. As such, there needs to be a balance between 3PL and integral logistic capabilities, an aspect that Jessica McCarthy highlights in her article^x.

Increased Costs

Replacing integral logistics capabilities with 3PL services can result in scope creep due to missions extending longer than expected, producing unexpected/unplanned increased costs. An example is the CAF's purchase of 28 CH 148 Cyclone helicopters. This contract was signed for \$3.2B in 2004, however, due to delays and overrun costs, the total project cost almost doubled to \$6.2B^{xi}.

Loss of Control

The military is known for their controlled style structure and engaging with a 3PL service provider results in some

loss of control within the organization. Once a 3PL provider is contracted to deliver a service, there is the potential for the loss of control in a situation resulting in the CAF being unable to successfully execute the mission. As a result, any unsatisfactory service received can portray an unfavourable image for the CAF and reduce morale in service members.

CONCLUSION

In the current volatile and complex operating environment, it is beneficial to use 3PL providers alongside our organic capabilities. While there are weaknesses and inherent risks involved in utilizing them, it is believed that the benefits of using another organization's skills and knowledge to foster enhanced financial stewardship, increase flexibilities and build strategic alliances will enable the CAF to re-align resources and focus more on mission success.

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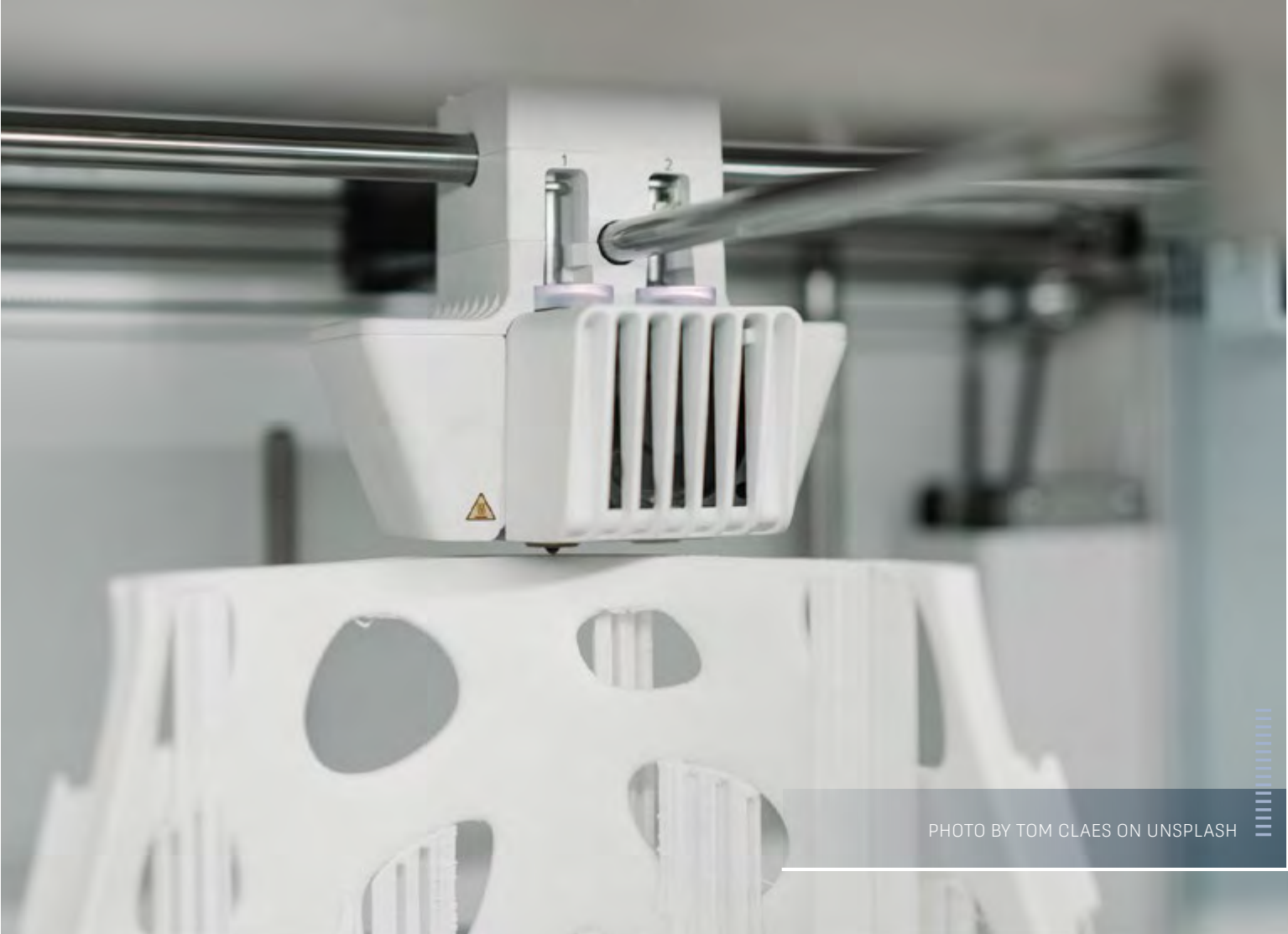


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CANADIAN ARMED FORCES
SUPPLY CHAIN MODERNIZATION
IS ADDITIVE MANUFACTURING THE ANSWER?

by Major Monica Fournier

BIOGRAPHY - MAJOR MONICA FOURNIER

Major Fournier enrolled in the Canadian Armed Forces in 2007 and received her Bachelor of Business Administration in 2009. After completing Logistics Officer Phase Training – December 2010- she was posted to 5th Canadian Division Support Group (5 CDSG) as the Supply Company, Administrative Officer. In 2012 she transferred to 5 CDSG, Corporate Service Branch where she was double hatted as the Financial Management Services Officer/ Deputy Commanding Officer until 2015 when she became the Finance Officer at 5th Canadian Division Training Center (5 CDTC). She is currently working as the Comptroller to the Judge Advocate General in Ottawa ON.

AIM

The aim of this paper is to assess if Additive Manufacturing (AM) will enable the Canadian Armed Forces' (CAF) Supply Chain Management System to effectively address the issues presented in the Office of the Auditor General (OAG) report published in the spring of 2020. AM, also referred to as 3D printing, is a process by which "a collection of manufacturing techniques create objects by depositing layers of material based upon digital models."ⁱ AM ideology and experimentation can be dated back to the 1960sⁱⁱ; however, it was not until 1986 when Charles Hull obtained the first patent that the technology truly began to emerge commercially.ⁱⁱⁱ Although this technology is still in its infancy, varying industries are exploring how AM can be leveraged. This paper will look at the recent and current uses of AM and then explore the benefits and risks associated with incorporating AM into the CAF Supply Chain Management System whether in garrison or on deployed operations.

INTRODUCTION

The OAG conducted an audit from 1 April 2017 – 31 March 2019 which assessed the Department of National Defence’s inability to effectively supply the CAF with the required materiel in a timely and cost effective manner.^{iv} The audit suggested that the CAF Supply Chain Management System is a cumbersome, complicated network of dispersed warehouses that are heavily reliant on both integral and commercial transportation networks for the movement of materiel. It was also noted that the current system is unable to have the right materiel at the right place at least half of the time and that this percentage increased by almost 10% for high priority orders.^v The majority of all delays were caused by stock shortages. It is important to note that the audit was conducted in a garrison context which is a stable and somewhat predictable environment. Consequently, the concerns found within would likely be exacerbated in a deployed theatre of operation.

The CAF Supply Chain Management System is a key piece to supporting formations, units, and soldiers and sustaining a military force in a theater of operations. In doing so, the existing CAF doctrine provides some guiding principles against which success can be measured. Considering the concerns raised within the OAG report, the application of the principles of flexibility and responsiveness warrant further review. Although the CAF supply chain has the ability to be flexible and adaptive, the existing construct

hinders its ability to adjust quickly to changing situations. This inability to adapt quickly results in extended lead times and increased transportation costs. Furthermore, the CAF Supply Chain Management System’s inability to be responsive, “the ability to provide the right support when and where it is needed”^{vi}, is the crux of the entire OAG report.

The OAG report highlights the requirement for CAF Supply Chain Management System to implement changes in order to meet the needs of those it supports. Canada’s Defence Policy - *Strong, Secure, Engaged* - specifically states that in order “for Canada to be able to deliver tangible results at home and abroad we will launch a range of initiatives that will allow us to ANTICIAPTE, ACT, and ADAPT.”^{vii} ACT speaks directly to leveraging new technologies. Is AM a technology that the CAF should leverage to effectively address the above noted supply chain concerns?

DISCUSSION

Current Applications

AM has certainly proven to pique the interest of manufacturing, medical, and supply chain management industries. As a result, it is being employed throughout the world in varying applications and environments including aerospace, medical, automotive, and defence. Within the CAF, the Royal Canadian Navy (RCN) started using AM in 2011 as a means to manufacture obsolete parts for their

aging fleet. They started first with manufacturing a non-critical fuel flow meter and have continued to explore ways to leverage this capability.^{viii} Most elements of the United States, Department of Defense (DoD) have been using AM to manufacture anything from high demand parts (e.g., nuts and bolts) to obsolete spare parts for their Naval Fleet and joint service crew masks.^{ix} The DoD has also successfully deployed AM assets with the Marines in a combat environment.^x

Opportunities

Reduced Supply Lines – Traditionally, militaries have been known for their long logistics tail and extended sustainment lines of communication. This translates to a heavy reliance on manufacturing and transportation industries to meet CAF supply demands. As was identified by the OAG, the current Supply Chain Management System is not able to successfully meet the demands of the CAF. One noted weakness was the methodology used to move materiel from industry to CAF depots and then onwards to supply units and end users.^{xi} AM has the potential to address this challenge as it is centered on the “movement of data and raw material”^{xii} only. Essentially, AM would enable end user demand to be immediately addressed in situ whether in garrison or in a deployed setting. Ultimately this would eliminate the excessive lead time required to meet the requirements of the end user.

Reduced footprint - Having the ability to print products on demand would enable the CAF to condense their present-day warehousing infrastructure. As is sits right

now, the current CAF supply chain management system is comprised of heavily stocked warehouses that are dispersed throughout the country. This construct has resulted in significant redundancy and excessive outdated stockholdings. The employment of AM technology, as previously suggested, would allow for products to be manufactured when and where they are required and has the potential to eliminate the requirement for an extensive network of warehouses.

Although the benefits stated above certainly have the potential to make the CAF Supply Chain Management System more efficient and effective, there are also some key considerations that warrant in-depth exploration before AM can be exploited to its fullest potential within the CAF supply chain.

Risks

From a CAF supply chain management perspective, there are several risks to employing AM. Many of these risks have been covered in other professional military papers on the topic, thus, the focus here will be on three relevant but less explored concerns.

Cyber threat - Maintaining large stockpiles of materiel, equipment, and parts has its disadvantages; however, the one clear advantage is that the custodian of said items can touch, see, and feel the physical asset on the ground. AM on the other hand is simply data and its reliance on digital files and connectivity inherently put it at risk of cyber-attack.^{xiii} The AM digital thread starts at the scan/



PHOTO BY TIMELAB PRO ON UNSPLASH

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xii. Matthew J. Lewis et al, *3D opportunity in the Department of Defense, Additive manufacturing fires up*, A Deloitte Series on Additive Manufacturing, Deloitte University Press, 4.

design phase right through to product end of life where a vulnerability to cyber threats exists at every phase. The level of cyber threat can vary greatly from curiosity to intent to cause harm.^{xiv} The latter should be of serious concern for the CAF. While this may not pose the greatest threat in a garrison setting it certainly warrants further examination if the CAF were to deploy AM assets to a theater of operations. If a hacker were to be able to obtain or corrupt AM data files the implications could be catastrophic, depending on the product (eg., ammunition, critical replacement parts).

Available CAF AM Technical Expertise - The AM manufacturing process is not as simple as loading a data file and hitting print. AM, like any other technological advancement, requires a certain amount of technical knowledge. In fact, the AM industry is finding that the “technology advancements have outpaced the ability of the broader workforce to adapt”^{xv} which has resulted in talent gap and a limited staffing pool. What are the implications of this for the CAF supply chain? Presently, the CAF is reliant on industry for goods and is not in the business of manufacturing. If the CAF were to embrace this technology, would the AM manufacturing role then fall to Army Material Technicians or equivalent trades in the other elements? Should a new trade be established? As previously stated there is already a civilian talent gap and the recruiting pool may be limited by this fact. Additionally, it takes upwards of a year for a soldier to reach their operational functional point which can fluctuate depending on the level of training required to obtain a specific skill set.

Availability of print material – Plastic is the most readily available material for AM however, due to the critical nature of most military requirements, they rely on stronger materials such as metals and alloys. Although, these materials are available for use in traditional defence manufacturing, this simply is not the case for AM. In fact “there are many materials used for defence applications that are underrepresented in currently available feedstock. These include aluminum and copper alloys, structural steels, polyoxymethylene (acetal), PMMA, polyesters, polyimides, etc.”^{xvi} So depending on the array of products the CAF desires to manufacture via AM, the availability of raw material could be an area of concern. Specifically, if the

CAF wishes to adopt metal AM technology it is important to note that the development of feedstocks in this area have not kept pace with the print technology and as a result, are not as readily available.^{xvii} The ever increasing application of AM within the aerospace, automotive and defence industries places high demand on such materials. If industry is unable to meet the demand for feedstock there is potential that the CAF supply chain would find itself in the same situation it is in now, unable to meet demands in a timely and cost efficient manner.

CONCLUSION

Although AM has been around for 20 plus years, its full potential has yet to be realized. There are many sectors within industry who have embraced AM technology and who are seeing incremental success within manufacturing and supply chain processes. The CAF, much like these organizations, continues to explore ways to exploit AM. It is apparent that the CAF Supply Chain Management System could benefit greatly from the introduction of AM into the existing framework in order to reduce both the sustainment lines of communication and effectively meet the supply needs of the organization by having the right materiel in the right place at the right time.

xiii. Simon Golberg et al., *3D Opportunity and Cyber Risk Management – Additive Manufacturing Secures the Thread*, A Deloitte Series on Additive Manufacturing, Deloitte University Press, 5-11

xiv. Ibid,

xv. Eric Vazquez et al., *Additive Manufacturing and the workforce of the future*, A Deloitte series on additive manufacturing, Deloitte University Press, 1.

xvi. Defence Research and Development Canada, *Review of Structural Additive Manufacturing for Defence Applications- Current state of the Art*(Dartmouth, Nova Scotia: Department of National Defence, 2019)

xvii. Equispheres, *The problem with additive manufacturing Whitepaper*, Equispheres (Ottawa Canada, 2020)

THE CAF NEEDS TO PUT THEIR HEADS IN THE “CLOUD”

By Lieutenant-Commander Tiffani Carrat

BIOGRAPHY

Tiffani Lynn Carrat, LCdr, Sea Log

Enrolling in the Canadian Armed Forces in 2006 LCdr Carrat attended the Royal Military College of Canada where she completed her BA in History and Politics. She has had the distinct pleasure of sailing onboard *HMCS Oriole*, *HMCS Protecteur*, *HMCS Ottawa*, *HMCS Charlottetown*, and most recently *HMCS Halifax*. As a Naval Logistician she has specialized and worked in Supply, Finance, Human Resources and Contracting in various sea-going platforms. LCdr Carrat has worked in financial audits, Naval Policy and Training, the Royal Canadian Navy Comptroller group, and as a Finance Officer in CANSOFCOM. All of these experiences have motivated her to make the most of her career and have an impact on the future direction of the CAF.

She is currently working as the Logistics Officer for the Canadian Submarine Force.

AIM

Throughout this paper I will outline the importance of automation to counter current inadequacies in our Supply Chain, the success of automation and outsourcing in industry, as well as how the CAF can benefit from outsourcing the development of an SCM system to a third party.

INTRODUCTION

The issue plaguing the Supply System is the inherent lack of accountability and oversight in the supply chain itself. “Cradle to customer” needs to be open and transparent so that at any time, much like Purolator, any item can be tracked, managed or updated in real time to reflect a customer’s requirements. Automating our supply chain management (SCM) system by outsourcing the development of an integrative “cloud-based” platform to a commercial company will ensure the Canadian Armed Forces receive what is required when it is needed.

PHOTO BY TAYLOR VAN RIPER ON UNSPLASH

This automation will make certain that we have positive control of our materiel at all times.

DISCUSSION

Industry is leading the way with outsourcing the aspects of their business in which they do not excel. Companies are hiring external contractors to overhaul existing processes in order to reduce costs, increase operating efficiency and implement the most advanced technological platforms available.

Issues in the CAF Supply Chain

SCM is not living up to expectations in the CAF because of a lack of flexible technology, innovation and appropriate training, in order to enable accurate tracking, accounting, movement and receipt of items. This has been identified as an area in which DND, as a whole, needs to do better. The Strong, Secured and Engaged Policy published by the Minister of National Defence in 2017 highlighted the need for change to our supply, contracting and procurement processes.¹ This was further broadcast in the July 2020 Office of the Auditor General (OAG) report titled, “Poor supply chain management within DND leads to late deliveries half of the time.”² This external audit of the DND supply chain investigated issues with everything from military uniforms to urgent High Priority Requests (HPRs).

“On average,” the report says, “material such as uniforms, rations and parts was delivered at least 15 days later than requested half of the time, and 40 days later 25 per cent of the time.” It was also highlighted that “among the high-priority requests, we found that 60 per cent arrived after the required delivery date. Of these, 50 per cent were at least six days late and 25 per cent were at least 20 days late.”³

“One-third of about one million requests were rerouted, resulting in increased use of commercial transportation, which is often more costly than other options.” In some cases the “minimum stock level was set at zero for all warehouses in a requesting unit’s supply chain structure, but National Defense could not confirm whether this level was by accident or design. Of the 129 high-priority requests examined by the audit, minimum stock levels were set at zero in 100 cases.”⁴

Put simply, this decreases credibility for the Canadian Armed Forces (CAF) when items are not arriving where they need to go when they need to be there. The report found that frequent shortages were due to unavailable stock, or materiel not being located where indicated in the system. This led to items being sent to the wrong location, which delayed delivery to the customer.

The current platform requires that Materiel Management Technicians manually input stock holdings in order to signal the need to re-order an item to avoid any shortages or delays in filling requests. This business process leaves room for human error and requires constant user engagement to ensure its accuracy. Training and constant supervision is burdensome to the department. Automating the business process and syncing our warehouse operations would ensure items are accounted for accurately and able to be located quickly to limit negative impact on operational capabilities. Automation removes the operator error and increases the accountability and oversight of materiel locations.

What Industry Statistics Say

In a recently conducted Canadian Third-Party Logistics (3PL) survey, companies indicated that the key challenges they face in their respective industries are costs, customer service, material management, average cycle length, and inventory levels. These challenges are common to the CAF as well as the private sector. Industry is resolving these issues through automation and outsourcing. The survey examined how many companies are in fact using outsourcing, what elements of operations are being outsourced, and overall satisfaction with outsourced services.

“Fifty-four percent of the respondents reported currently outsourcing some or all of their logistics functions. Only 16% of respondents reported never having outsourced and having no future plans to do so. The data show that outsourcing is helping companies deal with the top supply chain challenges: 42% of respondents reported that as a result of outsourcing, their logistics costs have declined; 37% indicated their service has improved; 29% stated their logistics assets (material handling equipment, vehicles, buildings, etc.) have declined; 15% reported

improvements in average order cycle length reductions; and 10% mentioned a shrinking in inventory levels.”⁵

All of these outcomes are favourable and facilitate the progressive optimization of business practices, which is a critical element to building a sustainable operation. Given these results, it is safe to assume that the CAF would also benefit from having expert intervention when it comes to optimization of the Supply Chain.

Effectiveness of Outsourcing in Industry
“Let there be change”

Outsourcing SCM has proven successful for major industry players such as Apple, Amazon, and Walmart, all of which have phenomenal all-encompassing automated Information Technology (IT) driven systems that are constantly evolving to meet their requirements. One company who is at the forefront of implementing changes like this is a consulting firm called Accenture (ACN), a provider of innovative IT solutions for business platform enhancement. ACN operates business processes on behalf of their clients for the integration of specific enterprise functions, including finance and accounting, sourcing and procurement, supply chain management, marketing and sales, as well as some industry specific services such as safety and security.⁶ They help organizations to:

“Reinvent themselves through intelligent operations, enabled by SynOps, our human-machine platform, powered by data and analytics, artificial intelligence, digital technology, and exceptional people, to provide tangible business outcomes at speed and scale, including improved productivity and customer experiences as well as sustained long-term growth.”⁷

All of these aspects can be of significant impact to the Forces as they aim to reduce costs, improve operations and provide accurate data to commanders. ACN’s main focus has been change and how it becomes the most “dynamic, powerful source of progress that a company has to be relevant.”⁸

Sun Chemical Case Study

Sun Chemical used ACN to optimize their transition to SAP Ariba, the implementation of which occurred over 10 months and completely revamped their processes.

ACN built a program to suit their unique IT, business, and functionality needs to consolidate their information into a single source “cloud” platform that also provided analytics. They offered hands-on training, proof of concept support and conceptualization of the final design platforms to the company. In less than a year they were fully operational. “With Accenture, we’ve implemented a flexible, up-to-date system that we can build on, and we’re meeting industry best practices as we continue on our journey.”⁹ Beyond improving the purchasing experience for its user base, Sun Chemical is also benefitting from: greater flexibility and adaptability; quick integration between SAP and Ariba; shifting connections to the cloud; seamlessly transferring data; industry best practices for purchasing; decreased one-time purchases; deployed informal bidding events; negotiated prices with suppliers in real time and enhanced functionality.¹⁰ The company now has an up-to-date platform enabling it to navigate complex decision-making and be more competitive in the market.

A Practical Application “Maritime in the New”

ACN has recently been involved in a new area of operations - providing IT expertise to optimize the naval shipbuilding industry. “Today’s naval shipbuilders must innovate to drive down costs, deal with increasing complexity and deliver new growth. Digital reinvention is their only option for achieving these objectives, and the best approach for shipbuilding is Industry X.o.”¹¹ Industry X.o is a next-gen industrial framework which uses intelligent systems connected via the Industrial Internet of Things to create a fully digital value chain. These

1 Canada. Department of National Defence. Strong, Secure, Engaged. Canada’s Defence Policy. Ottawa: DND Canada, 2017.
2 Gunn, Andrea. “Poor supply chain management within DND leads to late deliveries to military half of the time: AG report.” *The Chronical Herald Ottawa*. July 8, 2020. <https://www.thechronicleherald.ca/news/canada/poor-supply-chain-management-within-dnd-leads-to-late-deliveries-to-military-half-of-the-time-ag-report-471159/>.
3 Ibid. 2.
4 Ibid. 2.
5 Smyrlis, Lou. Canadian Transportation Logistics; Don Mills Vol. 107, Issue. 10, (Oct 2004): 24-26.
6 Forbes 500. “Accenture (ACN)” Accessed 4 November 2020. <https://www.forbes.com/companies/accenture/?sh=1d02116e8d6>.
7 Supply Chain and Operations. Accenture Media. Accessed 4 November 2020. <https://www.accenture.com/us-en/services/supply-chain-management-and-operations-index>.
8 Ibid.
9 Ibid.
10 James, Stacey. Q4: Accenture Fact Sheet. Accessed 4 November 2020. <https://news-room.accenture.com/fact-sheet/>.

platforms are then combined to provide the end-to-end oversight of the entire shipbuilding lifecycle, from design to operational service (from suppliers to navy users). This outcome is realized by collaboration with existing digitally-connected ecosystems to optimize capacity and utilize new technology (additive manufacturing, AI, and robotics) to provide improved services.¹²

Outsourcing Future Success for the CAF

The MND recently provided comments on the OAG report and concluded: “We [DND] have made improvements to stock-taking, the reporting of inventory costs and the oversight of supply work. We are also advancing a number of new management projects, such as procuring standardized barcoding technology and new electronic system capabilities, to further improve our performance. It is important to note that the steps we are taking today are not final actions regarding the way we order, store and distribute equipment for the Canadian Armed Forces.”¹³ It was noted that the department plans to enhance data analytics (i.e. SAP Hana) capabilities and rely on real time RFID technology in warehouses to ensure the “right equipment in the right quantities is at the right places to meet demands.”¹⁴

Moving to the Cloud

The CAF, by shifting its focus to a “cloud” based SCM operation, will ensure it is optimizing allocated resources and understanding its most important business process - supplying capability to effect operations. A “cloud” based approach is best for the type of organization: “that doesn’t want to rip out and replace the on-premise [sic] systems that it has been using for decades. The Cloud paves the path to newer, more modern applications that can be integrated into existing enterprise resource planning and other systems using application programming

interfaces (APIs). This then allows the organization to leverage new software capabilities and technology, such as machine learning, artificial intelligence (AI) and predictive/prescriptive analytics...on top of their existing solutions.”¹⁵

In the past any add-ons to existing programs (e.g. SAP DRMS) required expensive customizations, consulting and integration work. This is important as cost will become a determining factor as the CAF seeks government approval to move forward on remedying the issue.

Outsourcing our SCM system overhaul will enable us to focus on our core business, lower costs, and reduce managerial risk. An integrated approach will increase flexibility of the organization from the top down and bottom up. This will enable leaders to make more informed decisions and respond to changing customer demands, environments, and operational priorities.

“We know strong supply chain management provides the necessary backbone for effective operations, which is why we have developed a holistic supply management approach that not only responds to the auditor general’s report, but also modernizes our system and supports various strong, secure, engaged initiatives.”¹⁶ Currently, the CAF logistics community uses a whole gamut of platforms: Monitor Mass, HRMS, Guardian, Oracle, Phoenix, DRMS SAP (Deployed, FI and MM), Business Objects Tools, Business Planning Platforms (BPT), LOGFAS, Simply Accounting – Sage, Fleet Management System, National Management Defence System, Unitrack, and ACIMS just to name a few. The CAF needs a “cloud-based” solution that manages all of these programs.

Plans to improve the supply system are underway,

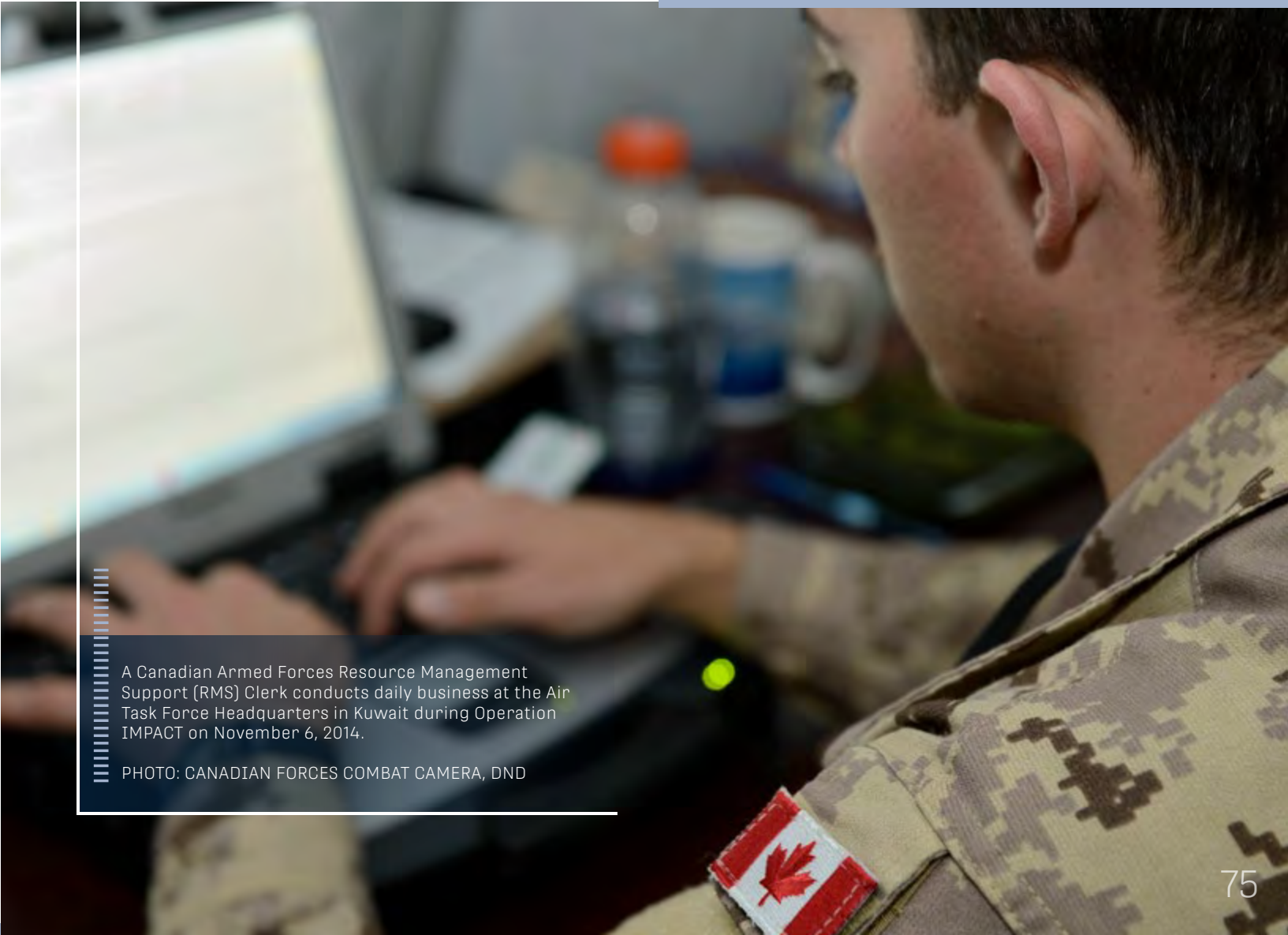
including implementation of RFID technology in warehouses linked to SAP Hana and the Business Objects Tool, both of which will be somewhat integrated in order to communicate with one another and provide analytics to the Chain of Command. However, that will not resolve all of the current shortcomings and will still leave our SCM well behind the state-of-the-art.

CONCLUSION

Outsourcing supply chain processes enables companies to focus their time, energy and resources on what they do best – developing better products and services for their customers.¹⁷ In order to properly provide what is promised in the Logistics motto “Servitium Nulli Secundus” the CAF needs to initiate a greater degree of modernization in the Supply Chain by employing state-of-the-art, cloud-based technologies.

RECOMMENDATION

The CAF should implement a **single**, multi-faceted business platform that encompasses the best practices learned from industry, as research clearly supports contracting out aspects of the SCM system. The CAF should seek guidance from a top level 3PL provider in order to be able to properly execute higher commander’s intent, improve accountability and more effectively meet the requirements of its customers.



A Canadian Armed Forces Resource Management Support (RMS) Clerk conducts daily business at the Air Task Force Headquarters in Kuwait during Operation IMPACT on November 6, 2014.

PHOTO: CANADIAN FORCES COMBAT CAMERA, DND

¹¹ “Maritime in the New.” Accenture Media. Accessed 13 November 2020. <https://www.accenture.com/us-en/insights/high-tech/maritime-new>.
¹² Ibid. 4-5.
¹³ Gunn, Andrea. “Poor supply chain management within DND leads to late deliveries to military half of the time: AG report.” *The Chronical Herald Ottawa*. July 8, 2020. <https://www.thechronicleherald.ca/news/canada/poor-supply-chain-management-within-dnd-leads-to-late-deliveries-to-military-half-of-the-time-ag-report-471159/>.
¹⁴ Ibid. 3.
¹⁵ McCrea, Bridget. “The Ongoing Convergence of Cloud and Supply Chain Software.” *Supply Chain Management Review*. Accessed on 17 November 2020. https://www.scmr.com/article/the_ongoing_convergence_of_cloud_and_supply_chain_software.
¹⁶ Gunn, Andrea. “Poor supply chain management within DND leads to late deliveries to military half of the time: AG report.” *The Chronical Herald Ottawa*. July 8, 2020. <https://www.thechronicleherald.ca/news/canada/poor-supply-chain-management-within-dnd-leads-to-late-deliveries-to-military-half-of-the-time-ag-report-471159/>.
¹⁷ Craig, Thomas. “Outsourcing Supply Chain Management: 8 Issues.” LTD Management. Accessed 2 November 2020. <https://www.ltdmgmt.com/050203.php>.



An exercise representative briefs members from the Canadian Armed Forces as exercise candidates prepare explosives for disposal during Exercise TAZ TORNADO in 4 Wing's Jimmy Lake Range, near Cold Lake, Alberta on September 14, 2017.

PHOTO: AVR CAITLIN PATERSON, 4 WING IMAGING

CFLTC X DIV PRODUCTION CELL NEW AMMUNITION TRAINING INITIATIVE

AS THE NEWEST PART OF THE EXPLOSIVES DIVISION (X Div) at CFLTC, one of the mandates of the Production Cell is to evolve the training of Ammunition Technicians of all ranks. With that in mind, an initiative has been undertaken to create ammunition training aids made of inexpensive, easy to obtain materials, which are environmentally friendly, yet durable and realistic. They can be used in the classroom as well as on the range as

target ammunition in place of live items, thus reducing costs, eliminating the need to track live target ammunition, and mitigate our environmental impact.

During the last few months, prototype ammunition facsimiles were produced using a plaster compound, and explosive trials were performed to test their effectiveness as training aids. We are proud to say that the trials were highly successful. After the detonation of the plaster compound items, there was no need to clean the range of the typical ammunition scrap that occurs when detonating conventional live ammunition. All that was left from the plaster test items was a powder (calcium sulphate -

CaSO₄) that washes away with rain.

The intent of the initiative is for the Production Cell to produce these aids for use in training for disposal operations and dud and misfire situations. This will allow X Div to train Ammunition Technicians with readily available, inexpensive and environmentally-friendly versions of current ammunition that is used in Canada and overseas, in realistic scenarios. In addition, the Production Cell will be able to maintain an inventory of these training aids for use on all of the courses and EOD training scenarios. X Div will use this stockpile to standardize the delivery of each scenario and when required, evolve the training scenarios in order to improve accuracy and realism for the students, by incorporating new items or multiple items at the same time, in order to better test their level of expertise.

The Production Cell will have the capability to add items to the training inventory soon after new munitions come into use, potentially long before a conventional inert training aid becomes available. This will keep Ammunition Technician training current as the CAF acquires new ammunition, something that has not previously been possible. Further trials are underway to enhance the design of these training aids, for example, by adding coloured target effects that would become evident after detonation in order to replicate a real-life situation. Imagine an item with a red coloured post-detonation effect that would signify fire. The colour effect within each target item would be unknown to the student until after it is detonated, adding realism and a surprise factor to the scenario.

In addition to these training aids, the Production Cell will use other materials to improve current aids and to create others that X Div and the Ammunition community require. These can be at the full size of the original, and be either light weight or the full weight of the original. Items that are too large to be used in a classroom setting can be appropriately scaled down. The Production Cell estimates that it can create reasonable replicas to be used for ammunition identification practice and testing at a fraction of the cost charged by civilian companies. Thus, the Production Cell will be the link from civilian market innovations to the training system.

Major J. Haylock - Officer Commanding X Div comments:
"X Div is still utilizing "live" items during training, including for all ECs and PCs. Live explosives and protective works are still disposed of by being burned in a fire.

The training aids being developed by the Production Cell training aids are intended for use in EOD and with duds and misfires, to enhance the scenarios and to assist with the entry of trainees into disposal operations. They are perfect for these applications because we can tailor our scenarios to the items that we will be faced with, and they allow us to add in other, secondary live items with the EFTAs for realism in training. CFLTC X Div will always require live items for our ranges, but now we can expand our capabilities. e.g. - 155mm HE surface detonation scenario without shutting down the roads or facilities close by.

Chief Warrant Officer G. Fraser – Strategic J4 Ammo, Senior Ammunition Technician comments:

"This is a great idea and I'm glad to see some good ideas coming out of the school. I have seen some of the product that has been produced and it is good to have excellent training aids that are more realistic in order to better teach the students going through the school. To have them environmentally friendly is an extra bonus."

Lieutenant Colonel M. Duchesneau – Strategic J4 Ammo:
"Very good initiative."

**A TECHNOLOGICAL DIVIDE:
IMPLEMENTING AUTONOMOUS
DELIVERY SYSTEMS WITHIN
THE CAF**

By Major Michael Anstey

Major Mike Anstey joined the Canadian Armed Forces in 2008 after completing a Bachelor of Science, with a major in Statistics, from Memorial University. He joined as a Logistics Officer and subsequently specialized in Finance as well as completing the Army Technical Services Officer (ATSO) Program. In 2017 he deployed with the enhanced Forward Presence Battle Group Latvia as part of Op REASSURANCE. He has also spent time in Kuwait as the Chief Administration and Financial Officer within the Joint Task Force Support Component on Op REASSURANCE. He is currently the Project Director for the Army Commercial Recapitalization Program within the Directorate Land Requirements.

AIM

This paper will provide an overview of Autonomous Delivery Systems (ADS) in the commercial and defence industries in order to consider the suitability of implementing these capabilities within the Canadian Armed Forces (CAF).

INTRODUCTION

The CAF, comprised of only 60,000 soldiers, has been one of the most professional and competent militaries in the world and, compared to others, our effectiveness on a per-capita basis easily places us in the top tier. This standing on the world stage is, however, being eroded due to our lack of agility in embracing new capabilities.

This paper will do three things. Firstly, it

will explore capabilities within the e-commerce and parcel delivery industry; secondly, provide a snapshot of what our allies are currently implementing; and lastly, emphasize the need for the CAF to consider adopting similar capabilities.

DISCUSSION

Within the consumer goods industry, e-commerce has seen meteoric growth, accounting for an estimated \$1.3 trillion in worldwide sales in 2014 with a forecasted estimate of \$4.3 trillion in 2020,¹ see Figure 1.

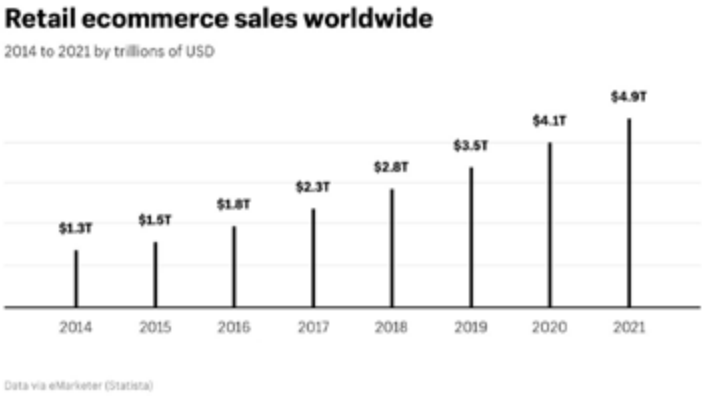


Figure 1. Global yearly retail sales within e-commerce.

This three-fold increase has provided companies such as Amazon, DHL, and Alphabet, the justification required to put substantial Research & Development (R&D) into last-mile logistics, which estimates indicate accounts for 53% of all shipping costs.²

Autonomous Delivery Systems (ADS)

Several multinational companies have begun conducting trials on implementing ADS. Google's parent company, Alphabet, successfully completed trials for the delivery of food and medicine in Australia with its "Project Wing"³. Amazon's "Prime Air", while not yet commercially available, boasts being capable of delivering products weighing upwards of 2.2 kg within a 25 km radius of a fulfillment center within 30 minutes⁴.

Other companies that are also researching these technologies, including FedEx and DHL, among many others. Each has similar capabilities, with variations on the exact delivery method. Many use aerial delivery



from brick and mortar warehouses while others travel back and forth between a delivery truck and destinations along their route, while a third variant has the ADS come to and from stationary delivery "boxes" akin to tiny, strategically placed warehouses.

These new delivery systems provide flexibility to vendors as well as customers regarding the timing and method of delivery; they provide opportunities to reduce costs by using more efficient means of delivery; allow for more direct routes to customers; and ultimately result in freeing up personnel from the most time-consuming portion of the supply chain. Companies are forging a new path within their respective industries that will

ultimately revolutionize small parcel delivery. It was only a matter of time before it became obvious that the efficiencies achieved in the commercial sector would be applicable to the defence industries and would provide significant benefit to military forces.

Autonomous Military Systems

Similar to the commercial sector, the defence community has begun investigating automating various levels of the logistics supply chain, especially where soldiers' lives are at greater risk. It is often said that within the military, people are our most important asset. It is only natural then that any new technology that alleviates a burden from our soldiers will be of value. In the following section

¹ Aaron Orendorff, *Global Ecommerce Statistics & Trends to Launch Beyond Borders*, (Shopify Plus, February 14, 2019), <https://www.shopify.com/enterprise/global-ecommerce-statistics>.
² Shelagh Dolan, *The Challenges of Last Mile Delivery Logistics & the Technology Solutions Cutting Costs*, (Business Insider, May 10, 2018), <https://www.businessinsider.com/last-mile-delivery-shipping-explained>.
³ Malek Murison, *Drone Delivery: Google's Project Wing Takes Off In Australia*, (Drone Life, April 11, 2019), <https://dronelife.com/2019/04/11/google-wing-drone-delivery-australia/>.
⁴ James Gelinas, *Amazon Prime Air Plans to Start Autonomous Drone Delivery within Months*, (Komando, November 12, 2019), <https://www.komando.com/shopping/look-up-in-the-sky-its-my-package-amazon-to-start-drone-delivery-within-months/571255/>.



Figure 3. The newest Kaman K-Max autonomous platform.

we will examine what our closest allies have been doing with ADS.

The US Military have been employing ADS in a myriad of applications. In 2011, US Forces successfully used an unmanned K-Max Synchropter in Afghanistan, delivering vital supplies such as food, fuel, and ammunition to US and coalition partners. Over a two-year period, they launched 1700 supply runs carrying 30,000 lbs of supplies each day, resulting in 4.5 M lbs of supplies being delivered.⁵ While this project was merely a proof of concept during the Afghan years, the United States Marine Corps (USMC) have now placed firm orders for their newest version, the K-Max⁶ which will have a lift capacity of 2,700 kg and a combat radius of 185 km⁷, see figure 3.

This Kaman aircraft can be either manned by a pilot or flown autonomously. It has been widely adopted by various industries including forestry, oil and gas, firefighting, emergency response and most recently has been proven during military operations.

The USMC are also considering implementing delivery drones similar to Amazon Air. The Tactical Resupply Unmanned Aircraft System (TRUAS) is capable of transporting parcels weighing upwards of 27 kg in a 9+ km radius⁸, see Figure 4.

With these new capabilities, among others that are being researched, the USMC are investigating implementing numerous ADS capable of delivering different classes of supplies across the battlespace.



Figure 4. The US Marines using UAV for replenishment of food/ammunition.

The US have also begun joint trials with the United Kingdom (UK) in order to determine the feasibility of delivering supplies within an allied coalition force.⁹ In figure 5, we see robotic High Mobility Multipurpose Wheeled Vehicles (HMMWV) moving in a convoy formation.

This joint experiment was meant to show not only the capability of large ground-based ADS, but also the interoperability between allied forces. Vehicles were directed to move in leader-follower formation while maintaining tactical spacing. This illustrates the ability to deliver supplies via large autonomous convoys under minimal supervision. While this may not be advisable in a warfighting operation, or where security is an issue, it does show that it could be implemented on Main Supply Routes (MSR) or domestically on cross-Canada strategic movements.

Australia, with only two-thirds the population of Canada, has also begun putting serious consideration into ADS. The Australian Department of Defence has

invested several million dollars in a partnership with Rheinmetall to examine autonomous vehicles as well semi-autonomous weapon platforms¹⁰.

Areas of Implementation

So far, we have reviewed several instances of autonomous vehicles being used in a supporting role, delivering vital supplies throughout the battlespace. So where does the CAF fit in? Presently, it appears that “one of these things is not like the other” is not just a kid’s game from Sesame Street. We are falling behind our five-eyes allies in this technological revolution. The US, UK and Australia are making significant gains in this space and we must step up to keep our place at the table.

There are many ADS capabilities that we could investigate, however, it would be extremely easy for Canada to begin using these technologies in the areas of humanitarian aid and support to local governments, in order to reduce costs, manpower, and increase the health/safety of our soldiers. Two scenarios where the CAF could begin implementing ADS immediately are described below.

⁵ “Using Autonomy to Supply the ‘Last Mile’”, (Army Technology, November 19, 2020), <https://www.army-technology.com/features/featureusing-autonomy-to-supply-the-last-mile-5852408/>.

⁶ Anaheim Garrett Reim, Kaman Wins ‘Multiple Orders’ for Autonomous K-Max Kits, (Flight Global, January 28, 2020), <https://www.flightglobal.com/hai-heli-expo-2020/kaman-wins-multiple-orders-for-autonomous-k-max-kits/136388.article>.

⁷ K-MAX Heavy Lift Helicopter, (Kaman, May 20, 2020), <https://www.kaman.com/aerosystems/solutions/air-vehicles-mro/k-max>.

⁸ Josh Spires, Drones to Be Used to Deliver Supplies to Marines in Combat, (DroneDJ, February 25, 2020), <https://dronedj.com/2020/02/25/delivery-drones-supplies-marines-combat/>.

⁹ Shelagh Dolan, The Challenges of Last Mile Delivery Logistics & the Technology Solutions Cutting Costs, (Business Insider, May 10, 2018), <https://www.businessinsider.com/last-mile-delivery-shipping-explained>.

¹⁰ Franz-Stefan Gady, Rheinmetall Partners With Australian Researchers to Develop Self-Driving Vehicles For Military, (The Diplomat, February 28, 2020), <https://thediplomat.com/2020/02/rheinmetall-partners-with-australian-researchers-to-develop-self-driving-vehicles-for-military/>.



Figure 5. Autonomous joint convoy trials being completed by the US/UK.



Figure 6. A Little Ripper Life Saver UAV carries an inflatable floatation device.

Disaster Assistance Response Team

The Disaster Assistance Response Team (DART), established in 1994, is Canada's rapid-response capability for emergencies. It is made up of a team of 200 CAF personnel who are typically the first Canadian support elements to arrive in a disaster zone. They maintain a constant state of high readiness at home in order to deploy at a moment's notice. Their most recent deployments include;

1. Op RENAISSANCE 13-01 in 2013 in the Philippines due to a typhoon, and
2. Op RENAISSANCE 15-1 in 2015 in Nepal due to a magnitude 7.8 earthquake.

In each of these operations, timeliness was absolutely paramount. These natural disasters devastated much of the infrastructure in the area including roads, the power grid, water supply, and medical services, among many more. This is where ADS would provide exceptional

capabilities, allowing immediate access to many areas before safe and secure routes have been re-established, decreasing the risk of injury and death to those affected.

When the DART deployed in 2015, one of their successes was providing vital supplies to those affected, having delivered 105,000 kg of food, 27,000 kg of humanitarian aid, as well as 4,700 kg of shelter and building materials.¹¹ ADSs, such as the K-Max, could have been employed for the delivery of palletized supplies during day- or night-time throughout this operation. With the use of electro-optic (EO), high definition, infrared and thermal imaging cameras,¹² and its small profile, it would have been capable of accessing harsh environments that aircraft, such as piloted Griffin helicopters, could not access safely.

Op LENTUS

Op LENTUS is the CAF's response to forest fires, flooding, and other natural disasters within Canada. Each year, the CAF is called upon by provincial authorities to help with their emergency responses to disasters. Flooding,

in particular, is a natural disaster that Canada has come to expect and its potential occurrence can usually be predicted based on the levels of precipitation and rising water levels.

Similar to the DART response, this is another opportunity to employ ADS. When bridges are damaged or roads are impassable, ADS with significant lift capability, such as the K-Max, can continuously provide support by dropping supplies in affected areas until safe ground passage can be re-established. Ongoing emergency situations could also dictate the need to aid in Search & Rescue operations. Where people have been stranded and have taken to the high ground (e.g., rooftops, trees), it would be feasible to use smaller UAVs to deliver personal flotation devices or even inflatable watercraft to those in need, until such time as they can be rescued, see Figure 6.¹³

CONCLUSION

The commercial and defence industries have made significant progress in ADS, and, in many cases, there are capabilities that could be implemented immediately. Our closest allies, the US, the UK, and Australia have begun implementing ADS for delivery of small packages, large, palletized supplies and have even been researching heavy autonomous vehicles capable of moving in convoys.

It is important that we remain abreast of the capabilities our allies and try, whenever possible, to procure similar technologies to remain interoperable. While there would be significant upfront costs, this is an opportunity to implement cost saving measures down the road with more efficient delivery systems. Employing ADS in scenarios such as emergency response would not only be more efficient, but reduce the risks to which our soldiers are exposed in dangerous situations.

RECOMMENDATIONS

The CAF should commence a phased approach to researching and implementing ADS across the Forces;

1. Force Development should begin identifying capability gaps and situations where organisations could benefit from the implementation of ADS,
2. The Logistics Branch should determine the feasibility of implementing ADS within the supply chain.
3. Force Generators should purchase various ADS on a buy-and-try basis, or even consider a competition such as TRUAS, in order to gain knowledge and experience from a variety of technologies.

¹¹ Government of Canada, *Disaster Assistance Response Team (DART) Deployments*, (Canada.ca, October 9, 2018), <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/types/dart/deployments.html>

¹² Vertical Mag, *Unmanned K-MAX Completes Firefighting Demo*, (Vertical Mag, February 24, 2017), <https://verticalmag.com/news/unmannedkmaxcompletesfirefightingdemo/>

¹³ Thuy Ong, *A Drone Has Rescued Two People from Rough Seas off the Coast of Australia*, (The Verge, January 18, 2018), <https://www.theverge.com/2018/1/18/16904802/drone-rescue-australia-video-ocean>.



DEVELOPING CAREERS FOR WOMEN IN LOGISTICS

AN INTERVIEW WITH:

Alma Arzate, Director, Global Supply Chain, Apotex. Inc.



In her current role at Apotex, Alma leads a diverse team of 140 supply professionals. She has over two decades of broad experience with global supply chains and operations in the Automotive, Electronics, Medical Devices, CPG and Pharma industries in Mexico, the USA and Canada. Despite her sometimes hectic schedule, Alma volunteers her time and knowledge to support multiple supply chain, education, women and immigrant-related initiatives.

In 2019, Alma was selected by Supply Chain Canada as part of their first-ever Top 100 Most Influential Women in the Canadian Supply Chain. In 2020, Alma was one of the 75 finalists of the 12th Annual RBC Top 25 Canadian Immigrant Awards, and she was the winner of the 2020 Woman of Inspiration Award from the Universal Women's Network (UWN), under the category of Authentic Leader. In March 2021, Alma was named by IBM and Supply Chain Digital magazine as part of their global list of Top 100 Women in Supply Chains Worldwide.

You have a unique personal background, having started your career in Mexico and now continuing it in Canada. How did you transition from Mexico where you grew up, to immigrating to Canada?

I am originally from Ciudad Juárez, Chihuahua. Juárez is the sister city of El Paso, Texas. There is a thriving maquiladora industry in town, and a lot of large, multinational companies have operations there, so that is where I worked earlier on in my career.

I was happy with the possibility of remaining in Mexico for the rest of my life. That is, of course, until I became a mother. In the mid 2000's, kidnappings and violence against women were becoming an everyday occurrence in my city. After many conversations with my husband, Jesus, we decided to explore options to immigrate to another country, so we could provide a better life for our young son.

Around that time, I received an email from a Canadian immigration firm offering me a skill assessment in order to evaluate my eligibility to obtain a Federal Skilled Worker visa. I had a Master's degree in Business Administration and several years of work experience. At the time, I was a supply chain manager, working for Johnson & Johnson in their Medical Devices sector. The odds looked good, so we decided to go ahead and started the immigration process.

After many years of preparations and searching, and about a year after I had acquired a Permanent Resident status, I finally landed a job as a project manager with Johnson and Johnson Consumer Packaged Goods in Montreal, and moved to Canada by myself in the winter of 2006. My family joined me in 2007 and we subsequently settled in Markham, ON.

As part of my move to Canada, I had to make a conscious decision to take a step back in my career, as I was already a people leader back in Mexico, but I successfully started integrating myself into the Canadian work environment. I was promoted to Manager, Project Management in 2009, then to Senior Manager, Supply Chain in 2011, which led me to land a role as a Director, Supply Chain Planning in 2012 with Apotex Inc., a generic pharmaceutical manufacturer in Toronto. I continue to work for Apotex Inc. to this day, but now as Director, Global Supply Chain Logistics.

I understand that you had originally planned to work in the medical field when you were younger. What drew you into logistics?

Indeed, when I was a little girl, I dreamed of becoming a medical doctor. Despite my early interest in medicine, I decided to get a business degree when I was in high school, encouraged by Dora, my mom, who was constantly showing me classified ads from companies looking to hire those who had a Bachelor of Business Administration. It simply seemed like the most practical path.

To be honest, I never thought of Supply Chain as a career choice. It was never highlighted as a possible pathway while I was attending the Instituto Tecnológico de Ciudad Juárez (ITCJ), where I completed my B.B.A, or the Universidad Autónoma de Ciudad Juárez (UACJ), where I obtained my M.B.A. Then, a couple of years after I graduated, a vacancy came up in the same company I was working for. They were looking for a Buyer, Indirect Procurement, and after some encouragement from my manager, I decided to go for it. At that time, I had experience only in finance, but the hiring manager took a chance on me. I really enjoyed the fast pace, how every day brought me different challenges to overcome, and how I was able to make tangible contributions to the success of the business. I was hooked!

Coincidentally, I was able to fulfill part of the medical field dream by becoming a volunteer Emergency Medical Technician (EMT) for a few years at the Mexican Red Cross, helping to care for sick or injured people, saving lives, and even assisting in a few emergency childbirths!

You have earned a number of awards and accolades for your work in supply chain management, including being named in the Top 100 Most Influential Women in Canadian Supply Chain. What role do you see women playing in the future of supply chain management? How might we encourage more women to work in supply chain or logistics occupations?

Unfortunately, I didn't have very many female leaders to look up to when I began my supply chain journey back in Mexico. The role models I had at the time were my managers and other senior leaders, and most, if not all, were male. When I was promoted to a management role for the first time back in 2004, I was one of only four females in a group of 104 operations and supply chain managers!

Since then, women have definitely made progress, but their

representation in the total supply chain workforce has remained unchanged at 39% for years. Moreover, when looking to advance their careers, I have seen how women often hold back if they don't check every possible qualification box. Other sources support this claim - for example, a 2014 blog post by Tara Sophia Mohr in the Harvard Business Review says that men apply for a job when they meet 60 per cent of the qualifications, while women apply to openings only if they meet 100 per cent. Since then, I have learned that not checking all the boxes and not having all the answers can sometimes be a strength. I am sure we have all been put in positions before where we didn't have experience, and we made up for our lack of experience with passion, creativity, perseverance and collaboration. As women, we just need to keep reminding ourselves we are more than capable to rise to any challenge.

Every day, I try to overcome barriers for woman wherever I go, and to inspire female supply chain professionals to reach forward and accomplish their dreams. My advice to them? Don't be afraid to say yes if you are approached to take on new opportunities, even if you don't know whether or not you will succeed. Trust that you will find a way to overcome the challenges and deliver results. There is a reason why you are being asked - your leaders believe in you, and you should, too. Say yes and give it your best!

In terms of how we might encourage more women to join supply chain or logistics occupations, a few things come to mind. One of them would be to continue to offer flexible hours. As a mother of three children (Jesus, 22; Victoria, 15, and Gabriella, 13), I can empathize with my team members when an emergency arises at home, or when one of them needs to leave early to take care of the family. I don't care as much about the time they put in as I do about the results they accomplish. As women, we have been conditioned to think we need to choose one or the other, but we can absolutely have both, a successful career and a happy and fulfilling family life. The other aspect that comes to mind would be to facilitate opportunities for professional growth. In this, sometimes we need to be resourceful, and even create opportunities where they did not exist before.

You are a member of the Apotex Women in Leadership Initiative. Can you tell us a bit about that?

The Women in Leadership (WIL) Initiative at Apotex was launched to strengthen our employees' experience by providing a platform for our female colleagues to collaborate, broaden their network, grow and develop. We seek to empower and inspire women at all levels of the organization, providing

support in shaping their career journey as they take tangible steps toward growing themselves. It was originally founded in the GTA in 2017 and since then has expanded globally. Our USA, Mexico and India facilities each have their own WIL branch.

As Joanne Campbell, SVP, Chief Human Resources Officer, and founding member of WIL, said recently: "One of our strengths as an organization comes from understanding and embracing our differences. There is power that comes from inclusion and harnessing unique perspectives and experiences. It brings fresh thinking, offers new approaches and ultimately provides opportunities for growth for both our employees and for Apotex. Over the years, I have seen many of our female employees become inspired and empowered, and we have encouraged and celebrated their development and talent."

Our WIL teams have launched many initiatives across Apotex global sites and have encouraged more awareness and conversation. We want all our employees to feel connected, respected and valued.

Recently you were the recipient of the 2020 Women of Inspiration Award: Authentic Leader. How do you define and apply "authentic leadership"?

Let's define first what being a leader means to me, in a very simple way: a leader is someone who can influence and inspire others to take action, while displaying enthusiasm, energy and optimism. Someone who can set aside self-interest, is willing to take accountability and is determined to deliver results. Now, let's add the authenticity factor to it. As a leader, you need to have a clearly established purpose, along with a set of values and beliefs, and have the courage and ethics to be consistent and stick to them in both good and bad times. This is what sets a leader apart from the crowd and earns for them the trust and respect of their team and others. Your people need to know what to expect from you at any given time; otherwise, chaos and confusion ensue.

The more authentic and genuine you are, the more you can create an inclusive environment to which others are drawn, and can successfully align diverse perspectives and people to form strong partnerships that create the best solutions. You can also help create a culture that is energized by taking on the seemingly impossible, and build excitement in the team to

push through challenges.

Don't try to be a version of someone else. Be yourself. Everyone else is already taken!

What advice would you have for leaders with regard to mentoring and developing leadership in subordinates?

For many years, I have been focusing my time and energy on encouraging others, both at work and externally. I have been a people leader for more than 15 years, and have recruited,

managed the performance of, and retained talent for many organizations in Mexico, the US and Canada. I support my team's ongoing development and professional growth through coaching, mentoring, training, and "on the job" assignments. It may sound like common sense, but I ask them to share their perspectives. I set up an expectation of continuous improvement. I reward team

members for suggesting creative ideas and for implementing them. I strive to create an environment where everyone feels they can offer constructive and candid feedback. You need to lead by example. Your team needs to see you talking about continuous improvement, challenging the status quo, and then they need to see you doing something about it and driving change. Walk the talk!

To be honest, I see every single person in my team as having the potential to be a leader, regardless of title, time in the organization, or if they already happen to have direct reports. Through the annual objective-setting process, my leadership team and I make sure we give each one of our team members the opportunities, resources and time required to lead initiatives that take them above and beyond the comfort zone of their day to day role.

I would summarize one of my greatest career accomplishments as follows: over the last few years, I have been directly involved in facilitating developmental moves or promotions for more than 30 of my direct reports and extended team members. This means to me that I have made a positive impact on their performance, self-confidence and career advancement. When I go to work every day, nothing gives me more pleasure than seeing these many leaders delivering outstanding results for Apotex Inc., knowing I played a part, however big or a small, in their development. This is an extremely rewarding way for me

to give back to the profession, as I am helping pave the way for the future leaders who will eventually rise to prominent positions within our companies.

Problem solving is a needed skill in supply chain management and you have been noted as being someone who is often stating that problems are opportunities. Can you elaborate on how you and your staff tackle challenging problems?

I have to say that there are no typical days in supply chain, which is one of the things I like the most about it. Some key traits you must develop in order to be successful in the long run are collaboration, resiliency and perseverance. We never know what opportunities are going to present themselves on any given day. What I know for sure is that my team and I will find creative ways to overcome and resolve any challenges. Some we will be able to tackle quickly, some will require more time and collaboration, especially when we are talking about revamping existing or implementing new processes or systems.

I try to think cross-functionally, identifying opportunities for improvement for the betterment of the enterprise, and collaborating with other leaders and teams. This has also enabled me to better sell my ideas and influence senior leaders, so they understand the drivers for change and are willing to support new ways of working.

In the supply chain, no one day is exactly the same as the prior one, and that is one of the main reasons why I really enjoy what I do. It keeps me on my toes!

What advice would you give to young people entering the workforce or people who are considering changing jobs that could encourage them to consider logistics as career choices?

Hearing the term supply chain management for the first time can be confusing, until you realize how much we rely on it and the daily impact it has on almost every aspect of our lives. Food, apparel, electronics, and many other products are all made available by means of a supply chain, which is basically the interconnected network of activities that creates and distributes value added products and services to the consumer.

We are currently experiencing a significant shortage of supply chain talent and expect vacancies to continue to increase. Finding and retaining supply chain professionals is one of our major focuses and concerns as leaders in the field. As you enter your first supply chain role, you will find that you are not limited to just one position, or just one industry.

As you gain more experience through on the job training, coaching and mentoring, and advanced education through, as an example, the CSCMP certification from Supply Chain Canada, you will be able to take on more advanced roles. The career choices within supply chain are widespread throughout a broad spectrum of industries. The skills you will learn are highly transferrable. And finally, employers are ready to offer competitive compensation for these skills due to the high demand.

I would absolutely recommend giving a career in supply chain a try. What could be the worst thing that could happen? If you end up deciding this is not for you, you can always change fields, but you get to keep the valuable experience you've already accumulated. But what about if, like a lot of us, you end up loving it? Then you gain the satisfaction of helping resolve the many challenges it presents, working your way through a number of pathways until you become an expert in the field, while ensuring that supply chain becomes a competitive advantage for your company, and in the case of the Canadian Armed Forces, for our country. Trust me, the journey is exciting and rewarding. You will not regret it!



- Is your unit doing something interesting?**
- Do you have expertise in a certain area?**
- Is there a recent book that you recommend to others?**
- Did you just return from a mission and have lessons to share with the logistics community and our allies?**
- Do you have useful practices from industry or our allies we should adopt?**

If so, we are accepting submissions with the following guidelines:

1. Ten pages or less
2. English or French
3. Pictures welcome with notations
4. Sources must be referenced as end notes, if using references

Email your submissions to the Cmdt of CFLTC at Gordon.Bennett4@forces.gc.ca
We welcome submissions from any rank, any trade, and any element.