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A FRAMEWORK FOR SUCCESS: AN ANALYSIS OF THE CF COMMAND AND CONTROL OPERATING CONCEPT

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TABLE OF CONTENTS

ABSTRACT

While the nature and function of command is unchanging, the method, or approach to command can change. The approach to command is largely dictated by the extent to which command authority is held tightly at the organizational core or is delegated to subordinates as in mission command. The former class of command approach is commonly referred to as 'centralized' and the latter 'decentralized.'

Command has evolved throughout history and can be viewed through three distinct methods. Command by Direction, command by Planning, and command by Influence. History points to command by influence and thus decentralization as being the superior of the three.

Contemporary theory promotes the use of decentralization, but adds that a flexible approach to command, or elasticity, is a key strength of any C2 framework.

To be successful in the future operational environment, the CF will need a flexible C2 framework, focussed on an ability to decentralize decision-making.

The CF *Command and Control Operating Concept* represents a flexible C2 framework, focussed on a decentralized approach to command.

INTRODUCTION

As described in Canadian Forces (CF) doctrine, command is an expression of human will to achieve a vision, mission or goal. Control, refers to those actions taken by the commander to regulate forces in order to implement the commander's vision.[1] Combined, they are referred to as command and control, or C2, and they have been present in armies, in some form or another, throughout the history of warfare.

The functions that command provides are vast and varied, and usually critical to the success of military operations. These functions generally include, but are not limited to, planning, decision-making, problem solving, organizing, directing, leading, managing and allocating resources. The principle preoccupation of command, is dealing with the inevitable uncertainty that is inherent in complex endeavours such as war and other operations. In both aspects, the functions of command and the principle preoccupation with uncertainty, the nature of command is unchanging. The way in which command is executed, however, can change.

A commander's method, or approach to command can be viewed in terms of how much supervision and direction a commander provides his or her subordinates. This equates to "… the extent to which command authority is held tightly at the organizational core or is delegated to subordinates as in mission command. The former class of command approach is commonly referred to as 'centralized' and the latter 'decentralized'."[2] In coping with the uncertainty inherent in operations, often referred to

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[1] Department of National Defence, B-GJ-005-000/FP-001, *Canadian Forces Joint Publication 01: Canadian Military Doctrine* (Ottawa: DND Canada, 2009), 5-2.

as “fog”, commanders, depending on their approach to command, can either centralize control of their forces, or decentralize control of their forces. This paper argues that a decentralized approach has historically been, and will continue to be, the superior method of the two.

The CF *Command and Control Operating Concept* released by the Vice Chief of the Defence Staff (VCDS) in June 2012, “… provides a framework for the efficient, flexible, adaptable development of the CF’s command and control capability.”[3] In outlining a plan to modernize the CF’s C2 framework, it is clear that command and control in the CF is evolving. The question remains, however, is it evolving in the right direction?

To meet the challenges of the future operational environment, the CF requires a flexible C2 framework, focused on a decentralized approach to command. This paper will show that the *Command and Control Operating Concept* will provide such a framework. To illustrate this, the method chosen herein is a simple one. Chapter one will examine the evolution of command from Alexander the Great through to the modern era. It will provide examples from history of both a centralized and decentralized approach to command and in so doing will provide ample evidence of the need to pursue decentralization.

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[2] Keith G. Stewart, *Mission Command: Elasticity, Equilibrium, Culture, and Intent* (Toronto: Defence R&D Canada, 2006), 3.

[3] Department of National Defence, *Command and Control Operating Concept* Signed and released by the Vice Chief of the Defence Staff, 14 June 2012, 2.

Chapter two will provide theoretical knowledge, through an analysis of three contemporary C2 frameworks. It will supplement the foundation provided by chapter one, and provide insight into recent endeavours in the study of C2 theory. Additionally, it will build upon the lessons of history, and illustrate the importance of a flexible approach to C2 in the modern operational environment.

Finally, chapter three will apply the historical and contemporary knowledge from the proceeding chapters to analyze the *Command and Control Operating Concept*. Through highlighting key concepts within the framework, it will become evident that the CF is adopting a flexible C2 framework, focused on a decentralized approach to command. This chapter will also touch briefly upon a number of areas of concern that could potentially hinder progress.

While technology is examined in some respects, the purpose of this is to analyze its effects on the commander's chosen approach to command. Thus the term C2 (command and control) has been differentiated from C2 systems (technology). When referring to a C2 arrangement (chain of command, hierarchy) the term C2 structure has been used, which is not to be confused with a C2 framework, which is much broader and reflective of a commander's overall approach to command.

This paper is about command, and how it is executed. It is about the methods and philosophies employed by commanders to direct their forces to achieve their vision, and as such it focuses on human aspects. It attempts to provide historical insight to a balanced view of contemporary theory, to provide an accurate assessment of the CF's evolving C2 framework.

Fools say they learn by experience. I prefer to profit by other people's experience

- Otto von Bismark

CHAPTER 1 - THE EVOLUTION OF COMMAND

Introduction

Although the function of command has remained unchanged throughout the history of warfare, the process of exercising that function, or the approach to command, has changed. The size, composition, capability and requirements of the force, the technical means available to the commander to exercise control, the cultural influences and demands of society, and the personality traits and behaviours of the specific commander, all influence the way commander's approach command. Yet, despite the multitude of factors that influence the command process and the many changes in warfare, there have been relatively few major shifts in the approach to command over the past two thousand years. While some have argued that these shifts came about due to technological factors, others have argued that the social and cultural aspects have had a far greater influence. Despite the differing opinions, however, the majority agree that the "…Generalship in one age and place may not at all resemble that of another."[4] As in all aspects involved in making war, the command of military forces has evolved over time.

A careful examination of the evolution of command will show that while there is no set solution, success has generally favoured forces that are capable of decentralizing decision-making. To illustrate this, this chapter will analyze the evolution of command,

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[4] John Keegan, *The Mask of Command* (New York: Viking Penguin Inc., 1987), 1.

through two distinct paradigm shifts from antiquity to the modern era. It will first examine command by *Direction*, as the earliest and most rudimentary approach to command. A review of Frederick the Great's command by *Planning* as an attempt to reduce uncertainty in war, and the conditions that lead to this paradigm shift will follow. A more detailed analysis of the approach to command demonstrated by Helmuth von Moltke, which embraced the uncertainty of war, and minimized control, will serve as the final method of command reviewed. Finally, the chapter will conclude with some key lessons from history.

While the literature on this subject is indeed vast, this chapter makes use of a few seminal works on the subject. In *The Mask of Command*, John Keegan outlines the evolution of command through an examination of four commanders from different periods in history. The method of command, he argues, is illustrated primarily through the behaviour of the commander, which is a reflection of the society in which he serves. The commander's level of shared risk in battle and his answer to the question of where to lead from, "In front always, sometimes or never…" defines the dominant command process of the day.[5] Martin Van Creveld's *Command in War* also charts the evolution of command, which he sees as predominantly influenced by technology and by the demands of increasingly complex military forces.[6] For Van Creveld, the evolution of command has seen commanders lead from the front, manage from the rear, and finally adopt mission-oriented tactics.

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[5] John Keegan, *The Mask of Command* …, 314.
[6] Martin Van Creveld, *Command in War* (Cambridge: Harvard University Press, 1985), 10.

The works of Robert Citino, R.R. Palmer and Gunther Rotherberg were all influential in providing insight into the Prussian and German perspectives, and the evolution of what Citino calls, "The German Way of War". Finally, Thomas Czerwinski's article entitled "Command and Control at the Crossroads" provides the foundation for this chapter. Czerwinski's article, which expands upon the methods of command introduced by Martin Van Creveld, provides the categories for the periods in question.[7] It is his methods of command, by *Direction*, by *Planning* and by *Influence*, for the purpose of this chapter, that best captures the essence of the other works surveyed, and best sets the stage for future discussions.

Command by Direction

Command by *Direction* is the earliest method of command, and virtually the only method used from the Iron Age (1500 B.C. to 100 A.D.) until the middle of the eighteenth century.[8] It focusses on leadership in its purest form rather than management, typified by the commander who leads from the font. Battles that exemplify this method of command have generally followed a similar pattern: "The commander in chief put on his armour – a significant act that helps put his role in perspective – and posted himself on what he hoped would be the decisive wing … [he] then stormed forward at the head of his wing in an attempt to force a decision."[9] Although this image is an over simplification of the complexity and difficulties encountered by a commander, it points to the fact that command by *Direction* traditionally required the commander to lead from within the

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[7] Thomas J. Czerwinski, "Command and Control at the Crossroads," *Marine Corps Gazette* (October 1995): 13.

[8] *Ibid.*

[9] Martin Van Creveld, *Command in War* …, 44.

army, and normally at the head of it. It is the method of command, perhaps most famously demonstrated by Alexander the Great in his conquest of Greece and Asia between 335-323 B.C.

Both Keegan and Van Creveld use Alexander to personify command by *Direction*, and for good reason. "He was courageous, principled, always leading from the front, and knew his army and its potential like few leaders of a major force before or since."[10] Despite being both military leader and reigning sovereign, Alexander led like virtually every commander of his era, from within his army, usually within close proximity to the enemy. On the battlefield, he situated himself at critical points within his force, which often corresponded to where the fighting was fiercest. For Keegan, Alexander embodies the style of leadership that he refers to as *Heroic Leadership*, characterized by "… aggressive, invasive, exemplary, risk-taking."[11] Alexander's society demanded this of him, both as a military commander and as a sovereign. In fact, there was no distinction made between Alexander's role as commander of the army and his role as king, and his legitimacy as both rested heavily on his ability to perform in combat, and to bring victory.[12] Van Creveld describes Alexander's method of command as *Stone Age Command*, a period he argues, "… before the functions of the commander became specialized to the point that he no longer fought with weapon in hand."[13] He goes on to argue however, notwithstanding the influences and demands of society, the limitations of technology meant that there were few other options open to Alexander.

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[10] Hal Klepak, "Some Reflections on Generalship Through the Ages," in Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership (St. Catharines: Vanwell Publishing Limited, 2001) , 23.

[11] John Keegan, *The Mask of Command* …, 10.

[12] *Ibid.*, 313.

[13] Martin Van Creveld, *Command in War* …, 17.

The armies that emerged during the Iron Age, of which Alexander's is one example, rivaled modern forces in their relative size, complexity and sophistication.[14] Despite this sophistication however, the methods available to a commander to communicate within his army or back to his homeland were very limited. Information normally travelled no faster than a courier could travel on horseback, and while long-range optical communications systems existed in the form of fire or smoke signals, the efficiency, accuracy and capacity to send detailed messages was extremely limited. This meant that at the strategic, and what we now call the operational level, command of a deployed army could only be exercised from within the army itself.[15] At the tactical level, the commander's ability to communicate across the entirety of his force was equally limited. Couriers occasionally delivered detailed messages, but by in large battlefield communications were limited to flags or audible signals, which could only deliver simple, pre-planned messages. With limited ability to direct his entire force once the battle commenced, Alexander could do little more than concentrate on controlling what he considered the focal point of the battle. Such was the norm in battle in Alexander's time, and from the perspective of command, very little changed over the next two thousand years.

Despite a separation of over two millennia, the command of European armies up until the middle of the eighteenth century differed little from that of Alexander's army.[16] Command at all levels was conducted from within the army, with the commander situated close at hand during battle, if not in the front lines. In Keegan's mind, this was

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[14] Richard A. Gabriel, *Great Captains of Antiquity* (West Port: Greenwood Press, 2001), 4.
[15] Martin Van Creveld, *Command in War* …, 22.
[16] *Ibid.*, 55-56.

attributable to the fact that very little had changed in the demands and expectations that European society placed on its leaders. Van Creveld on the other hand, points more towards the few advances in communications technology during that timeframe. Both agree however, that the *Stone Age of Command*, the era of *Heroic Leadership*, and what is referred to here as command by *Direction*, was the predominant form of command well into the eighteenth century, and in many instances beyond.

There is a striking similarity in the way Alexander commanded his army and the way that Gustavus Adolphus, King of Sweden from 1611-1632 commanded his. Gustavus was both sovereign and war leader, and despite often being called a founder of modern warfare, his methods of communicating within his army were no different from Alexander's. Moreover, his command ethos, like Alexander's two thousand years earlier, was undeniably *Heroic*. "In personal valour, carried to the pitch of recklessness, he surpasses even Alexander in the role of the great captains … where the King led the way into the danger zone so impetuously."[17] Gustavus of course, fell in battle while leading a cavalry charge in 1632, in a demonstration of heroism that would not have seemed out of place in Alexander's time.

This *Heroic*, or "knightly ethos" as Van Creveld terms it, that persisted throughout Medieval times, began to decline in the latter half of the seventeenth century. By the early eighteenth century, fewer and fewer commanders fought in person. While the duke of Marlborough was indeed unhorsed while leading a charge at Ramilles in 1706, it was more typical of him, and commanders of his timeframe, to direct the battle

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[17] B.H. Liddell Hart, *Great Captains Unveiled* (New York: Books for Libraries Press, Inc., 1967), 96.

from a hilltop or while moving about surveying the progress of his forces.[18] This was still very much command by *Direction*, but a transition away from Keegan's *Heroic Leadership* had begun. It is this transition and other solutions devised by commanders that highlight the challenges of command in this era, and the limitations of the command process that had existed largely unchanged for over two thousand years.

As has already been stated, commanders of this era had limited means by which to communicate over large distances. With virtually no advancement in communications technology between Alexander's era and the twentieth century, strategic and operational command could not move beyond the army itself. This meant that command was either surrendered to a trusted member of the sovereign's court, like Marlborough, or the ruler and commander were combined into a single person, as was the case with Alexander and Gustavus. This combination of sovereign and field commander however, became less and less prevalent from the seventeenth century onward.

Communications at the tactical level were likewise limiting. "Always unable to command the whole of their forces the whole of the time, commanders devised various solutions for dealing with the problem."[19] Commanders of small forces achieved overall control by combining their forces into a single mass, like the phalanx or the formations used during medieval battles. While this allowed a modicum of control of the entire force, these formations were capable of only a limited number of functions. Furthermore, this solution was not viable following the introduction of gunpowder. The widespread use of portable firearms, and the formations that made those firearms effective, required a

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[18] Martin Van Creveld, *Command in War* …, 53-54.
[19] Martin Van Creveld, *Command in War* …, 56.

level of organization and discipline within tactical units that had not existed since the fall of the Roman Empire.[20] This, combined with the thinning of the ranks, which resulted from the employment of the firearm, and increased the size of the front of an army, made it undesirable to combine any army into a single unit. With that, a commander could either command part of the army all of the time, as Alexander had done at the head of his decisive wing, or all of the army part of the time as Marlborough demonstrated roving about the battlefield.[21] Neither method however, allowed the commander to direct all of his forces all of the time.

It was this quest to command the entirety of a force all of the time, that led to the development of the next method of command. While communications technology still had not improved, the advances in weapons technology had an undeniable impact on the command of armies. Combined with the increased complexity and cost of armies following the Renaissance, this precipitated a shift away from command by *Direction*, towards what Czerwinski has coined, command by *Planning*.

Command by Planning

After two thousand years of command by *Direction*, the first real paradigm shift in the approach to command took place a little over two hundred and fifty years ago. It was an attempt to break the limitations of command by *Direction*, and to solve the problem of how to command all of one's forces all the time, by focussing on comprehensiveness in planning.[22] While it became a predominant method of command in

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[20] *Ibid.*, 52.
[21] *Ibid.*, 56.
[22] Thomas Czerwinski, "Command and Control …", 14.

the eighteenth century, and continues to influence the command process today, command by *Planning* was perhaps most famously demonstrated by Frederick the Great of Prussia.

Frederick II, King of Prussia from 1740 to 1786 was, by his literary and musical pursuits, and his belief in rational thought, a product of the Enlightenment through and through. He was also quite possibly the most aggressive field commander of the eighteenth century.[23] It was perhaps owing to this aggressiveness that he, "… with a small army of highly disciplined regulars, frequently beat those of states much larger than his own."[24] It was certainly owing to his rational nature, however, that he attempted to command his army by *Planning*, rather than by *Direction*.

Like Alexander, he inherited his father's army when he ascended the throne, and like Alexander, he instituted his own reforms within that army. Similar to Alexander and Gustavus, he was both king and field commander. However, Frederick's approach to command differed significantly from that practiced by Alexander and Gustavus. For Keegan, Frederick belongs to the *Anti-Heroic Leadership* category along with men like Wellington and Napoleon. Unlike Alexander and Gustavus who were always visible at the front, "… theirs was a style of leadership reflective and managerial rather than heroic; they were to 'lead' from the rear."[25] Van Creveld on the other hand, still considers Frederick to belong to the *Stone Age of Command* with the likes of Alexander and Gustavus. Yet he aptly points out, that "… Frederick the Great was probably the first

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[23] Robert M. Citino, *The German Way of War: From the Thirty Years' War to the Third Reich* (Lawrence: University Press of Kansas, 2005), 36.

[24] John Keegan, *A History of Warfare* (New York: Alfred A. Knopf, Inc., 1993), 351.

[25] John Keegan, *The Mask of Command* …, 61.

commander in chief regularly depicted as wearing a suit of linen rather than of armour."[26] He further notes that Frederick's use of the telescope allowed him "…to establish his headquarters at a fixed location overlooking the battlefield rather than having to rush around it, as was the practice of Gustavus Adolphus a century before."[27] While it is true that Frederick's methods of communicating were no more sophisticated than Alexander's, it is clear, both through his depiction in art, and his practice on the battlefield, that he had moved beyond the point of always leading from the front. In fact, as Keegan states, not unlike all of the great post-heroic commanders, in answer to the question of where to lead from, Frederick displayed a distinctive "in front sometime (but not always)" style of leadership.[28] This is enough to separate Frederick from those that commanded purely by *Direction*, but it was not the only way in which Frederick differentiated himself.

Frederick's aim as a commander did not differ greatly from those that had commanded by *Direction*. His goal, which is still common amongst commanders today, was to minimize uncertainty on the battlefield, and to maximize his ability to control his forces. He differed from those that preceded him however, in his approach to achieving this, and further, in his belief that this goal was completely achievable. His command structure was highly centralized, and he maintained complete responsibility for all operations, intelligence and planning within his army. Planning, of course, was the key element to Frederick's approach to command. Every move, every contingency, and in Frederick's mind, every variable could be accounted for with careful, comprehensive

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[26] Martin Van Creveld, *Command in War* …, 17.
[27] *Ibid*., 10-11.
[28] John Keegan, *The Mask of Command* …, 149.

planning prior to a battle. As R.R. Palmer states in *Makers of Modern Strategy*, "The aim was to achieve tactical mobility, skill in shifting from marching order to battle order, steadiness under fire, and complete responsiveness to command."[29] It was this complete "responsiveness to command" that was critical to Frederick, for with it, "[a] commander could form his conceptions in the knowledge that they would be realized."[30] For Frederick, the secret to success lie in a highly trained, highly disciplined force that was capable of executing his pre-planned manoeuvres flawlessly. Initiative and flexibility from those under his command, were far less important than precision in executing his careful direction. To this end, Frederick enforced strict discipline in the Prussian army, and drill became an almost ceaseless enterprise, during both peacetime and war.

On the battlefield, Prussian soldiers performed with robot-like precision, and Frederick's rational and methodical nature were at home, for the battles fought in Europe during this era, were methodical affairs. "Opposing armies were arrayed according to pattern, almost as regularly as chessmen at the beginning of a game."[31] Frederick's pre-planned battle order normally dictated the marching order, and thus as the Prussia army arrived on the battlefield in columns, it was ready to fight in short order. "The king as a rule would ride out ahead of the approaching army, observe the enemy at close quarters, and then assign each unit its direction as it passed by. From this point on the machine was supposed to function automatically."[32] It often did just that, resulting in stunning victories for Frederick. In other battles however, the inadequacies of this approach to command,

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[29] R.R. Palmer, "Frederick the Great, Guibert, Bulow: From Dynastic to National War," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age,* ed. Peter Paret, (New Jersey: Princeton University Press, 1986), 99.

[30] *Ibid.*, 99.

[31] *Ibid*., 99.

[32] Martin Van Creveld, *Command in War* …, 55.

despite its natural fit with the mathematical approach to warfare of the era, became evident.

Frederick's method of command lacked flexibility. His soldiers performed well when everything went according to plan, but were unable to adapt to rapidly changing situations or unforeseen circumstances. His highly centralized command structure ensured that all knowledge of the campaign plan, the intelligence that had been received before the battle, and the battle order itself, lie with Frederick, and Frederick alone. Initiative was not only discouraged in this environment, it was almost impossible. In the end, Frederick's army and more importantly his approach to command by *Planning*, was only moderately successful, producing almost as many defeats as victories over the course of Frederick's career in the field.[33]

Frederick's quest to minimize uncertainty, and to maximize control over his entire force, resulted in his highly centralized command structure and approach to command, by *Planning*. Keegan might argue this was a logical solution for Frederick, in that he was a product of the Enlightenment and the influences of society demanded a rational, methodical, almost mathematical approach to warfare. Van Creveld, on the other hand, might simply see Frederick as another commander hampered by rudimentary technology, struggling to achieve control of his army. Regardless, it is clear that Frederick the Great's command by *Planning*, stands separate and distinct from the command by *Direction* that preceded it. It also stands separate and distinct from the final method of command that Thomas Czerwinski refers to as, command by *Influence*.

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[33] Martin Van Creveld, *Command in War* …, 55.

Command by Influence

Unlike command by *Planning*, command by *Influence* embraces the idea of decentralizing decision-making. It places great reliance on the initiative of subordinate commanders with local situational awareness, to take semi-autonomous action within the bounded context of the commander's overall intent.[34] Whereas command by *Planning* seeks to minimize uncertainty outright and increase a commander's control over his forces, command by *Influence* accepts uncertainty and minimizes control. It is usually associated with the A*uftragstaktik, or "mission-type orders"* employed by the Germans in early 1918, and later refined in World War II, but the beginnings of command by *Influence* are traceable much earlier, and as far back as ancient Rome.

As has been stated, command by *Direction* was the predominant form of command from the Iron Age through to the eighteenth century. There were of course, a small number of exceptions to this, and as is frequently the case in exceptions to ancient rules, Rome was one of them. Successful escape from the *Heroic Leadership* that influenced command by *Direction* occurred in Rome, Keegan states, with the creation of a class of professional soldiers, which were largely isolated from political power.[35] Without the societal demand for *Heroic Leadership*, the Romans were free to innovate and adapt their command structure to best suit the available technology and prevailing tactics.

While most commanders of the era controlled their forces with a single, compact formation, or by placing themselves on the decisive wing, Roman commanders divided

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[34] Thomas Czerwinski, "Command and Control …", 14.
[35] John Keegan, *The Mask of Command* …, 313.

their forces into smaller units that could fight without the need of constant direction.[36] Each maniple (160 men), which was the basic tactical unit of the Roman legion, was a permanent unit, and had its own commander who could exercise initiative and conduct independent action. In a further innovation, soldiers and units were spaced further apart than in traditional infantry formations to increase flexibility and manoeuvrability. When arrayed in this famous checkerboard formation, each unit had room to manoeuvre and was able to attack or defend in any direction.[37] This also allowed commanders to see other units, and to provide mutual support should they need assistance. Combined with a well-rehearsed repertoire of tactical moves, executed by trained and disciplined troops, it has been said "…Roman legions in battle scarcely needed a commander in order to gain victory."[38] The result of these innovative tactics, impressive discipline and training, and a tailored approach to command, was an army that dominated the battlefield for almost four hundred years.

Having escaped the societal demands of *Heroic Leadership*, and thus the limitations of command by *Direction*, the Romans attempted to solve the issue of control on the battlefield by decentralizing decision-making and control. This approach was in stark contrast to the method of command employed by Alexander three hundred years before, and Gustavus almost two thousand years later, and clearly represents the genesis of command by *Influence*. As with so many other things, however, with the fall of Rome, command by *Influence* disappeared from Europe until the Napoleonic era.

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[36] Martin Van Creveld, *Command in War* …, 45.
[37] Richard Gabriel, *Great Captains of Antiquity* …, 12.
[38] Martin Van Creveld, *Command in War* …, 46.

Like the Romans, Napoleon revolutionized warfare, not through technology, but through his ability to adapt, to innovate, and to realize the potential of the forces he commanded. Napoleon's army was the dominant power in Europe between 1803 and 1815, and as the Prussians found out in 1806, his method of warfare differed significantly from that which had dominated the eighteenth century. "The army of Frederick the Great, the institution around which the entire Prussian state revolved, one that had managed even during its defeat to maintain a reputation for invincibility, collapsed in a single short day of battle."[39] The methodical approach to warfare, structured around command by *Planning*, was simply no match for Napoleon's innovations and his Grand Armée.

The key to Napoleon's success lie in the structure and organization of his army, and in his method of command. The French Revolution and the *Levée en masse*, provided him with a massive army, the likes of which had not existed since the Roman Empire. He divided this army into permanent corps, which consisted of infantry, cavalry, artillery, and administrative and support elements.[40] Each corps, had its own commander and staff, and was able to march independently and to fight on its own, for a limited time. Napoleon placed exceptional responsibility in the hands of his Marshals, who were often left without orders for days, but expected to execute the overall design of Napoleon's plan.[41] Similar to the command by *Influence* practiced by the Romans but on a greater scale, this provided Napoleon with exceptional flexibility in that he could confidently divide his forces on the march. The swift movement of forces and strategic surprise, which became

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[39] Robert M. Citino, *The German Way of War* …, 104.
[40] *Ibid.*, 108.
[41] Martin Van Creveld, *Command in War* …, 97.

the hallmark of Napoleonic warfare, resulted from Napoleon's willingness to decentralize control and adapt his command structure.

Oddly enough, his downfall may have come from his unwillingness to decentralize further. He delegated the day-to-day command and tactical control of the corps' to his Marshals, but Napoleon's overall command of the Grand Armée was very much centralized. Although routed through his staff, Napoleon himself still analyzed all of the intelligence gathered. Additionally, he held sole responsibility for all planning at the operational and strategic level, and his planning process was a mystery to all but Napoleon. Quite simply put, there was very little process, involved in the planning process.[42] Action at the operational and strategic level, therefore required Napoleon's direct attention, and as the army continued to grow and deploy further and further apart, it simply became unmanageable, even for Napoleon.

Like the Romans, success for Napoleon came not out of new technology, but out of his ability to adapt his command structure and organization to make the best use of the forces he had available to him. To command the massive army that the Revolution and the *Levée en masse* provided, he adopted a method of command reminiscent of that introduced by the Romans two thousand years earlier. While Napoleon re-introduced the concept of command by *Influence*, it was perhaps the Prussian and later the German armies of the nineteenth and twentieth century that most famously demonstrated it.

The Prussian army of the mid nineteenth century held little resemblance to the one that Napoleon defeated in 1806, and the impressive victories over Austria in 1866

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[42] Martin Van Creveld, *Command in War* …, 99.

and France in 1871, established Prussia as the premier military power in Europe. Key to the Prussian success was the organization and command structure of the army, and the command by *Influence* of the Prussian Chief of Staff, Helmuth von Moltke.

The world had changed considerably since Napoleon's time, and emerging technologies such as the telegraph, railway and the rifle all had a profound impact on the army, and the conduct of warfare.[43] Moltke recognized the importance of these technologies and their implications in terms of communications, mobility and lethality. When combined with the mass armies that came with the growth of industry, deadlock he was convinced, was an all too likely result in conflict. The solution in Moltke's mind, was to practice an offensive method of warfare, reminiscent of Napoleon's principle of the quick decisive battle, but adapted for the industrial age.[44] Moltke's strategy of "strategic envelopment", to outflank an enemy through a sequence of mobilization, rapid deployment and concentration of forces, to his reasoning, made the best use of technology and the army he had available. Splitting up this large army, which could now travel faster than ever before in history, however, required a flexible, adaptable command structure.

Moltke commanded by *Influence,* through his highly decentralized command structure and his use of *Auftragstaktik,* or mission-type orders. "The commander devised a mission, explained it in a short, clear order, and then left the methods and means of

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[43] Robert M. Citino, *The German Way of War* …, 148.

[44] Gunther E. Rothenberg, "Moltke, Schlieffen, and the Doctrine of Stategic Envelopment," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret, (New Jersey: Princeton University Press, 1986), 296.

achieving it to the officer on the spot."[45] In Moltke's mind, high command should only issue general instructions and objectives, allowing subordinate commanders the freedom to exercise initiative within the boundaries of an overall strategic design. Although similar to Napoleon's concept of command by *Influence*, Moltke's command structure was far more decentralized, and far less reliant on him personally. The vehicle that enabled decentralization of this magnitude was Moltke's General Staff. Under Moltke's direction, the Prussian General Staff was transformed "…into a unique instrument combining flexibility and initiative at the local level with conformity to a common operational doctrine and to the intentions of the high command."[46] At the high command level, it provided Moltke with a professional cadre of officers to conduct detailed planning, both in war, and perhaps more importantly during peacetime. It became the 'brain trust' of the Prussian army, dedicated to the professional study and preparation for war. At the division, corps and army level, the staff provided continuity in officers trained and educated in common doctrine from the Prussian Military Academy.[47] The overall result was a flexible, adaptable command structure, capable of orchestrating swift mobilization and rapid deployment of a massive army, in order to force a decisive engagement on its own terms.

The success of Moltke's design became evident in 1866 with a swift and decisive victory over Austria (the "Seven Weeks' War"), and again in 1871 against the French. In both cases, Moltke's influence was the key to victory. As Robert Citino concisely states in *The German Way of War*:

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[45] Robert M. Citino, *The German Way of War* …, 152.
[46] Gunther E. Rotherberg, "Moltke, Schlieffen, and the Doctrine …", 301.
[47] *Ibid*.

> He had devised a simple, sound operational framework, not a plan, but a sketch, based on a clear-headed analysis of the strengths and weaknesses of contemporary armies, as well as his insight into the difficulties of commanding mass armies in the field. As the campaign unfolded, he had altered his vision as circumstances and opportunity dictated. He had given his subordinate commanders a huge amount of leeway, and although he and they made several miscalculations and mistakes, when the time came, he managed to direct the crucial maneuvers of the campaign, bending it, just barely, to his will.[48]

Moltke's stunning victories would not have been possible if it were not for the command structure that he put in place. By decentralizing his command structure and providing only the essential elements of direction, he was ultimately able to influence far more of his force than if he had attempted to command either by *Direction* or by *Planning*. His critics argue that his highly decentralized approach was too light, and they point to a number of instances where orders were not executed as per Moltke's direction, and in some cases not executed at all.[49] This, however, disregards the fact that "In Moltke's view, a dogmatic enforcement of the plan of operations was a deadly sin [thus] great care was taken to encourage initiative on the part of all commanders, high and low."[50] Moreover, he was prepared to live with the uncertainty that came with this approach, as he was trading certainty for flexibility and initiative, the two factors that were critical to his swift, decisive style of warfare.

The Romans, Napoleon and the Prussian army under Moltke, were among the most successful armies in the history of warfare. Their armies dominated the battlefields

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[48] Robert M. Citino, *The German Way of War* …, 172.
[49] *Ibid.*, 171.
[50] Hajo Holborn, "The Prusso-German School: Moltke and the Rise of the General Staff," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret, (New Jersey: Princeton University Press, 1986), 290-291.

of their respective eras, and heavily influenced the conduct of war well into the future. In the study of command by *Influence* it is perhaps Moltke, that was the most influential of the three examples. The successes of Ludendorff's storm detachments of 1918, and the stunning gains made by the German *Blitzkrieg* in 1940, were a direct result of the influence that Moltke had on the German approach to command in war. Both Ludendorff in 1918 and the German commanders in 1940, tackled the problem of uncertainty in war through a decentralized approach to command. By encouraging initiative in their subordinate commanders, they traded certainty for flexibility. Through their command by *Influence*, although they surrendered an element of control of their forces, they were able to influence all of their forces, all of the time.

The Lessons of History

The title of this chapter is "The Evolution of Command" but the term evolution may be misleading, as it implies development and progression without reversion. While the methods of command have indeed developed over time, that is not to say that the earlier methods ceased to exist after the introduction of command by *Influence*. In fact, all three approaches to command are still very much in use today. As Czerwinski points out, the emergence of information technologies has in many respects, reinvented earlier methods of command. The U.S. Army's "Force XXI" and its digitized battlefield, which attempts to provide a commander with constant, real-time information on all of his forces all of the time, represents a reintroduction of command by *Direction*. Command by *Planning*, Czerwinski argues, exists in the modern battle space with the notion of the "system of systems", or more practically by the Air Tasking Orders associated with the

control of air assets. *Mission Command*, which is clearly influenced by Moltke's *Auftragstaktiks,* is an obvious example of command by *Influence*.

Perhaps the most glaring example of this myth of constant progression, is provided by the example of the First World War. Forty years after Moltke successfully demonstrated command by *Influence*, command by *Planning* again reigned supreme in Europe. In an attempt to minimize uncertainty in an increasingly complex and lethal environment, the command structures of First World War armies became highly centralized and operations strictly controlled. "Confusion in a word, was to be banished from the battlefield; that this could only be done at the cost of constricting tactics to the point that the battle would be lost before it started nobody seems to have considered."[51] Planning replaced initiative, and despite the introduction of numerous breakthroughs in technology, organizations and command structures did not adapt to capitalize on this technology. The bloody, costly stalemate of trench warfare ensued.

In over two thousand years of history from Alexander the Great to Moltke, what then, has history taught us? The first lesson is that in command there is no "master principle", silver bullet, or panacea that can address every situation. As Van Creveld states, "No single communications or data processing technology, no single system of organization, no single procedure or method, is in itself sufficient to guarantee the successful or even adequate conduct of command in war."[52] So varied and numerous are the factors that influence command in military operations, that a commander's approach must be tailored to the given situation and circumstance. What worked well in one

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[51] Martin Van Creveld, *Command in War* …, 161.
[52] *Ibid*., 261.

situation, therefore, may not work well in another, and a dogmatic approach to command, as with all manner of military operations, is eventually rewarded with failure. Such was the case leading up the First World War, as military historian Geoffrey Wawro describes in *Warfare and Society in Europe*:

> After 1870 every European army adopted the Prussian formula. They introduced conscription, expanded their railway and telegraphs, procured magazine rifles, machine guns and quick-firing artillery … Forgetting that the Napoleonic 'revolution in military affairs' had lost its punch once every army in Europe adopted it, these generals went to war in 1914 labouring under the 'short war illusion'; they were somehow convinced that their planning, armaments and tactics would defeat the enemy, even though the enemy possessed virtually the same technologies and doctrines that they did.[53]

Reliance on any system, framework or method, based purely on past success without careful consideration of the particular situation, historically has not worked well. Moreover, a similar reliance on new technology without the accompaniment of innovation will not guarantee success, which leads to the second lesson of history.

Historically, fortune has favoured innovators. Over the history covered so far, the most successful commanders have all demonstrated the willingness and ability to create innovative solutions to problems. Roman supremacy on the battlefield came from its innovative tactics, and a command structure and organization that was adapted to suit the environment, rather than from any real technical superiority.[54] Likewise, Napoleon's revolutionary system of command and approach to warfare came not from a technical

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[53] Geoffrey Wawro, *Warfare and Society in Europe, 1792-1914* (London: Routledge, 2000), 225.
[54] Martin Van Creveld, *Command in War* …, 56.

advantage, but from his ability to organize his forces and his command structure to best utilize the technology and resources he had available.

The third and principle lesson examined in this chapter pertains to uncertainty in war. As Czerwinski succinctly points out, "Generally the *directing* commander attempts to prioritize uncertainty, the *planning* commander to centralize uncertainty, and the *influencing* commander to distribute uncertainty."[55] In over two thousand years of military history, it has been those forces that attempt to distribute uncertainty, that have been the most successful. The accomplishments of the Romans, Napoleon and Moltke, provide excellent historical example of the success of decentralization and command by *Influence*. Ludendorff's storm detachments, which arguably achieved some of the most impressive tactical victories of the First World War, and the German *Blitzkrieg* of 1940 as more recent examples of this success. These examples lead both Czerwinski and Van Creveld to surmise that in the modern era, command by *influence* is, and will continue to be the superior method of command.

Not all academics share their view however. Author Robert Leonhard is critical of Van Creveld's approach, which he argues draws too heavily on Industrial Age examples and is not reflective of the modern or future operational environment.[56] While he sees the benefits of decentralization, he argues that there will be times when a centralized approach is better suited to the situation. While Leonhard's view holds merit and is widely shared by contemporary theorists, his critique is aimed more at Van Creveld's

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[55] Thomas Czerwinski, "Command and Control …", 13.

[56] Robert R. Leonhard, Thomas H. Buchanan, James L. Hillman, John M. Nolen, and Timothy J. Galpin, "A Concept for Command and Control," *John Hopkins APL Technical Digest* Volume 29, no. 2 (2010), 159.

method of historical analysis, than it is at his central point. As will be made evident in chapter two, most contemporary theorists, Leonhard included, promote the predominant use of a decentralized approach to command. This, combined with the wealth of historical examples, makes argument against Van Creveld's claim, a hard sell.

Summary

In over two thousand years of military history, success has clearly favoured those forces that are capable of decentralizing decision-making. The Romans, Napoleon and Moltke understood this concept, and effectively utilized it in commanding their respective armies to success.

Command by *Direction* represents the earliest, and virtually only method of command up until the eighteenth century. It is the method of command perhaps best portrayed by Alexander the Great, and is demonstrative of Keegan's *Heroic Leadership*. Unable to command the whole of his force, all of the time, Alexander generally led his army at the head of the decisive wing. This resulted in large part, from the rudimentary state of communication during his time, but also from strong cultural and societal influences.

Frederick the Great attempted to solve the limitations of command by *Direction*, and in so doing created the first paradigm shift in the evolution of command. His method of command by *Planning* was an attempt to reduce uncertainty on the battlefield through meticulous planning and preparation. Precision was the key to success for Frederick, and in his mind every move, every aspect, and indeed every eventuality of the battle was accounted for, with careful planning.

While the Romans first introduced the notion of command by *Influence*, and Napoleon re-introduced its use in Europe, Helmuth von Moltke truly developed the command philosophy. Moltke acknowledged the inevitable uncertainty that existed in operations, and decentralized his command structure to work within that environment. His concept of *Auftragstaktik*, or mission-type orders and his willingness to decentralize decision-making, empowered his commanders to use their initiative to great effect. The success of Moltke's army and the command philosophy he instilled, were highly influential on the successes of Ludendorff's Storm detachments of 1918, and the German army in 1940. These German successes, and Moltke's command philosophy continues to influence military thought today.

The idea that command has constantly progressed through its evolution, is a myth. While the approach to command has indeed changed over time, all three methods of command are still very much in use. The U.S. Army's "Force XXI" initiative is a modern example of command by *Direction*, while the use of Air Tasking Orders and the notion of the "system of systems" exemplify command by *Planning*. *Mission Command*, which decentralizes decision-making and empowers subordinate commanders to use their initiative, represents command by *Influence.*

A number of lessons become apparent through the history of command in war. The first lesson is that there is no single solution to command in war. So varied are the influences on military operations, that a dogmatic approach to command will eventually be rewarded in failure. The second lesson is that in military operations, fortune favours innovators. Success has come to military forces far more often due to an ability to innovate, to create novel solutions to complicated problems, and to integrate technology,

than it has come from any real technical superiority. The third, and most important lesson of the history of command, is that historically success has favoured those forces that are capable of decentralizing decision-making. Those forces that can be commanded by *Influence*, have proven far superior to those that cannot.

While the advantages of decentralized decision-making in military operations are abundantly clear from a historical perspective, it is important to assess its relevance in the modern era and into the future. To accomplish that, an examination of contemporary theory is valuable.

CHAPTER 2 - CONTEMPORARY THEORY

Introduction

The environment in which modern militaries must be prepared to operate has changed considerably since the end of the Cold War. The events of 9/11 and the subsequent wars in Iraq and Afghanistan illustrate the significant shift from the operations that NATO militaries conducted during the Cold War, and the modern reality. This changing environment, combined with the dawn of the Information Age, precipitated a renewed focus on the theory behind command and control. As a result, numerous theoretical concepts have surfaced during the past decade and a half. Three such concepts that have clearly influenced the Canadian approach to C2 are the focus of this chapter.

An examination of the principles of *Edge Organizations*, the Pigeau-McCann *Command Framework*, and "A Concept for Command and Control" by Robert Leonhard *et al*., will show that despite their differing views, all three concepts place importance on a flexible approach to command, a focus on *Intent*, and the need for *Agility*. To illustrate this, this chapter will first analyze the emergence of Network-Centric Warfare (NCW) as a precursor to the more progressive concept of *Edge Organizations*. A review of the Pigeau-McCann framework, which foregoes an emphasis on technology and instead places importance on the human aspect of C2, will follow. Finally, Robert Leonhard's "A Concept for Command and Control" will be introduced to round out the study of contemporary concepts, before moving on to analyze the Canadian approach to C2, in chapter three.

While the literature on this subject is abundant and diverse, this chapter will focus on the principle works of the authors of the respective concepts, and not necessarily the originators of the broader themes. The concept of NCW for example, which has spawned countless iterations including the UK's Network Enabled Capabilities (NEC), and the Network Enabled Operations (NEOps) adopted by Canada, was first developed by Arthur K. Cebrowski and John J. Garstka, in their article "Network-Centric Warfare: Its Origin and Future."[57] However, it is the work of David S. Alberts and Richard Hayes in *Power to the Edge* and *Understanding Command and Control* that expands upon NCW and introduces the concept of *Edge Organizations,* that is of greater relevance to this paper. Moreover, while the technical and war-fighting aspects of NCW are interesting, this paper is more concerned with the distributive nature of the decision-making within NCW. Canadians Ross Pigeau and Carol McCann have also figured prominently within the growing body of work on C2, and their model, which re-conceptualizes command and control, and its supporting work, is featured in this chapter. Robert Leonhard's recent work on C2 is also of interest, as it benefits from a hindsight view of earlier studies on the subject and proposes a balanced approach to contemporary theory.

Network-Centric Warfare and *Edge Organizations*

Today's technology provides decision-makers with more complete, more accurate and timelier information than has previously been possible.[58] It is this information, and the rapid and prolific rise of information technologies, that are at the heart of NCW, and

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[57] Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare: Its Origin and Future," *US Naval Institute Proceedings* 124, no.1 (January 1998), 28-35.

[58] David S. Alberts, *Information Age Transformation: Getting to a 21st Century Military* (Washington, DC: Command and Control Research Program Publication Series, 2002), 1.

Edge Organizations. Introduced in the 1990s by the U.S. Navy, the concept of NCW is quite simply an attempt to leverage the power of information to achieve superior combat effectiveness.[59] Its proponents argue that Industrial Age processes, with planning and decision-making centralized, do not make adequate use of the ability to share timely and accurate information, afforded by Information Age technologies. NCW represents a shift in the decision-making processes of the Industrial Age, where information flows from the edge of an organization to its centre, towards a model where situational awareness and overall intent moves outward, in order to facilitate decision-making at the leading edge of an organization. It makes use of a robustly networked force to first, achieve shared awareness, and second, to leverage that shared awareness to achieve a greater degree of *self-synchronization*.[60] *Self-synchronization*, as Alberts describes it, is a distributing of decision rights to the lowest possible levels. It is at the same time both a requirement and a result of NCW, and requires "… command intent, shared situation awareness, authoritative resource allocation, and appropriate rules of engagement, as well as similar measures that guide but do not dictate details to subordinates."[61] It is this idea of *self-synchronization*, the idea of moving decision-making away from a traditional commander that has caused the most controversy surrounding the tenets of NCW. If the idea of *self-synchronization* emerges in the tenets of NCW, it is truly at the forefront of the so-called *Edge Organizations*.

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[59] *Ibid.*, 7.

[60] David S. Alberts and Richard E. Hayes, *Understanding Command and Control* (Washington, DC: Command and Control Research Program Publication Series, 2006), 2.

[61] David S. Alberts and Richard E Hayes, *Power to the Edge* (Washington, DC: Command and Control Research Program Publication Series, 2004), 27.

Edge Organizations are "… collaborative organizations that are inclusive, as opposed to hierarchies that are authoritarian and exclusive."[62] They are organizations "… where everyone is empowered by information and has the freedom to do what makes sense."[63] Information Age technologies have allowed for the flattening of hierarchical decision-making in organizations, and as such the traditional hierarchies found in military command structures are no longer the only option. This does not imply however, that a traditional approach to command and control will never be appropriate, simply that there will be circumstances where a different approach yields better results.[64] *Edge Organizations*, Alberts and Hayes argue, represent the best way to make use of the power of information, and information technologies. The adoption of *Edge* principles however, requires a new way of thinking and a new approach to command and control.

Alberts and Hayes state that only organizations where the flow of information is not overly constrained, with situational awareness distributed across the entirety of the organization, will be successful in the Information Age. While this is reflective of the tenets of Czerwinski's *Command by Influence*, Alberts and Hayes go on to state that even organizations that practice mission-type orders, or *Mission Command*, do not go far enough to qualify as *Edge* approaches.[65] In fact, in true *Edge Organizations* where everyone is on the edge because they are all empowered through shared information, it is conceivable that command would be a shared and distributed responsibility, instead of

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[62] *Ibid*., 177.
[63] *Ibid*.
[64] David S. Alberts, "Agility, Focus and Convergence: The Future of Command and Control," *The International C2 Journal: The Future of C2* Volume 1, no.1 (2007): 2.
[65] David S. Alberts and Richard E Hayes, *Understanding Command and Control* …, 85.

the responsibility of any one person.[66] This idea clearly conflicts with the traditional approach to command and control, and the perceived role of the military commander.

Command and control, as Alberts sees it, should be assessed through the function it serves, which is unchanging, and not the position that normally executes those functions. He uses three core concepts identified as *Focus*, *Convergence* and *Agility*, to explore the functions of Command and Control. In fact, the terms *Command* and *Control*, he argues, are outdated for the Information Age and are counter-productive to further study of C2. He has chosen the terms *Focus* and *Convergence* to replace *Command* and *Control* respectively stating that each term speaks directly to what both command and control are meant to accomplish.[67] *Focus* describes a number of the functions associated with command, including "… intent, awareness, shared awareness, understanding, and shared understanding, [and it] represents a synthesis of how the situation is perceived and understood."[68] Intent is a key aspect of this concept, as a clear understanding of the overall intent is critical to ensure that all entities of the *Edge Organization* (individuals, organizations, and systems) are all working towards a common purpose.[69] *Convergence*, which replaces the term, yet describes the functions of Control "… is the goal-seeking process that guides actions and effect."[70] Combined, they describe the functions of C2, yet are separate enough from the traditional terms, so they are not associated with a single position or title.

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[66] David S. Alberts and Richard E Hayes, *Power to the Edge* …, 203.
[67] David S. Alberts, "Agility, Focus and Convergence …", 18.
[68] *Ibid*., 19.
[69] David S. Alberts and Richard E Hayes, *Understanding Command and Control* …, 37.
[70] David S. Alberts, "Agility, Focus and Convergence …", 3.

Agility, according to Alberts and Hayes, is one of, if not the most important characteristic of Information Age organizations. As outlined in *Power to the Edge*, *Agility* encompasses robustness, resilience, responsiveness, flexibility, innovation and adaptation. "Each of these attributes of *agility* contributes to the ability of an entity (a person, an organization, a coalition, an approach to command and control, a system, or a process) to be effective in the face of a dynamic situation, unexpected circumstances, or sustaining damage."[71] *Agility* has always been an important concept in military operations, and given the complex environment of the 21st century, it will play an even greater role in determining success.

The principles of NCW and *Edge Organizations* have not emerged without criticism, however. This criticism largely pertains to the reliance on technology that NCW and *Edge Organizations* have, but also to the fact that they are concepts centred on an approach to war fighting.[72] Robert Leonhard for example, is critical of NCW's love affair with technology, and over emphasis on kinetic warfare. "Although not without merit [he states], the problem with this perspective is that it views C2 as if it were all about targeting and rapidly unfolding industrial-age warfare."[73] It pays little mind to the intricacies of counterinsurgency, he argues. Babcock echoes this sentiment in *Canadian Network Enabled Operations Initiatives* by saying, "NCW tended to focus attention excessively on the network and its related technology, and seemed to exclude military

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[71] *Ibid*., 23.

[72] Allan English, Richard Gimblett and Howard Coombs, *Beware of Putting the Cart Before the Horse: Network Enabled Operations as a Canadian Approach to Transformation* (Toronto: Defence R&D Canada, 2005), 66.

[73] Robert Leonhard *et al*., "A Concept for Command and Control…", 159.

operations other than war."[74] That said, Babcock also praises the more human-centric approach to networking found in *Network Enabled Operations*, which is essentially just a more recent, more refined iteration of NCW. The idea that the function of command can be executed without a commander has also been somewhat controversial, with pundits asking, "Does this mean that nobody is in charge?" Alberts and Hayes are quick to point out however, a number of examples of organizations that practice shared and distributed decision-making, pointing to the U.N. Security Council, or a coalition of the willing, as examples.[75] This lack of emphasis on the human or individual aspect seems to be a common theme, and is perhaps the most significant weakness of this concept, in that it seems to be a difficult sell in a military context.

NCW and the concept of *Edge Organizations* hold clear ties to the Information Age and information technologies. That is not to say however, that the tenets of these concepts and the implications they have on C2, are strictly associated with technology. In fact, it is the underlying principles of decentralization, of a flattening of the organization and shared decision-making that are at the core of these concepts. It is the flexible approach to command, the focus on *Intent*, and above all else, the *Agility* within the organization, promoted by both NCW and *Edge Organizations* that are the most interesting aspects of these concepts.

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[74] Sandy Babcock, "Canadian Network Enabled Operations Initiatives" (Ottawa: National Defence Headquarters, Directorate Defence Analysis, 2005), 4.

[75] David S. Alberts and Richard E Hayes, *Power to the Edge* …, 203.

Pigeau / McCann Model

As if to answer the critics of NCW and *Edge Organizations*, Dr. Ross Pigeau and Carol McCann's *Command Framework* stresses the importance of the human element of a C2 structure. Allured by technology, the study of C2 in their view, is obscured in conceptualisations of structure and process, and void of a critical human element.[76] Militaries conduct complex operations that normally entail human adversity, and as such, the response more often than not, involves a human solution. "It is the human who must assess the situation, devise new solutions, make decisions, co-ordinate resources and effect change … It is the human who must (ultimately) accept responsibility for mission success or failure."[77]

Military forces, they argue, broadly accept the premise of a human aspect to military operations, and a human element within command. They point out that British, American and Canadian doctrine all highlight the human qualities of courage, leadership, vision, judgement and responsibility, among others, as key components of effective command.[78] Given this view, which is already widely accepted in military forces, it is not surprising that they would assess that "…all C2 systems, from sensors and weapons to organizational structures and chains of command, must exist to support human potential

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[76] Ross Pigeau and Carol McCann, *Re-defining Command and Control* (Toronto: Defence and Civil Institute of Environmental Medicine, 1998), 2.

[77] Allan English *et al.*, *Beware of Putting the Cart Before the Horse* …, 13.

[78] Carol McCann and Ross Pigeau, *Clarifying the Concepts of Control and Command* (Toronto: Defence and Civil Institute of Environmental Medicine, 1999), 5.

for accomplishing the mission."[79] Quite simply put, future C2 structures, must firmly establish the primacy of the human component.

Pigeau and McCann do agree with Alberts and Hayes, however, that current definitions for *Command* and *Control* are outdated and not reflective of the functions involved. They see the current CF and NATO definitions of *Command*, *Control*, and *Command and Control* as overly focussed on control and descriptive of the process aspects of C2, but not the principles behind it. Instead, they offer the following definitions of *Command*, and of *Control*:

- *Command* - the creative expression of human will necessary to accomplish the mission;

- *Control* – those structures and processes devised by command to enable it and to manage risk.[80]

While the definitions are simple enough, they hold significance. *Command* for example, speaks to both creativity and will. Pigeau and McCann "…assert that creativity is the most important aspect of command."[81] It is the ability to adapt, to innovate and to come up with unique solutions to complex problems, and it is a distinctly human endeavour. It is akin to the quality of *agility*, which Alberts and Hayes argue is so important to organizations.

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[79] Allan English *et al.*, *Beware of Putting the Cart Before the Horse* …, 13.
[80] Ross Pigeau and Carol McCann, *Re-conceptualizing Command and Control* …, 56.
[81] *Ibid.*, 55.

Similar to other aspects of *Edge Organizations*, this framework allows for the distribution of command away from the traditional commander. The definition "…explicitly states that human will and human creativity are sufficient, [and] any human, therefore, from the most junior member to the most senior general officer, is capable of command."[82] Unlike true *Edge Organizations* where it is possible to have no one in command, in the Pigeau-McCann framework, anyone can command, but *someone* must command. Successful command, they argue, combines creativity and will, with appropriate responsibility and authority.

Control, as the definition states, includes "…all those structures and processes (including cybernetic processes) put in place by the military to facilitate the accomplishment of its mission in a safe and efficient manner."[83] Control constrains the problem space, and attempts to increase response time, while reducing uncertainty. It is inextricably linked to command, but always subservient to it, as command creates, initiates, and ceases control. As Pigeau and McCann put it, "command cannot be exercised without control, but control is meaningless without command."[84] Control is indispensable to command, in as much as it is essential for action, but they caution, that once control is adopted, flexibility becomes restricted. Flexibility in regards to both command and control is a key element of this framework. It is about choosing the right control mechanisms or C2 structure for the given situation, and balancing the required amount of control without hindering the creativity essential to command.

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[82] *Ibid*., 56.
[83] *Ibid*., 54.
[84] *Ibid*., 62.

Pigeau and McCann define *Command and Control* (or C2), as "the establishment of common intent and the subsequent transformation of intent into co-ordinated action."[85] Similar to the Alberts and Hayes framework, the establishment of common intent is a key concept in the Pigeau-McCann definition of C2. "Intent embodies a human commander's vision and will, and is inevitably the product of history, expertise and circumstance."[86] As Pigeau and McCann define it, intent comprises both e*xplicit* intent, which is public through communications, orders, briefings and the like, and *implicit* intent, which are things not communicated, but understood and expected. The *explicit* order to "Take hill x by 1300", carries with it the *implicit* intent that hill x will be taken while making effective use of resources and not killing innocent civilians, for example.[87] *Implicit* intent derives from shared experience, training and deep cultural values, normally acquired over a lengthy period. Of the two types of intent, *implicit* intent is more difficult to establish, but ultimately more important. Combined, *explicit* and *implicit* intent form the commander's *common intent*. The relationship between the amount of *explicit* and *implicit* intent, will largely determine, the C2 structure in place. Centralized C2 structures tend to feature a higher degree of *explicit* intent, while decentralized structures, which are consistent with *Mission Command* and command by *Influence*, display a higher degree of *implicit* intent.[88] The Pigeau-McCann framework is flexible however, and it allows for the use of both centralized and decentralized structures without placing value on one over the other.

While the *Command Framework* by Pigeau and McCann clearly emphasizes a human-centric approach to C2, it also shares a number of key tenets of NCW and *Edge*

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[85] Carol McCann and Ross Pigeau, *Taking Command of C2* …, 3.
[86] *Ibid*.
[87] Allan English *et al.*, *Beware of Putting the Cart Before the Horse* …, 18.
[88] *Ibid*.

Organizations. It promotes a flexible approach to command, a focus on establishing *Intent*, and identifies *Agility* (they use creativity in this case) as a critical component of a command. It is perhaps, less progressive than the concepts of NCW and *Edge Organizations*, but this may ultimately be to its benefit. Despite acknowledging that any human within the organization is capable of commanding, Pigeau and McCann still see the role of the individual in command as necessary. Additionally, while they have provided new definitions for key terms, Pigeau and McCann have kept the institutionalized terms of *Command*, *Control* and *C2*. Given the difficulties associated with cultural shift in an organization, these two key differences may make the *Command Framework* an easier sell in militaries, and may explain why it has been far less controversial.

A Concept for Command and Control

In "A Concept for Command and Control," Robert Leonhard *et al* attempt to define general requirements for future C2 structures that strike a balance between developing technology and the human aspect of military operations. While they acknowledge previous efforts to refine C2 theory, they are highly critical of concepts that focus on previous experiences, without envisioning the future operating environment. The future operational environment, they argue, "…will be what it will be, and not what we want it to be."[89] They surmise that the future operating environment will span the spectrum of military operations from full-scale war to routine peaceful competition. "The spectrum includes conventional and unconventional, domestic and foreign operations,

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[89] Robert Leonhard *et al*., "A Concept for Command and Control…", 160.

manned and unmanned platforms and the full range of missions from disaster relief to war."[90] Moreover, they envision that these scenarios and operations could occur simultaneously, and the overall environment could change from day to day, and hour to hour. The challenges of such a complex and uncertain environment, they argue, will require the utmost determination and imagination (*Agility*) of commanders.[91] To meet these challenges, C2 structures must be responsive to, and reflective of the needs of commanders.

Like Alberts and Hayes, and Pigeau and McCann, Leonhard *et al* see the requirement for a refined definition of C2. They define C2 as "the arrangement of personnel, training, information management, doctrine, equipment, and facilities essential for the commander or other decision maker to conduct operations."[92] While it is not as progressive as the definitions supplied by the previous frameworks, in that it makes significant use of existing military terminology, Leonhard is quick to point out that their concept "…uses this terminology as a starting point but not an end point."[93] It does however, refer to "other decision makers", and Leonhard *et al* stress the fact that in future operating environments, command may be distributed away from traditional positions, and indeed future "commanders" will include individuals not in uniform.

Future commanders will make use of both centralized and de-centralized command structures. The selection of either will normally be dictated by the situation, and largely based upon the organization in question and the amount of relevant

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[90] *Ibid*.
[91] *Ibid*., 158.
[92] *Ibid*., 159.
[93] *Ibid*.

information a commander has.[94] Centralization may work best, and indeed may be necessary when the commander has the most accurate, timely and abundant information. Conversely, if a commander does not have the most accurate information, decentralization is a likely path to follow. In the case of decentralization, the commander's intent (*common intent* for Pigeau-McCann, and just *intent* for Alberts and Hayes) is of vital importance. Very similar to both the Pigeau-McCann framework, and Alberts and Hayes' *Edge Organizations* the key to success for Leonhard *et al*, resides in the ability to be flexible. "The path to success is to avoid selecting one extreme or the other and instead to perceive the dynamic balance between both approaches."[95] Flexibility and adaptability on the part of the commander and the organization for Leonhard, is paramount above all else.

While "A Concept for Command and Control" by Robert Leonhard *et al* offers a more moderate and perhaps traditional framework for C2, it is equally illustrative of the need for a flexible approach to command, focus on *Intent*, and A*gility*, present in the other frameworks reviewed. Through their careful consideration of the future operational environment and their insistence that flexibility and adaptation is the key to success in C2, they have presented a strong case for an approach balanced between seizing the potential of technology, with a focus on the human element.

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[94] Robert Leonhard, *Fighting by Minutes* (Westport: Praeger Publishers, 1994), 111-124.
[95] Robert Leonhard *et al*., "A Concept for Command and Control…", 164.

Summary

Despite the differing views presented in Alberts and Hayes' *Edge Organizations*, the Pigeau-McCann *Command Framework*, and "A Concept for Command and Control" by Robert Leonhard *et al*., their underlying principles all point to the importance of a flexible approach to command, a focus on *Intent*, and the need for *Agility* in an organization. Of the three common principles, it is flexibility in the approach to command, that resonates the loudest across all three frameworks. All three frameworks are clear that decentralization, to some degree and in some instances is required. The need to establish *common intent*, and demonstrate *Agility* largely stems from their argument in favour of decentralization. Yet as Leonhard argues, there are times when centralization in military operations is required. With that, it stands to reason that an organization's ability to be flexible in its approach to command, is the principle strength of its C2 framework.

The concepts of *Edge Organizations* and its precursor NCW are perhaps the most progressive of the three frameworks reviewed here, and not surprisingly, the most controversial. They attempt to leverage the power of information in order to gain maximum effect from all available resources, resulting in superior combat power. This requires an organization where the flow of information travels from the centre outward, with decision-making distributed to the edge of the organization. In a properly functioning *Edge Organization*, with a C2 structure flattened to the point that all members reside on the edge, command no longer resides with an individual. As NCW and *Edge Organizations* are highly developed around the flow of information, they also have a strong linkage with information technologies.

The Pigeau-McCann framework, on the other hand, focusses almost exclusively on the human element of C2. They point to the critical role that the human plays in military operations, an endeavour that they argue is uniquely human. Moreover, they surmise that an over emphasis on technology has largely relegated the study of C2 to focussing purely on C2 technical systems and not C2 structures. They offer revised definitions of key C2 components, but unlike Alberts and Hayes, Pigeau and McCann continue to use the terms *Command*, *Control* and *C2*. Their framework is built upon the foundation of these definitions, and as such, they are the central point to their argument. Although the *Command Framework* allows for any member of the organization to exercise command, the "commander" is still very much central to their idea of effective command. With its continued use of traditional terms, while perhaps less progressive than the concept of *Edge Organizations*, the Pigeau-McCann framework has proven far less controversial.

With the benefit of hindsight, "A Concept for Command and Control" by Robert Leonhard *et al*, promotes an approach to C2 that strikes a balance between the potential of technology, and the essential human element in military operations. Future C2 structures, they argue should be built around a solid understanding of the future operational environment. Success in the complex, uncertain environment of the future, will depend above all else, on the flexibility of the organization. They argue that militaries will employ both centralized and decentralized structures, and the key to success lies in an ability to adapt to the situation and avoid a strict adherence to one approach over the other.

A solid understanding of the benefits and disadvantages of each of these frameworks, and perhaps more importantly, the similar principles that are present in each, are critical to an assessment of any proposed C2 framework.

CHAPTER 3 – CF COMMAND AND CONTROL FRAMEWORK

Introduction

In over two thousand years of history, and through the recent revival in an interest in command and control theory, it is perhaps an oversimplification to reduce the vast number of lessons learned to two main points. This is however, required given the scope of this work and the method chosen, and as such, this paper has presented the following two arguments. First, success has historically favoured those forces that have been able to decentralize decision-making. Second, an organizations ability to be flexible in its approach to command and adapt to the situation or circumstance, will be critical to success in the future operational environment. Given the role of the CF, as outlined in the *Canada First Defence Strategy*[96], and the likelihood that the CF will continue to operate in complex, dynamic environments, it stands to reason then, that the CF requires a flexible C2 framework, capable of decentralization.

An examination of the recent CF *Command and Control Operating Concept*, will show that the CF intends to modernize its C2 capability by adopting a flexible C2 framework, focused around a decentralized approach to command. To illustrate this, this chapter will first analyze the key decentralization concepts of *Mission Command*, *Networking* and *Adaptive forces.* A review of the flexible nature of the C2 framework will follow, highlighting the CF's commitment to the comprehensive approach to operations and the flexibility of the proposed C2 structures. Finally, this chapter will look at the way ahead and identify areas that threaten the success of this new framework.

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[96] Department of National Defence, *Canada First Defence Strategy* (Ottawa: National Defence, 2008).

As the purpose of this chapter is to analyze the CF's C2 framework, the principle source used is the *Command and Control Operating Concept*, released by the VCDS in June 2012. This document "…provides a framework for the efficient, flexible, and adaptable development of the CF's command and control capability."[97] It acknowledges the evolutionary nature of C2, and the importance of both the enduring and evolving principles and concepts of C2 theory. Moreover, it recognizes the complex future operational environment and the need to work within a comprehensive approach. Keith Stewart has introduced an interesting concept is his analysis of an organization's ability to adapt its approach to command. He refers to this ability as an organization's *elasticity*.[98] As this coincides with the discussion so far on a flexible approach to command, the term *elasticity* will be used from here on out to describe the ability to adapt an approach to command. Finally, the contemporary concepts introduced in chapter two have framed much of the discussion so far, and as such, the works of Alberts and Hayes, Pigeau and McCann and Leonhard *et al* have influenced the work in this chapter.

Decentralization

As history has shown, in complex, uncertain environments success has generally favoured those forces with the capability to practice a decentralized approach to command. The CF promotes the tenets of decentralization, as outlined in CF Joint Doctrine. "To be effective, command should normally be decentralized to the greatest degree practicable in order to cope with the uncertainty, the disorder, the complexity, and

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[97] Department of National Defence, *Command and Control Operating Concept* …, 2.
[98] Keith G. Stewart, *Mission Command: Elasticity*…, 7.

the confusion that are usually present at the tactical level."[99] Three key elements of the *C2 Operating Concept* that promote decentralization are *Mission Command*, *Networking* and *Adaptive Forces*.

The concept of *Mission Command* is prevalent throughout numerous CF documents, and the new *C2 Operating Concept* is no exception. CF Joint Doctrine states, "CF culture emphasizes mission command and empowers all commanders with the authority to execute their mission while holding them accountable for the actions of the forces under their command."[100] The *C2 Operating Concept* echoes this statement, and further states that *Mission Command* "…promotes decentralized decision-making, freedom and speed of action and initiative."[101] There is also an acknowledgement that *Mission Command* requires strong organizational cohesion, and that establishing this takes time and effort. *Mission Command*, the document states, is only achievable with a clear understanding of *common intent*. The importance of establishing *common intent* as defined by Pigeau and McCann, which includes *explicit* and *implicit* intent and was already covered at length, figures prominently in the new *C2 Operating Concept*.[102]

The promotion of *Mission Command*, and the distributive nature of decision-making associated with it, is illustrative of the CF's push towards decentralization. The desired result of commanders at the lowest levels synchronizing their actions horizontally rather than vertically, is also reflective of another emerging concept adopted by the CF, *Networking*.

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[99] Department of National Defence, *Canadian Forces Joint Publication* …, 5-1.
[100] *Ibid.*
[101] Department of National Defence, *Command and Control Operating Concept* …, 20.
[102] *Ibid.*

The *C2 Operating Concept* identifies the CF C2 framework as a command-centric framework, but it also describes it as highly network-enabled. The document points to the complex operations that will be conducted in the future, and contends that "The command and control of these operations assumes that the force is network-enabled, with decision-makers highly distributed throughout the area of operations all sharing situational awareness."[103] It goes further to describe the increased speed of decision-making, the shared situational awareness that enables co-ordinated decision-making, and the capacity for decision-making at the lowest levels, or at the edge, of an organization. To achieve the full potential of networking, the *Operating Concept* calls for the continued development of innovative technology to support network-enabled operations.

Almost every aspect of the *Operating Concept's* approach to *Networking* is reflective of the ideas put forward by Alberts and Hayes in their concept of *Edge Organizations.* The flattened C2 structure that results from shared situational awareness, the distribution of decision-making and the need to leverage information through innovative technology, is all strikingly similar to ideas in *Power to the Edge*. The one critical exception however, is that the *Operating Concept* is clearly "…predicated on the principle that command authority is vested in an individual."[104] The most controversial aspect of the *Edge Organization* concept, the idea that the function of command does not require an actual "commander" it seems, is still a bridge too far.

An emerging concept within the CF, as outlined in the *C2 Operating Concept*, is the notion of *Adaptive Forces*. The complex nature of military operations combined with

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[103] *Ibid*., 22.
[104] *Ibid*., 15.

the rapid advancement of technology and an adversary that is increasingly agile, is driving the CF to become more adaptable. As defined in CF Land Doctrine, *Adaptive Forces* are "…land forces that are agile, lethal and non-lethal, net-enabled, multipurpose, and full spectrum capable."[105] As the *Operating Concept* describes them, *Adaptive Forces* have the ability to operate across the entire spectrum of conflict, and are capable of adapting the plan to the changing environment, while maintaining focus on the strategic aim of an operation.

Adaptive Forces are generally dispersed across the entire battle space, in order to simultaneously dominate the physical, moral and information planes. This approach is highly illustrative of decentralization. It devolves decision-making to the very edge of an organization, through highly trained, well-motivated forces. Furthermore, it requires that situational awareness and shared, common intent move from the centre outward to the edge of the organization, to empower those on the edge to make decisions based on timely, accurate information. The tenets of *Mission Command* are clearly present in the idea of *Adaptive Forces*. This notion is also highly reflective of the basic principles found in *Edge Organizations*, and other concepts that involve decentralization.

The CF clearly promotes the benefits of decentralization in the operational environment. Key CF documents, of which the *C2 Operating Concept* is one, encourage the decentralization of decision-making to the lowest practicable level possible. Established concepts such as *Mission Command* are already prevalent throughout the CF, while emerging concepts, like *Networking* and *Adaptive Forces* continue to gain

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[105] Department of National Defence, *Land Operations 2021: Adaptive Dispersed Operations, The Force Employment Concept for Canada's Army of Tomorrow* (Kingston: DND Canada, 2007), 18.

momentum. In the face of these and other initiatives, it seems clear that the CF sees an ability to decentralize decision-making, as a clear advantage in military operations.

Elasticity – A Flexible Approach to Command

While historically speaking organizations that can decentralize if necessary have proven more successful than those that cannot, the CF recognizes that there are situations where a centralized structure may be called for. As such, the CF is committed to adopting a C2 framework that is capable of transitioning along a continuum of command approaches from centralized to decentralized, defined by Keith Stewart, as *elasticity*. This commitment is evident through the emphasis placed on the comprehensive approach to operations, and the flexible C2 structures outlined in the *C2 Operating Concept*.

In a strategic context, the CF as an instrument of the Canadian Government does not exercise C2 in isolation. This is not a new phenomenon as Douglas Bland notes on the experience of Canadian commanders during past operations. "One lesson from the Canadian commanders is that the exercise of command is never entirely in the hands of the commander and is always linked to Canadian society, the state of the armed forces, and to fate."[106] This will continue to be a prominent factor in the future operational environment.

As the *Operating Concept* states, "A key driver for this operating concept is the need to act within a comprehensive approach to operations within which the CF must collaborate in almost every instance with other government departments and alliance

[106] Douglas L. Bland, "Military Command in Canada" In *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership* (St. Catharines: Vanwell Publishing Limited, 2001), 125.

partners."[107] Inherent in this notion of a comprehensive approach, is the understanding that this will result in a collaborative decision-making process. Whether this approach involves other government departments or alliance partners, the fact remains that the leaders involved will likely not reside within the same hierarchical chain, if they belong to any hierarchy at all. As Alberts and Hayes argue, the simple act of allocating decision rights, as would be the case in a comprehensive approach, requires a shift in the traditional approach to command.[108] There is an acknowledgement of this within the *Operating Concept* as it pertains to the requirement for a commander to understand the limitations and freedoms of the various agencies or alliances within the comprehensive organization. The comprehensive approach, it states, "…will drive commanders to become more agile and to augment their direct leadership skills with consensus building and cultural intelligence."[109] Implicit in the promotion of the comprehensive approach to operations, is the notion that both the organization and the individuals within the organization, will need to be flexible and adaptable in their approach to C2.

The CF's flexible approach to its C2 structure is another key indicator of the *elasticity* of its command and control framework. The *Operating Concept* identifies three different command and control structures in which CF elements will conduct international operations. These range from a construct for national unilateral operations, to those used for coalition operations either with, or without a Canadian area of responsibility. The *Operating Concept* outlines an additional structure for use during domestic operations. While these planned C2 structures are forward thinking and

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[107] Department of National Defence, *Command and Control Operating Concept* …, 1.
[108] David S. Alberts and Richard E Hayes, *Understanding Command and Control* …, 85-86.
[109] Department of National Defence, *Command and Control Operating Concept* …, 19.

demonstrate flexibility, it is perhaps the generic direction within the document, that is more indicative of the organizations push for *elasticity*.

As outlined in the *Operating Concept*, "Command and control structures vary in size and complexity depending on the level of conflict or level of command involved."[110] The *Operating Concept* expresses a need for command and control methods to be reflective of the situation, the resources allocated, the nature of the operation, and the authority required to conduct the mission. The approach to C2 should be tailored to the circumstances, and reflective of an assessment of the time, space and force factors. This allows the approach to command to be centralized or decentralized with forces commanded directly or through components, depending on the nature of the mission.

The *Operating Concept* places a premium on the correct utilization of command relationships, and states that careful consideration of the practice of command and control should be an aspect of the preparations for any CF operation. Given the future operational environment, and the complex organizations that will result from the comprehensive approach, as the *Operating Concept* states, "…a dogmatic application of only one type of command methodology in a given situation is not realistic."[111] This is a clear acknowledgement of a requirement to adapt command methodologies and C2 structures to fit the situation.

The emphasis placed on the comprehensive approach and the need for C2 structures tailored to fit each mission, points to the CF's push to achieve *elasticity* in its C2 framework. This *elasticity*, which will allow CF commanders to transition from a

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[110] *Ibid*., 8.
[111] Department of National Defence, *Command and Control Operating Concept* …, 9.

centralized to a decentralized approach to command dependent upon the situation and requirements of the mission, will be of critical importance in the future.

The Way Ahead

The advantages of *elasticity* and the ability to employ a decentralized approach to command, have been made abundantly clear. These two concepts, combined in a C2 framework, provide a commander with a C2 capability backed by both historical success and contemporary theory. Adoption of these concepts represents a leap forward in the CF approach to C2. However, while the CF promotes the tenets of decentralization and the advantages of *elasticity*, there are a number of challenges associated with creating and maintaining organizations of this nature. The building of organizational culture represents one such challenge, while the careful integration of technology represents another.

While the advantages of an ability to decentralize, and to employ *Mission Command* have been expounded upon, it should be noted that this approach may not be the best fit for every organization. Decentralized approaches are expensive, in terms of both time and money, and they require constant maintenance and careful consideration.[112] Quite simply put, one does not institute the concept of *Mission Command* in an organization overnight. Take for example, the experience of the Prussian and later German army in developing the concept of *Auftragstaktik*. While introduced successfully by Helmuth von Moltke in the mid nineteenth century, it was Ludendorff's storm detachments of 1918, and later the German Blitzkrieg of 1940 that were most demonstrative of this approach to command. All told, the German ability to utilize

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[112] Keith G. Stewart, *Mission Command: Elasticity* …, 21.

Auftragstaktik came of a significant investment of time, considerable thought, and above all else, establishment of a culture acceptant of this approach.

Building and maintaining an organizational culture around the tenets of *Mission Command,* is critical to achieving a decentralized approach. Commanders must encourage their subordinates to exercise their initiative. "This permissive culture is reinforced by the organization being seen to reward appropriate behaviour and, more importantly, being seen not to punish the mistakes that are an inevitable consequence of personnel exercising new found authority and responsibility."[113] As Stewart points out, this repeated behaviour ultimately results in an increase in the level of *implicit* intent present within the organization. It is the same *implicit* intent that Pigeau and McCann consider the most important aspect of achieving the *common intent* necessary to execute decentralized command.[114] It is only through the creation of a permissive environment that subordinates will confidently exercise the initiative so crucial to the execution of *Mission Command.*

The trust shared between superior and subordinate is another key aspect to establishing an organizational culture capable of accepting decentralization. The notion of trust is prevalent in almost every CF document on leadership, however as it pertains to decentralized command, trust holds a more specific meaning. A subordinate trusts that they have the support of their superior in exercising initiative, even when they make mistakes. "A superior trusts subordinates to act within command intent, even in situations

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[113] *Ibid*., 22.
[114] Carol McCann and Ross Pigeau, *Taking Command of C2* …, 4.

that the commander did not envisage when planning."[115] It is this trust, between subordinate and superior, and the superior's willingness to accept a level of uncertainty that is critical to the execution of the decentralized approach to command.

Trust, shared understanding and culture all take time. As Van Creveld points out, it usually comes about by allowing men and commanders "…to serve together for comparatively long periods of time, even at the expense of overall flexibility."[116] In an organization like the CF, which follows strict adherence to a regular posting cycle of normally not more than three years, this presents a challenge.

The careful integration of information technologies into the CF C2 structure represents another challenge. As the *Operating Concept* states, "Communications and information systems form the backbone of a digitized and network-enabled force."[117] Although a simple statement, it is indicative of the place of prominence that information technologies now hold in the CF C2 structure. Finding the right balance between the use of, and reliance on technology, and the human element, is a key aspect of any approach to command.

As illustrated in the concept of NCW and *Edge Organizations*, the use of modern technology can greatly enhance decentralized decision-making. Yet left unguided, this same technology has the potential to push an organization towards a more centralized approach. As Stewart states, communications and information technologies are now

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[115] Keith G. Stewart, *Mission Command: Elasticity* …, 20.
[116] Martin Van Creveld, *Command in War* …, 271.
[117] Department of National Defence, *Command and Control Operating Concept* …, 27.

making "…centralized approaches to command more feasible."[118] Alberts and Hayes have come to similar conclusions in *Command Arrangements for Peace Operations*, and indeed the U.S. Army's 'Force XXI' and its digitized battlefield which represents command by *direction*, is a further example. The CF is cognizant of this fact, as CF Joint Doctrine states, "Modern communications present commanders with two challenges: the temptation for higher levels of command to micromanage operations at lower levels; and the risk of relying too much on communications system, which may stifle initiative."[119] While modern information technologies can facilitate the distribution of information, and eventually shared awareness at the edge of an organization, it can also, and often does, facilitate the pull of information toward the centre of an organization. This often results in over-control and ultimately suppresses initiative at the edge.

The adverse effects of over-control are a topic of much discussion by Carol McCann and Ross Pigeau. In the extreme they argue, over-control can lead to an organizations inability to deviate from a collection of set responses. "Not only is the tailoring of responses to suit the particular military situation impossible, but so is any opportunistic initiative that might contribute to the *implicit* intent of the mission."[120] Even limited forms of over-control can have a detrimental effect on a subordinates ability and desire to exercise initiative. As Keith Stewart notes, "a culture of command by detailed orders is also 'demand-driven.' That is, unless they are carefully trained otherwise, personnel will expect and prefer to receive detailed direction – especially in high-risk

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[118] Keith G. Stewart, *Mission Command: Elasticity* …, 20.
[119] Department of National Defence, *Canadian Forces Joint Publication* …, 5-1.
[120] Carol McCann and Ross Pigeau, *Taking Command of C2* …, 7.

situations."[121] This clearly goes against the tenets of *Mission Command* and the decentralized approach.

Information technology has the capacity to either enable, or disable a decentralized approach to command. While the CF clearly intends on integrating modern information technology into its C2 framework, careful consideration of the application of this technology and the challenges it presents to commanders, is critical.

Summary

The recent CF *Command and Control Operating Concept*, illustrates the CF's resolve to modernize its C2 capability by adopting a flexible framework, focused around a decentralized approach to command. Both the tenets of decentralization and *elasticity* resonate loudly throughout the *Operating Concept*, and across CF Joint Doctrine.

Enduring concepts such as *Mission Command*, and the emerging concepts of *Networking* and *Adaptive Forces*, form the foundation of the new C2 framework. The push to devolve decision-making to the lowest level practicable, and the empowerment of subordinates to use their initiative, is a key tenet of *Mission Command*. *Networking* encourages the establishment of shared situational awareness, which Alberts and Hayes contend, further moves decision-making rights to the *edge* of an organization. The notion of *Adaptive Forces*, employed highly dispersed throughout an entire battle space, makes use of both *Mission Command* and *Networking*, and is perhaps the best example of the CF's push toward decentralization.

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[121] Keith Stewart, "Mission Command: Problem Bounding or Problem Solving?" *Canadian Military Journal* Volume 9, no. 4, (2009): 51.

The CF's commitment to the comprehensive approach to operations and the flexibility of the proposed C2 constructs, are clear examples of the CF's desire to achieve *elasticity* in its C2 capability. The comprehensive approach envisages the CF working with other government departments, agencies and partner allies, through a collaborative decision-making process to achieve a desired end state. Implicit in this approach, is the understanding that this will require commanders to be agile and to adapt their style of command. The notion that C2 structures are tailored in size, complexity and approach to fit the specific mission or situation, as presented in the *Operating Concept*, is the best example of the CF's acknowledgement of the advantages of *elasticity* in C2.

Achieving a flexible organization capable of decentralization is not an easy process, however. It requires an organizational culture acceptant of the principles of *Mission Command* and decentralization. The establishment of trust, *common intent* and an environment that encourages initiative helps to create this organizational culture. Information technologies can enable decentralized decision-making, but can conversely disable initiative if applied in an overly controlling manner. The maintenance of the organizational culture of decentralization, and the appropriate use of technology, requires careful consideration.

The drive towards a C2 structure focused on an ability to decentralize, but flexible enough to adapt its approach to best suit the mission, is a clear mandate of the C2 *Operating Concept*. The implementation of this framework will require the thoughtful application of technology, but more importantly the careful nurturing of organizational culture within the CF.

CONCLUSION

The CF *Command and Control Operating Concept* provides a flexible C2 framework, focused on a decentralized approach to command. This represents the next step in the evolution of C2 in the Canadian Forces, and a modern approach backed by both historical examples and contemporary theory.

Historically there have been three methods of command, being command by *Direction*, command by *Planning* and command by *Influence*. Although command has evolved over time, all three methods of command are still very much in use today. The U.S. Army's "Force XXI" initiative is a modern example of command by *Direction*, while the use of Air Tasking Orders and the notion of the "system of systems" exemplify command by *Planning*. *Mission Command*, which decentralizes decision-making and empowers subordinate commanders to use their initiative, represents command by *Influence.*

In over two thousand years of military history, success has clearly favoured those forces that are capable of decentralizing decision-making, and command by *Influence* has proven the most successful. The Romans, Napoleon and Moltke provide excellent example of this, as do the German forces of 1918 and 1940.

Of the numerous theoretical frameworks that have emerged in the last decade and a half, three models provide insight into the effectiveness of the CF C2 framework. The principles of *Edge Organizations*, the Pigeau-McCann *Command Framework*, and "A Concept for Command and Control" by Robert Leonhard *et al*., place importance on a flexible approach to command, a focus on *Intent*, and the need for *Agility*. While all three

frameworks promote the use of a decentralized approach to command, they all see flexibility in the approach to command, or *elasticity*, as the primary strength of a C2 framework.

Both the tenets of decentralization and *elasticity* resonate loudly throughout the *Command and Control Operating Concept*, and across CF Joint Doctrine. Enduring concepts such as *Mission Command*, and the emerging concepts of *Networking* and *Adaptive Forces*, form the foundation of the new C2 framework. All three of these concepts are fundamentally based on the principles of decentralization. The notion of the comprehensive approach, and the ability to adjust and tailor C2 structures to best suit the situation or mission, point to the flexibility, or *elasticity* of the framework.

Achieving a flexible organization capable of decentralization is not an easy process, however. It requires an organizational culture acceptant of the principles of *Mission Command* and decentralization. The establishment of trust, *common intent* and an environment that encourages initiative helps to create this organizational culture. Information technologies can enable decentralized decision-making, but can conversely disable initiative if applied in an overly controlling manner. The maintenance of the organizational culture of decentralization, and the appropriate use of technology, requires careful consideration.

The CF *Command and Control Operating Concept* is clearly aimed at a flexible C2 framework, focussed on a decentralized approach to command. This modern approach to C2, which is backed by both historical evidence and contemporary theory, is well suited for the future operational environment. The key to success for the CF however,

will be in its ability to institute this framework. This will require careful planning with respect to the integration of technologies, but more importantly, the nurturing of an organizational culture acceptant of the tenets of decentralization.

Future work on this subject should be directed at the CF's implementation of this framework. JOINTEX 2013 and OP NANOOK 2013 will both be executed under a C2 structure from the new framework. The capturing and analysis of the lessons learned from those two events will be crucial in assessing the effectiveness of this C2 framework.

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