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THE NETWORKED CANADIAN FORCES OPERATIONAL PLANNING PROCESS – A VIABLE ALTERNATIVE TO OPERATIONAL LEVEL PLANNING IN A COMPLEX OPERATING ENVIRONMENT

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ABSTRACT

This paper demonstrates that CF OPP is unsuitable as a design and planning tool to address the complexities inherent in today's operating environment and that a networked CF OPP is a viable alternative that merits further research. CF OPP, an analytical decision-model designed to solve linear problems of limited complexity, was conceived to address the linear conventional threat of the Cold War operating environment. CF OPP in its current form, however, is not ideally suited for operational level problems that possess the properties of complexity and agility. On the other hand, a networked CF OPP divided into deliberate and rapid response planning, has the potential to address complex problems inherent to the complex operating environment of the 21st Century. A networked deliberate CF OPP can engage the entire organization to conduct analysis in a timely fashion. A rapid response CF OPP can provide real time operational planning for the commander and their staff. A networked CF OPP deserves further attention with a view to improving CAF operational design and planning doctrine.

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CHAPTER ONE - INTRODUCTION

…[Y]ou've got to build a network to defeat a network...
- General (Ret'd) Stanley McChrystal

The summer of 1944 found the First Canadian Army fighting the German Army in the Normandy, France. Under Lieutenant General Guy Simonds, his operational staff had been constantly planning the execution of the campaign for over 6 months. In July 1944, he tasked his staff to prepare a plan which would see his Army breakthrough German defences and begin the Allied grand encirclement of all German forces in Western Europe.[1] Through constant work and updating, the plan was approved during the first week of August, 1944 and executed from 8 to 13 August, 1944. Simonds approved the very detailed, innovative, and complex plan, 'Operation TOTALIZE' with the full expectation of success. In reality, the plan did not survive the first contact with the enemy. It was not flexible, responsive, or versatile enough to adapt to the changing battle space.[2] In planning and designing TOTALIZE, Simonds' operational staff relied on information which came to them from day-old intelligence reports, dated situational reports from the front line, week-old enemy force estimates and dispositions, and other sources of planning information which had expired dated before it reached the planning staff. Once TOTALIZE began, the planning staff had no means to keep up with the changing dynamic of warfare to make the plan work. They did not receive information quickly enough to make a difference in the fighting at the Operational Level.

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[1] John A. English, *The Canadian Army and the Normandy Campaign : A Study of Failure in High Command* (Westport, CT: Praeger, 1991), 347., 263.

[2] *Ibid*, 289.

In the summer of 2010, a Danish Battle Group assumed responsibility for operations in Helmand province in Afghanistan, a country which had seen NATO forces fighting Taliban forces since 2003. Helmand province was considered one of the most complex battle space environments in the country and one of the key areas of counter insurgency operations (COIN) NATO forces aimed to curtail.[3] Not only did the Danish need to focus on military operations, they needed to focus on the economic and political impact their operations had on the local population. Operationally, the battle group entered the area with a classical command and control (C2) organization. A Commander at the top, the planning staff to plan and execute the operation, and numerous units beneath to carry out operations. Within days of arriving, the operational planning cycle was overwhelmed with dated information reducing the war-fighting effectiveness of the battle group.[4] Informal sharing of information resulted in an improvement in war fighting effectiveness but the hierarchical command and control could not cope with the speed and demands of a complex battle space. The operational planning staff was unable to collect and process the information which it received and translate it into action by tactical units. It did not have the organizational means to adjust and create new sources of information with non – military organizations. Once received, the information became 'stove-piped' up and down the organization before it was put to use rendering it dated and less useful.[5] Overall, the operational planning staff had all the modern day means of communication and real time sources of information; they could not process information

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[3] William Mitchell, *Battlespace Agility in Helmand: Network Vs. Hierarchy C2* (Copenhagen: Royal Danish Defence College Publishing House,[2011a])., p 10.

[4] *Ibid*. 17.

[5] William Mitchell, *Battlespace Intelligence: Social Network Vs. Traditional Time and Space Analysis in Helmand* (Copenhagen: Royal Danish Defence College Publishing House,[2011b])., p 29.

quickly enough to make a difference at the tactical level. With instantaneous communications covering the majority of the globe, they also had to worry about the impact their actions in Helmand province would have on the international community. A decision on the ground by one Danish soldier could be relayed within minutes around the world. Only by beginning to adapt a networked system of sharing information halfway through their deployment were the Danish able to adapt their planning and decision making processes in order to cope with the complex operational environment and the sharing of information within the organization.

The world is transitioning from the Industrial Age to the Information Age.[6] The Canadian Army in 1944 was an example of a military which reflected the Industrial Age; a hierarchal command organization with the emphasis on the industrial might of the tank, rifle, airplane, and warship. It relied on the massing of firepower and numerical superiority to win the battle. Operational Level planning staffs reflected this reality of the 20th Century. Staffs built operations based on day/week old information and relied on dispatch runners, carrier pigeons, mail correspondence, and telephone and broadcast systems to rely on passing and receiving information. The Danish Battle Group in 2010 had a different problem. Technology had improved and information was passed instantaneously to whomever they chose around the world. The problem however, was that the operational planning staff was overwhelmed with information which it could not digest and retransmit it quickly enough.

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[6] David S. Alberts, *The Agility Advantage: A Survival Guide for Complex Enterprises and Endeavors* (Washington, DC: CCRP Publications, 2011), 615., p 75.

Not only is technology able to overwhelm the operational staff, it can also overwhelm the strategic and political decision making processes of a nation. The same occurrence happened with the Abu Gharib prison scandal in 2004.[7] The United States military was left behind as the speed of the information released through social media severely damaged US foreign policy and credibility; even before news of the photos and reports of torture reached the Pentagon. As more and more photos of tortured prisoners were released, the United States could not respond to the accusations in a timely fashion. Secretary Of State Donald Rumsfeld commented to the US House Armed Services Committee:

> [M]y worry today is that there's some other procedure or some other habit that's 20th century, that is normal process, 'the way we've always done it',…a peacetime approach to the world, and there's some other process that we haven't discovered yet that needs to be modernized to the 21st century…[8]

Militaries and the governments which represent the 20th century organizational practices were being short-circuited by 21st century networked digital technology and the transition to the Information Age.

The Information Age has numerous definitions which attempt to explain the shift from traditional industry developed since the industrial revolution to an economy based

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[7] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 8.

[8] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 8.

on information and the globalization of the internet.[9] However, several key ideas are prevalent in each definition.[10] Some of them are:

a. Technologies make it easier to store, access, and exchange information;
b. Distances are less relevant;
c. Individuals have more access from a greater variety of sources;
d. These capabilities will help overcome human information processing limitations; and
e. These capabilities will change our institutions and societies. [11]

Over the last 20 years, scholars have identified and redefined the relationship between the command and control (C2) structures of militaries and the changing social interactions created by new technologies. This has led to the concept of Agility within an organization.[12] Agility is defined as, "…[T]he capability of C2 to successfully effect, cope with, and/or exploit changes in circumstances."[13] It enables entities to effectively and efficiently employ the resources they have in a timely manner. With the introduction of Web 2.0 technologies, social interaction is changing as people connect and transfer large amounts of data between their PDA, laptop, and computer.[14] The evolution of the internet as a means to hold and transmit large amounts of information is presenting the opportunity for organizations to transform from a hierarchical 'stovepipe' chain of

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[9] Alberts, *The Agility Advantage: A Survival Guide for Complex Enterprises and Endeavors* (Washington, DC: CCRP Publications, 2011), 615., 76.

[10] *Ibid*. p 99.

[11] *Ibid*, 99.

[12] David S. Alberts et al., *C2 Agility: Task Group SAS-085 Final Report* (Washington, DC.: CCRP Publications,[2012])., p 8.

[13] *Ibid*, p 20.

[14] *Guideline for External use of Web 2.0,* (2011): ., 4.

command to a networked 'horizontal' based 'web of command' Members of the organization can now freely share and exchange ideas, correspondence, and information throughout the organization rather than rely on a vertical passage of information. The challenge will be for organizations, such as the Canadian Armed Forces (CAF), to absorb, manage, and integrate technological innovation during the transition to a networked enabled force. David Schmidtchen of the Australian Land Warfare Studies Centre argued in 2007 that, "It is a great idea, but must mature before it is integral and obvious."[15] Furthermore, Donald Schon stated:

> [N]ew ideas become powerful as centres of policy debate and political conflict. They gain widespread acceptance throughout the efforts of those who push or ride them through the fields of force created by the interplay of interests and commitments… When the ideas are taken up by people already powerful in society gives them a kind of legitimacy and completes their power to change public policy. After this, the ideas become an integral part of the conceptual dimension of the social system and appear, in retrospect, obvious.[16]

In 2014, these ideas are becoming obvious due to advances in the internet, social networking, hardware, web 2.0 technologies, and the overall networking of younger generations. The internet in the 1990s provided the first jump in providing a widely available means to network, providing point to point information via emails or pushing information through websites. The requirement to be physically present to interact began to matter less. As well, such globalised communications were no longer simply point to point but could involve as many people in the conversation as imaginable. Economic factors have allowed for large amounts of data to be cheaply shared or stored. It was no

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[15] Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Hopkins (Australia: Land Warfare Studies Centre, 2007), 333.,2.

[16] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333. 2.

longer the military and government leading the technological change, but private industry and commerce now drive technological advancement. Hardware is not designed specifically for the military but instead the military is increasingly purchasing more 'Commercial off the Shelf' (COTS) technologies for future operations. The same is true for social networks and internet based technologies. Social media mediums such as Facebook, and Twitter, and concepts such as cloud-based storage, and mobile phone apps capitalized on this development and are changing the world in which we live.[17]

People are now connected and sharing information with everyone and anything connected to the network. Initially, this capability was restricted only to those who interfaced with a network via a computer or laptop, but the mobile revolution diversified those connections and has enabled anyone with a data phone, tablet, or wireless laptop to be connected to others, where ever service is provided in the world.[18] This has had a profound impact on how humans socialize. Large groups of people can now interact online to solve a problem; from the middle of a battlespace a soldier can interact with a staff officer at headquarters, while crowd coursing problem solving with professional colleagues via social media.. Any person with a mobile phone can now be considered a sensor and a source of multiple forms of information. A civilian can report on a humanitarian disaster as it is happening providing details on local conditions that would be otherwise unavailable. More worrisome, they can also report on troops' movements and activities in their area. Large groups can bond quickly and mobilize like never before

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[17] Bruce Forrester, "Twitter as a Source for Actionable Intelligence at 18th ICCRTS" (Alexandria, Virginia, Defence R&D Canada, 2013, 2013)., p C2-2

[18] N. E. Setchell, "R U Rdy i Rdy? the Royal Canadian Navy and Social Media" (Masters of Defence Studies Research paper, Canadian Forces College), ., p 9.

to effect change, such as the Arab Spring movements throughout the Middle East. Conversely, patterns in this information can be used by organizations to access the characteristics, and tendencies of both individuals and groups. Governments and political movements are using this information to track and monitor citizens while corporations are using it to monitor and adjust business strategies to increase profit. Regardless of the purpose, all organizations must be able to cope with the mass amount of information that is being generated daily by our digital infrastructure.

The Canadian Armed Forces (CAF) is at a point in history where information technology, and associated social networks, is responsive, versatile, flexible, innovative and adaptive enough to cause a fundamental change in both its command and control organization. Formed around a hierarchal chain of command, the CAF remains subject to decision making and information sharing in a 'stove piped' vertical fashion throughout the organization.[19] This is resulting in an inability to keep up with the operational pace in a complex operating environment (COE).[20] Currently, Canadian planners at the operational level of warfare are unable to conduct the types of deliberate or rapid response planning to maximize combat effectiveness within a COE.[21] In an 2007

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[19] Department of National Defence, *B-GJ-005-300/FP-001 Canadian Forces Joint Publication 3.0 Operation* (Ottawa: DND Canada, 2010a), 92., p 3-5.

[20] Complex Operating Environment is defined as conflict within this environment reflects the relationships between the underlying actions, structures, and beliefs resident within the conflict. Each dimension must be understood both individually and as a part of the larger whole, i.e. in terms of how they affect and are affected by the others. Land operations undertaken to resolve the root causes of conflict in the future security environment must therefore address the multi-threat, multidimensional, multinational, joint and interagency aspects of the operating environment**.** Department of National Defence, *B-GL-300-001/FP-000 Conduct of Land Operations - Operational Level Doctrine for the Canadian Army (English)* (Ottawa, Ontario: Department of National Defence, 1998), 150. , 16.

[21] Operational Level is defined as the operational level of conflict is concerned with producing and sequencing the campaign, which synchronizes military and other resources to achieve the desired end state and military strategic objectives. Military actions at the operational level are usually joint and often

evaluation of the Maintenance and Currency of CF Doctrine the overall assessment was "…[D]octrine development above the tactical level has not kept pace with recent changes to CF command and control architecture and new capabilities introduced through CF transformation."[22] LCol Craig Dalton of the Canadian Army identified in 2006 a 'degree of dissatisfaction' with operational level planning and asserted that the CAF may be experiencing 'a theoretical crisis' in operational design.[23] David Bryant from Defence Research Department Canada (DRDC) stated after observing 1 Canadian Mechanized Battle Group during Exercise *Virtual Ram* that Operational Planning, …"[I]s not ideally suited to military planning" and "…[N]ot especially in the time-constrained and uncertain environment of modern warfare."[24] Lieutenant Colonel Bernd Horn explains the inability of doctrine development to keep pace with the changing COE he states "Often we do not know what we do not know, and we assume our perception of the state of affairs is accurate and mutual, when in fact ground truth may be an entirely different reality".[25] The CAF simply might not be aware that the Operational Planning Process is ill suited for the COE.

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combined. Department of National Defence, *B-GJ-005-300/FP-001 Canadian Forces Joint Publication 3.0 Operation* (Ottawa: DND Canada, 2010a), 92.

[22] Canada, *Evaluation of the Maintenance and Currency of CF Doctrine* (Ottawa: Department of National Defence, 2007)., iii.

[23] C. Dalton, "
Systemic Operational Design: Epistemological Bumpf Or the Way Ahead for Operational Design?" (School of Advanced Military Studies, United States Army and Command Staff College), . , 22.

[24] David J. Bryant, "Can we Streamline Operational Planning?" *Canadian Military Journal* Winter 2006-2007, no. 4 (2006), 84., 21.

[25] Bernd Horn, *In Harm's Way: "The Buck Stops here": Commanders on Operations* (Kingston: Canadian Defence Academy Press, 2007)., 203

Lieutenant Colonel Omer Lavoie, Commanding Officer 1RCR Battle Group in Kandahar in 2006, argued that the "contemporary operating environment itself, specifically working in an insurgency, poses another whole range of challenges… such as the difficulty of gaining the necessary intelligence, as well as working in an environment where it is so difficult to differentiate friend from foe."[26] For operational commanders the goal of a full understanding of the COE is illusive. Militaries continue to struggle with framing the operational problem. When the problem is not properly framed, it translates into tactical action without strategic effect. Therefore, a new operational level planning tool is required utilizing the tools and social networks of the Information Age. This new planning tool can alleviate the shortcomings in the current operational planning process. By moving from a linear, sequential planning process to a networked operational planning process the CAF can begin to exploit the potential of the Information Age and bridge the gap between the tactical and strategic levels of thinking.

This paper will demonstrate that the Canadian Forces Operational Planning Process (CF OPP) is unsuitable as a planning tool to addresses the complexities inherent to those of today's complex operating environment and a networked based CF OPP is a viable alternative for operational level commanders.

Chapter two will introduce the notion of the hierarchal command and control organization and its use by the CAF. Secondly, the concept of network centric warfare (NCW) and its impact on current command and control organizations will be discussed. The final part of chapter two will be the development of a vertical command and control

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[26] Bernd Horn, *In Harm's Way: "The Buck Stops here": Commanders on Operations* (Kingston: Canadian Defence Academy Press, 2007)., 281.

organization, called an Edge organization, its potential within the CAF, and its ability to exploit the advantages of the information age.

Having understood the differences of command and control organizations on the CAF, Chapter three will examine the operational planning process currently employed by the CAF to address the operational level complexities. The first section will examine the role of CF OPP. The iterative steps will then be introduced in sequence. Finally, this chapter will identify deficiencies of CF OPP at the operational level and its inability to operate in a COE in the Information Age.

Once CF OPP has been analyzed within the context of the current COE, Chapter four will introduce a proposed network CF OPP model for deliberate planning. The first section will outline the proposed planning tool. The second section discusses the potential strengths and weakness of this planning tool in the information age while the final section proposes how it can be incorporated into the CAF.

Finally, Chapter five will introduce a proposed CF OPP model for rapid response planning. Unlike the current CF OPP rapid response planning, this chapter will identify the need for a distinct networked rapid response planning process. It will follow up with a strengths and weaknesses analysis and how it can be incorporated into the CAF.

This paper will conclude by providing recommendations on further areas of study beyond the scope of this paper with the aim of incorporating a networked CF operational planning process, its incorporation in the CAF command and control organization and the need for the CAF to adapt to remain a viable force in a complex operating environment.

CHAPTER TWO - HIERARCHICAL VS. VERTICAL C2 ORGANIZATION

The road to agility is paved with information.
Dr. Alberts – Power to the Edge – 2001

The CAF philosophy of command is built upon a hierarchal command and control structure dating back to the 19th Century and the age of the British Empire.[27] At the very top of the organization is the single Commander who carries the burden of accountability and responsibility for the entire organization. The essential elements of the CAF philosophy of command are:

> a. Commanders must ensure that subordinates understand their intentions; missions; and the political, strategic, operational, and tactical milieu in which they will operate;
> b. Commanders must use only the requisite amount of control to permit reasonable freedom of action for their subordinates;
> c. Subordinates must be provided with sufficient resources to achieve their missions; and,
> d. Subordinates must decide how best to achieve their assigned missions based upon clear guidance and adequate resources.[28]

Everything in this philosophy is based on the Commander and their ability to process and disseminate information based on his legal authority. Command is based on formally delegated authority and is the authority vested in an individual of the armed forces for the direction, coordination, and control of military forces.[29] Operational Command is the level of command that employs forces to attain strategic objectives in a theatre or area of operations through the design, organization, and conduct of campaigns and major

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[27] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142., p 5-5.

[28] *Ibid*, 5-1.

[29] *Ibid*, 5-2.

operations.[30] At the Operational Level, sea, land, air, and space activities must be conceived and conducted as a single, concentrated (or joint) effort. Activities at this level link strategy and tactics. A Commander at the Operational Level will generally be in command of a task force. A task force is a generic name for a temporary grouping of units, under one Commander, formed for the purpose of carrying out a specific operation, mission, or task.[31] A basic hierarchical organization of a CAF task group is shown in figure 1;

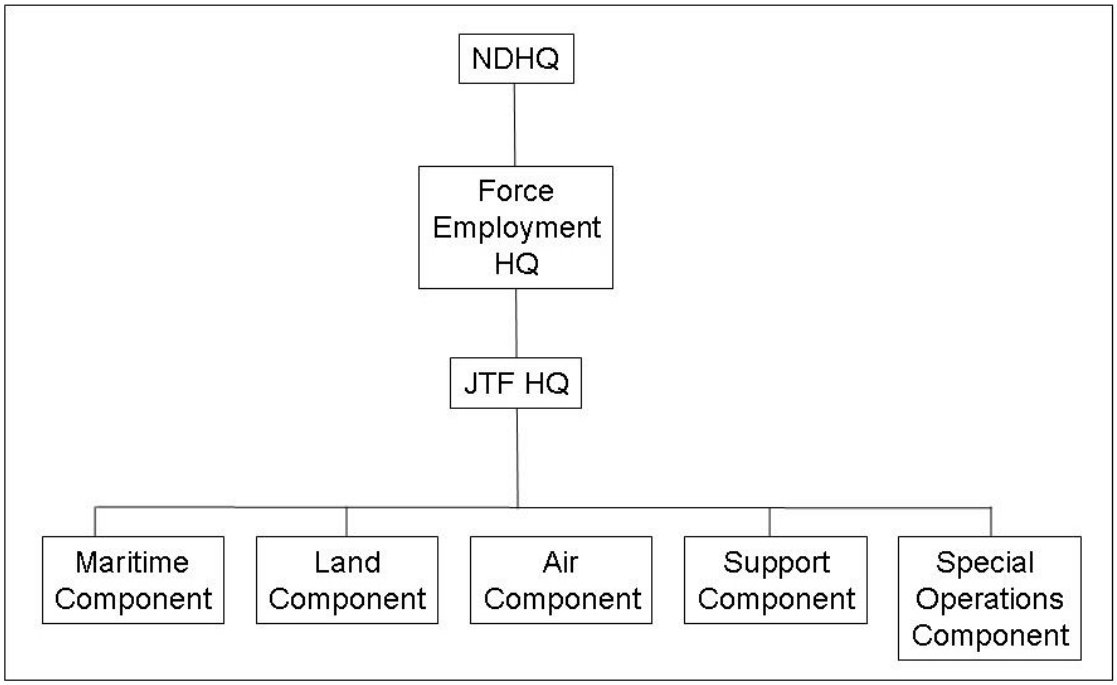

Figure 1 – Graphical Representation of CAF Task Group[32]

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[30] *Ibid.* 5-3.

[31] Department of National Defence, *B-GJ-005-300/FP-001 Canadian Forces Joint Publication 3.0 Operation* (Ottawa: DND Canada, 2010a), 92., 4-1.

[32] Department of National Defence, *B-GJ-005-300/FP-001 Canadian Forces Joint Publication 3.0 Operation* (Ottawa: DND Canada, 2010a), 92.

The diagram clearly illustrates how the CAF is set up as a hierarchical organization. The information flow within this organization is up and down; up to the Commander who makes a decision then back down to the subordinate. This battle rhythm takes time to complete a full cycle back to the lowest level of the organization. The more layers of organization it takes a piece of information to travel, the longer it takes and the increased likelihood the piece of information gets distorted, or irrelevant because the information will become dated. The hierarchical organization provides structure for highly organized activities. At each level within the organization, it seeks certainty through information security. For example, within the Government of Canada, certain departments must partake in a 12 step process before a single 140 character Tweet is posted online.[33] While posting a tweet can be as fast as a couple seconds, a Government of Canada tweet can take days, and sometimes weeks to post. The same can be said for a situational report, piece of intelligence, analysis paper, or any piece of information produced within the hierarchical organization and participates in a up and down information flow before decisions are made.

A C2 organization such as a CAF task force embodies an Industrial Age organization. Its entire effort is focused and controlled to bring order to disorganization through the leadership of one individual.[34] It simplifies tasks and routines to allow decision makers to make easy decisions by managing information complexity.[35] It creates routine, standard operating procedures, and checklists to ease the control and flow of

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[33] Anonymus, "Twitter Statistics," http://statisticbrain.com/twitter-statistics/ (accessed 06/02, 2014).

[34] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., 41.

[35] Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 147.

information. At the operational level, this control of information is embedded in the planning staff. This collective group of individuals attempts to link the strategic and tactical information and make it organized and coherent to fit into the single, joint effort. But how can this group accomplish this in a timely manner in the 21st century?

A problem confronted by operational planning staffs is that a hierarchical organization's efficiency decreases when faced with dynamic and complex situations.[36] 21st century operations are complex and multi layered and nearly always have non-military components. Planning staffs must now consider military and civilian objectives within operations including other government and non-governmental organizations.[37] Military computer networks such as DWAN and MCOIN offer members within the organization the ability to exchange information. Open networks with full access to the internet are less secure, however everybody, military and/or civilian, has access to collaborate on ideas and problems.[38] Social media is creating new relationships and exchanges of information; most of which do not adhere to the top to bottom informational flow found within a hierarchical command structure. Within a hierarchical organization, it is expected that information is tightly controlled and passed up and down the chain of command when dictated. Now, the lowest member of the organization has a direct link to the top boss if that boss is on the same social media site. On numerous occasions junior members of the Royal Canadian Navy have directly posed questions to senior Commodores and the Admiral via Twitter, thus engaging in a conversation with the

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[36] *Ibid* 56.

[37] *Ibid*, 1.

[38] Webopedia, "Web 2.0," http://www.webopedia.com/TERM/W/Web_2_point_0 html (accessed 01 Apr 2014, 2014)., p1.

Organizational bosses directly.[39] While of a non-operational nature, this direct link through social computing to the top of the hierarchical structure demonstrates new forms of information and networking. These characteristics of the Information Age dictate why the CAF must transform its C2 structure to reflect the changing COE. The key to the organizational change is to become more agile.

As organizations and individuals become increasingly networked and connected with each other, the CAF should consider changing its C2 structure to make it more agile. The Information Age is changing the ways institutions manage themselves and interact with individuals and collective groups in that the ability to acquire, manage, share, and exploit information will be done by everyone in the organization.[40] Some business corporations, such as Valve Corporation, functions as a flat organization; meaning there are no bosses and therefore no operational level.[41] Employees move between projects they wish to work on and produce information and software which the rest of the corporation reviews.[42] While Valve Corporation is an extreme case of a networked organizational model, Schmidtchen argues there is a place for a networked informational flow within a hierarchal organization.[43] He states that networks and hierarchies can co-exist within the same organization as there must still continue to be a formal power sharing agreement. Decision making can still reside with leadership and the

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[39] Twitter Feed – RAdm Newton, RCN. Accessed 02 June 2014

[40] Alberts et al., *C2 Agility: Task Group SAS-085 Final Report* (Washington, DC.: CCRP Publications, 2012)., 9.

[41] Valve is run as a flat organization without bosses, and uses open allocation (employees can move between teams at will).

[42] Valve, *Valve : Handbook for New Employees*, 1st ed. (new York: Valve Press, 2012).

[43] Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Hopkins (Australia: Land Warfare Studies Centre, 2007), 333.

organizational structure remains in a hierarchical structure, however embedded within is a networked based organizational form that can manage a more 'market-like' organizational philosophy of information sharing. Instead of information to flow up and down before decisions are made, a network environment is created where individuals create, post, share, and retrieve information from this 'market bazaar'. In the CAF terms, this networked organization is the networked CF OPP. While still required to perform tasks and report them up and down the chain of command, every member will be tasked to manage and produce information which will contribute to a networked CF OPP. This represents a shift to a web based culture and the idea of network centric warfare (NCW) becoming a major influence in the CAF organizational structure.

NCW is a technology-based, military driven, operational level concept that emerged from examining private sector technical solutions to the problem of information control and applying them to warfare.[44] The Chief of US Naval Research defines NCW as:

> …[M]ilitary operations that exploit state-of-the-art information and networking technology to integrate widely dispersed human decision makers, situational and targeting sensors, and forces and weapons into a highly adaptive, comprehensive system to achieve unprecedented mission effectiveness.[45]

NCW means employing technology and social computing to enable a more efficient and faster collaboration. It is associated with the phenomenon of globalization.[46]

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[44] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 5.

[45] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 4.

[46] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 4.

It strives to 'reduce the importance of distance between individuals', faster movement of ideas, technologies, cultures and economics amongst nations and individuals. NCW and globalization are promoting interaction and interconnectedness amongst people. NCW promotes technological developments which redefine the connections between various social groups within the military organization.[47] These developments will demand a change in the collective and individual behaviour which a hierarchical organization will struggle to fulfill. Creating a networked organization within will ease the transition NCW will induce as militaries such as the CAF attempt to agile enough to operate in the Information age.

NCW is a driving force behind an agile organization. It implies that a robust, networked organization improves information sharing. This information sharing and collaboration seeks to enhance the shared situational awareness of every member within the organization. The shared situational awareness enables the organization to self-synchronize collectively and increase mission effectiveness. No longer does the lowest member of the organization have to wait for information to pass up the chain of command for the Commander to make a decision and Commander to push the orders and direction back down to the member to implement. The 'flattening' of the C2 due to the networked C2 is what makes the organization agile. The 'Strategic Corporal' concept is the embodiment of this networked C2 organization.[48]

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[47] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 6.

[48] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., 65.

Emboldened by access to a larger amount of shared information, the amount of decision making and responsibility is devolved to the corporal on the streets conducting a patrol. Since the corporal has as much information as anyone else in the network, the corporal is able to make sound decisions and not have to wait for direction from the chain of command and risk that the moment to make a decision will pass. A key difference is the way the corporal receives information. Instead of relying on information being sent downwards in a hierarchical organization, in the networked organization is market based meaning all the information is available to all users to create, share, and manipulate.[49] It is an information retrieval network which promotes availability, open access, and information flow in all directions. This allows all the strategic corporals and users to collaborate and exchange information to solve a problem. They are self-enabled and self-synchronizing.

This self-synchronization increases mission effectiveness and speeds up the decision making process of the entire organization. It makes the organization more agile to deal with the changing battle space. This ability to increase the access to information at all levels within the organization, in particular at the tactical level, is what has been referred as an 'Edge' Organization.[50]

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[49] John Verdon, *The Wealth of People - Collaboration and Knowledge Governance - A Strategic Discussion Paper* (Ottawa: Defence R&D Canada,[2012])., 21.

[50] *Ibid*, 5.

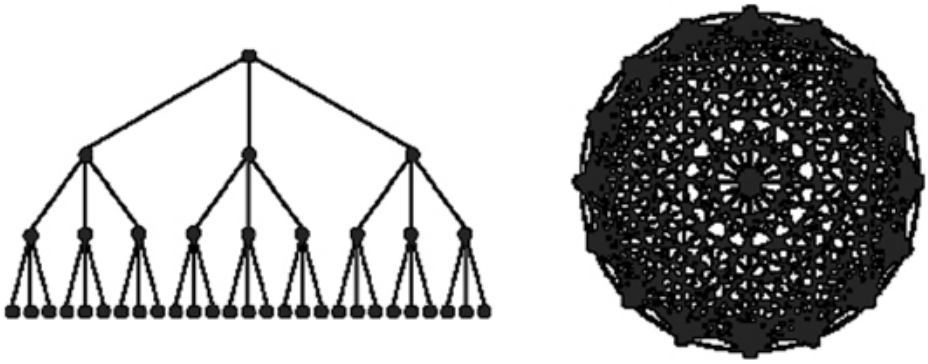

Figure 2. Hierarchical and Edged based Command and Control Organizations[51]

An edge/networked organization is built on the premise that agility is the most important characteristic of a 21st century Information Age organization.[52] The widespread sharing of information and importance of peer to peer relationships increases the agility of an organization.[53] It enhances the capability for peer to peer interaction and the sharing of information because everyone is at the edge and a part of the information and collaborative process.[54] All members of the organization are considered the 'strategic corporal' as every member has the capacity to share information and make decisions. It will help to remove information stovepipes within a traditional C2 organization. As the 21st century becomes an increasingly complex environment, an edge organization will be able to maximize effectiveness because its C2 arrangements are distributed and network enabled allowing it to handle more information and faster decision making.[55]

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[51] *Ibid*, 91.

[52] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013)., 32

[53] *Ibid,* 176.

[54] *Ibid*, 177.

[55] Alberts, *The Agility Advantage: A Survival Guide for Complex Enterprises and Endeavors* (Washington, DC: CCRP Publications, 2011), 615., 200.

There are six key components of an agile organization. They are *responsiveness*, *versatility*, *flexibility*, *resilience*, *innovativeness*, and *adaptability*.[56] *Responsiveness* is the time it takes to recognize, anticipate, and respond to changes in circumstances.[57] The quicker an organization can respond to any sort of change, the more agile it will become. This is important as a planning staff must respond to a large amount of information within a timely fashion. *Versatility* implies the organization's ability to change its mission and tasks.[58] Within a complex environment, an organization's mission might evolve or change once the operation commences. The CAF move from Kabul to Kandahar of Afghanistan in 2006 reflected a change in mission and tasks. The move from a relatively stable operating environment in Kabul to a complex operating environment in the south required the CAF to be versatile and flexible. *Flexibility* is the ability of the organization of solving a problem using different solutions.[59] It does not solve every problem with the same solution but has the capabilities to devise and execute various solutions. *Resilience* is the ability of the organization to withstand degradation within itself and continue functioning at an acceptable level of performance.[60] This ability to incur damage while continuing to operate is essential in military operations. In a network, for example, would be very hard to destroy because the loss of one node would have a minor impact as the remaining nodes can continue to interact with the others. In a hierarchical organization, the loss of a key leader would create a larger impact.

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[56] *Ibid*, 204.

[57] *Ibid,* 205.

[58] *Ibid,* 215.

[59] *Ibid,* 216.

[60] *Ibid,* 217.

Innovativeness implies the organization is able to develop new methods of problem solving when confronted with an unknown problem.[61] It should be encouraged within the organization in order to bring new ideas to difficult problems. Finally, *Adaptability* defines the organization's ability to change itself to become better suited to solve the problem.[62]

An agile network based organization is not without its shortcomings. Primarily, it changes the role of the Commander and the assigned roles and responsibilities associated with the position. Instead of one individual being responsible overall, responsibility is now shared throughout the network. Studies have demonstrated that while a network based C2 allows for greater knowledge and understanding of overall goals and objectives by the entire organization, it is initially slower in reaching a decision.[63] It is much quicker to make a decision by one individual instead of reaching a decision made by the collective. Trust is an important factor in a network. One must be able to trust that the other members will make sound decisions, must be able to trust that the network infrastructure will function properly, and that the network is secure.[64] An agile network requires a highly trained organization in order to fully exploit the networked organization. Studies have shown that one C2 model does not work for all complex environments.[65] It must be agile enough to adapt to the situation it is involved. A

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[61] *Ibid*, 218.

[62] *Ibid, 218.*

[63] Alberts et al., *C2 Agility: Task Group SAS-085 Final Report* (Washington, DC.: CCRP Publications, 2012)., 15

[64] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303.

networked organization also carries the risk of amplifying uncertainty and increasing the 'fog of war.'[66] The increase in the amount of data being produced by the network could easily overwhelm users and make it impossible to analyse in a timely fashion. Finally, a networked organization can allow the senior commander to micro-manage.[67] Some commanders will find it difficult not to intervene and rely on the decision making capabilities of junior personnel.

These shortcomings are important to consider when implementing a networked organization, however, it should not stop institutional change. Schmidtchen outlines four key concepts to maximize the potential of the information age which the CAF could adapt for its own use. In order to change the institution the CAF must review its technology, ideas, people, and the organization in order to create a networked organization.[68] In 2014, the technology is available, from the private sector in terms of hardware, software, and social computing, for the CAF to utilize. The idea of how to create a networked organization will grow as newer generations of CAF members introduce these concepts the information age has spawned. Once this occurs then these ideas will begin to spread throughout the organization and will eventually become

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[65] Alberts et al., *C2 Agility: Task Group SAS-085 Final Report* (Washington, DC.: CCRP Publications, 2012). 76.

[66] Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 9

[67] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 9.

[68] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Scott Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 11.

accepted. Finally, this will force a gradual change in the organization to reflect the actual working conditions. When considering these four concepts in terms of the operational level, the CAF has the technology and the ideas but not the people or organization to make the CF OPP a networked organization.

CHAPTER THREE – THE CURRENT CANADIAN FORCES OPERATIONAL PLANNING PROCESS (CF OPP)

> *"[U]nfortunately, the current operational-design construct is often incapable of providing planners and commanders the means of designing campaigns and major operations full-spectrum operations require. Today's doctrinal concepts for operational design hamstring planners' and commanders' abilities to design and conduct effective, coherent campaigns for operations across the spectrum of conflict in today's security environment"*[69]
>
> - *Colonel James K. Greer*

The CAF Operational Planning Process (CF OPP) is defined as a "…[C]ordinated process to determine the best method of achieving the desired end state in support of strategic guidance. This process enables the Commander to translate strategy and objectives into a unified plan…."[70] The CF OPP is the standard operating model used by the CAF and NATO for joint operations to translate political intent into campaign plans in a COE. It was developed during the Industrial Age to cope with an operating environment characterized by conventional warfare between large military organizations.[71] It contains five steps (Initiation, Orientation, Course of Action Development, Plan Development, and Plan Review), each of which contain several sub-steps.[72]

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[69] James Greer, "Operational Art in the Objective Force," *Military Review* 82, no. September/October (2002). 26/27

[70] Department of National Defence, *B-GJ-005-300/FP-001 Canadian Forces Joint Publication 3.0 Operation* (Ottawa: DND Canada, 2010a), 92., 5-2

[71] B. J. C. McKercher and M. A. Hennessy, *The Operational Art: Developments in the Theories of War*, eds. B. J. C. McKercher and M. A. Hennessy (Westport, CT: Praeger, 1996), 221., 180.

[72] Matthew Lauder, "Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity," *Canadian Military Journal* 9, no. 4 (2009)., 42

Figure 3. Graphical representation of the CF OPP five steps.[73]

The CF OPP is a linear and sequential process designed to link military, strategic, and tactical levels.[74] Events are planned and synchronized by operational staffs in order to allocate resources and taskings in order to achieve operational objectives. One of the key aids in the planning process staffs utilize is the operational design.

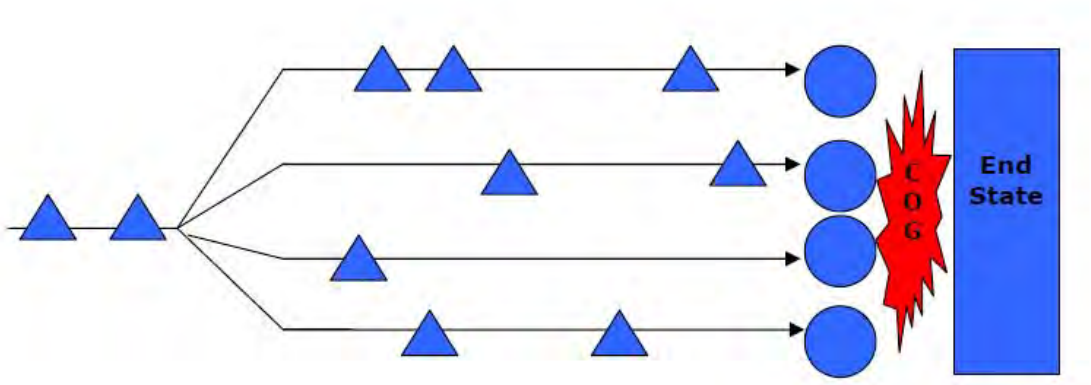

Figure 4. Graphical Representation of a Campaign and Operational Design[75]

The CF OPP can be described as a systematic approach to problem solving and aims to decompose the problem, specialize tasks, and optimize resources in order to control the process within a hierarchical organization.[76] It is commander led and staff-driven,

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[73] Matthew Lauder, "Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity," *Canadian Military Journal* 9, no. 4 (2009)., 42.

[74] CFJP 1.0 2-11

[75] CFC 230 II 14/17

meaning the commander provides the overall guidance and the planning staff conducts the mission analysis, develops the courses of action, develops and reviews the plan. The planners are typically divided and grouped into small, independent, groups and sequentially analyse each problem. The end product is a range of COAs (courses of action) for the commander to choose from.

The CF OPP is currently utilized throughout the CAF, particularity at the operational level. It is a mixture of what Matthew Lauder of DRDC describes as two approaches to decision making; normative approach and naturalist approach.[77] The normative approach is a formalized linear process which is a product of the industrial age and scientific, analytical reasoning. It consists of:

a. Canvassing opinion,
b. Surveying the objective,
c. Cost/risk rewards,
d. Assimilating new information,
e. Re-examining previous work, and
f. Planning.[78]

The CF OPP is modelled after this approach, however the problem with this linear approach is that it is not well suited for complex problems. There is also a danger that the linear process will shape the problem to make it fit into the solution. There exists the potential that the CF OPP will solve the wrong problem and not address the real needs of the environment and will not be adaptive enough to change to a complex operating environment.[79] The second approach the CF OPP is based upon is the naturalistic

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[76] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., p.225

[77] Lauder, *Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity*, Vol. 9, 2009). 42.

[78] Gary A. Klein, *Sources of Power: How People make Decisions* (Cambridge: The MIT Press, 1998)., 28.

approach. It defines decision making as how they assess the situation and judge its familiarity.[80] It is based on the experience, breadth, and depth of knowledge of the decision maker.[81] Its shortfall is that a naturalistic decision making approach is not suited for inexperienced decision makers who do not have experience, breadth, and a depth of knowledge. It is also open to bias and prejudices the decision maker might have which might cloud the judgement of the decision making process. Combined the naturalistic and normative approach constitute the current CF OPP. It has been described as "…[B]est suited for linear problems of minimal complexity," however, it is ill-suited for the complex operating environment.[82] One example was Operation Desert Shield/Storm in 1990-91. Using a similar linear analytical decision making process to the CF OPP, American and coalition planners found the speed of events often outpaced the ability to plan, which resulted in 'C2 on the fly' Planning.[83]

Since the end of the First Gulf War and the development of networks in the information age, the utility of the CF OPP and its similar counterparts in other Western nations continues to be debated. Dr. Milan Vego argues that "…[T]he nature of war has not changed therefore the Operational Planning Process is still relevant."[84] Howard

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[79] Gregory Ivey, "Systemic Operational Design: A Viable Alternative to the Canadian Forces Operational Planning Process" (Masters Defence Studies, Canadian Forces College), ., 12.

[80] Lauder, *Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity*, Vol. 9, 2009)., 42.

[81] Klein, *Sources of Power: How People make Decisions* (Cambridge: The MIT Press, 1998)., 28.

[82] Greer, *Operational Art in the Objective Force*, Vol. 82, 2002)., 82.

[83] Thomas A. Keaney and E. A. Cohen, *Gulf War Air Power Survey Summary Report* (Washington, D.C.: United States Air Force,[1993]). 76

[84] Milan N. Vego, "Systems Versus Classical Approach to Warfare," *Joint Force Quarterly* 1, no. 52 (2009)., 46.

Coombs from the Canadian Forces College (CFC) stated that "OPP is still an effective tool as long as it is used properly."[85] The CF OPP is still the main planning process taught at CFC to the soon to be operational level commanders and staff officers of the CAF.[86] Conversely, a variety of militaries have acknowledged that the current planning process does not meet the demands of the COE due to the globalization and technological advancements, the proliferation of non-state actors and increase in failed nations.[87] These are new challenges which the CF OPP cannot problem solve.

The CF OPP is designed to solve a military conflict in the Cold War era. It describes and focuses problems pertaining to the friendly force (FF) and Enemy Force (EF).[88] It does not look at other factors found in a COE. Naveh argues that the "…[N]ature of warfare has changed and commanders are faced with new complexities which did not exist…[I]t cannot be solved by a linear rational process."[89] Today's COE is 'organized chaos'[90] which the CF OPP is not well suited; it is a linear and simple process which Klein describes as "…[M]ore helpful for beginners."[91] Finally the rigid sub steps

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[85] McKercher and Hennessy, *The Operational Art: Developments in the Theories of War*, eds. McKercher and Hennessy (Westport, CT: Praeger, 1996), 221., 77.

[86] Canada, "
SYLLABUS CANADIAN FORCES COLLEGE (CFC) JOINT COMMAND AND STAFF PROGRAMME RESIDENTIAL (JCSP RESID) AND JOINT COMMAND AND STAFF PROGRAMMEDISTANCE LEARNING (JCSP DL)," (2013a)., 1-3/9.

[87] Ivey, *Systemic Operational Design: A Viable Alternative to the Canadian Forces Operational Planning Process*, Masters Defence Studies ed. Canadian Forces College, 2010)., 1.

[88] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142., 2-8

[89] Shimon Naveh, *In Pursuit of Military Excellence, the Evolution of Operational Theory* (London: Frank Cass, 1997)., 3.

[90] Shimon Naveh, *In Pursuit of Military Excellence, the Evolution of Operational Theory* (London: Frank Cass, 1997)., 8.

of the CF OPP encourage planners to view each step of the process in depth, sequential, and independent of outside factors. Its inherent rigidity and formality is why commanders and staff deviate from OPP in an operational setting. It is common in the CAF for the CF OPP to be modified or completely abandoned in favour of the naturalistic approach.[92]

Chapter four will propose that the CF OPP can be revised in order for it to function within the information age. It will propose that by creating a networked, collaborative CF OPP within the CAF; only then be able to view frame the operational problem in a holistic sense. Maintaining a hierarchical command and control organization designed to provide leadership and guidance, a 'flattened' command and control organization developed with the purpose of conducting CF OPP, can reside within the CAF. It will foster collaboration and spread the decision making and problem solving throughout the entire organization and not rest solely with the commander and the planning staff. The modern day COE, which possesses complexity and adaptability, requires a tool which can identify and analyse problems not in isolation but together and allow the commander and staff to understand the COE. A networked CF OPP can provide a viable solution.

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[91] Klein, *Sources of Power: How People make Decisions* (Cambridge: The MIT Press, 1998)., 6.

[92] Lauder, *Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity*, Vol. 9, 2009)., 43.

CHAPTER FOUR - THE NETWORKED BASED DELIBRATE PLANNING PROCESS

…Work of the masses – the wisdom of crowds…
James Suriwiecki

At the operational level, the current deliberate planning process is not suited to operate in an agile, networked organization. Being well versed in supporting the traditional hierarchical command and control organization, the current deliberate planning process is best suited to support a hierarchal organization, but unable to adapt to a more edge based, networked approach. Deliberate planning is a slow, time consuming process and does not take advantage of all the available resources offered in the Information Age. The purpose of the Operational Planning Process is to optimize logical, analytical steps of decision making in conditions of uncertainty.[93] The Commander receives strategic direction and guidance and then determines operational objectives to achieve the desired end state.[94] The Commander's personal experience and interpretation will influence the JOPG substantially and might be amicable to all the available resources and information available.[95] The Commander, in turn, will task the JOPG to analyse and resolve the situation, resulting in orders and direction to be issued to the tactical level. The role of the Commander in the current C2 structure is at the top of the organization with the ultimate responsibility and decision making capability. Experience and

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[93] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142., p 3-1.

[94] Department of National Defence, *B-GJ-005-300/FP-001 Canadian Forces Joint Publication 3.0 Operation* (Ottawa: DND Canada, 2010a), 92., p 5-2.

[95] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., 144.

intuitiveness play a key part in the intent and direction given by the Commander to JOPG. This tendency for leaders to exercise 'naturalistic' decision making leads to a preferred course of action during the operational design and a decision made 'from the gut.'[96] This influence in the JOPG favours one course of action during the development and analytical stage based on what the Commander will most likely prefer and overlook over factors which might lead to another course of action. For example, in a joint environment a Naval TG Commander might take a different approach to a solution than an Army TG Commander based on experience and background. A networked CF OPP could potentially allow for more information to be analyzed and more courses of action considered for implementation by the staff and Commander.

The Information Age, and the associated changes in hardware, networks, and social media, is changing the decision making processes of individuals and organizations alike. Governmental organizations are beginning to adapt and change the decision making process and dynamic between organization and citizen. The Ontario Emergency Management Organization responds to any crisis in the following order:

1. Go online to see what people are saying;
2. Monitor social networking in real time; and
3. Engage in a conversation.[97]

Organizations are learning to listen, engage, and measure the data and responses being created by individuals. This is allowing the networked organization to plan quicker, be more effective, and remain agile enough to respond to the changing COE. The 2013

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[96] David S. Alberts and Richard E. Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., p 144.

[97] Province of Ontario, "Emergency Management Ontario: Be Social," http://www.emergencymanagementontario.ca/english/beprepared/besocial/besocial html (accessed 06/02, 2014)., 1.

Boston Marathon bombing witnessed the Boston Police increase in Twitter followers from 32,000 to 400,000 overnight; all due to the acceptance that the Boston Police was listening, engaging, and measuring the response of the public in their efforts to find the bombers. Crowd sourcing played a key role in identifying leads and narrowing the search pattern for the bombers.[98] Social media was used to warn the public to stay indoors during neighbourhood patrols by Boston Police because social media and mobile apps became the primary source for news and information. This example demonstrated the potential of how an organization could employ a networked decision making process in a COE. It also demonstrated the adverse effects social media produces in real time situations. Mass hysteria, social bullying, and misinformation caused the Boston Police to chase down and arrest innocent people which illustrated the potential harm it can cause. Identifying the positive effects of social media, government organizations are focusing on grass roots decision making, increased transparency and accountability, and a democratization of data and knowledge. They are creating knowledge sharing communities where all members have access to the information for their own use. This is turn, allows the member to create new solutions and ideas which is then shared across the network. The CAF can employ these concepts in a networked CF OPP.

The proposed networked CF OPP would fundamentally change how the deliberate planning process in the CAF would occur. It would strive to be better suited to operate in an agile, networked organization. It would quicken the deliberate planning process to match the quickening pace of operations and would be better suited to maximize all the available resources available in the Information Age. While still maintaining a

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[98] Katherine Bindley, "Boston Police Twitter: How Cop Team Tweets Led City from Terror to Joy," *The Huffington Post*, sec. Tech, April 26 2013, 2013., 1.

Commander as the leader, with a JOPG as the main entity to conduct and organize the planning, the roles of the Commander, JOPG, and J2 would be dramatically altered. The goal of this redesigned CF OPP would be to identify more courses of action in a complex operating environment and translate these possibilities into usable direction which an agile military organization can implement them effectively.[99] If the CF OPP can perform these functions quicker with more accuracy than the opposition Commander, the CAF stands a better chance of success in a complex operational environment.

The Information Age is decreasing the amount of time decision makers have to make decisions. NATO has identified that it must rethink how it acquires, manages, shares, and exploits information in order to support individual and collective decision making. Success will be measured by what C2 approach to choose and the appropriateness of this organization in relation to the situation at hand.[100] Operational commanders will need to move seamlessly among C2 options to maintain operational momentum in achieving mission success without developing lengthy and dated contingency plans.[101] In terms of the CF OPP, it requires an organization which can operate faster and maximize all the available resources. The role of the Commander will change as less decision making, and the associated hierarchical information feed to the Commander, will take place. Instead, initial guidance will be given and the collaborative process within the networked organization will dictate the direction of planning.

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[99] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005)., 145.

[100] Alberts et al., *C2 Agility: Task Group SAS-085 Final Report* (Washington, DC.: CCRP Publications, 2012)., 18.

[101] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005)., 147.

The JOPG will evolve into more of a monitoring body to ensure the collaborative process is progressing at an acceptable rate. In order to monitor outputs and process all the available information, the JOPG must become a larger collaborative process. Instead of a group of 20-30 staff officers working in the same location, a networked CF OPP will be across the entire organization, regardless of rank and position, geographically separated, and have the same access of information available to anyone else within the networked organization. The goal of the networked JOPG will be to:

1. Create a common understanding of the situation;
2. Take advantage of different expertise, information, and capabilities within the networked organization; and
3. Organize activities they control in time and space such that they will avoid mutual interference and have a synergetic effect.[102]

Practically speaking, this process will be done through face to face interaction, video teleconference, cloud based collaborative forums, mobile apps and services, and social media forums.[103] This type of collaboration will improve the common operating picture. This will allow users to make better informed and timely decisions and increase the quality of product a deliberate planning process can produce.

The J2 will function in the same fashion as the current JOPG, becoming a networked organization which shares and processes information amongst all the members of the organization. It will cease to store information in a stove piped fashion and allow for a net-centric centralization of storage and management of intelligence related products.[104] This will allow the networked C2 organization to conduct deliberate planning

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[102] David S. Alberts et al., *Understanding Information Age Warfare* (Washington, DC: CCRP Publications, 2001), 319., 186.

[103] David S. Alberts et al., *Understanding Information Age Warfare* (Washington, DC: CCRP Publications, 2001), 319., 188.

within a complex operational environment. It will allow the organization to maximize the collaborative process in planning amongst multiple participants with different perspectives. This is due to the increases in cloud based and bandwidth technology, coupled with the changes in social interaction due to social media sites such as Facebook, Twitter, and LinkedIn. It will allow the Commander, JOPG, and J2 to make the C2 organization agile. The need for these changes will only increase with the changing demographic of the CAF.

Any member of the CAF who was born after 1990 is considered to be a 'digital native' or a person who has grown up with the internet and web-based 2.0 technologies always being available.[105] Peer production in a decentralized, collaborative environment will be expected by these types of individuals. The idea is to develop a network which can share information throughout the entire organization and further develop the sharing between organizations.[106] Once given a task, individuals will be expected to source their own information and provide it to the collaborative environment. Individuals will search out like minded persons and create groups with common interests. These interactions will increase the level of comfort users will have working within the network and increase the amount of trust they have with one another in the collaborating process. As like-minded individuals gravitate towards each other, they will begin to build a better capacity to identify components of the CF OPP and allocate human creativity and resources to work

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[104] Anne-Claire Boury-Brisset, Anissa Frini and Rejean Lebrun, "All-Source Information Management and Integration for Improved Collective Intelligence Production" (Quebec City, Defence R&D Canada: Valcartier, June 2011, 2011)., p2.

[105] A. Bruzzone, A. Mursia and M. Turr, "Degraded Operational Environment: Integration of Social Network Infrastructure Concept in a Traditional Military C2 System at 18th ICCRTS" (Alexandria, Virginia, CCRP Publications, 2013, 2013)., p7.

[106] Bruce Forrester, "Collective C2 in Multi-National Civil-Military Operations" (Quebec City, Defence R&D Canada - Valcartier, 2011, 2011)., p4.

on a problem.[107] These 'nodes' of like-minded individuals will be connected to the overall organization and share their work results with other 'nodes' to solve the overall problem.[108] All of this is monitored and guided by the JOPG. This concept of the entire organization being utilized to attack a problem will ease the work load of the JOPG and allow them to focus on key taskings.

The next generation of CAF members will be raised in a networked world where digital socializing and interaction is the norm. Texting replaced the phone call, and social media sites like Facebook, Twitter, LinkedIn, will continue to replace texting. These 'digital natives' are much more comfortable with technology, posting and sharing ideas online, and communicate with each other through other means than in person. Restricting access will not work as these users will find another way to gather information, turn away from participating, or not trust the networked process.[109] These people have different expectations in social interaction, expectations that a C2 approach is decentralized and networked, and the CF OPP is more collaborative and inclusive within the entire organization.[110]

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[107] Bruce Forrester, "Collective C2 in Multi-National Civil-Military Operations" (Quebec City, Defence R&D Canada - Valcartier, 2011, 2011)., 9.

[108] Bruce Forrester, "Collective C2 in Multi-National Civil-Military Operations" (Quebec City, Defence R&D Canada - Valcartier, 2011, 2011)., 9.

[109] Zhigang Wang, *Social Media and Social Network Analysis* (Ottawa, Ontario: Defence R&D Canada,[2011])., p1.

[110] Bruzzone, Mursia and Turr, *Degraded Operational Environment: Integration of Social Network Infrastructure Concept in a Traditional Military C2 System at 18th ICCRTS*, Alexandria, Virginia ed. CCRP Publications, 2013).,p 7.

An extreme example of social interaction and the collaborative process is the recent phenomena of 'TwitchPlayPokemon'.[111] In February, 2014 a programmer in Australia built a live stream online game where any person can control and manipulate the main character. The goal was to see how long it took to complete the game. 'TwitchPlayPokemon' became a large social interaction experiment with an average 70,000 online users simultaneously giving commands to move the main character up/down/left/right and complete the game. A certain number of users actively tried to prevent the majority from accomplishing the goal. At one point, over 15,000 users quit en mass when there were confronted with an obstacle. Blogs and chat forums were created of like-minded users to strategize and figure out the best way to move the main character and finish the game. Users began choosing groups as to the preferred course of action to implement. Overall it took 16 days for the collaborative network to complete the game; compared to 40 hours for the casual user. However, follow on games are witnessing an increase in speed and is shortening how long it takes to complete the mission and obtain the objective.

Governments and businesses are beginning to understand the power of this collaborative process. 86% of 18-29 year olds use social media on a cell phone, tablet, television, or computer every day.[112] They see this as an ability to engage the population in democracy and decision making, co-produce work and make the individual feel 'ownership' of the work, and crowd source[113] solutions and encourage innovativeness.[114]

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[111] Murray Rosenbaum, "What is TwitchPlaysPokemon?" *Huffington Post*, sec. Teen, 27 March 2014, 2014., 1.

[112] A. Kavanaugh, "Social Media use by Government: From the Routine to the Critical," *Government Information Quarterly* 29, no. 2012 (11 August 2012, 2012), 480., p1.

Web based social communities allow all members to broadcast and collaborate on information. It is a team building exercise and builds trust with other members of the social community which, in turn, speeds up the decision making and planning process of the group.[115] This network style organization also allows for a market style social interaction, meaning individuals can pick and choose who and what they wish to interact and collaborate with.[116] As long as the network, and all its contents are accessible to all users, it allows for a collective decision on resource allocation and decision making based on common information and contributions by all members of the organization. The idea is that with more users looking at the problem, each with own experiences and expertise; a common solution will be produced and will be more agile within the complex operating environment. In order to do so, the C2 organization, starting with the Commander, must become more interactive, share information, and able to socialize in a vertical and horizontal fashion.[117]

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[113] Crowd Sourcing is defined as to utilize (labor, information, etc.) contributed by the general public to (a project), often via the Internet and without compensation
http://dictionary reference.com/browse/crowdsourcing?s=t

[114] A. Kavanaugh, "Social Media use by Government: From the Routine to the Critical," *Government Information Quarterly* 29, no. 2012 (11 August 2012, 2012), 480., p2.

[115] J. Crebolder and T. Randall, "The Evolution of C2: Where have we been? Where are we Going? at 15th ICCRTS" (Santa Monica, CA, Defence R&D Canada, 2010, 2010)., p2.

[116] Erik Bjurstrom, Tommy Enkvist and Git Roxstrom, "A Harmonization Marketplace: C2 Goes Social " (Santa Monica, CA, Malardalen University, Sweden, 2010, 2010)., p9

[117] Erik Bjurstrom, Tommy Enkvist and Git Roxstrom, "A Harmonization Marketplace: C2 Goes Social " (Santa Monica, CA, Malardalen University, Sweden, 2010, 2010)., p9.

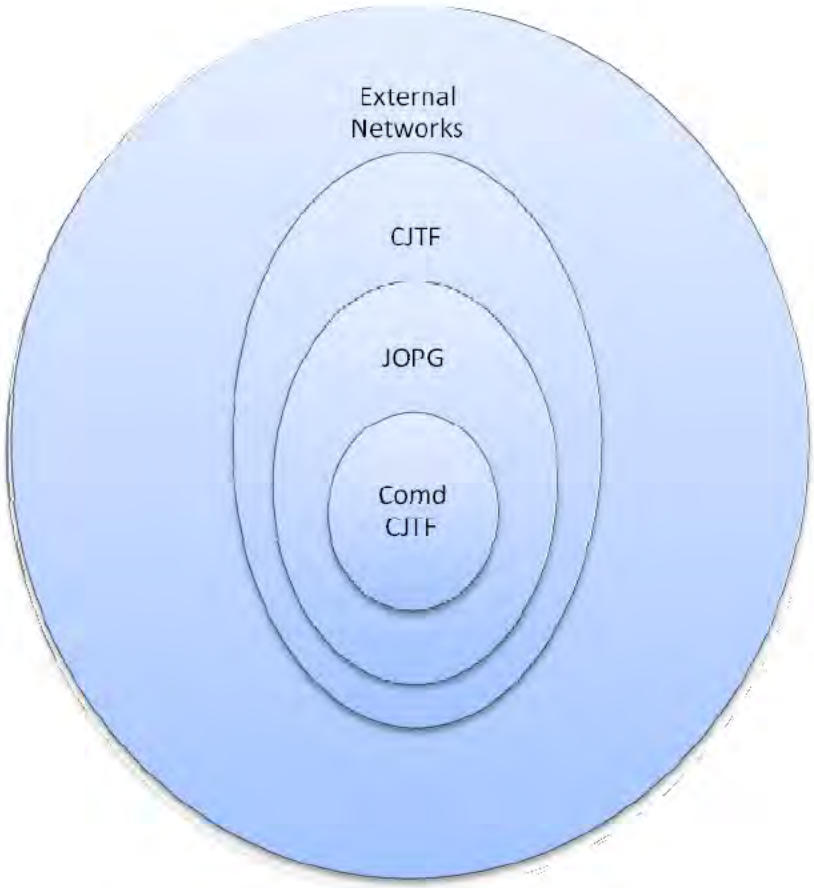

Figure 5. Networked CF OPP

The role of the Commander in the networked CF OPP will require a leap of faith for the individual. Instead of receiving all the information to make a decision, the Commander will give initial guidance and direction and allow the collaborative process within the networked organization to occur. By empowering the organization to determine the appropriate course of action and decision making, it will allow the organization, and in turn the Commander, to handle multiple tasks in a complex environment and speed up the deliberate planning process.[118] A Commander must establish sound and open social networks with the key staff members of the JOPG, J2,

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[118] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., 185.

and other key members within and across the organization.[119] In doing so, the Commander is improving flexibility within the organization as information and decision making do not follow the slower hierarchical chain of command.

The fundamental tenet for this networked C2 and the associated CF OPP to function properly is trust within the organization.[120] The Commander must be able to trust that the organization has received the initial guidance and understands the mission. All members must be educated and trained to the point they can be employed within a networked C2 and make timely decisions. All members must have trust in the network infrastructure that it is robust, secure, and everyone has full access within the organization. Without trust, the Commander will not be able to devolve decision making to subordinate Commanders and allow the collaborative process figure out such things as end state, objectives, CoG, decisive points, etc… The Commander will not have confidence the organization will be able to self-synchronize and adapt to the changing complex operating environment. The Commander must be able to issue initial direction, monitor progress, and make adjustments or 'veto' as required.[121] The main body to do this monitoring for the Commander will be the JOPG.

The Information Age has evolved to the point where it has the capacity to support a networked C2 approach with associated networked CF OPP. The internet, and the associated social interaction, is far reaching. Faster networks, greater bandwidth, more

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[119] David S. Alberts and Richard E. Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., 146.

[120] Forrester, *Collective C2 in Multi-National Civil-Military Operations*, Quebec City ed. Defence R&D Canada - Valcartier, 2011)., p1.

[121] Peter Thunholm, "C2 Agility: Evaluating a New Brigade Standard Operating Procedure for Information Management and Coordination at 16th ICCRTS" (Quebec City, QC, Swedish National Defence College, 2011, 2011)., p4.

tablets, phones, apps, and cloud based software are being developed and released each month. There are many tools which the networked CF OPP will utilize. Over the last twenty years, person to person email replaced the telephone as one of the main choices of communications.[122] Widely used in government, business, and military organizations it allows for direct correspondence and a paper trail of decisions and comments. The shortcoming of point to point email is it is another form of stove piping information. It is not conducive to collaborative work and sharing of information. A networked CF OPP would work on the premise where there are no emails to problem solve; all of the correspondence would be in a shared electronic forum for all to view. The shared electronic forum would be managed by the JOPG. This would break down the stove pipe of information, increase the overall situational awareness amongst all members of the organization, and foster trust and understanding.

Webpages are an important part of the networked CF OPP. A main webpage which is designed, set up, and monitored by the JOPG is the initial starting point for all work and allows all users within the network to gain familiarity with the location of information.[123] The webpage will be designed to foster a one stop 'market place' for all users.[124] As each smaller network within the organization completes a task or makes a decision, it would then be posted to this market place for others to view and adjust. The

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[122] Crebolder and Randall, *The Evolution of C2: Where have we been? Where are we Going? at 15th ICCRTS*, Santa Monica, CA ed. Defence R&D Canada, 2010)., p1.

[123] Webopedia, *Web 2.0*, http://www.webopedia.com/TERM/W/Web_2_point_0 html ed., Vol. 2014, 2014)., 1.

[124] Bjurstrom, Enkvist and Roxstrom, *A Harmonization Marketplace: C2 Goes Social* , Santa Monica, CA ed.Malardalen University, Sweden, 2010)., 9.

easier it is to source, post, and share information the quicker the decision making process and more agile is the CF OPP.

Linked to the networked CF OPP webpage are the social media tools. The ability to crowd source solutions is a powerful research tool which the JOPG can utilize to conduct deliberate planning. A problem or tasking can be identified and tasked to the network to solve. Like minded members of the network begin to work on this problem together and eventually come up with a solution, or many solutions. The U.S. Military has already begun to use this tool. Through the Defense Advanced Research Projects Agency (DARPA) it asked the general public for input in designing a new armoured vehicle.[125] The project was completed ahead of schedule in fourteen weeks and at a fraction of the cost of an internal design team.[126] This same concept can be utilized by a networked CF OPP to solve problems identified by the numerous working groups within the organization. Monitored by the JOPG, crowdsourcing offers the potential of faster analytical problem solving and generating numerous solutions for use by the entire organization.

Twitter is a social activity tool which can be utilized by the networked CF OPP. As of Jan 2014, Twitter has over 645 Million users and generates 58 million tweets per day.[127] Due to the requirement to keep social interaction to less than 140 characters per tweet, the speed and ease of posting information increases interaction between users

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[125] C. C. Weiss, "US Army Experiments with Crowd soucring Equipment Design," *Gizmag*, no. November (November 13, 2013, 2013).

[126] "DARPA Crowdsourcing Tank Design to Speed Up Heavy Weapons Development."http://www.gizmag.com/darpafang/23227/ (accessed 06/03, 2014).

[127] Anonymous, *Twitter Statistics*, http://statisticbrain.com/twitter-statistics/ ed., Vol. 2014, 2014b).

which increases social interaction.[128] It provides a much faster means of communication than blogs, shorter posts, shorter read time, and the tendency to generate more use and more frequent updates.[129] This social interaction builds the level of trust amongst the users, which generally migrate (like birds of the same feather) towards likeminded subjects, and increases collaborative work and innovativeness amongst the group. An individual can have a few followers, then within moments have hundreds of thousands of followers; the ability to interact and exchange information is tremendous. Twitter also allows the user to reach out and find other people or organizations with whom it can interact. It can start the conversation. As a source of intelligence, the J2 cell can use Twitter to understand populations and general trends. It can also use it as a monitor when a significant event occurs.[130] Finally, Twitter can be a tool to highlight key information which people within the networked CF OPP can use.[131]

If Twitter is a more formal social activity site to share information and seek information then Facebook can be viewed as the social network 'cocktail party' for informal engagement and discussion.[132] Facebook has over 1.28 billion users and

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[128] E. Fischer and A. Reuber, "Social Interaction Via New Social Media: (How) can Interactions on Twitter Affect Effectual Thinking and Behavior?" *Journal of Business Venturing* 26, no. 2011 (2011), 1., p1.

[129] Forrester, *Twitter as a Source for Actionable Intelligence at 18th ICCRTS*, Alexandria, Virginia ed. Defence R&D Canada, 2013).

[130] Bruce Forrester, "Twitter as a Source for Actionable Intelligence at 18th ICCRTS" (Alexandria, Virginia, Defence R&D Canada, 2013, 2013)., 1.

[131] Fischer and Reuber, *Social Interaction Via New Social Media: (How) can Interactions on Twitter Affect Effectual Thinking and Behavior?*, Vol. 26, 2011), 1., 3.

[132] E. Fischer and A. Reuber, "Social Interaction Via New Social Media: (How) can Interactions on Twitter Affect Effectual Thinking and Behavior?" *Journal of Business Venturing* 26, no. 2011 (2011), 1., 2.

generates 1 billion posts per day.[133] Face Book is the social media site to discuss issues at length and establish deeper relationships than utilizing Twitter. It can enable the collaborative work of a networked CF OPP by allowing trust to be built amongst users as they seek out build groups based on common interest. It can become the social lounge of a networked CF OPP.

These social network sites are now accessible across computers, laptops, tablets, and data phones. The networked CF OPP would need a robust infrastructure in order for it to make the CAF more agile. As the entire organization would work on the deliberate planning process, the ability to store all the collaborative work on cloud based software and accessible across all platforms is essential. More and more time is being spent by users on web based applications, which can be downloaded and used as required by the user.[134] These simple actions will assist in the sharing of information within a networked CF OPP and increase the agility of a networked C2 organization.

Militaries are developing cloud based applications which can be used by service members on personal and issues platforms. One system is being designed to be used by all members of a network to share, post, and download information.[135] Open to all users within the organization, it will restrict access to other organizations which are invited to

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[133] Anonymous, "How Many Active Users are there on Face Book?" http://wiki.answers.com/Q/How_many_active_users_are_there_on_Facebook?#slide=1 (accessed 06/03, 2014).

[134] Hamish McKenzie, "Web 2.0 is Over: All Hail the Age of Mobility," *Pando Daily*, 27 April 2012, 2012, .

[135] Max Hlywa and John W. Ross, *Briefing Note for DGMPRA: Social Media, Mobile Devices and Apps Reinventing Technology for Personnel (Smart4Pers)* (Ottawa: Director Research Operational and Organizational Dynamics,[2012]).

participate with have, thus ensuring security and the maintenance of trust within the network.

Studies conducted on the ability of a networked organization have begun with certain militaries. In Norway, studies conducted evaluating the performance of a networked edge based Army Brigade to conduct deliberate planning and issue orders demonstrated several key points. Overall, the networked model was faster and produced a faster decision loop cycle, conducted a faster deliberate planning process, and issued orders quicker than a standard brigade based on several reasons.[136] First, the sharing of information is necessary to enable horizontal coordination amongst units of equal standing within the same C2 organization. Second, all parties must have a shared opinion regarding the common goal and intentions from higher command. This understanding of the Commander's intent built trust and understanding of what needed to be accomplished. Third, all the information available within the networked C2 must be made available to all members. All members should be able to update and the common operating picture made available to all. Finally, the networked model maintained the Commander is overall in charge and had a 'veto power', the Commander allowed the lower level to self-synchronize, problem solve, and come up with collective solutions and orders.[137] The networked model used all the tools available and relied on the process similar to the proposed networked CF OPP.

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[136] Thunholm, *C2 Agility: Evaluating a New Brigade Standard Operating Procedure for Information Management and Coordination at 16th ICCRTS*, Quebec City, QC ed. Swedish National Defence College, 2011)., 5.

[137] Peter Thunholm, "C2 Agility: Evaluating a New Brigade Standard Operating Procedure for Information Management and Coordination at 16th ICCRTS" (Quebec City, QC, Swedish National Defence College, 2011, 2011)., 4.

A networked approach has been used in both Afghanistan and Iraq. American Special Forces under the guidance of Lieutenant General Stanley McChrystal built an organization based on agility and the ability to share information within the network.[138] Not happy with the hierarchy of information going up the chain of command McChrystal was able to develop with his highly trained special forces 'agile groupings' of people to share, process, and act on information. His staff at the Joint Special Operations Command (JSOC) utilized an intranet which permitted all members, regardless of rank, to access the same information. He built similar outposts throughout the region to feed into this network. His staff worked from a common webpage and communicated with each other via headset. This fusion of information and operations quickened the planning process and the time it took for forces to act in the theatre of operations.[139] McChrystal's development of a network C2 planning process is credited with the increase in successful operations in Iraq and played a key factor in the turnaround of American fortunes in 2005-2007.[140] McChrystal demonstrated that an agile network is effective within a complex operating environment. It also demonstrated that deliberate and rapid response planning was blending into one process as the pace of information and operations quickened. It showed that C2 organizations which are hierarchical in nature, much like the CAF and non-Special Forces organizations with the U.S. Military were too slow in their deliberate and rapid response planning process.

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[138] Mark Urban, *Task Force Black: The Explosive True Story of the SAS and the Secret War in Iraq* (New York: St Martin's Press, 2010), 336., 51.

[139] Mark Urban, *Task Force Black: The Explosive True Story of the SAS and the Secret War in Iraq* (New York: St Martin's Press, 2010), 336., , 69

[140] Mark Urban, *Task Force Black: The Explosive True Story of the SAS and the Secret War in Iraq* (New York: St Martin's Press, 2010), 336., 70

The CAF is currently reviewing the way ahead regarding its C2 in a complex operating environment. It is attempting to provide an outline for the CAF to transition to the NATO NEC C2 concept.[141] It is aware that as an organization it needs to adapt as the world becomes network enabled.[142] It is predicted that by 2028, networked based technologies will be fundamental to our future capabilities and that organizations will depend on networked devices which will become smaller, lighter, and less expensive.[143] Therefore it is important the CAF align its C2, CIS, ISR, and C4ISR policies to adapt to a networked environment.[144] Coupled with this is the requirement for the CAF to work closely with other departments and organizations and be able to connect to them and become a network. It will be through this comprehensive approach that the CAF will form a part of an integrated defence and security team with an overall goal of combining efforts and be able to work with industry and non-governmental organizations.[145] While the CAF acknowledges the need to enact a network enabled approach of improving the planning and execution of operations through the sharing of data, information, and communications to link people, processes and networks it will not support a fully flattened edge C2 network.[146] It is not ready to adopt a networked C2 organization nor

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[141] Vanguard Magazine, "Forming the Future Joint Network," *Vanguard* 2013., 2.

[142] Melanie Bernier and Joanne Treurniet, *CF Cyber Operations in the Future Cyber Environment Concept* (Ottawa: Defence R&D Canada,[2009])., p1.

[143] Melanie Bernier and Joanne Treurniet, *CF Cyber Operations in the Future Cyber Environment Concept* (Ottawa: Defence R&D Canada,[2009])., 2.

[144] W. J. Natynczyk, *CDS Directive - Joint C4ISR Requirements* (Ottawa: National Defence,[2012])., 1.

[145] Bernier and Treurniet, *CF Cyber Operations in the Future Cyber Environment Concept* (Ottawa: Defence R&D Canada, 2009), 1., p10.

[146] Melanie Bernier and Joanne Treurniet, *CF Cyber Operations in the Future Cyber Environment Concept* (Ottawa: Defence R&D Canada,[2009])., 13.

has it looked at the potential of a networked CF OPP in either the deliberate or rapid response planning process.

In the near future, the CAF will remain a command-centric organization and continue to lead from the top and demand information be pushed to the Commander. What the CAF is leaning towards is an organization based on the sharing of information from a 'need to know' to a 'need to share' commitment.[147] It supports the idea enabling all users within the CAF to share, retrieve, and make decisions based on the information placed within the CAF C2 organization. This concept can also be applied to a networked CF OPP; with a Commander at the top of the organization however with different roles and responsibilities. Issuing initial guidance the Commander can allow the JOPG to set up, enable, and monitor the networked organization to conduct the deliberate planning process knowing that they hold the veto power to overturn any decisions made within the organization.

The big difference between the current deliberate planning process and the proposed deliberate planning process is that the actual problem solving and developing a plan is conducted by the entire networked organization. The second fundamental difference is with the increasing operational pace within the complex operating environment. The difference between deliberate and rapid response planning is diminishing and they are merging into one process.

What is becoming different is how the operation is being conducted at the operational level and how it is adapting to the changing situation. Rapid response planning will change into real time planning to effect operations as they occur. As

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[147] Melanie Bernier and Joanne Treurniet, *CF Cyber Operations in the Future Cyber Environment Concept* (Ottawa: Defence R&D Canada,[2009])., 13.

General McChrystal demonstrated in Afghanistan and Iraq, and the Danish Battle Group in Helmand Province in 2010, this type of networked planning process can work. It can work not only in deliberate planning but also in rapid response planning. The final section of this paper will look at how the CAF can adapt a networked C2 organization can effectively use a networked rapid response process.

CHAPTER FIVE - THE NETWORKED BASED RAPID RESPONCE PLANNING PROCESS

…This is now a continuous feedback kind of world, and we need the organizational nimbleness to respond…

Unidentified CEO, Financial Markets, United States

At the operational level, the current rapid response planning process is not suited to operate in an agile, networked organization. Similar to the CAF deliberate planning process, the rapid response planning process is best suited to meet the requirements of a traditional hierarchical chain of command organization based in the Industrial Age. The purpose of rapid response planning is to optimize logical, analytical, steps of decision making in conditions of uncertainty.[148] It is accelerated mission planning in response to an immediate or sudden crisis, in which time is the biggest difference between deliberate and rapid response planning. In its current definition and form, the current rapid response planning process it is not agile enough to work in the Information age; up to and including an Edge based organization. In Canadian joint doctrine, there is very little discussion on rapid response planning; in fact, it is a reiteration of deliberate planning except for the amount of time allocated to conduct the planning process. In the chart below, there is little to differentiate between the two planning processes;

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[148] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142., 3-1

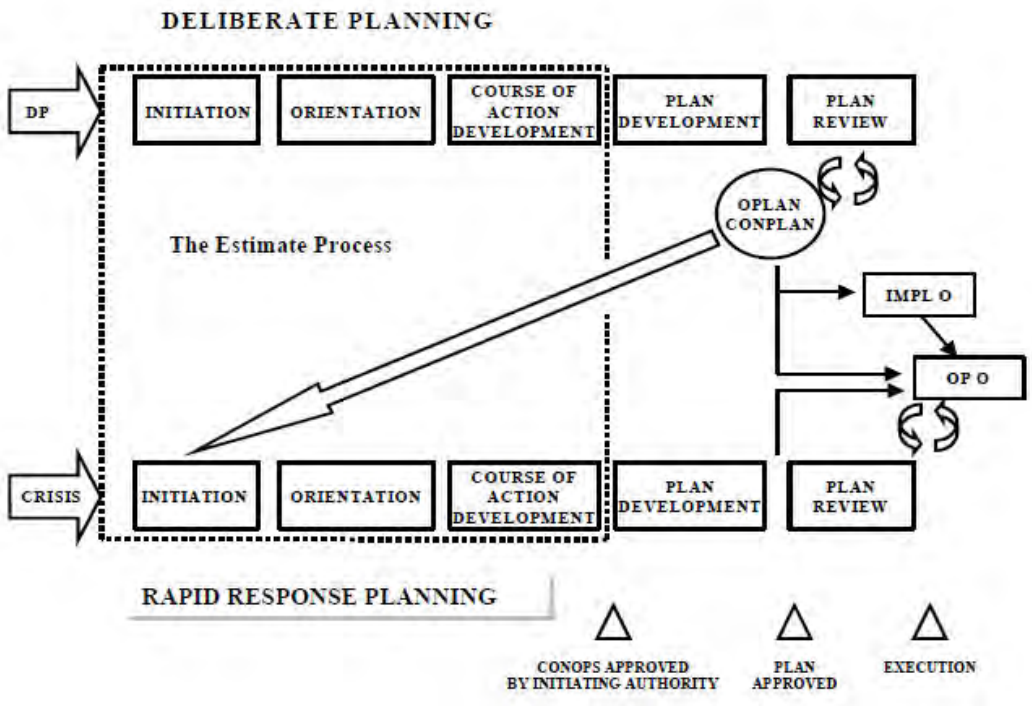

Figure 6. The Deliberate and Rapid Response Planning Process[149]

Information still flows in a vertical fashion in the chain of command, which still creates stove piped information and a reduction in sharing amongst members of the organization. Plans and orders are still produced in rapid response planning, however it is accepted that due to a lack of time to conduct a detailed analysis, the Commander is willing to accept a lesser amount of fidelity in order to respond to the crisis in an appropriate amount of time.[150] In its current state, the rapid response process expects the Commander to be further involved with the JOPG and to exercise direct control.

Today the CAF is presented an opportunity to update what it considers rapid response planning so that it can effectively function in the Information Age. It can be

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[149] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142., 4-1.

[150] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142. 3-9

refined so that it can operate within a complex operating environment and reflect the changing culture and networked C2 approach. It can become agile enough so that rapid response planning can occur in an edge based C2 approach. By comparing the current rapid response planning process with a proposed networked rapid planning process, a new definition of the rapid response planning process can be presented.

Rapid response operations are defined as "…[O]perations which require immediate CAF action to save lives, reduce suffering, and mitigate property damage."[151] The Commander must be willing to assume a higher risk to mission success and to the protection of lives in the planning, preparing and co-ordination of the operation. If the aim of deliberate planning process is to produce contingency plans which will be used in the future, rapid response planning is to produce orders with the expectation that the orders will be implemented immediately. For example, during OP MOBILE in 2011, the Canadian government ordered the immediate deployment of 6 CF-18 fighter jets participate in a NATO led operation to military intervention in Libya. These jets departed Canada within hours, with only the order to fly to Europe and await further instructions. While in flight, the JOPG conducted rapid response planning and issued a quick set of orders for the jets when they arrived in Europe. Being driven by the Commander, the planning staff is focused on identifying the mission, selected a solution, developing a plan, and issuing orders in a short period of time. Canadian doctrine does not go into detail in rapid response planning. It is almost an afterthought and only identified to show the difference in analysis conducted. Compared to the deliberate planning process, the amount of analysis is shortened. This lends itself to a naturalistic approach with direct

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[151] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142.6-2.

leadership and a 'hands on' approach from the Commander. It lends itself to the 'gut check' or intuitive choice of course of action based on the experiences and reasoning of the Commander in order to meet the timings during the crisis. In a complex operating environment, the 'gut check' course of action may not be the preferred option. CFJP 5.0 also explains that rapid response planning and its relationship with domestic crisis planning. It describes rapid response planning as being, "…[D]riven from the bottom up, originating at the municipal, regional, or provincial levels."[152] This amount of exposure within Canadian doctrine helps to develop a culture of treating rapid response planning as an afterthought amongst Commanders and their associated staffs. Rapid response planning is paid 'lip service' as the Commander will dictate what the course of action will be.

A networked rapid response planning process would empower the Commander and the JOPG to coordinate an analysis of the crisis situation. It would allow the CF OPP to be agile enough to work within whatever C2 approach the Commander decides to utilize within the mission. Specifically, a networked rapid response planning process would be based on the idea of supporting an edge based C2 approach, vice the current state of supporting a conflicted C2 approach. It would allow the Commander and the JOPG to maximize the use of the available data and information which is available within the Information Age. Like the networked deliberate planning process, it would encompass the entire organization to work on the analysis and the problem. The key to a networked rapid response planning process would be the ability for the organization to self-synchronize and respond immediately to the changing complex operating

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[152] Department of National Defence, *B-GJ-005-500/FP-000 Canadian Forces Joint Publication 5.0 the Canadian Forces Operational Planning Process*, Vol. Change 2 (Ottawa: DND Canada, 2010b), 142., 3-5

environment. Due to the nature of the crisis and time constraints, there will be gaps in the planning process. The organization will not have all the available information however it must mitigate the risk and respond quickly in an appropriate manner. The gaps will be filled as the situational awareness of the complex operating environment is filled and monitored. The networked rapid response planning process does not finish with the initial decisions, it continues throughout the duration of the crisis until the complex operational environment has reached a semblance of stability, which will allow for a detailed networked deliberate planning to occur. The networked rapid response planning must be agile and adaptive to change to the changing environment, and be able to produce quality decisions and orders for the organization to implement.

The Information Age has created new pressures on how the CAF conducts its rapid response planning. The time it takes for an individual or organization to become aware of a significant event or crisis in now reduced, thus reducing the amount of time a Commander and the JOPG can conduct planning.[153] This means that the organization needs to be flexible and agile enough to plan for any sort of crisis. Instead of relying on contingency plans and a 'one size fits all' concept, rapid response planning must be ready to change and adapt as the crisis changes and evolves. Society has become accustomed to immediacy and instantaneous information and feedback. Technology has enabled the world to become networked and the delivery of 'real time' information and the CAF must take this into account when it responds to a crisis.[154] Therefore, as soon as a crisis is

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[153] Alberts, *The Agility Advantage: A Survival Guide for Complex Enterprises and Endeavors* (Washington, DC: CCRP Publications, 2011), 615., 105.

[154] Elizabeth Kohn, Alexander Kalloniatis and Irena Ali, "Operationalizing C2 Agility: The Accountability Dilemma in the Network Centric Era" (Fairfax, Virginia, Defense Science & Technology Organisation - Defense Establishment Fairbain Australia, 2012, 2012)., p4.

identified in which the CAF will respond to, the rapid response planning much strive to develop priorities, develop situational awareness, process and distribute information, and begin interacting not only internal members of the organization, but with members of the general public, other governmental departments and non-governmental organizations.[155] This will require a networked rapid response planning process.

A networked rapid response planning process would not be driven by the Commander and the JOPG. Instead, once a crisis occurs, the Commander would order the JOPG to begin creating and managing the network within the CAF to begin the analytical process. As the complex operating environment changes, so does the rapid response planning and the associated priorities and resources; being able to, "…[R]eorganize on the fly."[156] It is key that the organization has the analytical muscle to respond to a crisis with relevance and immediacy.[157] It will require a rapid and agile organization to utilize the knowledge of all the members, in a way that doesn't require an organization to reconfigure. It will be able to self-synchronize based on trusted personnel, create forum accountability, context leadership and networked individualism.[158] The CAF will need to move from the industrial age concept of 'need to share' to the informational age concept of 'connecting and collaborating.'[159]

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[155] Elizabeth Kohn, Alexander Kalloniatis and Irena Ali, "Operationalizing C2 Agility: The Accountability Dilemma in the Network Centric Era" (Fairfax, Virginia, Defense Science & Technology Organisation - Defense Establishment Fairbain Australia, 2012, 2012)., 8.

[156] Alberts and Hayes, *Power to the Edge: Command... Control... in the Information Age*, 3rd ed. (Washington, DC: CCRP Publications, 2005), 303., 158.

[157] IBM, "Leading through Connections: Highlights of the Global Chief Executive Officer Survey" (Powerpoint, IBM Global Business Services, USA, 2012). 10

[158] Verdon, *The Wealth of People - Collaboration and Knowledge Governance - A Strategic Discussion Paper* (Ottawa: Defence R&D Canada, 2012)., p v.

A networked rapid response planning process will operate in real time crisis situations. It will strive to improve, "The planning and execution of operations through the seamless sharing of data, information, and communications technologies to link people, processes, and ad hoc networks."[160] The United States Military has begun to change its culture to adopt rapid response planning. Its definition of *mission command* is, "The command philosophy which decentralization and empowers the advances in information and communication technology and mobility computing."[161] It will allow members of the military, "…[W]ith mobile devices to reach back to networked based services and allow distributed Commanders and staffs to collaborate as though co-located."[162]

> …[D]eveloping a network that can simultaneously integrate secure and non-secure communications will widen the circles of action of who can support an operation. It will allow diverse stakeholders to contribute insights and expertise in *real time*…[163]

This is the key difference between the current rapid response planning process and the networked rapid response planning process. A JOPG will manage a crisis by monitoring and facilitating the collaboration of personnel across diverse fields of expertise in order to

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[159] Hayes et al., *Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS*, Alexandria, Virginia ed.18th ICCRTS, 2013)., 15.

[160] Bernier and Treurniet, *CF Cyber Operations in the Future Cyber Environment Concept* (Ottawa: Defence R&D Canada, 2009), 1., p. 11.

[161] Jonathan R. Agre, Karen D. Gordon and Marius S. Vassiliou, "C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS" (Alexandria, Virginia, Institute for Defense Analysis, 2013, 2013)., p1.

[162] Jonathan R. Agre, Karen D. Gordon and Marius S. Vassiliou, "C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS" (Alexandria, Virginia, Institute for Defense Analysis, 2013, 2013)., p1.

[163] Jonathan R. Agre, Karen D. Gordon and Marius S. Vassiliou, "C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS" (Alexandria, Virginia, Institute for Defense Analysis, 2013, 2013)., p1.

plan, develop, and issue orders. During a crisis, a premium is placed on seeking, handling and managing information in a timely fashion in order to make effective decisions.[164] The role of the JOPG is to monitor and manage the networked rapid response planning process. It also allows the Commander to monitor the solutions being built and delivered, allowing them to intervene in the decision making as required. The Commander, and the JOPG, will need to allow the self-directed collaboration to occur in order for the network users to research, debate, and formulate a decision. Their responsibility will be to ensure that the networked teams working on a problem will have access to all the shared information. The leader must empower the team to move on their own and determine the best path forward – an 'eyes on and hands off' style of leadership. The decision point for the leader will be to determine if a mistake is made during the effort to speed up the planning process, will the mistake be costly and result in a mission failure? This is where the leader steps in and provides direct leadership.[165]

As is the same within the networked deliberate planning process, like-minded individuals with common interests and knowledge will gravitate towards one another and without direction begin to work on problems. The organizational structure will reflect the crisis and the complex operational environment it is working within, making the 'one size fits all' structure irrelevant; there are simply too many factors to build an organization C2 approach prior to the crisis occurring. Instead, it will be the role of the Commander to decide what kind of networked C2 approach to adopt. The role of the JOPG will be:

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[164] M. Chumer and B. Osatuyi, "Collective C2 in Multi-National Civil-Military Operations at 16th ICCRTS" (Quebec City, QC, New Jersey Institute of Technology, 2011, 2011)., p1.

[165] 2014., part 1.

> …[F]oster a culture of innovation and collaboration through conversation. That is, the staff will ensure engagement and commitment in people that enables empowered, accountable action for the assemblage of the right people to make the right contribution to the right effort at the right time…[166]

Technology and the emergence of the Information Age have allowed the networked rapid response planning process to become a possibility. Specifically, web based 2.0 technologies and social media tools are changing how individuals and organizations respond and interact during a crisis event. Members of the CAF expect to have wireless capabilities comparable with personal devices with connectively to their peers, subordinates, superiors, external individuals and organizations, and overall connection to the World Wide Web.[167] These web-savvy members will work within cloud, crowd, and SMS based technologies where they can engage in crisis response at an unheard level. The ability of the CAF member or civilian to be the 'sensor' during a crisis, to provide real time data to the organization to collect, share, and make decisions from is changing the actions of organizations in crisis situations.[168] The JOPG must coordinate the rapid response planning process and be able to interact and respond to the 'sensors' within the complex operating environment. This real time interaction will improve the quality of the planning and execution of the military/whole of government operation. The sharing of information can improve rapid response planning by correcting errors made by the smaller groups within the organization, exchange alternate views, identify sources of

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[166] Verdon, *The Wealth of People - Collaboration and Knowledge Governance - A Strategic Discussion Paper* (Ottawa: Defence R&D Canada, 2012)., xiv.

[167] Agre, Gordon and Vassiliou, *C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS*, Alexandria, Virginia ed. Institute for Defense Analysis, 2013)., 2.

[168] Kathryn B. Laskey, "Crowd sourced Decision Support for Emergency Responders" (Alexandria, Virginia, George Mason University, 2013, 2013)., p1.

information and enable others to judge the motive and intent of the operation.[169] As General McChrystal pointed out the, "…[B]est decisions are made in the field and closest to the action – not at headquarters."[170] Technology is allowing the planning process to adapt a networked C2 approach and a networked rapid response planning process.

The change from the current rapid response planning to a networked rapid response planning is not only about changing the C2 approach from a conflicted to edge based C2 approach – it is about how social media tools are affecting decision making. Technology and the associated social media tools are changing how we interact. There also exists the opportunity to improve the networked C2 approach and rapid response planning model as the involvement of the entire organization and citizenry will be able to contribute to the enhanced situational awareness, self-synchronization and effectiveness of the organization in times of crisis.[171] An informed, active, and digitally empowered audience will demand authorities present network-enables connections and collaborative capabilities.[172] Some of the key points of this new interaction between the networked rapid response planning and the individuals in the complex operating environment are

a. Social Media has a part to play in crisis situations;
b. Government and organizations are beginning to use social media;
c. Social media providers, such as Google and Twitter, are willing to participate in crisis situations;

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[169] Hayes et al., *Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS*, Alexandria, Virginia ed.18th ICCRTS, 2013)., 15.

[170] Smith, *Innovation at Scale*, 2014)., part 2

[171] Hayes et al., *Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS*, Alexandria, Virginia ed.18th ICCRTS, 2013)., 15.

[172] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013)., 20.

d. Governments, NGOs, and individuals are creating templates and processes to generate rapid, flexible common responses;
e. Trust is key; and
f. Information sharing is a trigger activity which enables improved information quality, creating shared situational awareness, and enabled self-synchronization and collaboration.[173]

For the JOPG and the networked rapid response planning process, social media can provide insight into the operational environment in real time. It can monitor trend spotting and recognize events as they happen.[174]

For the JOPG, it will require that the organization sets up monitoring teams for social media, which can share the information with the rest of the collaborative organization. A networked rapid response planning process will also be able to utilize a digital library of contingency plans of archived content. Compared with real time information of the current crisis, the collaborative group can conduct a more thorough, detailed analysis in a quicker fashion.[175] Web based systems for crises contribute to the permanent monitoring and evolution of crisis events. Crowd mapping functions, reports tracking on maps, alert services and interactions with multiple sources of information all are contributing to increasing the overall situational awareness and building the common operating picture.[176] One example is the Google-based systems which receive input from a number of deployed entities in humanitarian and disaster relief. From GPS tracking of

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[173] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013)., 21.

[174] Kavanaugh, *Social Media use by Government: From the Routine to the Critical*, Vol. 29, 2012), 480., 481.

[175] A. Kavanaugh, "Social Media use by Government: From the Routine to the Critical," *Government Information Quarterly* 29, no. 2012 (11 August 2012, 2012), 480., 484.

[176] Kohn, Kalloniatis and Ali, *Operationalizing C2 Agility: The Accountability Dilemma in the Network Centric Era*, Fairfax, Virginia ed. Defense Science & Technology Organisation - Defense Establishment Fairbain Australia, 2012)., 6.

vehicles to individuals, to airborne mounted video and imagery, collaborative efforts such as Google Crisis is an example of a networked rapid response planning process.[177] The creation of similar military applications is growing in importance and is vital in creating a networked rapid response planning process. The CAF will, "…[N]eed to create apps for the cloud, put them up there, verify the apps work, and then let the analysts and users choose what they want."[178] Smartphones with cloud computing will extend collaborative maps to mobile users and tactical units with updating the collaborative picture with real time updates. These ideas and concepts will need to be implemented in order to fully realize the potential of a networked C2 approach and the associated rapid response planning process. Other key social media forums also will affect how decisions are made within the CAF command organization.

One Canadian initiative currently under development is the Online Government Advanced Research and Development Environment (ONGARDE). ONGARDE is a collective intelligence platform that will span the whole of government.[179] The intent of ONGARDE is to provide an environment for connecting people within a collaborative platform with a focus on training, education, and associated research. Further development of ONGARDE is to provide a supportive and secure social network for security professionals to exchange research, ideas and solutions. The goal is to eliminate

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[177] M. Crewes et al., "SPARCCS - Smartphone-Assisted Readiness, Command and Control System at 17th ICCRTS" (Fairfax, Virginia, Naval Postgraduate School, 2012, 2012)., 4.

[178] Agre, Gordon and Vassiliou, *C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS*, Alexandria, Virginia ed. Institute for Defense Analysis, 2013)., 2.

[179] Bill Railer, Phil Hoddinott and Jason Barr, "Change for the Better – the Canadian Defence Academy, Future Plans, and Moving Forward," *Canadian Military Journal* Spring 14, no. 2 (2014), 70., 71

information barriers between departments, reducing duplication and enable the sharing of information.[180] ONGARDE aims to provide a collaborative environment through social networking and provide an application store for users to download and utilize on mobile technologies. ONGARDE gets

> …[T]he right information to the right people at the right time. It is easy to locate people, content, and conversations inside the environment. It not only lets one search faster, it intelligently breaks down all areas of the system into categories in real time… Through the sharing of research and digital resources, organizations can accelerate project completion and lower overall development costs… Online environments have changed dramatically since organizations stared enabling service-oriented communities on their website. Online communities break down barriers, answer questions amongst themselves, and develop real time knowledge bases…'[181]

ONGARDE is the type of idea and project which a Networked CF OPP can utilize and incorporate into everyday use.

Social Media platforms such as Twitter play a key role in the networked rapid response planning process. Twitter is instantaneous and is becoming the first indicator of a crisis or emergency. Social media tools can monitor and analyze tweets. It can be used by the J2 and intelligence community for open source intelligence and pattern behaviour. It can be used as 'social radar' to detect break points that signify major sentiment shifts likely to have an effect or behaviour on the population, government, or adversary.[182] Twitter can be used as a tool to confirm results from a decision or action taken. By providing instant feedback crowd sourcing can allow the CAF to gain access to a large

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[180] Canada, "ONGARDE: Changing how we Work Together" (Newsletter, Chief of Military Personnel Newsletter, Department National Defence, Ottawa, 2013b)., 6.

[181] Railer, Hoddinott and Barr, *Change for the Better – the Canadian Defence Academy, Future Plans, and Moving Forward*, Vol. Spring 14, 2014), 70., 72.

[182] Forrester, *Twitter as a Source for Actionable Intelligence at 18th ICCRTS*, Alexandria, Virginia ed. Defence R&D Canada, 2013)., 14.

community of potential workers who have a diverse set of skills and expertise. It can be used within the CAF to allow networks to established and work on problems in the networked rapid response planning. Externally, the CAF can use crowdsourcing to interact with the population. It can develop intelligence and build trust with the population.[183] It can allow the CAF to create large, interconnected networks capable of instantaneous communications allowing intelligence collection and widespread distribution of information. This can only be done if the CAF adopts the hardware and infrastructure to allow it to operate in the Information Age.

Hardware and the associated infrastructure are now developed by the business community, not the military. Adapting commercial off the shelf (COTS) products allows the military to utilize the advanced features and up to date platforms, less cost, and faster time to develop.[184] Hardware such as smartphones and tablets are being incorporated into military, disaster relief, humanitarian aid, and intelligence organizations. Military specific hardware is being developed such as the Nettwork; a smartphone designed to replace the tactical radio.[185] The United States Marine Corps is evaluating a hand held platform aimed at adapting commercial mobile device technology for secure communications.[186] In 2010, the United States Navy began installing 4G LTE networks in warships; enabling

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[183] Nicholas Mumm, "Crowdsourcing: A New Perspective on Human Intelligence Collection in a Counterinsurgency," *Small Wars Journal* (Jan 3 2012, 2012)., 6.

[184] Agre, Gordon and Vassiliou, *C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS*, Alexandria, Virginia ed. Institute for Defense Analysis, 2013)., 2.

[185] Jonathan R. Agre, Karen D. Gordon and Marius S. Vassiliou, "C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS" (Alexandria, Virginia, Institute for Defense Analysis, 2013, 2013)., 5.

[186] Jonathan R. Agre, Karen D. Gordon and Marius S. Vassiliou, "C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS" (Alexandria, Virginia, Institute for Defense Analysis, 2013, 2013)., 8.

one ship to create a wireless network up to 20 nautical miles in distance and effectively reducing the requirement for some other means of communication.[187] These are only a few examples of hardware solutions which will enable the military to adopt a net centric warfare posture. The CAF is attempting to field the Integrated Solider System Project within the Canadian Army.[188] It is a Canadian based project to connect the solider on the battlefield within a computer network to share information and interface with various sensors. Scheduled to be fielded in 2014, the technology will already be dated because the CAF did not buy COTS technology – making it difficult to maintain and upgrade. The 'Canadian solution' means that the programme will be expensive and outdated by the time it reaches functionality and will be unable to interface with other networks within a coalition. The CAF will need to ensure its hardware is agile and flexible enough so that the organization can adopt a networked CF OPP. This will allow it to utilize a networked rapid response planning process.

Researchers have begun to test the validity of a networked C2 approach with a planning process similar to rapid response planning.[189] Students at George Washington University were organized in similar fashion to a JOPG working in a networked rapid response planning process during a crisis situation. Geographically separated, the group

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[187] Jonathan R. Agre, Karen D. Gordon and Marius S. Vassiliou, "C2 in Underdeveloped, Degraded and Denied Operational Environments : Commercial Technology at the Tactical Edge at 18th ICCRTS" (Alexandria, Virginia, Institute for Defense Analysis, 2013, 2013)., 8.

[188] David Pugliese, "High Tech Warriors: The CAF Integrated Soldier System Project," *Esprit De Corps* 21, no. 2 (2014), 8.

[189] Laskey, *Crowd sourced Decision Support for Emergency Responders*, Alexandria, Virginia ed. George Mason University, 2013), 3., 1.

was connected via the internet and social media. The main components of the virtual ecosystem were:

> 1. A common webpage to share and post information,
> 2. A Twitter-like social media application to notify others of key developments and interact with individuals involved in the crisis situation,
> 3. Social media analysis tools, and;
> 4. A real time common operation picture, being automatically updated from different sources of information.[190]

The aim of the study was to analyze the integration of crowd sourced social media with local and regional first responders (users), decision makers (JOPG) and leadership (Commander). The results of this study were threefold. First, citizen involvement affected both the emergency managers (users) and the public.[191] The decision makers were able to gain first hand situational awareness from citizen involvement. By reading tweets and webpage postings, managers were able to decide when and how to provide information and support to the public. It also helped the managers understand the immediate needs of the public and the need to be kept informed of the changing situation. Secondly, from the public perspective, it kept the public informed of the changing situation about the crisis.[192] This level of knowledge kept the public at ease and made them feel their needs were being taken into consideration by the managers and leadership. It created a sense of involvement and ownership in the decision making process. Third, Twitter was the most

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[190] Kathryn B. Laskey, "Crowd sourced Decision Support for Emergency Responders" (Alexandria, Virginia, George Mason University, 2013, 2013)., 3.

[191] Kathryn B. Laskey, "Crowd sourced Decision Support for Emergency Responders" (Alexandria, Virginia, George Mason University, 2013, 2013)., 8.

[192] Kathryn B. Laskey, "Crowd sourced Decision Support for Emergency Responders" (Alexandria, Virginia, George Mason University, 2013, 2013)., 9.

used social media tool.[193] It was the tool most referred to, updated and viewed. It helped built the level of trust between the public and the crisis response team. Finally, it was assessed that social media is not a replacement but a tool for decision makers to use.[194] A Commander and a JOPG will still require the organization to participate in the networked rapid response planning process, however this study demonstrated the power of social media to assist in the self-synchronization of an organization and interact during a crisis in a complex operating environment.

Crisis events which have occurred over the last decade also demonstrated how a networked rapid response planning process could operate. Natural disasters in Haiti, Japan, and the United States have demonstrated the challenges organizations and crisis management teams are affecting their management systems, plans, processes, and organizations. In 2010, a powerful earthquake struck off the coast of Haiti resulting in widespread damage in the capitol of Port-au-Prince. However, most of the country's cell phone towers remained intact. This enabled collaborative work to begin using text messages to become the main tool the general public, first responders, organizations, military planners, and even concerned citizens across the world used to collaborate and organize.[195] Collaboration continued to expand to include various aid, government, and individual groups as the crisis grew and then eventually stabilized over the following

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[193] Kathryn B. Laskey, "Crowd sourced Decision Support for Emergency Responders" (Alexandria, Virginia, George Mason University, 2013, 2013).,9.

[194] Kathryn B. Laskey, "Crowd sourced Decision Support for Emergency Responders" (Alexandria, Virginia, George Mason University, 2013, 2013)., 10

[195] Hayes et al., *Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS*, Alexandria, Virginia ed.18th ICCRTS, 2013)., 5.

weeks. Included in this were the first indications of a networked rapid response decision making process which began to self-synchronize.

In March 2011, a powerful earthquake struck off the coast of Japan resulting in widespread damage caused by a combination of the earthquake and tsunami. While phone and other emergency systems broke down, the internet remained intact and Twitter became the main tool for emergency service, interaction, and information.[196] The Japanese government did not have a unified disaster management framework resulting in a confused decision making structure. The decision making process was more concerned about the protection of information and the associated stove piping up each department than information sharing and group collaboration.[197] This affected the mobilization of the Japanese Self-Defence Force and the relief and rescue coordination. While this example of a non-networked decision making response illustrates the damaging effects of stove piped information, social media tools were used to engage and calm the general public during the crisis at the Fukushima power plant.[198]

In October, 2012 a powerful storm came ashore off the Eastern United States seaboard. Hurricane Sandy affected 8.2 million people, knocked out power to over 750,000 people, and resulted in numerous deaths.[199] Government and emergency response actively used social media tools to engage in the public, which affected the

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[196] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013)., 8.

[197] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013)., 8.

[198] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013)., 8.

[199] Margaret E. Hayes et al., "Social Media Influencing C2 in Underdeveloped and Degraded Operational Environments at 18th ICCRTS" (Alexandria, Virginia, 18th ICCRTS, 2013, 2013).

decision making and responses of the decision makers. As images, texts, video, tweets of the impact of the storm were posted, networked rapid response planning groups were able to use this real time information and prioritize resources and taskings. Social media tools like Google Crisis presented a one stop location for all information on the Hurricane. It provided a real time common operating picture, and other reports. It linked the general public to all the official social media sites of the first responders, managers, and leadership. Hurricane Sandy and the response of both government and citizens during the crisis, demonstrated the effect of a networked rapid response planning process. In a complex operating environment, not only with the government organization conduct internal networked planning during the crisis, it will also interact, respond, and adapt with the general public.

These three disaster response example can be translated into military operations. A military will find it increasingly difficult to operate in silence and restrict transmission of information by all of the users in a complex operating environment. A military operating near any human 'sensor' must function with the understanding that some reporting and sharing of information will occur. The three examples demonstrate how a networked rapid response planning process would potentially function in a complex operating environment. The crisis will happen quickly, require a faster response from the organization, and process the ability to monitor and adapt as the crisis unfolds. Contingency plans, for the most part, will become dated and ineffective after the first few minutes of a crisis. Instead, an organization needs to be agile enough in the C2 approach and planning process to interact in the complex operating environment.

A networked rapid response planning process needs to be viewed not as a shortened deliberate planning process but as a separate entity. This lends itself to the Commander making a snap decision based on experience and intuition and not analytical thinking. A networked rapid response planning process can provide the capability to conduct planning in times of crisis; it can do this by enabling the entire CAF to work on the problem and share information amongst all. It can interact with outside agencies and individuals in a timely and efficient manner. It needs to be viewed as a planning process which needs to operate in the present and be able to interact and adapt to a changing operational environment. It will not have all the information but through information sharing, interaction with external sensors will be able to enhance situational awareness and allow the organization to plan and act. It needs to be viewed as the planning process required to respond to crisis situations with no warning. The networked deliberate planning process should be viewed as the process to be used for any sort of operation which is not a crisis; i.e. given that the amount of time to anticipate and react is shortening in the Information Age, it is less likely a JOPG will be able to conduct deliberate planning with ample time prior to commencing an operation.

CHAPTER SIX - CONCLUSION – CAN THE CAF MAKE THE LEAP?

…either move faster than the market and define the standard, or become yesterday's news…

Brad Smith, CEO Intuit, Jan 2014.

In his retirement, General Stanley McChrystal has advocated four key points to leadership in the Information Age. First, the organization must have a common purpose and it is the leaders' responsibility to form the common purpose in a clear manner so that it touches the organization's heart, mind, and soul. This will make every member of the organization have a sense of ownership and move from a 'me' to 'we' mentality.[200] Secondly, the organization needs to have a feeling of shared consequences of making a decision.[201] It must strive to push the decision making into the users hands and not remain at the headquarters. To achieve this you need a free flow of information from a 'need to know' to a new model of rapid, well informed decision making across the entire organization. Everyone needs to feel able to 'think out loud' and work in a collaborative environment. The end result is faster, better, decision making by all members as an adaptive, empowered self-learning organization is built. Third, the organization must empower execution within smaller units in the organization.[202] It will allow users to move independently and determine what the best path forward is to accomplish the goal. As a leader, it is important to understand when to let the users continue and when to step in in order to avoid critical mistakes which will hurt mission success; not to micromanage and see it down your way but acknowledge there are many ways to solve a problem. Finally,

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[200] Smith, *Innovation at Scale*, 2014)., Part 1.

[201] 2014., Part 2.

[202] 2014., Part 3.

the organization needs to build trust within itself.[203] If the decision making powers are to be pushed out of headquarters and into the hands of the users, if the planning processes are to be pushed to the entire organization vice the JOPG, a high level of trust must be built within the organization.

This paper has demonstrated that the current CF OPP is unsuitable as a planning tool to address the challenges inherent in today's complex operating environment and that a networked CF OPP is a viable option which merits further research for operational level commanders. A Networked CF OPP with a clear distinction between a Deliberate and Rapid Response planning process can improve the CAF operational design capability.

Contemporary military planning procedures, like the CF OPP, were conceived during the Industrial age to address conventional warfare amongst nations. They are characterized by linear procedures and are optimised to deal with situations of limited complexity. Therefore, CF OPP is an appropriate planning tool for conventional operational level problems. CF OPP must be agile to become an appropriate planning tool for operational level problems in today's complex operating environment. The CF OPP must be networked in order to encourage collaboration, speed, responsiveness, and agility.

A Networked CF OPP is still in its infancy. As Schmidtchen states, in order for an organizational change to occur**,** technology, ideas, people, and organization must

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[203] 2014., Part 4.

change.[204] In 2014, the CAF has the technology and the ideas, however, not the people or the organization to create the change. In today's Information Age, the hardware is available in the form of smartphones, tablets, and laptops with enough bandwidth, coverage, and redundancy to meet the needs of the CAF. Social media tools such as Twitter, crowd sourcing, social media analyses, common operating pictures, and webpages present the CAF an opportunity to integrate its planning and execution of missions. The CAF has the capacity to change and become an agile organization which can maximize the analytical and decision making power of the organization as a whole. What it needs to do is to change the culture of the organization.

Canadian definitions of deliberate and rapid response planning do not fit within the Information Age and a complex operational environment. In its current definition, there is very little to differentiate between the two planning processes, save for the amount of time available and the expected product. In the Information Age, the planning processes are accelerating in conjunction with the deliberate and rapid response decision making processes; therefore a shift in thinking must occur. Instead of looking at both processes as a linear, step by step decision making process, it must be looked as a network working within a complex operating environment. Finally, these changes to the planning process cannot occur without a fundamental change to the culture of the CAF. This will allow the CAF to be able to maximize the tools and hardware of the Information Age.

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[204] Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military*, ed. Hopkins (Australia: Land Warfare Studies Centre, 2007), 333., 11.

Information and the ability to share it within the organization must be with every member of the CAF, regardless of rank and position. This will allow the Commander and the JOPG of a CJTF to maximize the human processing power of the entire organization. It will allow for collaboration and for every member of the CAF to contribute to the plan, contribute their knowledge and skills, and share in the common purpose and goal of the assigned task. Instead of a linear approach which is espoused in the current CF OPP operational design chart, a networked CAF and planning process will quicken the decision making and allow users, planners, and leaders to tackle the many problems or situations at the same time within the complex operational environment.

The end state of this paper is to improve the CAF's ability function in the information age and design operational campaigns which will achieve the strategic goals of the nation. It is recommended that further research be conducted on the following two subjects. The first is the practical application of a networked CF OPP and the testing and evaluation of a networked CF OPP to facilitate operational planning. It is recommended that a series of Command Post Exercises test this concept prior to testing in a Joint Exercise. Second, the impact of a 'flattened' command and control organization embedded within the current CAF hierarchical organization is recommended for further study. The two command and control organizations within the CAF must achieve a balance; special attention to the networked CF OPP and its ability of all members to access, post, and share all information. These two topics for further research will expose the CAF to a new command and control model, however, as more and more 'digital natives' enter the CAF and assume operational and strategic level command position, the potential exists for the idea to take hold and organizational change to occur.

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