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Campaign Design: One Framework for a Volatile, Uncertain, Chaotic and Ambiguous Environment?

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ABSTRACT

The need to confront the challenges of the strategic environment has logically led to a search for the ideal campaign design framework that military leadership can translate into doctrine. The ability to attain objectives, integrate and conduct strategies, and organize forces using operational art must be orchestrated utilizing campaign design tools. When applied in a coordinated manner these tools form an operational design framework with skills, imagination, and creativity to assists commanders and designers in organizing their thoughts. Whether it is an 'analytically or intuitively' based campaign design framework it is realized that no good analysis can happen without intuition and no good intuition happens without analysis. Strategic problems require adaptive and progressive approaches like the *Strange* or the *Decide-Detect-Deliver* methods to address the complex strategic environment of the 21st century. The design framework that worked previously may not be applicable to a new strategic situation. Thus, the ends, ways, and means of strategy may require commanders and designers to select a new campaign design framework for each problem, based on changing strategic influences, personal preference and experience.

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> *The transformation process is evolutionary and has no definable end state. Transformation focuses on people, technology, ways of conducting operations and ways of thinking. It does not seek to restructure the Canadian Forces completely, or reequip it, but rather to blend existing and emerging systems and structures to create greatly enhanced capabilities relevant to future mission, roles and tasks.*[1]
>
> Canadian Forces Transformation Homepage

INTRODUCTION- ENVIRONMENT

Has the strategic environment of war changed over the past century? Carl von Clausewitz stated in *On War* that the climate of war was comprised of four elements: danger, uncertainty, exertion, and chance.[2] In 2006, the United States Army War College summarized the environment of war as volatile, uncertain, complex and ambiguous (VUCA).[3] So, again has the strategic environment of war changed or is it in fact that the *friction* of people interacting on a global scale combined with evolving technology has increased the *fog* in which militaries must think and conduct operations, represented in Figure 1. [4] It is this transformation in the interaction of people that has not changed

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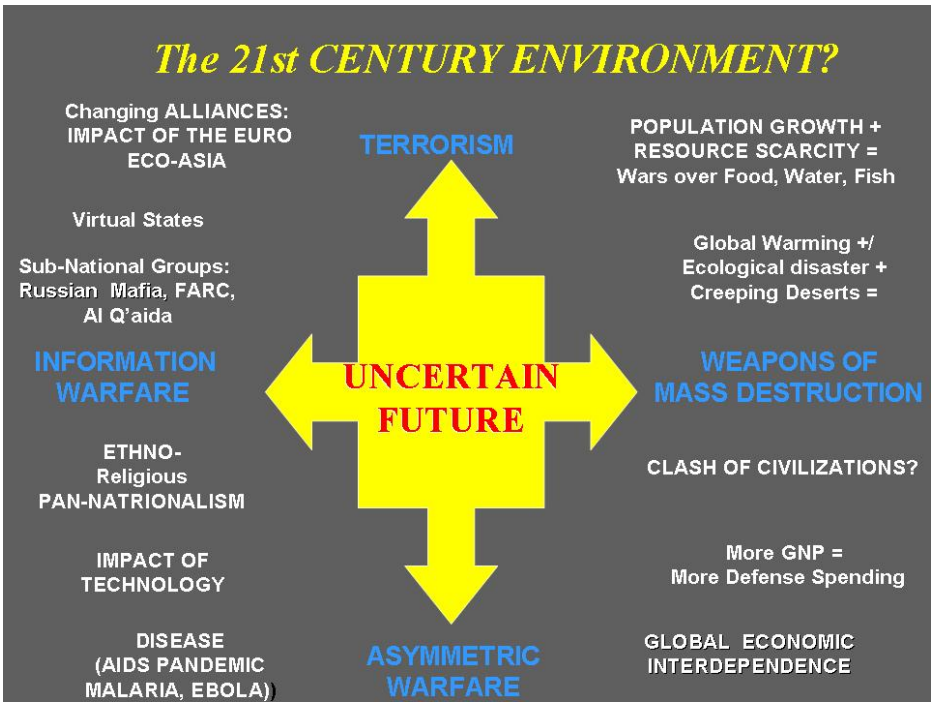
[1]Department of National Defence, "CF Transformation- From Vision to Mission," http://www.cds.forces.gc.ca/cft-tfc/intro_e.asp; Internet; accessed 5 February 2008.

[2]Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 104.

[3]Harry R. Yarger, "The Strategic Environment," in *Strategic Theory for the 21st Century: The Little Book on Big Strategy* (Carlisle Barracks PA: Strategic Studies Institute, Army War College, 2006), 18.

[4]The military concept of *fog and friction* is attributed to Clausewitz. Friction refers to the physical impediment to military action. So in the context of Clausewitz and the USAWC's VUCA environment can be compared to: the danger, volatility, exertion and complexity. Whereas fog refers to the commander's lack of clear information and in the Clausewitz and the USAWC's VUCA environment is likened: uncertainty, ambiguity and chance. Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 119- 121.

Figure 1- The VUCA Environment



Source: *From Information Warfare (IW) to Information Operations (IO) to the Global 'War' on Terrorism,* COMM 5500: Lecture 4 Prof. Phil Taylor (ICS, University of Leeds) www.leeds.ac.uk/ics/pmt; Internet; accessed 19 April 2008.

the environment of war but created a societal culture with truly distinct *tame* and *wicked* problems.[5]

The foundation that society is being confronted with *tame* and *wicked* problems was proposed in 1973 by urban planners Horst W.J. Rittel and Melvin M. Webber of the University of California, Berkley in "Dilemmas in a General Theory of Planning." This theory was built upon in 1974 and 2001 by Russell Ackoff in his book *Re-designing the Future* and Robert Horn in "Knowledge Mapping for Complex Social Messes," respectively, which proposed that society is not just faced with problems but *messes* that do

[5]Horst W.J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4 (1973): 160.

not have straightforward solutions.[6] The author offers that Rittel and Webber's original theory provides military leaders with a clearer understanding of today's environment in which they struggle for solutions.

In 2001, the original theory of *tame* and *wicked* problems was furthered by Jeff Conklin in his book *Dialogue Mapping: Building Shared Understanding of Wicked Problems* which was about a new way to create shared understanding. He characterized a *tame* problem as well-defined and stable with a definite end-state. Moreover, the solution to a *tame* problem could be objectively tried and abandoned as it belonged in a similar class of problems with a limited set of alternative solutions.[7] The classical linear military planning systems approach that organizes problems into five distinct phases: understand the mission; gather the information; analyze the information; synthesize the information and work out a solution, worked for *tame* problems.[8] Unfortunately, the *friction* and *fog* of today's society has resulted in *wicked* problems which cannot automatically be systematically solved. *Wicked* problems are dynamic, ill-defined, ambiguous, complex and evolving within a society.[9] They are unique problems that are characterized as a symptom of another problem that have no definitive formation or stopping rule. In addition, there is no immediate or

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[6]R. Horn, "Knowledge Mapping for Complex Social Messes," A presentation to the "Foundations in the Knowledge Economy" at the David and Lucile Packard Foundation, 1.

[7]Jeff Conklin, "Wicked Problems and Social Complexity," in *Dialogue Mapping: Building Shared Understanding of Wicked Problems* (CogNexus Institute, 2006), 9.

[8]Horst W.J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4 (1973): 162.

[9]Tom Ritchey, "Wicked Problems: Structuring Social Messes with Morphological Analysis," *Swedish Morphological Society*: 1-2, http://www.swemorph.com; Internet; accessed 1 February 2008.

enumerable set of potential solutions but a 'one-shot operation' that is good or bad.[10] Thus in order to solve a *wicked* problem a shared understanding and commitment to the problem and possible solutions must be created.[11] Likewise, military leaders can achieve solutions and coherence with the utilization of a common language of tools, methods and practices-strategy.[12]

Military strategy "is derived from political direction and results in the application of the military power through force or a threat of force to achieve policy goals."[13] In other words strategy could be a continuum of ends-ways-means.[14] Yet there is a danger in this continuum as military leaders can default to a process that is resource driven which is emphasized by David Jablonsky when he argues:

> …students weaned on the structural certitude of the five-paragraph field order and the Commander's Estimate naturally find…structure comforting which dealing with the complexities of strategy. [He cautioned] In an ever more interdependent world [VUCA] in which variables for the strategists within the ends-ways-means paradigm have increase exponentially, strategists are no nearer to a 'Philosopher's Stone' than they ever were. Strategy remains the most difficult of all art.[15]

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[10]Horst W.J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4 (1973): 162.

[11]Jeff Conklin, "Wicked Problems and Social Complexity," in *Dialogue Mapping: Building Shared Understanding of Wicked Problems* (CogNexus Institute, 2006), 14.

[12]*Ibid*., 19.

[13]Howard G. Coombs, "Perspectives on Operational Thought," in *Operational Art: Canadian perspectives: context and concepts*, ed. Allan English, Daniel Gosselin, Howard Coombs and Laurence M. Hickey (Winnipeg: Canadian Defence Academy Press, 2005), 75.

[14]Gabriel Marcella, "The Strategy of Teaching Strategy in the 21st Century," http://www.strategicstudiesinstitute.army.mil/pdffiles/of-interest-6.pdf; Internet; accessed 5 December 2007.

[15]*Ibid*., 2.

Thus strategy today requires leaders with creative, focused, instinctive and flexible decision making skills and processes or what Colonel Robert Brown refers to as Agile-Leader Mind-Set.[16] This is required in order to exercise influence over the Volatility, control the Uncertainty, simplify the Complexity, and resolve the Ambiguity.[17] Leaders must take doctrinally furnished "intellectual tools that bolster leaders against stress, friction, and fog"[18] and apply it to the operational level of war. It is at this level where *wicked* and *tame* problems for the military are studied, analyzed evaluated and solved within a campaign plan.

The Canadian Forces has doctrine that defines the requirements for strategic and tactical level leaders and the associated roles and responsibilities each must play to be successful. Conversely, at the operational level, leaders are faced with a less defined environment, an environment that forces the requirement for leaders to become translators (in a sense) between the institution and people. Within the context of the Canadian Forces, it can be said that strategic leaders are focused on leading the institution and implementing change to achieve success. Tactical leaders are focused on leading the people through motivation to achieve the desired effect. Operational leaders are the first leaders to define the strategic vision. They use the classic doctrine of operational art to synchronize and achieve strategic objectives through campaign design which makes tactical level actions

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[16]Colonel Robert B. Brown, "The Agile-Leader Mind-Set: Leveraging the Power of Modularity in Iraq," *Military Review* (July-August 2007): 39.

[17]Harry R. Yarger, "The Strategic Environment," in *Strategic Theory for the 21st Century: The Little Book on Big Strategy* (Carlisle Barracks PA: Strategic Studies Institute, Army War College, 2006), 18.

[18]Montgomery C. Meigs, "Operational Art in the New Century," Parameters 31, no.1 (Spring, 2001): 12.

more efficient and coherent.[19] Thus, operational art is a doctrine that is utilized at the operational level in order to successfully use tactical forces to achieve strategic objectives.[20]

The Canadian Forces defines operational art as "the skill of employing military forces to attain strategic objectives in a theatre of war or theatre of operations through the design, organization and conduct of campaigns and major operations."[21] This linear model at Figure 2 represents operational art. Arguably applying operational art in this fashion

Figure 2- Operational Art

Source: The Army Operational Art Model from Canada. Department of National Defence, B-GL-300-000/FP-000 *Canada's Army*. Ottawa: DND Canada, 1998. pg 102.

lends itself to an analytical process of overcoming *tame* problems. Yet is it applicable to *wicked* problems in today's VUCA environment? Military leaders are challenged with

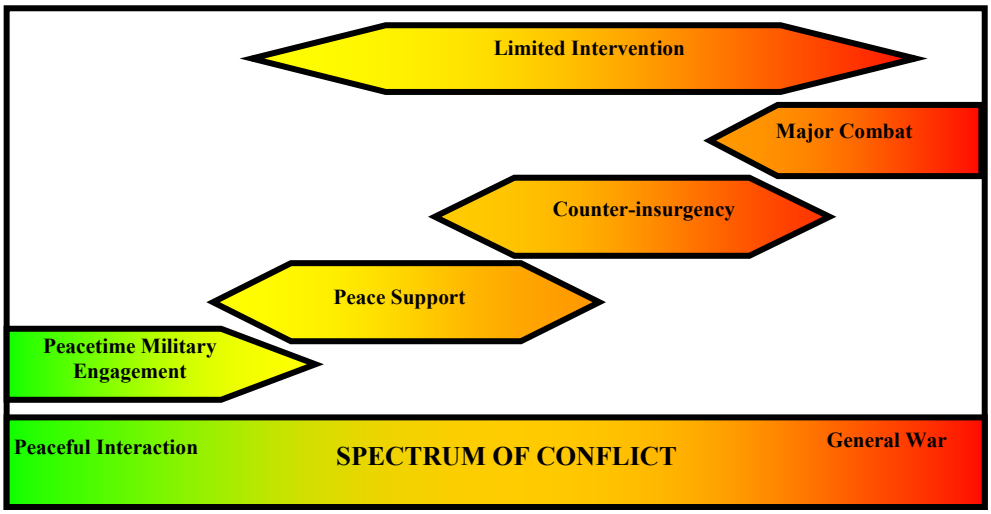
[19]Colonel J.H. Vance, "Tactics without Strategy or Why the Canadian Forces Do not Campaign," in *Operational Art: Canadian perspectives: context and concepts*, ed. Allan English, Daniel Gosselin, Howard Coombs and Laurence M. Hickey (Winnipeg: Canadian Defence Academy Press, 2005), 272. A good source to learn about the development of operational art is the book *The Operational Art: Developments in the Theories of War* ed. by B.J.C. McKercher and Michael A. Hennessy, Editors (Westport, CT: Praeger Publishers, 1996). And for a Canadian perspective of operational art the book *Operational Art: Canadian perspectives: context and concepts*, ed. Allan English, Daniel Gosselin, Howard Coombs and Laurence M. Hickey (Winnipeg: Canadian Defence Academy Press, 2005).

[20]Colonel J.H. Vance, "Tactics without Strategy or Why the Canadian Forces Do not Campaign," in *Operational Art: Canadian perspectives: context and concepts*, ed. Allan English, Daniel Gosselin, Howard Coombs and Laurence M. Hickey (Winnipeg: Canadian Defence Academy Press, 2005), 272.

[21]Department of National Defence, B-GJ-005-300/FP-000 *Canadian Forces Operations* (Ottawa, DND Canada, 2005), GL-7.

planning and decision making throughout the full spectrum of conflict shown at Figure 3.[22] This environment demands that militaries find new ways to solve *wicked* problems and is challenging the level at which operational art is practiced and the campaign design

Figure 3- Spectrum of Conflict



Source: Predominant Campaign Themes across the Spectrum of conflict from a presentation by Major Dave Lambert, "Fundamental of Land Power: The Generation &Application of (Land) Fighting Power." Canadian Forces College Joint Command and Staff Program Lecture. C/DS-525/CPT/LD-02. 31 January 2008.

frameworks in which doctrinal tools are applied. At Canadian Expeditionary Force Command (CEFCOM) the current adhoc approach to operational-level campaign design is believed to be insufficient and has resulted in the proposed solution of adopting one campaign design framework model into Canadian Forces doctrine.[23] However, this proposal may result in commanders and planners using a campaign design framework model that does not address the problem. As a result, this paper will demonstrate that the current operating environment supports campaign design framework models that are not captured in

[22]Department of National Defence, B-GJ-005-300/FP-000 *Canadian Forces Operations* (Ottawa, DND Canada, 2005), 1-2.

[23]Pierre Lessard, "Campaign Design for Winning the War…and the Peace," *Parameters* (Summer, 2005): 45.

doctrine but uniquely selected based on the specific problem in order to create a durable and long lasting peace.

The debate to whether operational art is practiced solely at the operational level or throughout the levels of war has been debated extensively.[24] For the purposes of this paper, the debate of *what* operational art is and the level of war it is practiced will not be addressed. Rather the definition provided by Howard Coombs will be used as it emphasizes the analysis of a problem and recognizes the complexity of the contemporary operating environment unlike the Canadian Forces definition. Coombs defines operational art as "the use of theory and doctrine to dissect complex military problems and to develop and sequence campaigns."[25]

This paper will concentrate on *how* operational art is exercised and the framework used to translate strategic aims (ends) into campaigns (ways) using the Canadian Forces doctrinal elements of operational design that permits the allocation of resources (means) that are utilized at the tactical level in order to achieve strategic objectives.[26] First, this paper will examine analytical and intuitive human problem solving approaches and how they are currently used in operational design and planning to solve *tame* and *wicked* problems within the operational art model and establish "there is no good analysis without

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[24] For example, military leaders such as Colonel James Simms, "Keeping the Operational Art Relevant for Canada: A Functional Approach," and Colonel J.H. Vance "Tactics without Strategy or Why the Canadian Forces do not Campaign," have provided an experienced perspective on this rigorous debate.

[25]Howard G. Coombs, "Perspectives on Operational Thought." in *Operational Art: Canadian perspectives: context and concepts*, ed. Allan English, Daniel Gosselin, Howard Coombs and Laurence M. Hickey (Winnipeg: Canadian Defence Academy Press, 2005), 78.

[26]*Ibid*., 78.

intuition, and no good intuition without analysis."[27] Next, this paper will define the current doctrinal elements of Canadian Forces campaign design which will provide a common lexicon for the subsequent examination of two western frameworks of campaign design; Strange Analysis and Decide-Detect-Deliver Concept. Finally, these two frameworks will be analyzed to demonstrate how they can equally be applied against the complex scenario of North Atlantic Treaty Organizations Zoran Sea Crisis.[28] Concluding that in order to address the ill-structured environment of the 21st century, the campaign design template that worked last time may be unusable. Thus, the ends, ways, and means of strategy may require commanders and planners to select a new campaign design tool for each problem.[29]

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[27]William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005): v.

[28]The NATO Zoran Sea Crisis scenario has been developed by NC3A and the Canadian Forces College (Toronto). It is a useful scenario that is built to address both symmetric and asymmetric operations and precipitates complex problems. Moreover, these complex problems challenge campaign designers and allow them to utilize multiple campaign design tools. Background on this scenario is available at PfP LMS. "Zoran Sea Exercise Read Ahead," http://pfp.ethz.ch/ilias.php?baseClass=ilSAHSPresentationGUI&ref_id=182; Internet; accessed 13 March 2008. Appendix 2 provides the basic overview of the Zoran Sea Crisis.

[29]United States Department of Defense, Army TRADOC Pamphlet 525-5-500, *Commander's Appreciation and Campaign Design* Ver 1.0 (28 January 2008), 16.

Truly successful decision making relies on a balance between deliberate and instinctive thinking.
Malcolm Gladwell, Blink: The Power of Thinking without Thinking

CHAPTER ONE- PROBLEM SOLVING- MEANS

Is a leader's brain right or left side dominant? This question was important to scientists a generation ago when it was believed that thought processes were based on the two sides of the brain.[30] They believed that the left side of the brain processed information in a planned and structured manner and solved problems by logically and sequentially looking at the parts of things- *analytical*. The right side of the brain responded to information in a fluid and spontaneous manner which solved problems with hunches, looking for patterns and configurations- *intuitive*.[31]

Within a military context, the friction and fog that is created by a volatile, uncertain, complex and ambiguous (VUCA) environment places leaders in positions that require decisions that are derived from both sides of brain dominations based on the information they have at a specific point in time.[32] In order to provide leaders with refined and detailed information on which to base decisions, which should reduce uncertainty, processes have been developed that logically provide information in a structured and established format. This process for the Canadian Forces is called the Operational Planning Process (OPP). The Canadian Forces OPP is defined as "planning processes that is applicable to all aspects of

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[30]William Duggan, "Coup D'oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005), 1.

[31]Left Right Hemisphere Brain Processing, "Logical versus Intuitive Processing," http://www.web-us.com/brain/LRBrain.html#Logical; Internet; accessed 19 April 2008.

[32]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 1-2.

the employment of military force not just war fighting."[33] What is important for this paper is that operational art is practiced within this process and provides the foundation in which to design a campaign.

This chapter will first provide further detail into analytical and intuitive problem solving processes and introduce a new problem solving term- *intelligent memory*. Next, it will introduce the Canadian Forces OPP and provide insight into how campaign design is nested within this process. Finally, using the concepts of problem solving, it will be demonstrated how the Canadian Forces OPP is an intertwined process that incorporates holistic thinking which is suitable for solving tame and wicked problems.

Analytical thinking is attributed to the classical Greeks, as far as Western civilization is concerned.[34] According to the Greeks, they invented analytical thinking; the Romans build really straight roads with it; the Dark Age lost it, and the Enlightenment rediscovered it.[35] Analytical decision making approaches are methodical and they breakdown problems into recognizable elements: analysis of a problem; generation of several solutions; comparison of the solutions against established criteria, and the selection of the best possible solution,[36] which is similar to the classical military planning systems approach discussed in the introduction. Contemporary authors have taken this structured

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[33]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 1-1.

[34]Ezine articles, "Analytical/ Intuitive Thinking," http://ezinearticles.com/?Analytical-/-Intuitive-Thinking&id=94800&opt=print; Internet; accessed 1 March 2008.

[35]*Ibid*., 2.

[36]William Duggan, "Coup D'oeil: Strategic Intuition in Army Planning," United States Army Strategic Studies Institute (November 2005), 7.

approach and further developed the idea of analytical thinking as critical thinking or rational action which could be likened to the Greek, Roman, Dark Age and the Enlightenment eras.

The basis for critical thinking is believed to have begun in 1910 (the Greek era) with the book *How We think* by John Dewey.[37] He introduced the concept of reflective thought which is defined as an "active, persistent, and a careful consideration of any belief or supposed form of knowledge in the light of the grounds that supports it, and the further conclusions to which it tends."[38] Taking Dewey's definition and combining it with his process of five logical distinct steps of reflective thinking it could be argued that his concept is equated to analytic problem solving.[39] Dewey presented the five logical steps as:

> (i) a felt difficulty; (ii) its location and definition; (iii) suggestion of possible solution; (iv) development of reasoning of the bearings of suggestion; (v) further observation and experiment leading to is acceptance or rejection; that is, the conclusion of belief or disbelief.[40]

In 1933, Dewey revised *How We Think* and changed his five logical steps to phases.[41] Despite the phases not being identical to steps the central ideas on reflective thinking remained intact and emphasized that "although all of the phases are necessary in the process

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[37]James Thomas Stieb, Ed.D, "History and Analysis of Critical Thinking," Dissertation (Memphis State University, December 1992), 6.

[38]*Ibid*., 7.

[39]The United States Army Publication Field Manual 5-0 *Army Planning and Orders Production,* January 2005, 1-6, states that Analytical decision making approaches a problem systematically. Leaders analyze a problem, generate several possible solutions, analyze and compare them to a set of criteria, and select the best option.

[40]John Dewey, *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process* (Boston: D. C. Heath, 1933), 72.

[41]John Dewey's revised book was titled *How We think: A Restatement of the Relation of Reflective Thinking to the Educative Process.*

of reflective thinking, under some circumstances some of the phases may or may not be more important that other phases."[42] Moreover, he noted that the phases may not "follow one another in a set order,"[43] which is a concept that was to be reintroduced later in the century. Dewey's concept of reflective thinking, which can be interpreted as traditional problem solving, as it appeared to overlap or intersect with critical thinking, established the foundation for the future development of critical thinking in the 1940s and 1950s.[44]

In the 1940s and 1950s (the Roman Era) the concept of reflective thinking transitioned to the currently used term of critical thinking. The concept of critical thinking and its subsequent development can be attributed to a number of people, one of whom is Edward M. Glaser.[45] Glaser's book *An Experiment in the Development of Critical Thinking* was the first to extensively use the term critical thinking.[46] He believed that "critical thinking calls for a persistent effort to examine any belief of supposed form of knowledge in the light of evidence that support it and the further conclusions to which it tends."[47] Although Glaser did not use Dewey's five steps or phases in his initial research, the five steps were articulated in future works and added to Glaser's two new concepts: of

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[42]James Thomas Stieb, Ed.D, "History and Analysis of Critical Thinking," Dissertation (Memphis State University, December 1992), 25.

[43]John Dewey, *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process* (Boston: D. C. Heath, 1933), 115.

[44]James Thomas Stieb, Ed.D, "History and Analysis of Critical Thinking," Dissertation (Memphis State University, December 1992), 28.

[45]*Ibid*., 30.

[46]*Ibid*., 31.

[47] Edward M. Glaser, *An Experiment in the Development of Critical Thinking,* Teachers College, Columbia University, Contributions to Education 843. (New York: Bureau of Publications, Teachers College Columbia University, 1941. Reprint, New York: AMS Press, 1972), 6.

recognition of unstated assumptions; and the accurate comprehension of language.[48] Yet, despite slight differences in Dewey's original theory, Glaser also concluded that critical thinking and problem solving overlap or intersect. It would not be until the 1960s and 1970s that the concept of de-linking critical thinking and problem solving would be attempted.

A number of authors attempted to de-link the idea of problem solving and/or scientific method from critical thinking in the 1960s and 1970s (the Dark Ages). In the 1980s to 1990s (the Enlightenment) critical thinking was revived which resulted in Robert H. Ennis introducing rational thinking.[49] Ennis' concept of rational thinking was originally defined (1979) as simply "the correct assessing of statements."[50] This definition was changed in 1985 when Ennis argued that "an increased interest in the assessment of critical thinking…requires an expanded definition."[51] So, he expanded the definition of critical thinking to "reflective and reasonable thinking that is focused on deciding what to believe or do."[52] Along with this new definition Ennis included a list of five categories and twelve abilities as shown in Table 1 below.

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[48]Edward M. Glaser, *An Experiment in the Development of Critical Thinking,* Teachers College, Columbia University, Contributions to Education 843. (New York: Bureau of Publications, Teachers College Columbia University, 1941. Reprint, New York: AMS Press, 1972), 6.

[49]James Thomas Stieb, Ed.D, "History and Analysis of Critical Thinking," Dissertation (Memphis State University, December 1992), 76.

[50]*Ibid*., 76.

[51]Robert H, Ennis, "A Logical Basis for Measuring Critical Thinking Skills," *Educational Leadership* 43, no.2 (October 1985): 45.

[52]*Ibid*., 45.

Table 1: Robert Ennis Critical Thinking Categories and Abilities

Elementary Clarification	
1	Focusing on a question
2	Analyzing Arguments
3	Asking and answering questions of clarification and/or challenge
Basic Support	
4	Judging the credibility of a source
5	Observing and judging observation reports
Inference	
6	Deducing, and judging deductions
7	Inducing, and judging inductions
8	Making and judging value judgments
Advanced Clarification	
9	Defining terms, judging definitions
10	Identifying assumptions
Strategy and Tactics	
11	Deciding on an action
12	Interacting with others

Source: Robert H, Ennis, "A Logical Basis for Measuring Critical Thinking Skills," *Educational Leadership* 43, no.2 (October 1985): 46.

Ennis believed that the first ten abilities "focused on acquiring reasonable beliefs," and the eleventh and twelfth focused on "deciding on an action," which included:[53]

- Define Problem
- Select criteria to judge possible solutions
- Formulate alternative solutions
- Tentatively decide what to do
- Review, taking into account the total situation, and decide
- Monitor the implementation

This inclusion of the strategy and tactics category within Ennis' critical thinking model demonstrated that problem solving and critical thinking are not exclusive but inclusive of one another as articulated by Dewey and Glaser. Moreover, Ennis continued to develop

[53] Robert H, Ennis, "A Logical Basis for Measuring Critical Thinking Skills," *Educational Leadership* 43, no.2 (October 1985): 46.

former critical thought theories by reinforcing Dewey's original concept that "phases may not follow one another in a set order," when Ennis stated:

> …it does not mean that critical thinking follows an ordered, linear path. Rather this apparent direction represents the logical relationships involved, not how one thinks critically in practice. In practice, critical thinking can proceed in many directions and can stop, restart, and retrace.[54]

However, Ennis did introduce a new concept in his definition of critical thinking, "reflective and reasonable thinking that is focused on deciding what to believe or do," - reflective thinking.[55] Ennis has been criticized for the use of the word reflective by author Richard W. Paul when he stated:

> [it] assumes that the reader has a clear concept of rationality and of the conditions under which a decision can be said to be a "reflective" one. There is also a possible ambiguity in Ennis' use of "reflective." As a person internalizes critical standards,…the application of these standards to action becomes more automatic, less a matter of conscious effort, hence less a matter of overt "reflection": assuming that Ennis means to imply by 'reflection' a special consciousness or deliberationess[sic].[56]

Yet Ennis', now joined by Stephen P. Norris, responded to the above comments and stated, "critical thinkers must be reflective…[and] must consciously seek and use good reasons. Saying that critical thinking is reflective thinking is meant to indicate this overt, conscious aspect of good thinking."[57] Moreover, Ennis' definition incorporated the idea of reasonable which when combined with reflective precipitated into concept of good thinking. So, good thinking "is automatized [sic], meaning that it occurs without conscious effort and

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[54]James Thomas Stieb, Ed.D, "History and Analysis of Critical Thinking," Dissertation (Memphis State University, December 1992), 111.

[55]*Ibid*., 105.

[56]*Ibid*., 109.

[57]*Ibid*., 109.

reflection,"[58] which arguably introduced creative thinking (intuition) as part of problem solving.

Intuitive thinking has "been mankind's chief possession since the dawn of time."[59] It is converse to analytical thinking in that it is unfocused, non linear, and contains 'no-time.'[60] Yet, despite the seeming chaotic foundation intuitive thinking can be an appropriate decision making concept. The concept of intuitive problem solving is founded on pattern recognition and is based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character. This method of problem solving has been described as happening in the 'blink' of an eye or the 'power of a glance'.

The intuitive portion of the brain (right side), as mentioned above, is fluid and spontaneous and is capable of leaping to conclusions unconsciously.[61] This unconsciousness is not the one Sigmund Freud referred too when he grouped unconsciousness in two broad categories "*Eros* (the life instinct), which covers all the self-preserving and erotic instincts, and *Thanatos* (the death instinct), which covers all the instincts towards aggression, self-destruction, and cruelty."[62] Instead the new notion is adaptive unconsciousness which is thought of as "a kind of giant computer that quickly and

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[5858]James Thomas Stieb, Ed.D, "History and Analysis of Critical Thinking," Dissertation (Memphis State University, December 1992), 110.

[59]Ezine articles, "Analytical/ Intuitive Thinking," http://ezinearticles.com/?Analytical-/-Intuitive-Thinking&id=94800&opt=print; Internet; accessed 1 March 2008.

[60]*Ibid*., 1.

[61]Malcolm Gladwell, *Blink: The Power of Thinking Without Thinking* (New York: Hachette Book Group, 2007), 11.

[62]The Internet Encyclopedia of Philosophy, "Sigmund Freud (1856-1939)," http://www.iep.utm.edu/f/freud.htm; Internet; accessed 2 March 08.

quietly processes a lot of data…in order to keep functioning as human beings."[63] This type of thinking could be what cognitive psychologist Gerd Gigerenzer calls 'fast and frugal,'[64] or as author Malcolm Gladwell maintains happens in a 'blink'.

In Malcolm Gladwell's *Blink: The Power of Thinking Without Thinking*, he proposes that "our unconscious is a powerful force."[65] Gladwell believes that people are capable of teaching themselves how to make controlled and educated snap judgments and first impressions based upon their profession, education and experience. However, he does admit that our instinctive reactions do compete with "all kinds of other interests and emotions and sentiments."[66] Nevertheless, Gladwell proposes that instantaneous expressions and conclusions can be cultivated with self acknowledgement and the inherent unconsciousness ability to find patterns in situations and behaviors based on very narrow slices of experience.[67] Yet, admittedly, Gladwell does not profess this to be a new theory and identifies its similarity to the power of a glance.

The power of a glance or the better known French translation 'coup d'oeil' is a well known expression for military leaders. Carl von Clausewitz wrote of coup d'oeil in his book *On War*. He stated that coup d'oeil was the "idea of a rapid and accurate decision [which] was first based on the evaluation of time and space" but soon was used to articulate "any sound

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[63]Malcolm Gladwell, *Blink: The Power of Thinking Without Thinking* (New York: Hachette Book Group, 2007), 11.

[64]*Ibid*., 11.

[65]*Ibid*., 15.

[66]*Ibid*., 15.

[67]*Ibid*., 16-23.

decision taken in the midst of action."[68] Clausewitz further went on to state the when you strip the metaphors and restrictions that are placed on the phase coup d'oeil the true concept emerges which is "the quick recognition of a truth that the mind would ordinarily miss or perceive only after long study and reflection."[69] Nevertheless, the idea of coup d'oeil must be put into the context in which Clausewitz articulated his theory. He spoke of military geniuses and commanders when he referred to coup d'oeil. Thus, arguably these men were educated, experienced and used their "innate talents to capacity…to seize on what is right and true as though [it was] a single idea formed by their concentrated pressure…a response to the immediate challenge rather than a product of thought."[70] So, whether it is a 'blink' or a 'glance' the ability to solve and make sound intuitive decisions should be supported with experience and education or combined with analytical theories.

When John Dewey's reflective thought, Edward Glaser's critical thinking and Robert Ennis' rational thinking/critical thinking theories are combined, it is evident that problem solving is a structured process that ensures all factors relevant to the problem are considered- *science*. The intuitive thinking of Clausewitz's coup d'oeil and Malcolm Gladwell's blink involves subjective analysis of the relationships between variables that in many cases cannot be measured- *art*. [71] So it is recognized by many militaries that when the science and art of problem solving is harmonized the net result is a viable military decision

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[68]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 102.

[69]*Ibid*., 102.

[70]*Ibid*., 578.

[71] United States Department of Defense, Army Publication Field Manual 5-0 *Army Planning and Orders Production* (January 2005), 2-2.

making process that "structures the thinking of the commanders and staffs while supporting their insight, creativity and initiative."[72]

The United States (US) Army has emphasized the importance of problem solving and decision making and has incorporated it into their Field Manuals.[73] Although the US Army clearly states that "not all problems require lengthy analysis to solve," they do recognize that a problems complexity dictates the amount of analysis. The US Army submits that critical reasoning (thinking) is "an essential leader skill and is a central aspect of decision making."[74] Moreover, it is the "key to understanding situations, finding causes, arriving at justifiable conclusions, making good judgments and learning from experience."[75] Yet, despite the US Army's emphasis on critical thinking, it does not limit problem solving to only analytical style thinking.

The US Army has also included creative thinking (intuitive) within the aforementioned doctrinal publications. It identifies that some situations may require leaders to "apply imagination, [which is] a departure from the old way of doing things."[76] This method of problem solving allows leaders to "rely on their intuition, experience, and knowledge" and provides an avenue for subordinates to become a "shareholder in the

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[72]William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005), 5.

[73]See United States Department of Defense Field Manual (FM) 5-0 *Army Planning and Orders Production* and FM 6-22 *Army Leadership Competent, Confident, and Agile* for additional information concerning problem solving and decision making.

[74]United States Department of Defense, Army Publication Field Manual 5-0 *Army Planning and Orders Production* (January 2005), 2-1/2.

[75]*Ibid*., 2-2.

[76]*Ibid*., 2-4.

accomplishment of difficult tasks."[77] However, this collaborative creative thinking process can result in what the US Army refers to as *groupthink* which "refers to a mode of thinking that people engage in when they are deeply involved in a cohesive group,"[78] which can lead to "no debate or challenge to a selected solution."[79] To avoid *groupthink* it falls to the leader to ensure that the group is not prejudiced by old habits and refrain from expressing new ideas due to the fear of being "thought of as a fool."[80]

In order to assist leaders in problem solving and benefit from both a leaders' ability to critically think while challenging approaches and ideas the US Army has adopted the following Seven Step Problem Solving Model as per Figure 4. As depicted, this seven step problem solving model may seem very analytical/systematic. However, it is important to identify that the "continual assessment" (located on the far left of the figure) provides creative thinking to be added throughout the process thereby arriving at the best possible

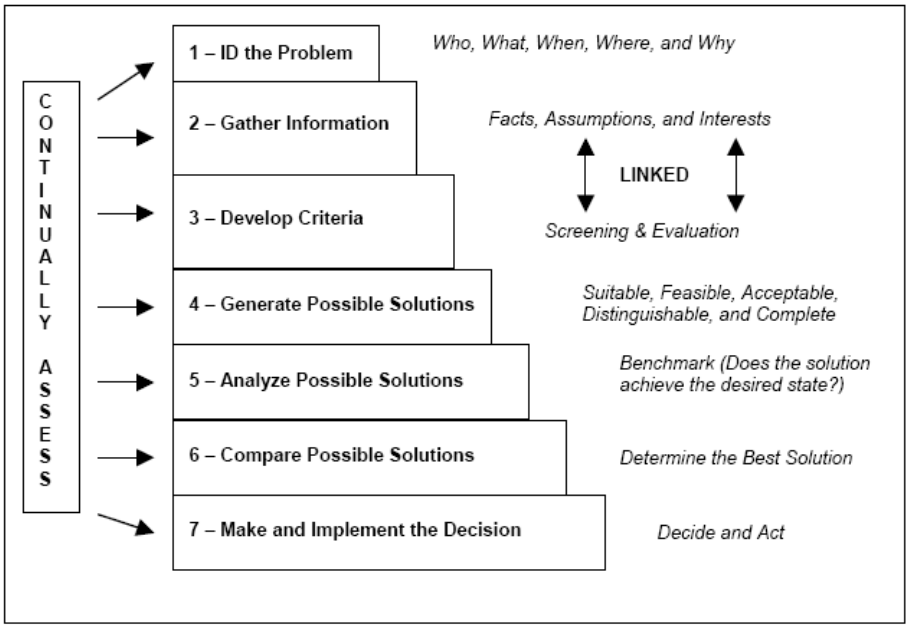
[77]United States Department of Defense, Army Publication Field Manual 5-0 *Army Planning and Orders Production* (January 2005), 2-4.

[78]*Ibid*., 2-4.

[79]*Ibid*., 2-4.

[80]*Ibid*., 2-4. A recent TRADOC Pam 526-5-500, Commander's Appreciation and Campaign Design (28 January 2008) has incorporated this idea that commanders must create an operational design that provides sufficient context and structure for implementation and action. If the commander determines his understanding has not developed enough to allow him to make a meaningful adaptation of the campaign design, he should scrap the design in favour of a more effective approach. United States Department of Defense, Army TRADOC Pamphlet 525-5-500, *Commander's Appreciation and Campaign Design* Ver 1.0 (28 January 2008), 18-30.

Figure 4- Seven Step Problem Solving Model



Source: United States Army Publication Field Manual 5-0 *Army Planning and Orders Production,* January 2005.

solution. Although the Canadian Forces does not highlight a problem solving model within its Army of Joint doctrinal publications, the Canadian Forces OPP does show evidence that the process incorporates critical and creative thinking.

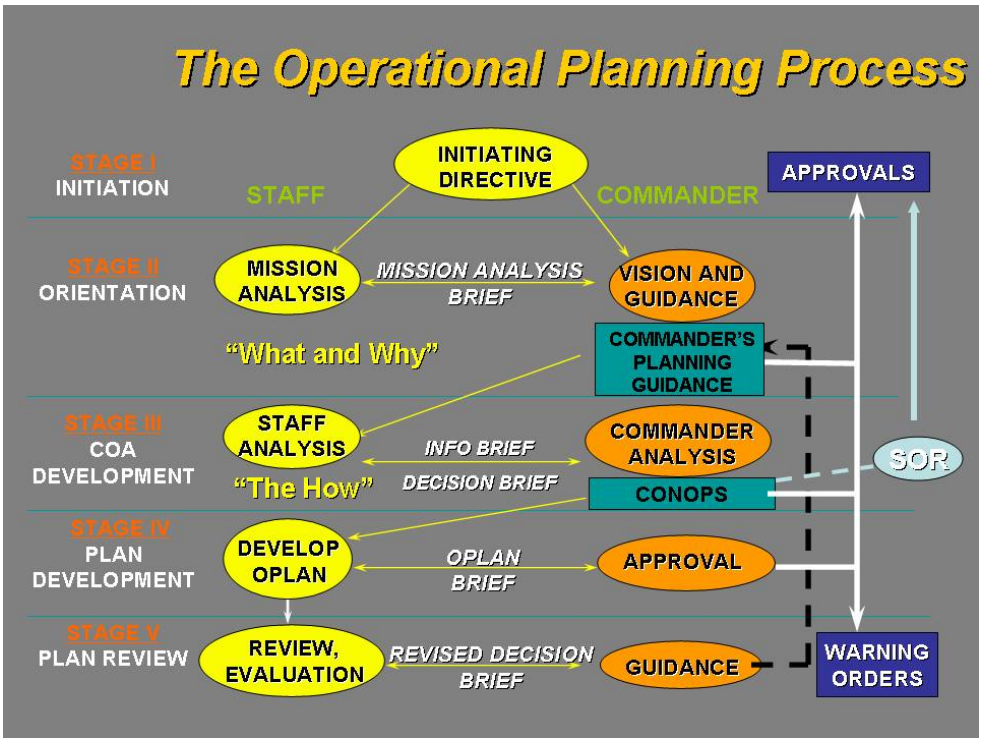
The Canadian Forces OPP is "a coordinated process to determine the best method of accomplishing assigned operational tasks and to plan possible future tasks."[81] The OPP is "designed to optimize logical, analytical steps of decision making in conditions of uncertainty and ambiguity,"[82] in the following five steps that mirror the North Atlantic Treaty Organization (NATO) Bi-SC Guidance on Operational Planning: Initiation,

[81]Department of National Defence, B-GJ-005-300/FP-000 *Canadian Forces Operations* (Ottawa, DND Canada, 2005), 4-2.

[82]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 3-1.

Orientation, Course of Action (COA) Development, Plan Development, and Plan Review.[83] Interestingly, these five steps closely resemble John Dewey's and Robert Ennis' steps mentioned above. Although, the Canadian Forces OPP analytical steps may indicate an inability to accept creative thinking, a stated objective of this process is "to maximize the commander's and staffs' creative thinking and associated thought processes."[84] Despite not being indicated in Figure 5 the Canadian Forces OPP experience tells us that much like the US Army seven step decision making process, creative thinking takes place throughout the

Figure 5- CFOPP Overview



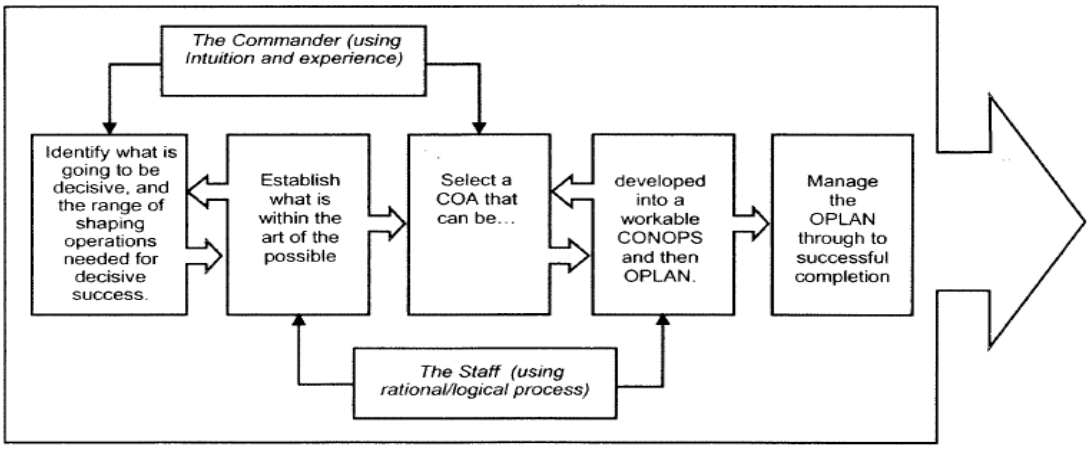
Source: Operational Design presentation. "CFOPP." Canadian Forces College Joint Command and Staff Program. Lecture C/DS-524/PLN/TU-01. 27 September 2007.

[83]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 3-1.

[84]*Ibid*., 3-1.

entire OPP. Moreover, as the NATO OPP overview indicates the activity and ability of the Commander and Staff to influence the overall plan can take place during regular staff activity or formal briefs. Additionally, the OPP "provide[s] maximum freedom to the staff to consider ideas and concepts in order to develop a wide range of COAs,"[85] as indicated in Figure 6, by the NATO Command and Staff influences. Therefore, if we superimpose the OPP structure onto the US Army seven step decision making process it is clear that despite

Figure 6- NATO Command and Staff influences



Source NATO Allied Joint Operations. AJP-01(C). (NATO, 21 March 2007), 6-2.

not highlighting a stand alone decision making process within its doctrinal publications both the Canadian Forces' and NATO's OPP have a decision making process that is intertwined and coordinated in order to find the best possible solution to any problem. However, the weakness in the OPP, as depicted in Figure 5, is that it places leaders and staffs into a mindset that is analytically/systematically based which much like *groupthink* can lead to a lack of creativity.

[85]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 3-1.

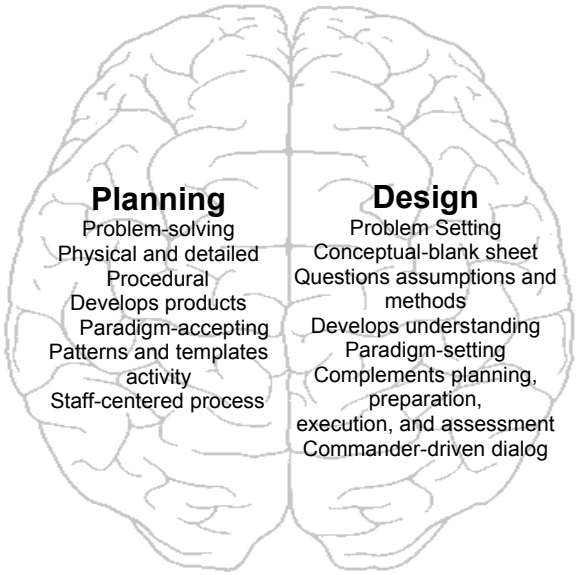
The OPP stages can be applied to the full spectrum of operations and are all applicable to both deliberate and crisis action planning. Although a somewhat slower option is crisis planning. Yet, it is stage two, orientation, which "is critical to the success of the plan."[86] Within this stage mission analysis is conducted and the "commander places his personal energies to ensure the staff is focused," while being careful not to confine their thinking processes. It is during stage two that brainstorming takes place between the commander and staff, and the *art* of problem solving is exhibited.[87] So, because the OPP is analytical by nature and does not highlight the importance of creative thinking, it is imperative leaders ensure that the planning group understands the conceptual disparity between steps one and two- *art* (design*)* and steps three, four and five – *science* (planning*)*.

Design and planning are two fundamentally different processes that must be intertwined in order to define and express a solution to a problem as indicated in Figure 7. Design uses the right side or creative side of the brain while planning uses the left side or

[86]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 3-1.

[87]*Ibid*., 4-4.

Figure 7- Design and Planning Differences.



Source: United States Department of Defense, Army Publication Field Manual 3-24 *Counterinsurgency.* (December 2006), 4-2. Version modified by author. Design and planning differences combined to reflect actual right and left side of brain activity and added to picture of brain, http://faculty.washington.edu/chudler/gif/colorb8.gifhttp://faculty.washington.edu/chudler/gif/colorb8.gif; Internet; accessed 13 March 2008.

logical/scientific side of the brain.[88] Design sets and develops the problem and is focused "on learning about the nature of an unfamiliar problem."[89] Planning focuses on generating the plan in a series of executable actions."[90] Together they form what could be term as *intelligent memory*.[91]

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[88]Major William G Cummings, "Operational Design Doctrine: Hamstrung or Footloose in the Contemporary Operating Environment?" (Toronto: Canadian Forces College Command and Staff Course Masters of Defence Studies Paper, 2007), 41.

[89]John F Schmitt, "A Systemic Concept for Operational Design," http://www.maxwell.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf; Internet; accessed 16 October 2007.

[90]*Ibid*., 6.

[91] William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005), 1.

Some scientists no longer believe that the right side and the left side of the brain form two different modes of thought. Instead, they believe that analytical and intuitive functions are combined into a "giant warehouse."[92] The brain "takes in information, breaks it down, and puts it on its warehouse shelves- analysis. As the information is shelved matches are put together in a flash of intuition which some call intelligent memory. As Neuroscientist Barry Gordon states

> …intelligent memory is like connecting the dots to form a picture. The dots are pieces or ideas, the lines between them are your connections or associations. The lines can coalesce into larger fragments, and these fragments can merge to form a whole thought. This whole thought may be a visual image, a piece of knowledge, an idea, or even a solution to a problem. Individual pieces, the connections, and the mental processing that orchestrates them generally work together so they appear to be a single cognitive event.[93]

This description of intelligent memory is important to remember as it will be demonstrated that in many ways it describes a campaign plan. Nevertheless, the idea of intelligent memory can be thought of as part of problem solving and become the continuum design and planning.

The VUCA operating environment emphasizes the importance of "locating, identifying and formulating the problem, its underlying causes, and structure and operative dynamics" prior to applying established planning procedures.[94] If design and planning are placed on an *intelligent* continuum and the location of where current planning procedures are added, a *design gap* is identified at the beginning of the spectrum, as indicated in

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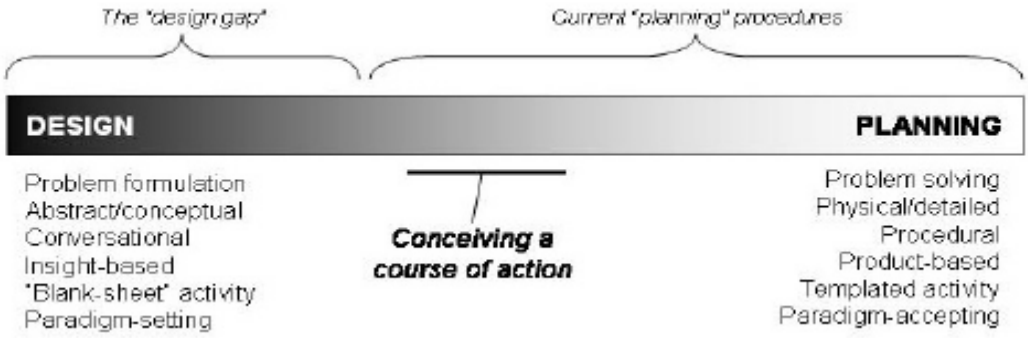
[92]William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005), 1.

[93]*Ibid*., 1.

[94] John F Schmitt, "A Systemic Concept for Operational Design," http://www.maxwell.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf; Internet; accessed 16 October 2007.

Figure 8. It is this design gap that has lead to the rigorous debate and the evolution of numerous design frameworks and concepts that attempt to systematically structure this

Figure 8- The Design-Planning Continuum



Source: John F. Schmitt, "A Systemic Concept for Operational Design. http://www.maxwell.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf; Internet; accessed 16 October 2007).

portion of the problem solving. It is this *design gap* which is challenging the operational art of the Canadian Forces throughout the entire spectrum of conflict as new ways are explored in which to solve *wicked* problems.

The desire to formalize, in doctrine, a specific campaign design framework has resulted in a reemergence of the idea that either *analytical* or *intuitive* problem solving methods are the panacea in which to design campaigns. However, as it has been demonstrated "there is no good analysis without intuition, and no good intuition without analysis."[95] The modern critical thinking authors of John Dewey and Robert Ennis have discussed the *science* of problem solving and provided the foundation for problems to be solved in analytical manner and provided steps in which to critically analyze a given

[95]William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005), v.

situation. Likewise Clausewitz and modern author Malcolm Gladwell have discussed the *art* of problem solving. Their concept, based on the power of a glance or blink or an eye, has provided the basis for problems to be creatively solved primarily on pattern recognition and experience. Together the critical and creative concepts have been incorporated, emphasized and articulated into the problem solving models of the US Army and are also reflected in the Canadian Forces OPP. This combination of art and science can be characterized as *intelligent memory* and when incorporated with planning procedures provides us with a clear understanding of the problem militaries face in the VUCA environment, the *design gap*. It is this *design gap* that is returning the debate to which side of the brain is dominant and best suited to solve *wicked* problems. The *design gap* will not be overcome by returning to this old debate. It will be solved with commanders and planners being given the latitude to use a multitude of campaign design frameworks that have a common lexicon.

> *On the one hand, military operations appear extremely simple…at the same time we can see how many factors are involved and have to be weighed against each other; the vast; the almost infinite distance there can be between the cause and its effect, and the countless ways in which these elements can be combined.*[96]
>
> Carl von Clausewitz, *On War*

CHAPTER TWO- ELEMENTS OF CAMPAIGN DESIGN- WAYS

The achievement of strategic goals is the core of military campaigns. For many campaigns may look, as Carl von Clausewitz implied, extremely simple. In fact campaigns are nothing farther from the truth. Clausewitz states a campaign "denotes all military events occurring in a single theater of war."[97] When placed in a volatile, uncertain, complex and ambiguous (VUCA) or conventional environment the ability to attain objectives, organize forces, and integrate and conduct strategies using operational art must be done using campaign design tools. These tools when combined form an *operational design* and with skills, imagination, creativity assist leaders and staffs in organizing their thoughts and understanding the conditions for success.[98]

As defined in the previous chapter, campaign design is conducted in the first two stages (Initiation and Orientation) of Canadian Forces Operational Planning Process (OPP) as per Table 2. This stage of the OPP "is critical to the success of the plan,"[99] and is the

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[96]Carl von Clausewitz, *On War*, ed and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 577.

[97]*Ibid*., 281.

[98]NATO Allied Joint Operations, AJP-01(C) (NATO, 21 March 2007), 4-17.

[99]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 3-1.

"heart of a joint plan."[100] Campaign design is a command driven activity which expresses a commander's vision in a graphic and conceptual model.[101] It is this model that will "sequence actions and effects along lines of operations in order to defeat the adversary

Table 2- Design in Relation to CFOPP Stages

	Orientation	COA/Concept Development	Plan Development
Strategic Direction Provides: • End State • Strat Mil Objectives • Strategic CG • May provide Strat Comd Mil Asssessment			
Campaign Design Products:	•Refined End State •Operational CG and Strange Analysis (Host Nation, Adversary, Friendly and Allied Forces) •Operational or Campaign Design	•Refined Operational or Campaign Design (phasing, synchronization, and sequencing of DPs; refined Measures of Effectiveness (MOE) •Assess DPs for critical interdependencies	
OPP Staff Products:	Mission Analysis Brief Commander's Planning Guidance	Decision Brief CONOPS	CONPLAN or OPLAN

Source: Canadian Forces College Aide Memoire to the Canadian Forces OPP ver4_1_22_feb_08.

and accomplish national or an Alliance objectives."[102] The design of a campaign, which could be related to what neuroscientist Barry Gordon spoke of about *intelligent memory*, is

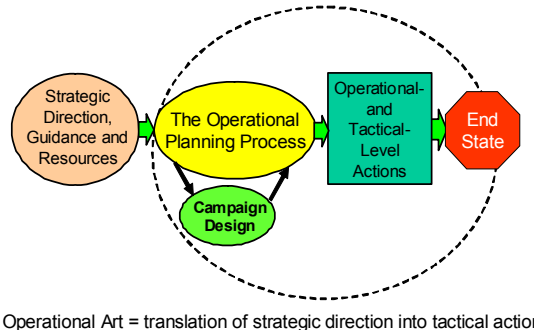
[100]Department of National Defence, *Canadian Forces College Combined and Joint Staff Officer's Handbook (CFC CJ SOH)* (Toronto, DND Canada 2005), II-1-3/16.

[101]*Ibid*., II-1-3/16.

[102]*Ibid*., II-1-3/16.

a connection of dots (decisive points) that merge and form a whole thought (objective) which may present the solution to a problem in a single cognitive event (campaign).[103] Moreover, "it clarifies the end state to be achieved, identifies how the adversary's strengths will be countered and his vulnerabilities exploited"[104] to achieve national alliance objectives. This process of campaign planning and the nesting of campaign design within the OPP and operational art are clearly defined in Figure 9. In order to

Figure 9- Relationships among Campaign planning, Campaign design, Canadian Forces OPP and Operational Art



Source: Canadian Forces College Aide Memoire to the Canadian Forces OPP ver4_1_22_feb_08.

explore different campaign design frameworks, there must be a common lexicon. This chapter will provide this lexicon from a Canadian perspective. It will first introduce the current campaign design tools of the Canadian Forces, United States and North Atlantic Treaty Organization (NATO). It will then define Canadian design tools, with examples, and reveal how similar they are to the United States tools. Lastly it will place the Canadian Campaign design tools together to provide a clear depiction of a campaign design graphic.

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[103]William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," United States Army Strategic Studies Institute (November 2005), 1.

[104]Department of National Defence, *Canadian Forces College Combined and Joint Staff Officer's Handbook (CFC CJ SOH)* (Toronto, DND Canada 2005), II-1-3/16.

This will enable the exploration of two accepted western frameworks of campaign design; Strange Analysis and Decide-Detect-Deliver Concept.

The Canadian Forces does not expressly define operational design in its *Canadian Forces Operational Planning Doctrine Manual*.[105] In contrast, Canada's two biggest allies: the United States (US) and United Kingdom (UK) do provide differing definitions of this *design gap* but with a common theme, essentially defined as framing and refining the problem. Nevertheless, even without a definition; the idea of campaign design is placed within Canadian Forces doctrine in terms of operational tools.[106] Although, the Canadian Forces planning tools[107] starkly resemble those of the US and NATO as per the Table 3,[108] when compared to one another it is evident that Canadian design tools are closer to the US. As identified in italics, there are four identical tools that are common to all: end state, centre of gravity, decisive points and lines of operation. For the remainder, despite not being identical, it can be argued that the Canadian Forces tools encapsulate the spirit of the other US and NATO tools.

[105]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 2-1.

[106] *Ibid*., 2-1.

[107]The term tools can be used interchangeably with the US term elements and the NATO term concepts.

[108]For US and NATO Operational Design conceptual models see Appendix 1.

Table 3- Campaign Design Tools- Canadian, United States, NATO

Canadian	**United States**	**NATO**
End State	Termination	*Centre of Gravity*
Centre of Gravity	*End State* & Objectives	*End-State*
Decisive Points	Effects	*Decisive Points*
Lines of Operation	*Center of Gravity*	*Lines of Operations*
Sequencing	*Decisive Points*	Sequencing & Phases
Direct and Indirect Approach	Direct versus Indirect	Contingency Planning
Culmination	*Lines of Operation*	Operational Pause
Manoeuvre	Operational Reach	Culminating Point
Tempo	Simultaneity & Depth	
Operational Pause	Timing and Tempo	
	Forces and Functions	
	Leverage	
	Balance	
	Anticipation	
	Synergy	
	Culmination	
	Arranging Operations	

Note: common design tools are italicized

The first tool for campaign design and arguably the most important is the *centers [sic] of gravity*. [109] It is the "most difficult confronting campaign planners in the process of campaign design as it attempts to identify friendly and adversary strategic sources of strength, power and resistance."[110] Clausewitz believed that out of the "dominant characteristics of belligerents [adversaries] developed a certain centre of gravity, the hub of all power and movement, on which everything depended and the point at which all our energies should be directed."[111] Doctrinally, the Canadian Forces defines *centre of gravity* as "characteristics, capabilities or localities from which a nation, an alliance, a military

[109]The Campaign Design tools are defined using the Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002).

[110]Colonel Dale C. Eikmeier, "Center of Gravity Analysis," *Military Review* (July-August, 2004): 2.

[111]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 595-596.

force or other grouping derives its freedom of action, physical strength or will to fight."[112] Despite this clear Canadian Forces definition, the concept of defining a centre of gravity has been described by Colonel Dale Eikmeier of the United States (US) Army as "like blind men describing an elephant."[113] The reason defining or identifying the centre of gravity is so difficult is that different militaries are using different definitions. In some cases services within one military do not use the same definition.[114] For example, Joseph Strange of the United States Marine Corps War College defines centres of gravity as the "physical and moral entities that are the primary components of physical or moral strength, power and resistance. They don't just contribute to strength; they are the strength."[115] Joint Publication (JP) 3-0 *Joint Operations* defines centre of gravity as "the source of power that provides moral or physical strength, freedom of action, or will to act."[116] So because centres of gravity exist at all levels of war and ensure unity of effort it is important that there is a common lexicon. For the purpose of this paper the concept of the centre of gravity will remain at the operational level which is generally more concrete and military focused than the strategic that can be complex and abstract. Examples of the operational centre of gravity are a geographic location, an operational offensive capability or operational manoeuvre formation.

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[112]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 2-2.

[113]Colonel Dale C. Eikmeier, "Center of Gravity Analysis," *Military Review*(July-August, 2004): 2.

[114]*Ibid*., 2.

[115]Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf; Internet; accessed 17 October 2007.

[116]United States Department of Defense, Joint Publication 3-0 *Joint Operations* (17 September 2006), GL-8.

The next tool in priority and importance "includes the required conditions that, when achieved, attain the strategic goal or allow other instruments of national power" - *end state*.[117] End state is defined as "the political and/or military situation to be attained at the end of an operation, which indicates that the objective has been achieved."(AAP-6) In order for a strategic end state to be achievable it must be clearly understood at the initial phases of campaign design. Moreover, when the military end state is defined it must meet two criteria: be achievable and be measurable with associated criteria for success. The key to unlocking the centre of gravity (gravities) in order to achieve the end state are *decisive points.* The decisive point is "a point from which a hostile or friendly centre of gravity can be threatened. The point may exist in time, space or in the information environment."[118] Decisive points are determined not selected and they indicate the "conditions that must be set in order to achieve the aim of the campaign, which is to affect the centre of gravity."[119] Thus, decisive points can be described as events. Examples of decisive points are National Army is sufficiently developed, Adequate Rule of Law established, and Insurgency contained.[120]

In order to organize decisive points to affect the centre of gravity and achieve the end state the concept of *lines of operations* are utilized in campaign design. These lines of operation "establish the relationship between decisive points; produce a critical path in time and space along a path to the centre of gravity and ensure that events are tackled in a logical

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[117]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa, DND Canada, 2002), 2-2.

[118]*Ibid*., 2-3.

[119]*Ibid*., 2-3.

[120]Joint Forces Command Brunssum- Operational Campaign Design (Unclassified Draft).

progression."[121] They are oriented towards the desired end state and provide connectivity and mutual support between decisive points resulting in a harmonized campaign plan.

Due to the fact there are multiple lines of operation within a campaign design there is a requirement to *sequence* decisive points in order to achieve a synergy of effects. Sequencing is "the arrangements of events within a campaign in an order that is most likely to achieve the elimination of the opposing centre of gravity."[122] Further, because campaigns could be extended over time and space the sequence of decisive points can be further broken down in phases. Phases break the campaign into more manageable parts and provide flexibility to leaders to successfully achieve the end state either simultaneously or sequentially. An example of sequencing would be along a governance line of operation where two decisive points would exist: adequate Rule of Law established and government capable of governing the country, on an enduring basis, without the presence of coalition forces. In this example the latter decisive point would have to be sequenced ahead of the first in order to achieve the military end state of Host country security forces providing security and continued stability without the support of the coalition.

In the VUCA environment, whether involving conventional or unconventional (asymmetric) operations, campaigns will most likely have multiple lines of operation with carefully sequenced decisive points that pierce the opponents' centre of gravity to reach the end state. The method of achieving this can be a *direct* or *indirect approach*. Using the adversaries Armed Forces as his operational centre of gravity an example of a direct

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[121]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa: DND Canada, 2002), 2-4.

[122]*Ibid*., 2-4.

approach could be attacking his main forces in order to disrupt and fragment his ability to resist future attacks and protect his assigned objectives. Using the same centre of gravity, an adversaries Armed Force, an example of an indirect approach may be attacking his reserve thereby not allowing him to reinforce or inhibit your force. The direct approach is a linear, uninterrupted approach that is the quickest and most decisive means to attain the opponents' centre of gravity. The indirect approach avoids an opponent's strength using a more non liner method and involves the exploitation of his critical vulnerabilities. These critical vulnerabilities are revealed when decisive points are analyzed from an opponent's perspective. A decisive point's vulnerability can be assigned resources to protect or control it; however, if it is exposed and seen as a weakness versus strength it can be attacked directly or indirectly. The use of both approaches within a sequenced campaign design can result in "manouevre, tempo and operational pauses to overload an opponent's decision-making capability"[123] thus achieving culmination.

An operation reaches *culmination* "when the current situation can just be maintained but not developed to any greater advantage."[124] Operations can reach a culmination point for several reasons, for example: available stocks may be exhausted; a force may be physically exhausted and morally less committed to attacking; and/or defender may feel their interests sufficiently threatened. In order to mitigate reaching your own culmination point prior to you opponent, a campaign design that is synchronized and balanced over multiple lines of operations will remove the potential tendency of a leader to make "one last

[123]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa: DND Canada, 2002), 2-4.

[124]*Ibid.,* 2-5.

effort to reach the objective that is just beyond the capability of achievement."[125] As mentioned in the previous paragraph, options exist for a commander to adjust his campaign prior to reaching a culmination point. These options include using manoeuvre, managing tempo and imposing an operational pause.

Manoeuvre is used "to seek to gain a position of advantage in respect to the opponents from which force can be applied or threatened."[126] Conceptually manoeuvre can occur directly or indirectly. The success of manoeuvre is predicated on deteriorating an adversary's cohesion and effectiveness which may result in complete failure or exposure of the centre of gravity as decisively and quickly as possible. The destruction of an opponent's capability to resist can be accomplished using two approaches. You can directly attrit and exhaust your opponent's forces or you can indirectly manoeuvre to defeat his cohesion and will. Within a campaign different approaches may be required to achieve specific decisive points and thus are linked to sequencing, and tempo.

Managing *tempo* "is the rate of rhythm of activity relative to the opposition."[127] Tempo allows the competitive pace, either faster or slower, of operations to change which can force your opponent decision action cycle to collapse thereby eliminating his ability to appropriately react to your operations. The risk to increasing operational tempo is that it must be maintained and thus is directly related to culmination and sequencing. One

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[125]Department of National Defence, B-GJ-005-500/FP-000 *Canadian Forces Operational Planning Process* (Ottawa: DND Canada, 2002), 2-5.

[126]*Ibid.,* 2-5.

[127]*Ibid*., 2-6.

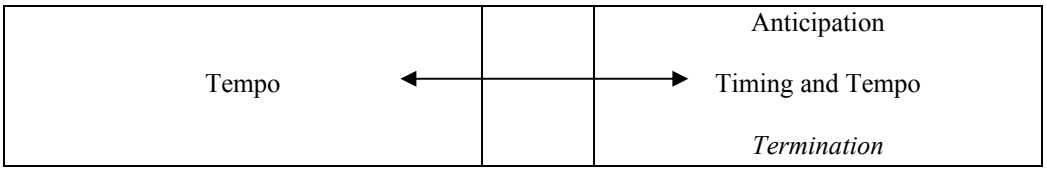
additional tool exists if a campaign has not reached its culminating point which is taking an operational pause.

Taking an *operational pause* is the final concept within Canadian Forces doctrine and can be used to regenerate fighting power and/or sustain operations. Although a campaign design may take into account the requirement to conduct an operational pause, it is imperative that operations are sequenced along multiple lines of operations in order to maintain the initiative and successfully achieve the desired end state.

The definitions are clear for the above Canadian Forces campaign design tools but it is important to show that they are in harmony with accepted US concepts as many of the western campaign design frameworks are devised by military leaders and academics within the American military system. Table 4 below displays this unity. The only tool or concept

Table 4- Comparison of Canadian and United States Campaign Design Tools

Canadian	**United States**
Centre of Gravity	Center of Gravity
End State	End State & Objectives
Decisive Points	Decisive Points Effects
Lines of Operation	Lines of Operation
Sequencing Operational Pause	Arranging Operations Simultaneity & Depth Synergy
Direct and Indirect Approach	Direct versus Indirect Forces and Functions
Culmination	Culmination
Manoeuvre	Operational Reach Leverage Balance

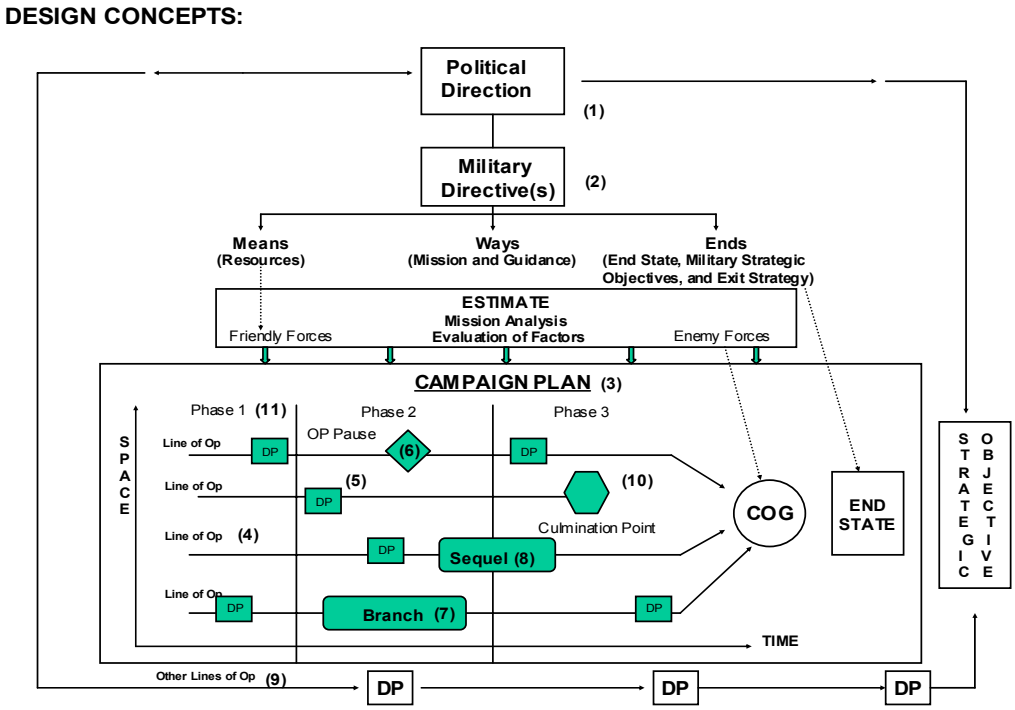


that does not fit neatly within the Canadian Forces design tools is *termination.* Termination can be defined as "knowing when to cease all types of military operations and how to preserve achieved military objectives."[128] Termination design "is driven in part by the nature of the conflict itself,"[129] and dependant upon whether a conflict is value, interest based and/or both requires planning at the onset of the campaign. In a Canadian Forces context this specific design tool is not independently considered. Instead it is considered as part of mission analysis under criteria for success. Nonetheless, the achievement of strategic goals within a military campaign can be a complex process that requires common tools to ensure objectives are attained, forces are organized and operations that are integrated. The Canadian Forces provides doctrinal campaign tools that when combined can result in a campaign design as shown in Figure 10, Campaign Schematic. So, with a common lexicon established, from a Canadian Force s perspective, an analysis of the Strange Analysis

[128]United States Department of Defense, JFCOM Joint Publication 5-0 *Joint Operation Planning* (26 December 2006), IV-7.

[129]*Ibid.,* IV-7.

Figure 10- Campaign Design Concepts



Source: Canadian Forces College Aide Memoire to the Canadian Forces OPP ver4_1_22_feb_08.

model and Detect-Decide-Deliver Concept can be analyzed to demonstrate how they can equally be applied and adopted as Canadian Forces doctrine in order to decrease the friction and fog that exists within full spectrum of operations in today's VUCA environment.

> *Therts, the goddess in Greek mythology, took her son Achilles and dipped him in the holy river Styx, to make him immortal. The current was so fast that she was forces to hold him by the heel, which remained untouched by the magical waters. Through the heel alone could Achilles be wounded by ordinary mortal.*[130]
>
> Ancient Greek Legend

CHAPTER THREE- STRANGE ANALYSIS- ENDS

The campaign design concept of centre of gravity is one that is currently highly debated by academics and professional soldiers alike.[131] Carl von Clausewitz could be heralded as the founder of the centre of gravity concept, which was a key concept in his book *On War*. However, it is the study and translation of this book, over years, that have led to diverging views of what centre of gravity (gravities) really means as it relates to nature of war. In 1996, Dr Joseph Strange, a professor of strategic studies at the United States Marine Corps War College, published a monograph which attempted to bring standardization to the concept of centre of gravity.

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[130]A.S. Bahal, "Centres of Gravity: Relationship with Effects-Based Operations and Campaign Planning," *Air Power* 2, no. 4 (October-December 2005): 73.

[131]Dr Joseph Strange and Dr Milan Vego lead the list of academics who debate COG and have published articles concerning the concept. For example Joseph Strange and Richard Iron, "Center of Gravity: What Clausewitz Really Meant," *Joint Force Quarterly*, Issue 35 (Autumn 2004): 20-27, and Milan Vego, "Clausewitz's Schwerpunkt: Mistranslated from German – Misunderstood in English," *Military Review*, (January-February 2007): 101-109. Colonels Mendel, Tooke and Eikmeier of the Unites States Army provide articles that show this concept has been debated since the early 1990s. For example, Colonel William W. Mendel and Colonel Lamar Tooke, "Operational Logic: Selecting the Center of Gravity," *Military Review,* Issue 73 (June, 1993): 2-11, and Colonel Dale D. Eikmeier, "Center of Gravity Analysis," *Military Review* (July-August, 2004): 2-5.

This chapter will address the origins of Dr Joseph Strange's centre of gravity concept and provide some context that supports his definition of centre of gravity. Next, it will describe the Strange Analysis concept, which is founded on centre of gravities, using the framework of the NATO Zoran Sea Crisis in order to demonstrate its utility in solving tame and wicked problems in the VUCA environment. Lastly, the Strange Analysis will be analyzed to consider its inherent strengths and weaknesses, which will demonstrate why it can be considered a campaign design method.

Starting in the 1980s the United States military placed significant emphasis, within it education system, on the theories and concepts of Clausewitz and the study of operational art.[132] As such, "a tremendous emphasis has been placed in doctrine on the center [sic] of gravity (COG) as a central element [tool] of campaign planning."[133] However, as mentioned above, there is great ambiguity on how to define a COG. The arguable source for this rigorous debate is Clausewitz's "most quoted passages regarding the centers [sic] of gravity,"[134] in book eight of *On War* which states:

> …one must keep the dominant characteristics of both belligerents in mind. Out of these a certain center [sic] of gravity develops, the hub of all power and movement, on which everything depends. That is the point against which all our energies must be directed.[135]

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[132]Rudolph M. Janiczek, "A Concept at the Crossroads: Rethinking the Center of Gravity," (United States Army Strategic Studies Institute, October 2007), 1.

[133]*Ibid.,* 1.

[134]Joseph Strange and Richard Iron, "Center of Gravity: What Clausewitz Really Meant," *Joint Force Quarterly*, Issue 35 (Autumn 2004): 21.

[135]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 595-596.

In 2004, Dr Joseph Strange and Colonel Richard Iron co-authored an article in *Joint Force Quarterly* titled "Center of Gravity: What Clausewitz Really Meant." [136] Within this article they identified two sources of the misunderstanding that is associated with the above Clausewitz quote.

The first source of confusion originates from the "most commonly used English edition of *On War*" the translation by Michael Howard and Peter Paret.[137] Although Howard and Parent are usually clear and consistent, aside for some possible mistranslations, which is addressed later, some interpretations of COG may have been interpreted out of context.[138] An example of a misinterpretation is the term *dominant characteristics*. Strange and Iron submit that this term "has been applied devoid of context."[139] They state, "*Out of* these [dominant] characteristics a certain center [sic] of gravity *develops*…," does not mean "One of the characteristics will emerge as a center of gravity." [140] Strange and Iron used the Clausewitz characteristics of cohesion, unity and political interests to emphasize this point.

> …there is a decided difference between the cohesion of a single army, led into battle under the personal command of a single general, and that of an allied force extending over 250 or 500 miles, or even operating against different fronts. In the one, cohesion is at its strongest and unity at its closest. In the other, unity is remote, frequently found only in mutual political

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[136] Colonel Iron, British Army and the head of the doctrine branch in the Directorate of Land Warfare at the Joint Service Command and Staff College and has commanded an armoured infantry battalion.

[137]Joseph Strange and Richard Iron, "Center of Gravity: What Clausewitz Really Meant," *Joint Force Quarterly*, Issue 35 (Autumn 2004): 22.

[138]*Ibid.,* 22.

[139]*Ibid.,* 22.

[140]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 595. Emphasis added by author.

> interests, and even the rather precarious and imperfect; cohesion between the parts will usually be very loose, and often completely fictitious.[141]

In the above context, cohesion, unity, and political interests are "clearly not viewed as candidate[s] for centers [sic] of gravity,"[142] but in parallel with the concept of critical vulnerabilities which will be defined during the description of Strange Analysis. If these characteristics were included as potential centres of gravity "virtually anything could be a centre of gravity: logistics, road networks, unit cohesion, or radar systems." So, Strange and Iron advocate that interpreting Clausewitz's *On War* cannot be completed using a single thought or term; instead it must be "interpreted within the context of the relevant passages elsewhere."[143]

The second source of confusion can be attributed to the translation of Clausewitz's book *On War*. For example, remarks found in Chapter 27 "Defense of a Theater of Operations", of book six"[144] where translated, in 1976, by Howard and Parent to mean "A center of gravity is always found where the mass is concentrated most densely. It presents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center of gravity."[145] In 1874, J.J. Graham translated the same remarks to be "As a centre of gravity is always situated where the greatest mass of matter is collected, and as a shock against the centre of a body always produces the greatest effect, and further, as the most

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[141]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 486.

[142]Joseph Strange and Richard Iron, "Center of Gravity: What Clausewitz Really Meant," *Joint Force Quarterly*, Issue 35 (Autumn 2004): 23.

[143]*Ibid.,* 22-25.

[144]*Ibid.,* 22.

[145]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 485.

effective blow is struck with the centre of gravity of the power used, so it is also in war."[146] Taking the translation by Graham, which is to some extent more literal the idea that the centre of gravity produces an *effect* on an enemy, and the "blow it strikes is the most effective- not necessarily the heaviest."[147] Thus, in interpreting Clausewitz *On War*, "one should not adhere dogmatically to [the] 180-year-old definition,"[148] but understand the context which "is no doubt that Clausewitz meant center [sic] of gravity as the main strength of the enemy.

Strange and Iron suggest, "Clausewitzian centers [sic] of gravity are not characteristics, capabilities, or locations. They are dynamic and powerful physical and moral agents of action or influence certain qualities and capabilities that derive their benefit from a given location of terrain. Using Gulf War One as an example General Norman Schwarzkopf's operational centre of gravity was physically the Iraqi Republican Guard, "not only because it was well trained and equipped, but because it was a threat to VII Corps."[149] An example of strategic moral centre of gravity are the Palestinians who believe that they have been wronged by occupation of its territories by the Israeli Defence Force and are unwavering in fighting indefinitely for their cause.[150] Although, Strange and Iron submit that the "will of the people" can be a centre of gravity we will return to the agent

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[146]Joseph Strange and Richard Iron, "Center of Gravity: What Clausewitz Really Meant," *Joint Force Quarterly*, Issue 35 (Autumn 2004): 24.

[147]*Ibid.,* 24.

[147]*Ibid.,* 24.

[148]*Ibid.,* 23.

[149]*Ibid.,* 24.

[150]*Ibid.*, 25-27.

when we discuss the strengths and weaknesses of Strange Analysis. Nevertheless, they suggest that *leaders* - Winston Churchill (1940-41) and Saddam Hussein (1990-91), *ruling elites* – Soviet Politburo (1970s) and the clerics of 1979 Iranian revolution, and s*trong willed populations*- the above mentioned Palestinians and the Americans after the attack on Pearl Harbor, are all moral centres of gravity because they have "the will to fight and the ability to command the necessary resources."[151] Therefore, understanding that the original ideas of Clausewitz can be misunderstood contextually and/or translated differently, Strange and Iron's offer this definition of centres of gravity:

> …physically or moral entities that are the primary components of physical or moral strength, power and resistance. *They don't just contribute to strength; they ARE the strength*. They offer resistance. They strike effective (or heavy) physical of moral blows. At the strategic level, they are usually leader and populations determined to prevail. At operational and tactical levels that are almost invariably specific military forces.[152]

In every war, campaign, and battle a situation has developed in which one side started to win and the other started to loose causing the culmination of military action.[153] Reaching culmination can be attributed to what Clausewitz describes as a decisive act. Decisive actions "create an environment in which an enemy has either lost physical capability or the will to resist."[154] According to Strange and Iron "the essence of operational design lies in the identification of what's going to be decisive in a joint campaign, and an understanding

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[151]Joseph Strange and Richard Iron, "Center of Gravity: What Clausewitz Really Meant," *Joint Force Quarterly*, Issue 35 (Autumn 2004)*:* 26.

[152]Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf: Internet; accessed 17 October 2007.

[153]*Ibid.,* 1-2.

[154]*Ibid*., 2.

of what shaping operations are needed to achieve that decisive action."[155] Achieving this decisive action is done with *intelligent memory* as factors are critically analyzed and coupled with an intuitive understanding of the effect of your own operations will have on your adversary. When a decisive action causes culmination this is usually because an adversary's operational or tactical centre of gravity was defeated, thus the connection between the concept of centre of gravity and operational art can be made. To assist operational level campaign designers in finding what is required to achieve a decisive action within a campaign; Dr Joseph Strange has proposed the Strange Analysis model[156] which aims at defeating an adversary's centre of gravity.

The Strange Analysis is an analytical model that assists commanders and staffs "to analyze existing and potential vulnerabilities of a center [sic] of gravity, and determine which of those could be especially critical."[157] In the development of a campaign plan operational designers attempt to "identify the adversary's centre of gravity and its critical vulnerabilities" in order to force culmination and achieve the desired end state. There is no proscribed method to utilize the Strange Analysis model. However, in order to effectively use this model it important to understand the Strange Analysis key interrelated concepts: Critical Capabilities (CC), Critical Requirements (CR), and Critical Vulnerabilities (CV). Figure 11 below describes how the respective concepts are related.

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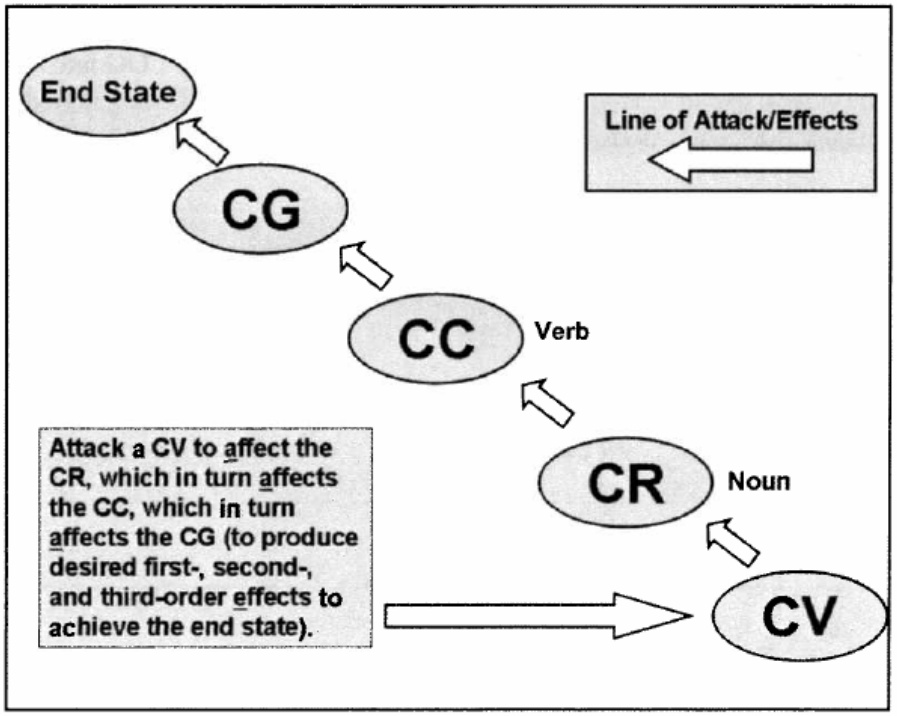
[155]Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf; Internet; accessed 17 October 2007.

[156] The analysis of the Strange model will be achieved by primarily using the concept paper written in concert with Col Richard Iron. Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf; Internet; accessed 17 October 2007.

[157]*Ibid.,* 1.

Figure 11- Relationships between the Strange Analysis Concepts.



Source: Dr Jack Kem, *Campaign Planning: Tools of the Trade Second Edition*, Department of Joint and Multinational Operations (U.S. Army Command and General Staff College, Fort Leavenworth: June 2006).

Prior to addressing each concept, it must be understood that the Strange Analysis is done from both a Joint Task Force Intelligence (J2) and a Joint Task Force Plans (J5) perspective during the orientation stage of the OPP and compared to prior to making the final campaign design. The examples that follow are from the J5 perspective, thus the Strange Analysis is being done focused on the friendly centre of gravity. The following centre of gravities (COG) is proposed for the NATO Zoran Sea Crisis in accordance with the Strange definition: the Strategic COG could be the President of Auriga and the Operational COG could be the Aurigian Armed Forces. For the purpose of this paper the examples will be at the Operational level.

The first concept to be addressed is Critical Capabilities (CC). Dr Strange classifies a CC in simple terms as "what can this center [sic] of gravity do to you that puts great fear (or concern) into your heart in the context of your mission and level of war?"[158] The key word in a CC is the verb: it can *destroy* something, *seize* an objective, or *prevent* you from achieving the mission.[159] Turning to our example possible CCs are: *increase* the capacity of the Aurigian Armed Forces in countering conventional and asymmetrical threats, *assist* Aurigian Armed Forces in safeguarding energy resources, *prevent* the flow of illegal arms to the Batari Liberation Army (BLA), *deny* the BLA freedom of movement; and *restore* security in area seized by BLA. To accomplish these CCs resources are required which leads us to our next concept- Critical Requirements.[160]

Critical Requirements (CR) are nouns that define "conditions, resources and means that are essential for a center [sic] of gravity to achieve its critical capability."[161] Using the Strange Analysis relationships from the figure above, Table 5 will be incorporated to display the Zoran Sea Crisis scenario.

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[158]Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf; Internet; accessed 17 October 2007.

[159]*Ibid.,* 7.

[160]Dr Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 46.

[161]Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf; Internet; accessed 17 October 2007.

Table 5- Strange Analysis- Critical Requirements

End State	Operational COG	CC	CR	CV
Zoran Sea region safe and secure with conditions restored or established that enable uninterrupted access to the sovereign and territorial integrity of alliance Partners for Peace	Aurigian Armed Forces	*Increase* the capacity of the Aurigian Armed Forces in countering conventional and asymmetrical threats	- Force Generate Allied Forces to conduct training - Modernization of Armed Forces - Efficient intelligence infrastructure - Maintain Aurigian C2 structure	
		assist Aurigian Armed Forces in safeguarding energy resources	- Current Aurigian plan reinforced - Increase use pf technology - Increase intelligence reporting on possible threats - Increase use of civilian security firms to "free up" Aurigian Armed Forces	
		prevent the flow of illegal arms to the Batari Liberation Army (BLA),	- A secure border - Improved Policing capacity - Increased surveillance capacity - Interdiction of resupply routes - Diplomatic pressure on suppliers - Prioritize intelligence sources on arms suppliers	
		deny the BLA freedom of movement	- Improved Policing capacity - Increase surveillance capacity - Increase movement control posts on all routes in/out BLA controlled regions - Impose curfew in BLA controlled regions	
		restore security in area seized by BLA	- Increase Aurigian Armed Forces - Increase use of technology - Increase surveillance on BLA - Control movement in/out of BLA areas	

Following Strange's logic, the next step in the Strange analysis concept is Critical Vulnerabilities.

Critical Vulnerabilities (CV), described as nouns, are "those critical requirements, or components thereof, that are deficient, or vulnerable to neutralization or defeat in a way that

will contribute to a center [sic] of gravity failing to achieve its critical capability."[162] In general, the destruction of single CVs will not lead to the destruction of the centre of gravity.[163] However, Strange does submit the *silver bullet type* example of a cruise missile destroying an adversaries leadership which results in immediate culmination of a conflict. Usually, the direct or indirect destruction of a centre of gravity is completed with the synchronized destruction, neutralization or interdiction of a combination of CVs.[164] This series of operational success leads to an imbalance in power, which could be categorized as the decisive action results in conflict termination.[165] So, for the Zoran Sea Conflict scenario

Table 6- Strange Analysis- Critical Vulnerabilities

End State	**Operational COG**	**CC**	**CR**	**CV**
Zoran Sea region safe and secure with conditions restored or established that enable uninterrupted access to the sovereign and territorial integrity of alliance Partners for Peace	Aurigian Armed Forces	*Increase* the capacity of the Aurigian Armed Forces in countering conventional and asymmetrical threats	- Force Generate Allied Forces to conduct training - Modernization of Armed Forces - Efficient intelligence infrastructure -Maintain Aurigian C2 structure	- Number of available Allied Forces - Attrition exceeds training - Increased training time if Allied weapons systems utilized - Supply build up required - ITAR permissions - Antiquated intelligence system - Security classifications - Access to modern intelligence sources - English not primary language - Lack of Educated Officer Corps
		assist Aurigian Armed Forces	- Current Aurigian plan reinforced	- Number of sites to be protected

[162]Joseph Strange and Colonel Richard Iron, "Understanding Centers of Gravity and Critical Vulnerabilities," http://www.au.af.mil/au/awc/awcgate/usmc/cog2.pdf; Internet; accessed 17 October 2007.

[163]*Ibid.,* 8.

[164]*Ibid*., 8.

[165]*Ibid.,* 8.

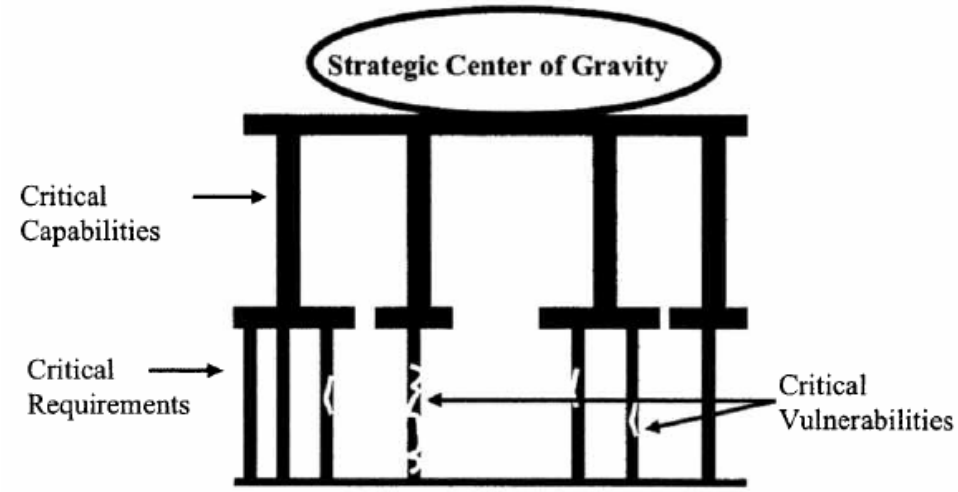
		in safeguarding energy resources	- Increase use of technology - Increase intelligence reporting on possible threats - Increase use of civilian security firms to "free up" Aurigian Armed Forces	- Increased training requirements - Reliability of HUMINT sources - Money to pay for firms - Use of Force procedures not matching Alliance which would decrease stability
		prevent the flow of illegal arms to the Batari Liberation Army (BLA),	- A secure border - Improved Policing capacity - Increased surveillance capacity - Interdiction of resupply routes - Diplomatic pressure on suppliers - Prioritize intelligence sources on arms suppliers	- A weak border security infrastructure - Recruiting and retention - Access to modern intelligence sources - Multiple routes in poor terrain. Helo support required - Sharing of intelligence from Alliance Partners
		deny the BLA freedom of movement	- Improved Policing capacity - Increase surveillance capacity - Increase movement control posts on all routes in/out BLA controlled regions - Impose curfew in BLA controlled regions	- Recruiting and retention - Access to modern intelligence sources - Number of available Aurigian Forces - Number of routes - Support from local population - Potential decrease in Alliance legitmacy
		restore security in area seized by BLA	- Increase Aurigian Armed Forces - Increase use of technology - Increase surveillance on BLA - Control movement in/out of BLA areas	- Recruiting and retention - Access to modern intelligence sources - Capacity and reliability of HUMINT resources - Number of access routes

it is clear that with the use of the Strange Analysis model the commander and planners can logically link the relationships of CV-CR-CC to target the COG. If a CV is attacked it will influence a CR which is turn affects the CC thereby potentially destroying the COG, as shown in Figure 12 and achieving the end state.[166] Prior to analyzing the Strange model,

[166]Dr. Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 51.

Jack Kem of the United States Army War College published "Campaign Planning: Tools of the Trade" 2 ed. which proposed an additional concept as part of the Strange Analysis.

Figure 12- Strange Analysis Model



Source: Lieutenant Colonel S.P. Myers, "Applying Operational Manoeuvre Theory to Contemporary Operations," (Toronto, Canadian Forces College Advanced Military Studies Programme, 2006), 5.

Although it is believed that this concept has not been adopted, it is worth highlighting as it demonstrates that campaign models are a start point for design of a campaign and can be adapted dependant on the type of problem. The additional concept that Kem suggests is Critical Weaknesses (CW). A CW is derived from CRs as they have inherent weaknesses.[167] He suggests that these weaknesses have been derived since the terrorist attacks of September 11th 2001 as requirements to achieve critical capabilities have become more difficult to procure. CWs differ from CVs as "they may either not significantly contribute to achieving a CR, they may not be vulnerable to attack by friendly forces, or

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[167]Dr. Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 49.

they may not be *targetable*."[168] So, if CWs can be identified they may provide insight into an adversary's intent and the means in which he may execute operations. The following are some examples of possible J5 CWs:

- Requires resolve for the long term with fickle populations
- Lack of unanimity in the world political arena
- Religious tension – concept of a "crusade"
- Instantaneous press coverage of everything
- Personality dependent, particularly with allies
- Lack of coherent coordination between diplomatic, informational, military, and economic (DIME) elements [169]

Nonetheless, the current accepted Strange Analysis model provides planners with a *crosswalk* in which CRs and CVs are the *means* to affects the *ways* (CCs) that lead to *ends* (end state) thereby facilitating campaign design.[170]

The Strange Analysis provides commanders and planners with an analytical model in which to dissect and reveal potential vulnerabilities to requirements and capabilities that protect a centre of gravity. This step by step process, that combines both analytical and intuitive thinking that could be called intelligent memory, closes the *design gap* and can be useful in solving both *tame* and *wicked* problems. By considering and understanding the connectively between the CCs-CRs-CVs a commander and staff can develop lines of operation which target CVs which deny the enemy CCs and CRs "he needs to fight and

[168]Dr Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 48.

[169]*Ibid*., 53.

[170]*Ibid.,* 56.

which support or defend his centre of gravity."[171] A commander than can use this *science* and apply *art* in the form of sequencing decisive points in a direct or indirect approach to attack adversary's centre of gravity. This is particularly useful in a VUCA environment where a "centre of gravity is difficult to directly target with kinetic means."[172]

Lastly, this sequential method of defining centre of gravity allows commanders and staffs with minimal professional experience and education to be guided in identifying the problem, gathering information and developing criteria in order to conceive a course of action. Although, Cummings has proposed that Strange Analysis is not a campaign design method, because "it only addresses the concept of COG and not other campaign design tools,"[173] using the relationships between the COG-CC-CR-CV[174] yields decisive points that can be grouped and sequenced onto a crosswalk which "provides a systemic method for translating the often-nebulous concept of the COG into meaningful military tasks."[175]

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[171]Lieutenant Colonel S.P. Myers, "Applying Operational Manoeuvre Theory to Contemporary Operations," (Toronto, Canadian Forces College Advanced Military Studies Programme, 2006),7.

[172]*Ibid*., 5.

[173]Major Cummings states that "the Strange Analysis only addresses the concept of COG and not other elements of design thus is not considered a method of Operational Design unto itself.." Conversly, he does submit "that Strange Analysis constructs a framework for determining key Operational Design elements [tools/concept]. " Major William G. Cummings, "Operational Design Doctrine: Hamstrung or Footloose in the Contemporary Operating Environment?" (Toronto, Canadian Forces College Command and Staff Course Masters of Defence Studies Paper, 2007), 68-70.

[174]Due to the fact that CWs are not part of Dr Strange's concept, as stated in the paper it is worth highlighting, as it demonstrates that campaign models are a start point for design of a campaign and can be adapted dependant on the type of problem, which is something that will be demonstrated during the subsequent chapter.

[175]Colonel James K Greer, "Operational Art for the Objective Force," *Military Review* (September-October, 2002): 29.

However, it is also this focus on COG which informs the debate on the utility of the Strange Analysis.

Strange Analysis, an analytical model, which was "offered a decade ago has been generally accepted in the joint community and formed the foundation of COG analysis in current United States joint doctrine."[176] However, the application of the process and its associated focus of a COG have not been universal.[177] An example of the how the process is not universal is demonstrated in targeting. The Strange Analysis process of critical vulnerabilities yields a high-value/high payoff target approach to operational planning.[178] The J2 provides the J5 with the critical requirements that the adversary does not have and that could be translated as a CW. The J5 then analyzes the CVs that are derived from the CWs to determine which are vulnerable to attack and leads to an approach to targeting. Conversely, the Strange Analysis process can be utilized to produce target value analysis. Target value analysis focuses on an adversary's CRs. The J2 provides the J5 with a list of critical assets that are required for the adversary to accomplish his mission. The J5 then conducts analysis, on these CRs that are identified as high value targets in conjunction with the friendly Course Of Action (COA). If the CR can be attacked it may be given a higher priority for attack and become a high-payoff target.[179] This target value analysis method

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[176]Rudolph M. Janiczek, "A Concept at the Crossroads: Rethinking the Center of Gravity," (United States Army Strategic Studies Institute, October 2007), 3.

[177]*Ibid.,* 3.

[178]Colonel James K. Greer, "Operational Art for the Objective Force," *Military Review* (September-October, 2002): 29.

[179]Dr. Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 59.

approached targeting from "what the enemy has."[180] So, the same Strange Analysis process provides two equally useful methods of targeting in campaign design. The other significant portion of Strange Analysis that is not universal is the COG.

For the practitioner of the Strange Analysis method of campaign design, "…being able to identify friendly and adversary centres of gravity as the sources of strength, power and resistance is the most important task.[181] Yet, there is a belief that "the quest for battle is fed by the Western fixation on the center [sic] of gravity."[182] Moreover, the importance of the COG, which has "spawned a cult-like following," has elevated it to a point where planners have lost sight of the campaign objectives and it has become "a pole attraction for many other elements of campaign design. [183] This traditional focus of the COG in a VUCA environment that is mixed with political, economic and military efforts may not be capable of providing a stable campaign design that can endure years versus months of conflict. Instead, a COG focus can lead to campaigns that are only designed for the duration of formation rotation. The benefit is the problem is constantly viewed from a "fresh perspective" however, the danger is that the campaign design results in a plan that "quickly degenerates into the realm of coordinating tactical actions"[184] in order to destroy the COG. Perhaps the campaign design should focus on "attainment of the *end state* by linking the

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[180]Dr. Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 62.

[181]Colonel Dale C. Eikmeier, "Center of Gravity Analysis," *Military Review* (July-August, 2004): 2.

[182]Pierre Lessard, "Campaign Design for Winning the War…and the Peace," *Parameters* (Summer, 2005): 38.

[183]*Ibid.,* 38.

[184]Howard G. Coombs and General Rick Hillier, "Planning for Success: The Challenge of Applying Operational Art in Post-Conflict Afghanistan," *Canadian Military Journal* (Autumn 2005): 7.

conditions necessary for success throughout the length and breadth of a campaign."[185] Another possibility of where the focus would be in designing the campaign may be Conflict Termination Conditions (CTC) that derives campaign objectives "which serve to focus effort, facilitate the communication of the commander's intent, and establish a link to instruments of national and coalition power."[186] The focused campaign design tool would allow the *sequencing* of the certain sets of effects, or conditions that need to be achieve victory. Therefore, focusing a campaign design on one specific tool like COG, end states or sequencing may have value, but there must be acknowledgement that there is a danger of loosing sight of the aim.

Clausewitz paid tremendous attention to the concept of centre of gravity in *On War*. As indicated earlier, the exact translation and context of what Clausewitz meant by the centre of gravity being the "hub of all power" has been and continues to be debated. Nevertheless, it is Strange that has provided significant clarity and focus on the centre of gravity by providing an analytical campaign design method that enables commanders and planners to select a centre of gravity (gravities) that will lead to decisive action and the culmination of adversary. The method of attacking adversaries' critical vulnerabilities (his Achilles heals) is proven useful in the VUCA like Zoran Sea Scenario. However, despite its inherent strengths it is not the panacea of campaign design methods as both processes and primary focus (centre of gravity) of the Strange Analysis may allow campaigns to "lose sight of the fact that strategic objectives must dominate the campaign planning process at

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[185]Howard G. Coombs and General Rick Hillier, "Planning for Success: The Challenge of Applying Operational Art in Post-Conflict Afghanistan," *Canadian Military Journal* (Autumn 2005*,* 12.

[186]Pierre Lessard, "Campaign Design for Winning the War…and the Peace," *Parameters* (Summer, 2005): 45-46.

every juncture."[187] Therefore, the Strange Analysis is not acceptable as a sole doctrinal campaign design method throughout the full spectrum of operations. If this is the case, the questions remains is whether of not there is a campaign design model that can be used throughout the full spectrum of operation in the VUCA environment? The next chapter will examine the Decide-Detect-Deliver concept as an alternative to the analytical Strange Model to examine this question.

[187]Pierre Lessard, "Campaign Design for Winning the War…and the Peace," *Parameters* (Summer, 2005): 37.

> *But the human spirit recoils even more from the idea of a decision brought about by a single blow. Here all action is compressed into a single point in time and space.*[188]
>
> Carl von Clausewitz

CHAPTER FOUR- DECIDE-DETECT-DELIVER CONCEPT- ANOTHER ENDS

In discussing Carl von Clausewitz, Milan Vego notes that the destruction or neutralization of the enemy's forces was believed to by the key to victory**.** Further, Vego submits a massive amount of time and energy has been expended trying to develop concepts that seek victory which become the "theoretical underpinnings" of doctrine. [189] For the past 30 years the United States has produced doctrinal documents that reveal how pervasive and essential the Clausewitzian concept of center of gravity (COG) has become to Operational thinking and is "regarded as the heart of any sound plan for a campaign or major operation."[190] As discussed in Chapter 3, Clausewitz's COG concept is the focal point of much debate which is based on mistranslation or its improper contextual use. In 2007, Vego highlighted the fact that the problem in defining, analyzing and arguing this concept was, from a historical perspective, that Clausewitz never used the term *centre of gravity*. The center of gravity concept was derived from the term *Schwerpunkt*, which really meant "weight (or focus) of effort".[191] As such, the original *Schwerpunkt* concept underpins the doctrinal concept of "what the United States military now calls the *sector of main effort* and the *point of main attack* (defence)." Vego submitted that despite this possible

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[188]Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 259.

[189]Milan Vego, "Clausewitz's Schwerpunkt: Mistranslated from German – Misunderstood in English," *Military Review* (January-February 2007): 101-102.

[190]*Ibid*., 101.

[191]*Ibid.,* 101.

mistranslation, *Schwerpunkt* did encompass both physical and human elements, like the COG concept.[192] Thus, accepting the fact that Clausewitz did not specifically use the term centre of gravity but meant *Schwerpunkt*, the underpinning theory of Schwerpunkt is identical. It focuses a campaigns weight of effort directly at "an adversary's hub of all power and movement"[193] Moreover, "no matter what the central feature of the enemy's power may be – the point on which your efforts must converge – the defeat and destruction of his fighting force remains the best way to begin, and in every case will be a very significant feature of the campaign."[194] It is this philosophy that leads to the discussion of our next campaign design framework – Decide-Detect-Deliver which is not synonymous with the 1990s United States campaign design framework of Destroy-Dislocate-Disintegrate.[195]

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[192]Milan Vego, "Clausewitz's Schwerpunkt: Mistranslated from German – Misunderstood in English," *Military Review* (January-February 2007): 101.

[193]Carl von Clausewitz, *On War*, ed and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 595-596.

[194]*Ibid*., 596.

[195] In the 1990s, the United States Army Training and Doctrine Command (TRADOC) fostered a campaign design approach called Destroy-Dislocate-Disintegrate. This design framework, largely theoretical, seeks to rapidly conduct military operations and apply combat power to successively (ideally simultaneously) destroy, dislocate, and disintegrate opposing military forces. Arguably, in 2000, Professor James J. Schneider furthered this design framework approach in his article, "A New Form of Warfare," in which he offered the concept of *cybershock*. Schneider believed that cybershock causes "paralysis by attacking the enemy's nervous system in the same was that maneuver causes exhaustion by defeating the enemy's metabolic system-his logistics." However, he cautions that defeating an adversary could not be completed solely by paralysis but the complementary and mutually reinforcing strategies of exhaustion, annihilation and paralysis, Major Robert C. Johnson "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity." Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994, and James J. Schneider, "A New Form of Warfare," *Military Review*, Issue 80, Vol 1 (January-February 2000): 56-61.

This chapter will focus on the Effects-Based approach of campaign design and introduce the concept of a Decide-Detect-Deliver (D3) campaign design framework which identifies centers of gravity and effectively and efficiently synchronizes operational design.[196] First, the concept of Warden's Five Rings[197] will be discussed. Next, the Mendel-Tooke method will be introduced and joined with Warden's Five Rings to provide the D3 framework and placed into the NATO Zoran Sea Crisis scenario in order to demonstrate its utility in solving tame and wicked problems in the VUCA environment. Lastly, D3 will be analyzed to consider its inherent strengths and weaknesses, which will demonstrate why it can be considered a campaign design method.

Colonel John A. Warden III of the United States Air Force published "Strategic Warfare: The Enemy as a System," in 1995.[198] His premise is that strategic entities such as a state, a business organization, a terrorist organization are systems that encompass a central subsystem that is a human being which gives direction and meaning. Warden believes that "objectives are the key to success in strategic war," and as such they must be useful and "go far beyond those such as merely beating the enemy or wrecking his military forces."[199]

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[196] Major Robert C. Johnson "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity." (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), ii.

[197] Colonel John A Warden's, "Strategic Warfare: The Enemy as a System.," *Airpower Journal* (Spring, 1995), http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008 is the original source of the Warden's Ring theory. However, additional sources include Major David S. Fadok, "John Boyd and John Warden: Air Power's Quest for Strategic Paralysis," Air University Press, Maxwell Air Force Base, Alabama, February 1995. http://aupress.maxwell.af.mil/saas_Theses/Fadok/fadok.pdf; Internet; access 20 April 2008.

[198] Colonel John A. Warden's article, "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995), http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008, will be used as the primary source for this chapter.

[199] *Ibid*., 3.

Therefore, to execute warfare well, Warden submits that we must think in terms of systems; we and our enemies [adversaries] are systems and subsystems with mutual dependencies."[200] He proposes that our objective is to take all necessary action to ensure an adversary does not damage our system or any of its subsystems while reducing the overall effectiveness of the adversaries system. In order to do this well, Warden submits "we must reverse our normal method of thinking; we must think from the big to the small, from the top down."[201] In order to attain our objectives we must cause one or more parts of the adversaries physical system to change which results in the adversary adopting our objectives or being physically impossible to oppose us. To simplify this concept, Warden provides a model which gives us a "comprehensive picture of a complex phenomenon [VUCA]…and a good approximation of the real world"[202] Figure 13 depicts this model.

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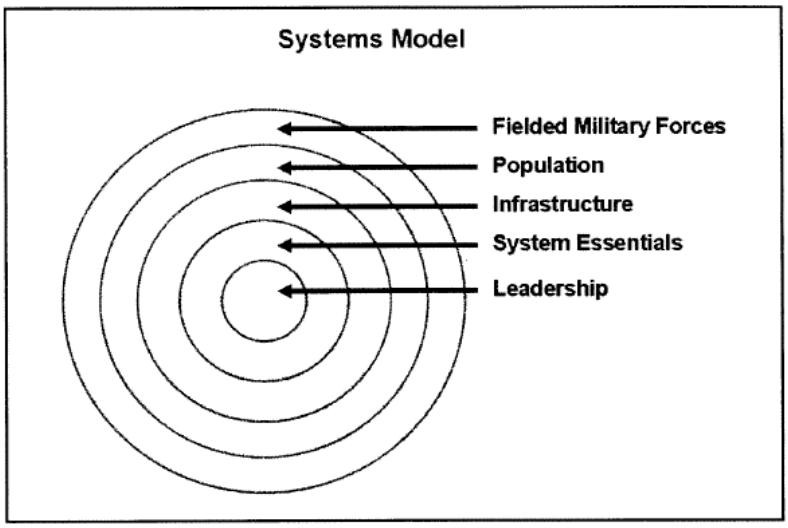
[200]Colonel John A. Warden's article, "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 12, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm;Internet; accessed 15 March 2008.

[201]*Ibid*., 12.

[202]*Ibid*., 3.

Figure 13- Warden's Five Rings



Source: Dr. Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 62.

Warden's Five-Ring model accepts that "every state and military organization will have a unique set of centers [sic] of gravity or vulnerabilities."[203] The five ring model is a good start point for selecting and identifying COGs by suggesting detailed questions to ask and a priority for operations from the most vital (middle) to least vital (outside). Prior to describing each ring from Strategic and Operational perspective, it is useful to relate the five ring model to something more familiar. Warden uses the human body to articulate his model. The human body can be "thought of in terms of systems and although we can assign various levels of importance to the body, the parts really constitute a system."[204] The table below displays the human body with the five rings (in the first column), from Brain equaling Leadership to Leukocytes equaling Fighting Mechanism. Thus, "if any part of the

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[203] Colonel John A. Warden, "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 7, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

[204] *Ibid*.,. 5

system becomes incapable of functioning, it will have a more or less important effect on to rest of the body."[205] In describing the five rings model as a human body it clearly provides an understanding of how systems are dependant on one another and facilitates the comprehension of how States are a system of systems. Using Table 7 and the

Table 7- Warden's Model in Relation to other Systems

System Attributes				
	Body	State	Drug Cartel	Electric Company
Leader	Brain -eyes -nerves	Government -communication -security	Leader -communication -security	Central control
Organic Essential	Food/oxygen -conversion via vital organs	Energy (electricity, oil, food), money	Coca source plus conversion	Input (heat, hydro) Output (electricity)
Infrastructure	Vessels, bones, muscles	Roads, airfields, factories	Roads, airways, sea lanes	Transmission lines
Population	Cells	People	Growers, distributors, processors	Workers
Fighting Mechanism	Leukocytes	Military, police, firemen	Street soldiers	Repairmen

Source: Dr. Jack Kem, "*Campaign Planning: Tools of the Trade Second Edition*," Department of Joint and Multinational Operations (U.S. Army Command and General Staff College Fort Leavenworth, June 2006), 63.

State column, the potential strategic centers of gravity, which are also rings of vulnerability are listed and identify what is "absolutely critical to the functioning of a state."[206] So, the fact that in the five-ring model the first ring is the most critical and the fifth ring is least critical, Warden submits that operational artists must not believe that the focus of war is the

[205]Colonel John A. Warden, "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 5, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

[206]*Ibid*., 7.

clash of military forces. Although clashes may be necessary they should be avoided as they are a "means to an end and not an end it itself."[207] Keeping in mind that the system is the sum of its functional parts this paper will now describe each ring, from a strategic and operational level, starting with the most critical.

The most critical ring is the *leadership* ring (also called the command ring by Warden). This ring is the most critical because whether it is a civilian at the head of the government or it is the only element that can make the very complex decisions that are necessary to keep a state on a particular course or that can direct a country in conflict. From an operational point of view this ring is the military commander and their command, control and communications systems. In modern times, whether at the strategic or operational level, capturing or killing the leader has "become more difficult but not impossible."[208] But at the same time, the ability to influence the command structure that surrounds a leader has increased in importance and is vulnerable to direct attack. Therefore, if the leadership ring cannot be directly attacked in order for the state or military leader to become incapable of leading, indirect pressure must be placed on this ring. The intent of this indirect pressure is to force the leader to make concessions by removing his ability to continue a particular course or to continue combat. The success of this indirect pressure will be reached when the "degree of damage imposed on the surrounding rings" forces culmination.

The o*rganic essentials* ring is the next most critical. Organic essentials are those facilities or processes which a state or military cannot do without. From a state perspective

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[207]Colonel John A. Warden, "Strategic Warfare: The Enemy as a System," *Airpower Journa*l (Spring, 1995): 2, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

[208]*Ibid*., 7.

organic essentials may be electricity, petroleum products or essential industrial capabilities that are required to keep it operating. Operationally, organic essentials could be thought of as logistics. Without logistics, a commander will not have the ammunition, fuel, or food to ensure his forces can execute their assigned mission. Direct pressure on the organic essentials ring may make the leadership ring make concessions because;

- Damage to organic essentials leads to the collapse of the system.
- Damage to organic essential makes it physically difficult or impossible to maintain a certain policy or to fight.
- Damage to organic essentials has internal political or economic repercussions that are too costly to bear. [209]

Depending on the size of the state or military, the number of organic essentials that may present themselves as possible targets may be relatively small. Consequently, in order to influence the leadership ring, pressure may be required on the infrastructure ring.

The *infrastructure* ring contains the majority of a states industry that does not fall within the organic essentials ring. The infrastructure ring is composed of the systems that enable a state's industrial capacity to function, develop and grow. Thus it includes "rail lines, airlines, highways, bridges, airfields, ports, and a number of other similar systems." At the operational level many of the above listed systems would be similar, however, it would be those systems that would be needed to employ fielded forces, for example communications lines and pipelines. Many states and militaries have 'hardened' this ring by ensuring there is redundancy. This minimizes the attacker's options in directly or indirectly influencing the leadership or organic essentials ring. Therefore, the fourth ring, *population* becomes a potential point of attack.

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[209]Colonel John A. Warden "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 8, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

As Warden articulates, "moral objections aside," directly attacking the *population* ring is difficult.[210] Within a state or a military there are a plethora of targets but most will not provide an advantage to the attacker. If attacked the increased number of targets may make it impossible to directly influence the population or military support personnel in order to put pressure on the leadership ring. However, it is possible to indirectly attack the population ring and "create the conditions that lead the civilian population…to call on its government [or military] to change the state's policies."[211] An example of this indirect method could be the North Vietnamese influencing the American people by raising the American military casualty levels higher than was tolerable. However, the direct or indirect attack on this ring is unpredictable which was demonstrated when the Germans bombed the British in World War II. This action did not result in the fragmentation of the leadership ring but rather increased the populations' resolve to support leadership actions and policies.[212] Despite the appropriateness of attacking the population ring, the probability of an adversary attempting a direct or indirect attack in order to influence the command ring "isn't likely to go away in the near future."[213] So the system must be protected by the fifth ring *fielded military*.

The *fielded military* ring exists to protect the other four rings or to cause direct or indirect influence on an adversary's system. Although military forces have classically been

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[210]Colonel John A. Warden, "Strategic Warfare: The Enemy as a System," *Airpower Journa*l (Spring, 1995): 8, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

[211]*Ibid*., 8.

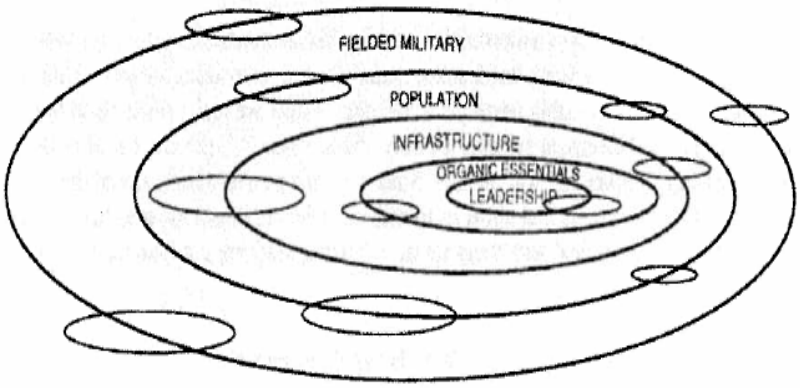
[212]*Ibid*., 8-9.

[213]*Ibid*., 9.

seen as a means to an end, modern technology has made it possible to provide new and politically powerful options "that in fact can put fielded forces into the category of means and not ends."[214] The fifth ring is the toughest, so campaigns that are designed with the intent of directly or indirectly attacking the military ring in order to influence the leadership ring may the longest and bloodiest. However, as Warden stated above, clashes should be avoided as they are a "means to an end and not an end it itself."[215] This is imperative to remember as all actions should be aimed against the system as a whole.

The five ring model represents most systems built around any type of life forms that exist in the world today. Although each ring may not be equal, as Figure 14 depicts, the leadership ring will remain the dominant ring in importance. This combined with the fact that each ring is designed to withstand some degree of direct or indirect attack implies

Figure 14- Warden's Five Ellipses



Source: Colonel John A. Warden, "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 6, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

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[214]Colonel John A. Warden "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 9, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

[215]*Ibid*., 2.

"it will normally be necessary to strike at several of the inner rings" simultaneously to achieve victory.[216]

This type of synchronized attack is termed by Warden as *parallel attack*.[217] It involves striking directly or indirectly multiple state or military (from an operational standpoint) rings in order to influence the leadership ring. Therefore, it is not targeting a single *Schwerpunkt* or COG through a series of attacks, understood as serial warfare which produced "that point at which the campaign is in near equilibrium where the right effort on either side can have significant effect"[218]- *culmination point*. Instead, parallel attack "makes very real what Clausewitz called the ideal from of war, the striking of blows everywhere at the same time."[219] This is possible if states and militaries are considered as systems and subsystems with mutual dependencies [COGs].

The weakness in Warden's five ring model is that it does not provide a method for selecting which COGs should be selected for parallel indirect of direct attack. To address this weakness, the Mendel-Tooke method can be utilized as a complement to Warden's five rings and thereby provides the framework for the Decide-Detect-Deliver campaign design framework.

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[216]Colonel John A. Warden "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 10, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

[217]*Ibid*., 12.

[218]*Ibid*., 12.

[219]*Ibid*., 12.

In 1993, US Army Colonel William Mendel (retired) and Colonel Lamar Tooke published an article "Operational Logic: Selecting the Center [sic] of Gravity. The hypothesis of their article "is that there is a strong linkage between the strategic aims and the center [sic] of gravity, which defines a selection process useful"[220] to operational commanders and staffs. Their method is based on two principles;

- Centers [sic] of gravity are derivative of the aims or objectives established at the level for which you are planning (strategic, operational, or tactical).
- Aims or objectives established at the operational and tactical levels should contribute to our ability to impose our will (such as destroy, defeat or delay) over the center of gravity at the next higher level of war. [221]

Mendel and Tooke submit that their operational logic is not designed to be a formula or prescription but a point of departure in the selection of a COG. In attempting to utilize this methodology, a "great deal of thinking and discussion [groupthink] are required"[222] and the validity of each potential COG should be testing by asking:

> …if I desire to impose my will upon this center [sic] of gravity, will that action create a cascading, deteriorating effect on morale, cohesion and will to fight that prevents my enemy [adversary] from achieving his aims and allows the achievement of my own? Further if I have selected a valid center [sic] of gravity, do I have a feasible ability to impose my will over it?[223]

The process which provides the answer to this question is depicted in Figure 15-the Mendel-Tooke method of selecting a COG. Figure 15 shows that the process begins

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[220]Colonel William W. Mendel and Colonel Lamar Tooke, "Operational Logic: Selecting the Center of Gravity," *Military Review* 73 (June, 1993): 5.

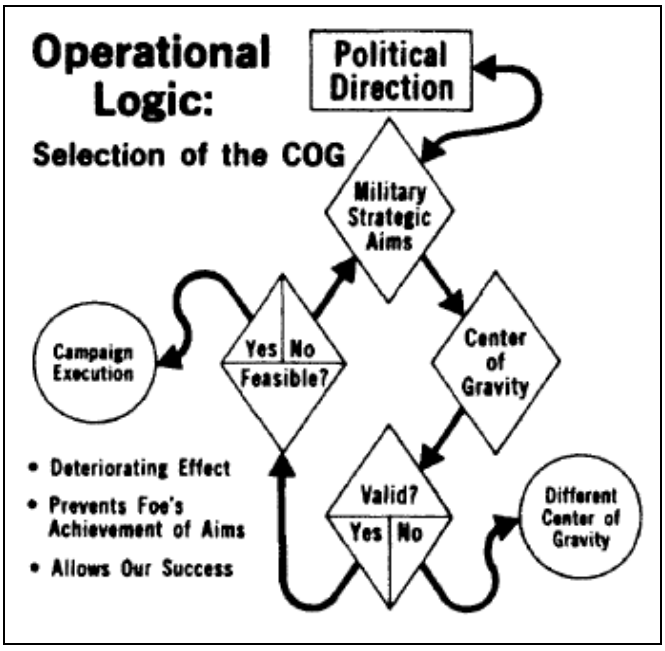
[221]Ibid., 5.

[222]*Ibid.,* 5.

[223]*Ibid.,* 5.

with the Political Direction that establishes the national aims and sets the conditions for the use of military power. Next, military strategists determine the appropriate strategic aims that will support the political ends. Third, based on the strategic aims potential centres of gravity can be considered by submitting them to the following test: Can imposing our will upon the selected COG create the deteriorating effect that prevents our foe from achieving his aims and allows the achievement of our aims? If the answer if yes, then a valid COG is established, but if the answer is no,

Figure 15- The Mendel-Tooke Method for selecting a COG



Source: Colonel William W. Mendel and Colonel Lamar Tooke, "Operational Logic: Selecting the Center of Gravity," *Military Review* 73 (June, 1993): 5.

then another potential COG must be considered. Mendel and Tooke contend that at the operational and tactical levels multiple valid COGs could exist, however "to the extent that they proliferate, the less useful the concept of center [sic] of gravity in

bringing unity of purpose to the campaign."[224] With a valid COG determined the next step is to determine if it is feasible to impose our will. If this capability does not exist then the military strategic aims in step two must be adjusted and validated. If the capability does exist then the COG and operational goals establish the foundation for the selection of tactical objectives that support the strategic aims.[225] This "direct and intrinsic relationship between strategic aims and center of gravity [operational art]… allows the commander [to] conceptualize the military design and conditions that will ultimately achieve the strategic aims."[226] Yet, the weakness in the method is that it does not have a foundation on which to begin the selection of the COGs. Hence Warden's five ring model provides a good start point that tells designers what detailed questions to ask, and "it suggest a priority for questions and for operations from the most vital at the middle to the least vital at the outside."[227] Combined Mendel and Tooke and Warden produce the Decide-Detect-Deliver campaign design framework.

The Decide-Detect-Deliver campaign design framework was proposed in 1994 by Major Robert Johnson in an unpublished monograph entitled "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's

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[224]Colonel William W Mendel and Colonel Lamar Tooke, "Operational Logic: Selecting the Center of Gravity," *Military Review* 73 (June, 1993): 5-6.

[225]*Ibid*., 6.

[226]*Ibid*., 6.

[227]Colonel John A. Warden, "Strategic Warfare: The Enemy as a System," *Airpower Journal* (Spring, 1995): 7, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

Capabilities against Enemy Centers of Gravity." In this monograph[228] Johnson submits that combining the Warden/Mendel-Tooke methods "can effectively and efficiently synchronize the joint force attack."[229] Johnson takes the two methods and places them in a targeting framework. He defines targeting as "the process of identifying enemy targets for possible engagement and determining the appropriate attack system to use to capture, destroy, and degrade to neutralize the target in question."[230] Although, this foundation is tactically focused, Johnson submits that this process is applicable to the operational level in the Decide-Detect-Deliver (D3) methodology.[231]Conceptually, a commander can use the same tools and process but instead of focusing on targets he would orient on the COG(s).[232] Using the D3 process will result in the following questions being answered:

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[228]Major Johnson's monograph was written in 1994 using Colonel John Warden's, "Strategic Warfare: The Enemy as a System," which was unpublished and was an Air Command and Staff College document in January 1993. This paper used the published article, in the Airpower Journal from 1995.

[229]Major Robert C. Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 26.

[230] *Ibid*., 27.

[231] Prior to discussing the D3 method the following terms are necessary for the discussion: *High-Value Target* (HVT): Assets the enemy (or commander) needs to successfully complete his mission. *High-Payoff Target* (HPT): HVTs that must be found and successfully attacked (protected from J5 perspective) for the success of the friendly commander's mission. *High-Payoff Target List* (HPTL): A list of enemy targets that should be found and attacked. *Collection Plan*: Process that links acquisition and intelligence systems to locations and times in order to determine where and when targets should be found and who can find them. *Attack Guidance Matrix* (AGM): A matrix reflecting the commander's specific guidance on how to attack selected targets and the type of results he expects. Major Robert C. Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 27.

[232]Major Robert C. Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 32.

- What are the COGs that we should acquire and attack?
- Where are the COGs and who can locate them?
- How and when should the COGs be attacked?
- How do we determine is our attack on the COS was successful? [233]

Johnson submits that similar to the tactical commander, the operational commander could use the HPTL, collection plan or AGM to find answers to the above questions. However, it will be demonstrated using the Zoran Sea Scenario (Tables 8-8C) that the D3 method is also useful within a campaign design framework. The D3 method does not fit a specific format as it is more of an intuitive approach to campaign design. However, for the purposes of this paper the D3 method will be placed in a table from a J5 perspective.

The first step and arguably the most critical in the D3 method is *decide*. Referring back to the Mendel-Tooke model the commander receives the strategic objectives, end state, military objectives, mission and his next higher commander's intent.

Table 8- D3- Zoran Sea Scenario- Strategic Objectives and Intent

Political Direction	The United Nations Secretary-general has indicated his intention to call upon the Alliance, under Chapter VII of the Charter, to provide the means as may be required to establish a Multinational Force under a unified command structure with the means necessary to fulfill this mandate. On the basis of the Secretary-General's intention, the council has reaffirmed overall Alliance willingness to support the United Nations and has agreed upon the following objectives and end states with respect to the crises in the North Zoran Sea. Objective 1- Restoration of international peace and security in the Zoran Sea Region End State 1- International Peace and Security in the Zoran Sea Region restored with full implementation of all UNSC resolutions and the sovereignty and territorial integrity of alliance partners for peace preserved Objective 2- Prevent further escalation and widening of the conflict End State 2- External threats and support for the armed conflict neutralized and conditions established for political resolutions of the conflict. Objective 3- Protection of Human Rights and Humanitarian assistance. End State 3- A safe, secure environment in which displaced civilians and refugees are able to return to their homes. Objective 4- Safe evacuation of Foreign Nationals trapped in Auriga

[233]Major Robert C. Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 33.

	End State 4- Foreign National located in safe areas Objective 5- Free access to the region and its energy resources End State 5- Access to the region via international air and sea lanes uninterrupted Objective 6- Prevent environmental destruction End State 6- Armed threats to natural energy resources and infrastructure neutralized without damage to the environment
Military Strategic Aims	The assessment of potential Military Response Options (MROs) must be directly related to clearly identified Strategic Military objectives derived from the Alliance's strategic political objectives (list above) Military Objective 1 (MO1)- Restoration of peace and security in Auriga and Perseus Military End State 1 (ME1) a. International peace and security are not longer threatened by armed conflict b. BLA is no longer able to conduct large-scale guerilla operations c. There is full implementation of likely UNSC Resolutions d. Displaced civilians and refugees are able to return to their homes. Military Objective 2 (MO2)- Keep open Capella International Airport and establish secure conditions for the provision of humanitarian assistance Military End State 2 (ME2) a. Capella International Airport is secure and functioning. b. The flow of humanitarian aid into Auriga and the evacuation of personnel are not interrupted by armed attacks c. Freedom of movement is secured for humanitarian aid in Auriga and Perseus d. Risks to UN and international aid workers from armed attack are minimized Military Objective 3 (MO3)- Prevent further escalation and widening of the conflict Military End State 3 (ME3) a. External threats are neutralized b. BLA is contained c. The flow of illegal arms into Auriga is halted d. Conditions are established for political negotiations Military Objective 4 (MO4)- Establish the conditions for the safe evacuation of foreign citizens Military End State (ME4) a. Multinational evacuation routes and departure points are secure and functioning b. Foreign nationals moved to safe areas by national authorities Military Objective 5 (MO5)- Assist Auriga and Perseus in safeguarding the flow of Zoran Sea energy supplies Military End State 5 (ME5) a. Flow of oil and gas from region is uninterrupted by armed attacks b. Armed threats to natural energy resources are neutralized c. Risk of environmental disaster from attacks of energy sources and infrastructure is minimized.

The operational commander then proceeds through four steps within the decide function. First, using the combined Warden and Mendel/Tooke model he attempts to identify the COGs for each ring from an adversary and friendly perspective. Once he articulates valid COGs he then decides how he wants to influence the COGs and the desired effects. These effects could be expressed as destroy, neutralize, disrupt or contain, to name a

few. Combining the COGs and the desired effects the operational commander then decides the "best military instrument [requirement] of power" that must be used to either protect (from a friendly perspective) or attack (from an adversarial perspective).[234] Johnson further proposes that when determining these instruments consideration should also be given to Diplomatic, Informational and Economic instruments at the disposal of the commander.[235] Taking these three decisions into account the commander then "visualizes a combination of simultaneous and sequential operations necessary to achieve desired conditions of the end state" and decides how to best arrange them which results in the determination of phases.[236]

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[234] Major Robert C Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 34.

[235] In 2005 international policy statement Prime Minister Paul Martin introduced the 3D concept, which has since been replaced by the term whole-of-government. Nevertheless, the concept is that the Department of National Defence (DND), Foreign Affairs and International Trade Canada (DFAIT), and the Canadian International Development Agency (CIDA) work together to execute a common strategy. This reconciling of military, diplomatic and humanitarian objective provide a more effective way to stabilizing failed and failing states, for example Afghanistan. This concept is similar to the United States DIME concept. The USJFCOM glossary defines DIME as the areas of national power that are leverages in "effect-based" operations against an adversary's vulnerabilities identified by Operational Net Assessment (ONA), and targeted against his will and capability to conduct war. Moreover, the ONA is a critical enabler for achieving rapid decisive operations. It is integrated, collaborative product of Department of Defense and other appropriate government and non-government organizations. Taylor Owens and Patrick Travers, "3D Vision: Can Canada reconcile its defence, diplomacy, and development objectives in Afghanistan," *The Walrus*, July-August 2007; http://www.walrusmagazine.ca/articles/2007.07.Afghanistan-and-Canada/; Internet; accessed 20 April 08. United States, Department of Defense, JFCOM Glossary, http://www.jfcom.mil/about/glossary.htm#ONA; Internet; accessed 20 April 08.

[236] Major Robert C Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 36.

Table 8A- D3- Zoran Sea Scenario- Decide

	Warden's Rings				
	Leadership	**Organic Essentials**	**Infrastructure**	**Population**	**Fielded Military Forces**
Decide					
Mendel/Tooke					
Possible COG	ME1a- International peace and security are no longer threatened by armed conflict ME1b- There is full implementation of likely UNSC Resolutions ME 3- Conditions are established for political negotiations	ME2- Capella International Airport is secure and functioning. ME5- Risk of environmental disaster from attacks of energy sources and infrastructure is minimized.	ME 2- Freedom of movement is secured for humanitarian aid in Auriga and Perseus ME4- Multinational evacuation routes and departure points are secure and functioning ME5a- Flow of oil and gas from region is uninterrupted by armed attacks ME5b- Armed threats to natural energy resources are neutralized	ME1- Displaced civilians and refugees are able to return to their homes. ME2a- Risks to UN and international aid workers from armed attack are minimized ME2b- The flow of humanitarian aid into Auriga and the evacuation of personnel are not interrupted by armed attacks ME4- Foreign nationals moved to safe areas by national authorities	ME1- BLA is no longer able to conduct large-scale guerilla operations ME3a- External threats are neutralized ME3b- BLA is contained ME 3c- The flow of illegal arms into Auriga is halted
• Valid & Feasible	ME1a-No ME1b- No ME3- No	ME2- Yes ME5- No	ME2-Yes ME4-Yes ME5a-Yes ME5b-Yes	ME1- Yes ME2a- Yes ME2b- Yes ME4-No	ME1-Yes ME3a-No ME3b-Yes ME3c-Yes
COG	The Legitimacy of Aurigian Government- Not applicable to operational	- Capella International Airport	- Transportation Routes - Flow of Natural Resources uninterrupted	- Conflict assistance personnel	-Aurigian Armed Forces

	level				
• Effect		1. Secure Airport and Associated Infrastructure	1.Secure routes deny BLA movement 2. Current Aurigian plan reinforced 3. Increase use of technology 4. Increase intelligence reporting on possible threats 5. Increase use of civilian security firms to "free up" Aurigian Armed Forces 6. Increase surveillance on BLA 7. Control movement in/out of BLA areas	1. Assist in increasing capacity of Aurigian security services 2. Improved Policing capacity 3. Increase surveillance capacity 4. Increase movement control posts on all routes in/out BLA controlled regions 5. Impose curfew in BLA controlled regions 6. Increase surveillance on BLA	1.Force Generate Allied Forces to conduct training 2. Modernization of Armed Forces 3. Efficient intelligence infrastructure 4. Maintain Aurigian C2 structure Force Generate Allied Forces to conduct training 5. Modernization of Armed Forces 6. Efficient intelligence infrastructure 7. Secure border 8. Improved Policing capacity 9. Increased surveillance capacity 10. Interdiction of resupply routes 11. Diplomatic pressure on suppliers 12. Prioritize intelligence sources on arms suppliers
• Instrument		-Military -Development -Information -Diplomatic	-Military -Development -Diplomatic	-Military - Development	-Military -Diplomatic -Development

The *detect* function of D3, enables the commander to "articulate his intelligence acquisition priorities based on his decisions made in the decide phase."[237] From a campaign planning perspective these information requirements could be in the form of Commander Critical Information Requirements (CCIRs)[238]. These CCIRs would contain Priority Information Requirements (PIRs), Friendly Forces Information Requirements (FFIRs) and although not considered a CCIR, Essential Elements of Friendly Information (EEFIs). With the identification of the CCIRs, as part of the Collection plan, identifying and locating of decisive points to deliver the desired effects.

Table 8B- D3- Zoran Sea Scenario- Detect

Detect					
	N/A	1. CCIR	1.PIR 2.- 3. - 4. PIR 5. - 6. PIR 7. -	1. PIR 2. FFIR 3. - 4. FFIR 5. - 6. -	1. FFIR 2. - 3. EEFI 4. FFIR 5. - 6. - 7. PIR 8. FFIR 9. - 10. PIR 11. - 12. -

[237]Major Robert C Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 36.

[238] According to FM 5-0, CCIRs are key elements of information commanders require to support decisions they anticipate. During planning, CCIRs focus information needed to determine which COA to choose. During preparation and execution, CCIRs focus on information needed to validate the selected COA or determine when to initiate critical events. CCIRs include PIRs which identifies the information the commander considers most important for decision making and FFIRs which consist of information on the mission, troops, and support available and time available for friendly troops. EEFIs are critical aspects of a friendly operation that, if known by the enemy, would subsequently compromise, lead to failure, or limit success of the operation, and therefore must be protected from enemy detection. EEFIs become CCIRs when the commander states them. United States Department of Defense, Army Publication Field Manual 5-0 *Army Planning and Orders Production* (January 2005), 3-8.

With decisions taken and detection prioritized a commander can now focus on how to *deliver* the effect. It is at this point that the D3 method could be framed within a campaign design. The identification of the COG(s) leads to the decision of the desired effects on each one of the COGs which could be articulated as decisive points. With the COG(s) and decisive points identified, the required instruments of power could be related to lines of operation. Taking the lines of operation and arranging the decisive points in time and space would facilitate the delivery and the identification of phases and opportunities to conduct parallel attack. The targeting of specific opportunities on decisive points could then be identified as HVTs or High-Payoff Targets and placed on the HPTL. The result is that by using the D3 method the commander can "effectively align capabilities to results, ends to means."[239]

Table 8C- D3- Zoran Sea Scenario- Deliver and Potential Objectives

Deliver					
		1. HPT	1. HVT 2. - 3. - 4. HVT 5. - 6. HVT 7. -	1. HVT 2. HPT 3. - 4. HVT 5. - 6. -	1. HPT 2. - 3. HVT 4. HPT 5. - 6. - 7. HVT 8. HPT 9. - 10. HVT 11. - 12. -
Potential Objectives		Capella International Airport operational	Route security is essential Natural Resource security	Capacity increase to Aurigian Forces	Capacity Increase to Aurigian Forces

[239] Major Robert C Johnson, "Joint Campaign Design: Using a Decide-Detect-Attack (DDA) Methodology to Synchronize the Joint Force's Capabilities against Enemy Centers of Gravity," (Fort Leavenworth, Kansas: United States Army Command and General Staff College, School of Advanced Military Studies Course Paper, 1994), 40.

As the example highlights there are a number of strengths and weaknesses with the D3 model. There are three strengths with the D3 model. First, with the use of the Mendel-Tooke model a commander incorporates Political direction and Military Strategic Aim which provides a logical pathway to potential COGs. Coupled with the addition of Warden's five rings the commander or planning staff is provided with holistic perspective of the entire *wicked* problem [system] and a shared understanding and commitment to the problem and possible solutions can be created.[240] By validating each COG at the operational level a commander can provide feedback to his higher commander. If a commander cannot validate the COG then the higher commander must change the Military Strategic Aim or provide the resources for the commander to impose his will on the specific COG. Lastly, the D3 model does not limit the definition of what a COG can be, unlike the Strange Analysis. By having potentially multiple COGs the campaign design may be more end-state focused and provide a clearer perspective of where the campaign's weight of effort (*Schwerpunkt*) should be in order to achieve the Military Strategic Aim.

The weaknesses of the D3 model is that it requires experience, professional knowledge and may be too kinetically focused for the VUCA environment. First, the D3 model is intuitively based. It requires experience to conceptualize and develop an understanding of the problem and formulate solutions which commanders and staffs do not always have especially in the potentially unfamiliar VUCA environment. Next, although the D3 model was placed in a table format to articulate the Zoran Sea Scenario, it does not have a specified template, like that found with the Strange Analysis. This requires commanders

[240]Jeff Conklin, "Wicked Problems and Social Complexity," in *Dialogue Mapping: Building Shared Understanding of Wicked Problems* (CogNexus Institute, 2006), 14.

and staffs to be knowledgeable in using campaign design processes and tools in order to effectively analyze the problem. Lastly, the D3 model can be confused with the Destroy-Dislocate-Disintegrate model. Coupled with the underpinning of the D3 model being targeting, it may lead commanders and planners to have a more kinetic or direct means in solving a problem versus a non-kinetic or indirect means. Within in VUCA environment this may lead to attrition like serial warfare focused on the clash of military forces, which may be necessary but should be avoided as they are a "means to an end and not an end it itself."[241]

In conclusion this chapter has introduced the Decide-Detect-Deliver campaign design model. The combination of the effects based Warden's five-ring model and the intuitive Mendel-Tooke method of selecting a centre of gravity resulted in a framework that is easily suited to the entire spectrum of operations. Most importantly, the demonstration that a campaign design framework can be a combination of models only strengths the argument that a single doctrinal design model should not be adopted by the Canadian Forces.

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[241] Colonel John A Warden, "Strategic Warfare: The Enemy as a System," Airpower Journal (Spring, 1995): 2, http://www.airpower.maxwell.af.mil/airchronicles/apj/apj95/spr95_files/warden.htm; Internet; accessed 15 March 2008.

> *Our challenge as leaders will be to leverage our past experience even as we break from it. If we do not, and we fail to make the adjustments we must make to be successful, we will be neither relevant nor ready to win the long war*.[242]
>
> Colonel (P) Robert B. Brown

CONCLUSION

This paper demonstrates that the current operating environment supports campaign design framework models that are not captured in doctrine but uniquely selected based on the problem in order to create a durable and long lasting peace. Military leaders are faced with the complexity and friction of the battlefield which challenges their ability to impose their will within the full spectrum of operations.[243] Whether it is the use of critical thinking or its predecessor, creative thinking, leaders have realized "that there is no good analysis without intuition, and no good intuition without analysis,"[244] in trying to solve the wicked problems within today's volatile, uncertain, chaotic and ambiguous environment. Doctrinal campaign design tools provide the basis to frame a campaign plan within an operational planning process, however, they do not provide the *how to* approach for conducting operations. Strategic military problems require more adaptive and progressive approaches to current operations.[245] As per Table 9, the Strange Analysis Campaign Design model applies well to the VUCA environment and its analytical nature exposes a centre of gravity that

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[242]Colonel Robert B. Brown, "The Agile-Leader Mind-Set: Leveraging the Power of Modularity in Iraq," *Military Review* (July-August 2007): 44.

[243]Edward Allan Smith, "Complexity: The Promise and the Problems," from *Complexity, Networking & Effects-Based Approaches to Operations* (Washington DC: CCRP Publications, 2006), 34.

[244]William Duggan, "Coup D'Oeil: Strategic Intuition in Army Planning," (United States Army Strategic Studies Institute, November 2005), v.

[245]General William S. Wallace, "FM 3-0 Operations: The Army's Blueprint," *Military Review* (March-April 2008): 2.

Table 9- Campaign Design Framework Strengths and Weaknesses

Campaign Design Framework	Strengths	Weaknesses
Strange Analysis	-Analytical supported by Intuitive thinking - A Scientific method supported by Operational Art -COG-CC-CR-CV provide a crosswalk and a systematic method for translating strategic direction into military tasks -Can be utilized to produce target value analysis -Allows designers with minimal experience to be guided in identifying the problem	-Single COG focus that is military in nature at the Operational Level
D3 Method	-Intuitive supported by Analytical thinking -Operational Art supported by a Scientific method -Warden's Rings combined with Mendel and Tooke COG analysis provide a framework to translate strategic direction into military tasks. -Can be used to produce target value analysis	-Requires more experienced designers to be guided in identifying the problem

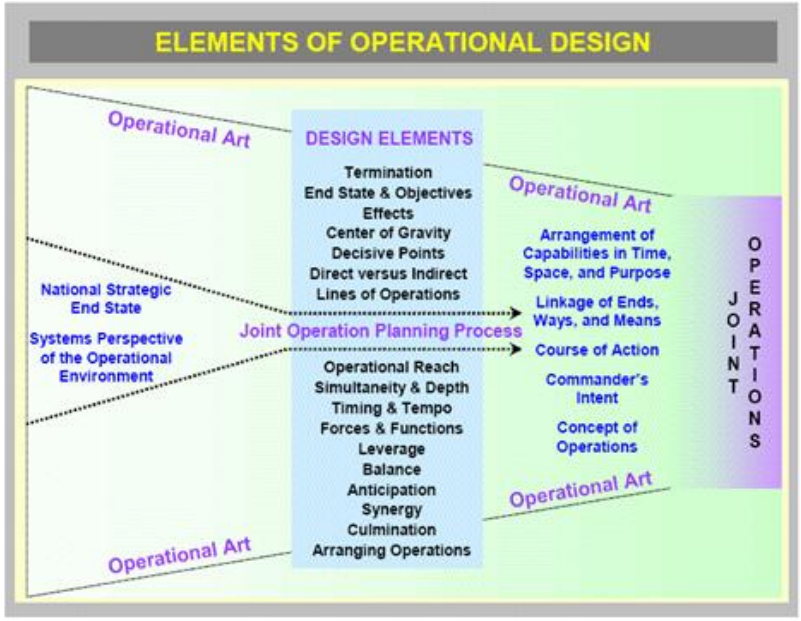
can be exploited thorough the direct or indirect influencing of critical vulnerabilities. Likewise, the Decide-Detect-Deliver method combines the systems of systems approach of Warden's five-ring model with the intuitive methods of selecting a centre of gravity of Mendel and Tooke. The result is another campaign design framework which allows designers to understand the best way for military forces to parallel attack an adversary's leadership ring. The D3's success is the indirect pressure or culmination point which will normally be reached as a conclusion of the degree of damage imposed on the surrounding rings. This paper has concentrated on *how* operational art is exercised and *how* the framework is used to translate strategic aims (ends) into campaigns (ways) using the

Canadian Forces doctrinal elements of operational design. A review of the various concepts leads to the conclusion that in order to address the ill-structured environment of the 21st century; the campaign design template that worked last time may be unusable. Thus, the ends, ways, and means of strategy may require commanders and designers to select a new campaign design framework for each problem, based on personal preference and experience.[246]

[246]Milan Vego, "Clausewitz's Schwerpunkt: Mistranslated from German – Misunderstood in English," *Military Review* (January-February 2007): 109.

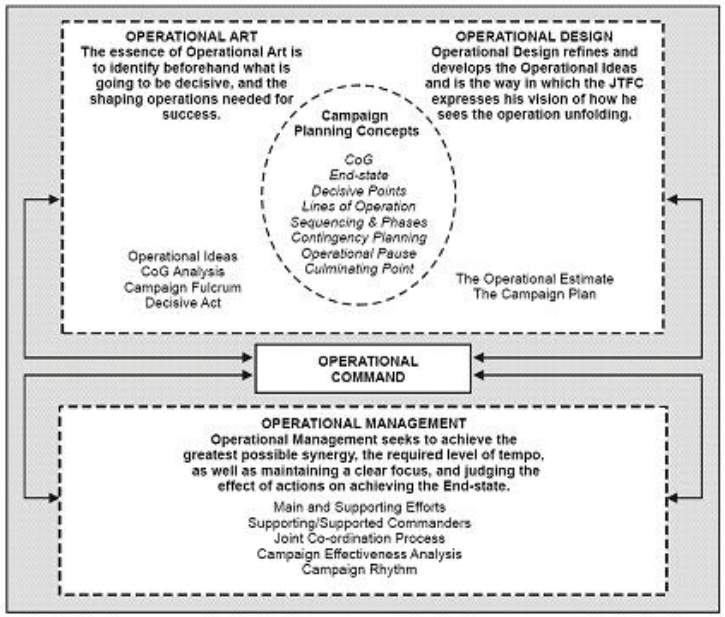
Appendix 1- United States and NATO Campaign Design Concepts

United States



United States, Department of Defense, Joint Publication 3-0 *Joint Operations (*17 September 2006): IV-6.

NATO



NATO Allied Joint Operations, AJP-01(C) (NATO: 21 March 2007), 4-16.

Appendix 2

CANADIAN FORCES COLLEGE
DEPARTMENT OF MILITARY PLANNING AND OPERATIONS
JOINT COMMAND AND STAFF PROGRAMME
DEFENCE STUDIES
OPERATIONAL DESIGN AND PLANNING
THE SITUATION IN THE NORTH ZORAN SEA

Overview

1.The Zoran Sea Region is a remote area in central Constellatia where different cultures from the North, East and the West of Constellatia converge. As a consequence of its geostrategic location, the region historically has been an important crossroads for trade as well as a volatile area of instability due to friction and conflict between disparate ethnic populations, competing religions and rival clans. Over the centuries, these sources of conflict frequently have led to vio-lence, sometimes in the extreme.

2.Successions of great empires have sought to control the region but none were ever able to completely dominate or unite the myriad of ethnic populations and fiercely independent tribes that inhabited the region. The Djeras Mountains, which stretch between the Zoran and Kama Seas, have proven to be natural barriers to conquest from the east or west and provide safe sanctuaries from which their inhabitants could resist incursions by outsiders. South of the Zoran Sea, the remote and inhospitable terrain of Constellatia's central arid wastelands has been equally effective in impeding outsiders.

3.The recent discovery and exploitation of large oil and natural gas reserves has made the Zoran Sea Region an area of increasing geostrategic importance. The region is now believed to contain the world's second-largest energy reserves and has become an important strategic alternative to global dependence on Middle East oil. As world confidence in the uninterrupted flow of Middle East oil has been undermined by continued instability in the Persian Gulf, the Zoran Sea has become a focal point of international competition to access new sources of energy needed to sustain global economic growth.

4.Given its geostrategic importance, the dramatic escalation of the crisis in the North Zoran Sea Republics of Auriga and Perseus has serious global implications. For the past four years armed Batari separatists have waged a guerrilla insurgency to create an ethnically pure Batari state in the Eastern Djeras Mountains of Auriga and Perseus. More than 27,000 civilians have been killed and more than 600,000 have been displaced from their homes as a result of organised ethnic violence. The latest offensive by the Batari Liberation Army (BLA), which was launched with covert support from the neighbouring Republic of Vulpecula, has claimed at least 2,500 civilian lives and forced more than 170,000 to flee their homes. The UN has been unable to bring an end to the fighting and its efforts to provide humanitarian relief are being disrupted by BLA attacks on aid workers, relief convoys and IDP/Refugee Centres.

5. The BLA now controls up to 30% of Eastern Auriga as well as large areas in Southeast Perseus. BLA fighters have infiltrated in strength toward the capital of Capella and after

repeated attacks on the International Airport have effectively forced it to close. Up to 4,000 foreign citi-zens, including a significant number from Alliance member nations, are potentially at risk in areas threatened by fighting. In addition, an estimated 2,300 remain trapped in areas seized by the BLA. Attacks on oil and gas pipelines by the BLA as well as terrorists have continued to interrupt the flow of Zoran Sea oil and gases pushing the spot market price for oil to US$110 per barrel. Further escalation of the conflict risks a far greater disruption of energy supplies that would have grave consequences for global economies.

6.Despite assistance from Perseus, Auriga has proven incapable of coping with the scale of the BLA's guerrilla campaign or the magnitude of the humanitarian disaster. Public confidence is eroding and there are increasing signs of the government's beginning to collapse. The disintegration of Auriga would create a political vacuum that would further destabilise the region and would allow violence to spread rapidly into Perseus, threatening its nascent democracy.

7.Indications that Vulpecula may threaten to intervene militarily in Auriga to end the fighting have raised military tensions in the region. The Federative Republic of Aquila has declared that it would not accept Vulpeculan intervention and would respond militarily to any incursion. There is now a growing risk of a major regional conflict involving Vulpecula and Aquila.

Strategic Background

8.The Zoran Sea Region comprises six countries — Aquila and Vulpecula (the major region-al powers), and the four newly independent states of Auriga, Cetus, Corvus and Perseus. These new republics were formerly part of the greater Aquila Confederation and gained their independence toward the end of the last century. They encompass an assortment of ethnic enclaves and tri-bal areas, some of which have struggled to retain their own autonomy within these new states. Vulpecula is the successor to the ancient Eastern Empire, which once dominated most of the Zoran Sea Region. It shares a common ethnic, religious and cultural background with many people in the region and recently has begun to extend its influence in the region.

9.For the states of the Zoran Sea Region the global demand for energy has provided an im-mediate source of hard currency and capital investment that is badly needed to revitalise stagnant economies and to further develop the infrastructure required to fully exploit regional energy re-sources. This in turn has opened the door for the international community, especially the major industrial nations of Europe, North America and Asia, to play an ever greater role in the develop-ment of the Zoran Sea Region. It has also provided new opportunities for the states of the region to advance their own national interests. To this end, controlling the flow of oil and gas from sources in the Zoran Sea Region to world energy markets is proving to be vital.

10.Most of the states of the region share a common interest in exploiting the energy resources for economic gain. However, other national interests differ and often conflict. The newly independent states — Auriga, Cetus, Corvus and Perseus — have a vital interest

in expanding direct contacts with the international community in order to strengthen their independence and counter regional dominance by Aquila and Vulpecula, as well as to improve regional stability. Perseus, which has made the greatest strides toward becoming a functioning democracy, has developed strong international ties. Both Perseus and Auriga are struggling to control internal instability and ethnic violence caused by the BLA, and are increasingly concerned by evidence of Vulpecula's covert support for the BLA. In addition, the increase in terrorist activity by Tamasura Shama's terrorist organisation and militant Mithraists have added to instability. Both Perseus and Auriga are members of the Alliance's "Partners for Peace" programme.

11.Conversely, the dominant regional powers — Aquila and Vulpecula — see the growing in-ternational presence as an encroachment on their spheres of influence. While Vulpecula views the international presence as a potential threat to its own aspirations for regional dominance, Aquila sees an opportunity to use the international community to counter Vulpeculan expansionism without becoming directly involved in a costly regional conflict. Both Aquila and Vulpecula have demonstrated a vital interest in securing the transhipment of oil and gas via their respective national pipelines in order to enhance their own position vis-à-vis the energy-producing states and the international community.

Controlling the Flow of Energy

12.Ten years ago, the race to build pipelines was on. Alternative pipeline schemes put forward by various international and state-owned energy consortiums highlighted a wide range of commercial as well as strategic implications for the energy-producing states of the Zoran Sea as well as the international community. Six years ago, the first pipeline was opened through Aquila, giving Aquila virtual control over all Zoran Sea energy exports (see map). However, the vulnera-bility of this pipeline to interdiction by ethnic separatists in Aquila's eastern provinces soon forced Aquila to build an alternative pipeline further west. Before this could be completed another major oil pipeline through Auriga and Perseus began operating.

13.The Auriga–Perseus pipeline has offered a number of commercial advantages that substantially undermined Aquila's strategic goal of controlling the flow of Zoran Sea oil and gas. A continuation of the Auriga–Perseus pipeline under the Zoran Sea made it possible to connect directly with the oil and gas fields of Northern Cetus. This together with the continuation of the pipeline through the Kama Sea and Sagitta to the Gulf of Retto, which is due to open in two years, will significantly boost the flow to world markets. The latest pipeline to come online this year began pumping oil and gas resources from Cetus and Corvus to ports in Vulpecula. Additional pipelines are under construction to carry oil and gas resources from Cetus and Corvus to ports in Aquila; however, attacks on the Auriga–Perseus pipeline in recent months by the BLA have demonstrated the vulnerability of energy infrastructure and set alarm bells ringing in world energy markets.

14.The surge in the development of energy sources increased foreign commercial activity and the presence of international oil consortiums in the region. Capital investment in oil and gas ex-ploration and infrastructure development totals more than US$13 billion. It is estimated that more than 17,000 expatriates from more than 30 countries are living and working in the region. However, concerns for their safety have grown recently in response

to the increased level of instabili-ty and violence perpetrated by the BLA and international terrorists. Many nations have issued travel advisories for the region and international oil consortiums discourage workers from bringing their families to the trouble spots in the region.

15. Energy revenues, estimated to be US$8 billion over the past 10 years, to a large extent have gone to repay international oil consortiums for capital investments. However, untold millions have been squandered by inept government bureaucracy or siphoned off by corrupt officials. As a con-sequence, only a small percentage of the population has enjoyed economic prosperity and all too often this has been seen as garish and wasteful extravagance. The economic boom is evident only in the major cities where the flourish of investment has attracted the big names of international business and luxury hotels to accommodate visiting foreign executives. For the vast majority of the people of the region there has been little noticeable improvement in health, education or social welfare and patience is running thin. Rising levels of public dissatisfaction with the failure of state governments to transform energy revenues into improved standards of living have led to growing resentment against global capitalism.

Threats to Regional Stability and Security

16. The Zoran Sea Region faces a number of threats to stability and security. These include a resurgent Vulpecula as well as a number of armed ethnic movements and terrorist organisations that are willing to use armed violence to achieve their aims. Increasingly, this is seen as a threat to the stability of the region as well as the interests of the international community, especially re-garding the safety of their citizens and the uninterrupted flow of oil and gas.

17. Vulpecula. The growing political, economic and military power of Vulpecula as well as its involvement in armed insurgencies, tribal warfare and international terrorism make Vulpecula the major, long-term threat to regional stability. Having consolidated his grip on power and built up the strength of his armed forces, President Asroor Valdimar has increasingly demonstrated his willingness to use force to shape events in the region. Although Vulpecula is still largely isolated from the international community, rising oil and gas exports have further boosted its recent economic growth. This has allowed Vulpecula to build up and modernise its military forces. In ad-dition to finding a number of countries eager to sell modern weapons for hard currency, Vulpecula has also exploited foreign assistance in developing an indigenous defence industry. Vulpecula produces a wide range of conventional weapons and, with foreign assistance, has developed the capability to produce its own short- and medium-range surface-to-surface missiles (SSMs) and advanced chemical weapons (CW). These weapons of mass destruction (WMD) increasingly pose a threat to neighbouring states in the region as well as members of the Alliance. Although Vulpecula possesses nuclear technology, the capability to produce nuclear weapons is still some years away. It has launched two communications satellites using commercial launch capability provided by Serpensia.

18. The Batari Liberation Army (BLA). The immediate threat to regional stability comes from armed Batari separatists belonging to a number of different armed groups operating in the eastern provinces of Auriga. Collectively known as the Batari Liberation Army (BLA),

for five years, the Bataris have waged a guerrilla war in the Eastern Djeras Mountains against the governments of Auriga and Perseus to establish control over traditional Batari homelands and form an independent and ethnically pure Batari state. While most of the BLA operates in the Eastern Djeras Mountains or from safe sanctuaries in Vulpecula, the Batari 'Simbas' are a terrorist organisation with cells operating covertly in most major cities in Central and Eastern Auriga. The Bataris clearly recognise the strategic importance of the flow of Zoran Sea oil and gas and have increasingly tar-geted the Auriga–Perseus pipeline in an effort to draw international attention to their cause in or-der to gain *de facto* recognition and to pressure Auriga's political leadership for concessions. The BLA is known to receive support from Vulpecula as well as other insurgent movements and ter-rorist organisations.

19. The Militant Mithraist Movement (M3). The Militant Mithraist Movement (M3) has proven to be a major force transforming political, cultural and religious institutions south of the Zoran Sea. The M3 rose to power in the Delphinian Republic following a brutal civil war that de-stroyed much of the country. Having consolidated its control in the western provinces of Delphi-nia, M3 have continued a crusade into neighbouring areas to impose their extremist manifesto and to purge all vestiges of capitalism as well as foreign influences. The break-up of Cetus last year left a vacuum of power which the militant Mithraists have been quick to exploit. They now con-trol large areas of Eastern Cetus. In the process they have gained possession of large quantities of conventional military hardware and stocks of munitions including some chemical munitions. There are also unconfirmed reports that militant Mithraists may have come into possession of one or more aged nuclear weapons that went missing from underground storage areas established by Aquila in Cetus long before it gained independence.

20. Tamasura Shama Terrorist Organisation. The international terrorist organisation of Tama-sura Shama, known as "Milites Oppressorum" (MO) (meaning "Soldiers of the Oppressed"), op-erates internationally from bases in areas under the control of M3. Shama is a highly educated, radical intellectual and self-made billionaire who is committed to a protracted war against globalisation and the spread of international capitalism. He has developed a sophisticated and highly capable international terrorist organisation that has been linked to bombings of embassies, government facilities and major corporate headquarters as well as the assassination of a number of se-nior government officials and corporate executives in different parts of the world. Close connections with the Militant Mithraists have provided Shama with secure bases of operation. There is increasing evidence that the MO is directly involved in acts of terror directed against internation-al interests, in particular energy resources, in the Zoran Sea Region.

Break-up of the Cetus Republic

21. In less than a decade the balance of power in the region has been radically altered by the declining influence of Aquila, the resurgence of Vulpecula, and growing international influence. Faced with new political, economic and social pressures, many of the new republics have found it difficult to cope, especially when confronted with extremist violence, tribal warfare and armed insurgency within their own borders. The political collapse and break-up of Cetus illustrated just how fragile many of the new republics might be.

22. The fiercely independent tribes of Cetus had been held together by the President, Broza Dimo. Although President Dimo was from the Tano Tribe, the second largest in Cetus, he had proven to be a charismatic leader and shrewd politician able to play off the ambitions of other tri-bal leaders. His assassination by an unknown assailant several months ago left the country with no effective successor. No longer held in check by a strong central authority, tribal interests soon took over. As the institutions of government collapsed, Benjamin Tikko, the leader of the Maros, declared himself the interim President. The Maros are the largest tribe in Cetus and control the energy-rich areas of Northern Cetus where Tikko quickly took control.
23. Fighting quickly erupted as the Tanos and other tribes of Cetus challenged Tikko for con-trol of the Northern provinces. With tribal conflict raging in the north of Cetus, the Militant Mithraist Movement soon began incursions into the south of Cetus, gradually extending its control northward. Recognising the potential threat that this would pose to the flow of oil and gas to Vulpecula, Asroor Valdimar was only too willing to respond to Benjamin Tikko's pleas for military assistance.

The Batari Guerrilla Insurgency

24. Indications are growing that Vulpecula may openly take sides and participate in the internal Cetan conflict on the side of Benjamin Tikko.

25. Vulpecula will ultimately try to secure its share of the Cetus and South Zoran Sea energy reserves.

26. Batari Nationalism. The rise of Batari nationalism began some ten years ago as ethnic Bataris began to search for their own national identity in a region undergoing radical change. Perhaps encouraged by events in the Balkans and elsewhere, Bataris began to lay exclusive claim to traditional tribal homelands in the Eastern Djeras Mountains. Ethnic violence ensued and Ba-tari clan warlords were engaged in low-intensity guerrilla warfare against other ethnic groups in-habiting the Djeras, as well as against government security forces in Auriga and Perseus. Reports of widespread human rights abuses and atrocities committed by militant Bataris were becoming a matter of international concern. As ethnic violence gradually spread to other parts of the Djeras, local inhabitants fled to the safety of towns and cities where they quickly overwhelmed government capabilities to provide for their welfare.

27. UN Mission to Auriga (UNMA). Two years ago, the UN began airlifting humanitarian aid into Auriga and provided assistance in establishing the first UN Refugee/IDP Centres in Yirga Alam in Auriga and El Kawa in Perseus. In addition, the UN High Commission for Human Rights (UNHCHR) has been invited by the government of Auriga to investigate reports of human rights abuses on both sides of the ethnic fighting. Last year, the UN Secretary-General appointed a Spe-cial Envoy to the Zoran Sea Region to encourage diplomatic negotiations among the various par-ties as well as to co-ordinate the efforts of the different UN agencies now operating in the region. The UN Mission to Auriga (UNMA) established its main offices in the capital city, Capella.

28. Support from Vulpecula. It soon became clear that the Batari insurgency was receiving external support and that disparate Batari irregulars were becoming better trained, organised

and equipped. There was increasing evidence of Vulpecula's covert assistance to the BLA. Batari fighters routinely withdrew to safe sanctuaries in Vulpecula. At base camps in Faya, El Arak, Mugad and Shaki, the BLA received advanced arms and munitions as well as training and technical intelligence before returning to Auriga. With support from Vulpecula, the BLA gradually matured into a capable guerrilla force. Vulpecula has also extended political and diplomatic sup-port to the BLA in arguing for Batari autonomy.

The BLA Renews its Guerrilla Offensive

29. BLA Attacks Along the Border. A series of well-rehearsed attacks against Aurigan Government outposts and fortified villages in Eastern Auriga close to the border with Vulpecula was conducted by the BLA. A BLA raid on Kilwa Point, including a waterborne assault across Lake Kilwa, overran the Aurigan Army Garrison and inflicted heavy casualties. Subsequent BLA at-tacks against outposts at Canton and Al Anz were supported for the first time by medium-range surface-to-surface missile strikes. A BLA attack on a UN humanitarian aid convoy 10 km from Serenje killed three UN workers and their local interpreter whose mutilated body was found next to a burned-out UN vehicle. Within three months, BLA attacks had gained pace. In the attack on Yirga Alam, BLA fighters took control of a major urban area in the Djeras Mountains for the first time, repelling government efforts to retake it. Using SA-14 Gremlin man-portable air defence systems (MANPADS), the BLA brought down a number of government helicopters airlifting troops and providing close air support. On several occasions, the BLA has distributed leaflets warning all non-ethnic Bataris to leave the declared state of "Batar".

30. Auriga tried desperately to push reinforcements into the Eastern Djeras with the main ef-fort to dislodge the BLA from Yirga Alam, which is about 70 km from the border with Vulpecula. Vulpecula sent a strong note of warning to Aurigan authorities stating that it viewed such troop movements as a dangerous escalation of the crisis. Three days later Vulpecula deployed forces from its Western and Southern Military District to the Aurigan border, sending an ominous signal that Vulpecula might be prepared to intervene in the crisis. These actions, together with Vulpecu-la's increasingly harsh criticism of Auriga and Perseus for selling out to global capitalism, triggered a sharp reaction from many capitals. In particular, Sagitta cautioned Vulpecula against fur-ther involvement in the crisis and increased the state of readiness of military units close to the border with Vulpecula.

31. The Aurigan Government has been harshly criticised at home and abroad for its inability to deal with the crisis, especially the failure of its armed forces to contain the BLA and stabilise the situation in the east of the country. Auriga's armed forces had been trained and equipped for conventional operations and operational readiness had steadily declined. They were neither trained nor equipped to fight unconventional guerrillas, especially in the rugged mountains. After a suc-cession of tactical defeats at the hands of the BLA, Aurigan forces were prone to indiscriminate use of force, which often resulted in widespread civilian casualties. Without the support of the civilian population, Aurigan forces have found it difficult to operate in the Djeras Mountains where some garrisons became virtually besieged. Ethnic Bataris serving in the Aurigan Army have refused to fight in the Djeras Mountains, often out of fear of reprisals against their families. Desertion in the field was increasingly common and many Batari deserters may have taken up arms with the BLA.

The Government decision to relieve ethnic Batari commanders has further fractured the military and caused several units composed largely of Bataris to mutiny.

32. Increased UN Assistance. A total of more than 70,000 civilians had fled the fighting in the Djeras Mountains and made their way to makeshift refugee/IDP camps in the Kandar Valley and in neighbouring Perseus. In addition, untold numbers of Bataris have joined families in cen-tral Auriga. The influx of Bataris into these areas has further added to the instability and severe-ly stressed government resources for providing aid as well as for maintaining security, law and or-der. Government authorities and international organisations (IOs) have struggled to provide hu-manitarian support. The UN High Commissioner for Refugees (UNHCR) established offices in Perseus as well as Auriga to co-ordinate the efforts of growing numbers of international aid workers and opened three UN Refugee/IDP Centres in Auriga, near Bambari, Duru and Lankor, as well as two in Perseus, near El Kawa and Panga. The Camp at Yirga Alam has since had to be evacuated. Outraged by repeated BLA attacks on UN convoys and aid workers, the UNSC agreed to deploy a UN Security Force for Auriga (UNSECFORA) to protect HA convoys in Auriga, consisting of three motorised infantry battalions.

BLA Offensive in the North

33. Attacks Along the Auriga-Perseus Border. Having secured a number of key areas in Eastern Auriga close to the border with Vulpecula, the BLA began a second major offensive in north-ern Auriga. Operating more openly in areas under its control, the BLA proved to be a well-equipped and well-trained fighting force, increasingly capable of taking on Aurigan security forces and ex-panding their attacks on government facilities and commercial targets. They seized control of Evale, only 18 km from the Perseus border, where terrified civilians who had fled the Lake Kilwa district had gathered before continuing on to the UN Refugee/IDP Centre near Panga in Perseus. Before the cameras of international television crews, the BLA systematically stripped the refugees of their belongings and separated young men and women from their families. Bataris were taken off to join the ranks of the BLA. Non-Bataris were led away to an uncertain fate. The subsequent shelling of the UN Centre at Panga shocked the world and drew further UN condemnation.

34. BLA Attacks in Kandar Valley. The BLA began infiltrating toward the Kandar Valley and attacked the pipeline station at Kandar and the UN Refugee Centre near Bambari (see map 7). BLA forces in the narrow valleys ambushed Aurigan forces attempting to reinforce Kandar from the south and a major battle for Kandar ensued. The BLA continued to infiltrate the Kandar Val-ley, launching guerrilla hit-and-run attacks as far south as Lankor, cutting the pipeline on several occasions and ambushing both government and UN convoys. In an ambush north of Lankor, the BLA captured six UNSECFORA soldiers and 14 aid workers, who are still being held. The BLA attacked the pipeline terminal and railroad-switching site at Lankor. BLA 122mm rocket attacks against Aurigan forces in Lankor also hit the nearby UN Refugee/IDP Centre, causing horrific ci-vilian casualties in the overcrowded camp. Media coverage of the tragedy stunned viewers around the world. As the BLA continued to ambush government and UN convoys in the Kandar Valley, the provision of military supplies and humanitarian assistance soon became a major military undertaking. Vulpecula's offer at this point to mediate in the crisis was rejected by Auriga and Perseus.

35. The UN Security Council condemned the offensive by the BLA forces and expressed its outrage at the attacks on UN Refugee/IDP Centres, relief convoys and personnel. UNSC Resolution 4627 was issued demanding that the BLA "immediately and unconditionally release unharmed all detained UNMA and UNSECFORA personnel" and authorised the Secretary General to:

> "use all resources available to him to restore the security and safety of the UN Refugee Centres at Bambari and Lankor in the Republic of Auriga and Panga in the Republic of Perseus and to safeguard the provision of humanitarian assistance in accordance with the UN mandate."

36. Auriga–Perseus Security Cooperation. Perseus has had some success in containing the BLA in the Djeras Mountains in the southeast of the country. However, the government has been unable to cope effectively with the flow of refugees and evacuees fleeing into Perseus. Following high-level talks with Auriga on ways to improve security arrangements and cooperation, Perseus deployed a Mechanised Brigade to the Kandar Valley in Northern Auriga to assist Aurigan forces in securing the UN Camp at Bambari as well as lines of communication between the two countries. Vulpecula was quick to condemn this move and accused Perseus of a dangerous escalation of the conflict. Vulpecula reiterated its threats to intervene militarily and underscored its words with the deployment of forces from the Western Military District to its border with Perseus.

37. Terrorist Attacks on Urban Areas. The dramatic rise in terrorist attacks in urban areas in Southeast Auriga and Central Perseus in the past several months has added to the problems for se-curity forces and increased public anxiety as well as international concerns for the safety of foreign nationals. Bombs planted in public buildings, government facilities and commercial centres have caused widespread damage and scores of casualties. Several groups have claimed responsi-bility for these attacks, including the BLA, the MO and Militant Mithraists.

38. BLA Human Rights Abuses and Atrocities. There have been recent reports, circulated amongst international aid workers and the media, of widespread atrocities and numerous massacres committed by the BLA in the Djeras. UN aid workers had received reports of a BLA massacre of civilians in the Kasari village of Rutana, in northeast Auriga, and suspected use of chem-ical weapons (CW) after treating numerous casualties for skin burns. However, it was not until local villagers, escorted by Perseus soldiers, led a team of reporters back into Rutana that reports of the massacre could be confirmed. Tissue samples were taken from mass graves near Rutana where remains of approximately 1,700 civilians were found. Last month, international investigators confirmed that many of these victims had died from the effects of mustard gas. UN investigators made it into the Kasari village of Yonjugol where they discovered the bodies of 52 civil-ians in a hastily dug mass grave. Many of the victims had been brutally hacked to death. As in-ternational media reported the discovery, public outrage and calls for international action were heard in many capitals around the world.

THE BLA'S SOUTHERN OFFENSIVE

39. Intel indicators and recent attacks against Capella Airport suggest that the BLA may be re-grouping in the south, with a possible thrust towards Serenje and the UN DPRE/refugee centre near Duru.

40. Attack on Capella International Airport (IAP). The attack on Capella International Airport (IAP) last month marked the first time that BLA guerrillas struck so close to the Capital. It began with a suicide attack by BLA Simbas against the main passenger terminal, producing dev-astating effects. The attack continued with rocket attacks by BLA fighters infiltrating the hills overlooking the airport and mortar attacks by BLA guerrillas concealed in adjacent urban areas. Continued attacks have disrupted the scheduled flow of humanitarian aid and air evacuation of special humanitarian cases. The lack of suitable alternatives continues to impede international relief efforts.

41. Safety of Foreign Nationals. Most foreign nationals in Auriga lived and worked in the South, near Lisala and Capella or along the pipeline in the Kandar Valley. In response to the de-teriorating conditions, embassies advised their citizens to leave. In addition, many international oil consortiums and foreign businesses took action to provide for the safety of their personnel by evacuating families and consolidating operations and living accommodations in Sindara, where security conditions close to the capital appeared better. Private security firms were hired to provide additional security and protection. However, the deteriorating security situation around Ca-pella and the lack of secure evacuation routes out of the Kandar Valley impeded departures. With the disruption of normal traffic of Capella IAP, evacuation by air may be put at risk. This may leave upward of 6,000 foreign citizens from more than 30 countries, including a significant number from Alliance member nations, stranded in Auriga, some still in areas threatened by fighting.

42. Reports increasingly indicate BLA's willingness to take international hostages to achieve its political goals. The international commercial zone at Sindara seems to be a focal point

43. Interdiction of Oil and Gas. The BLA continued to target the oil and gas infrastructure in Auriga and Perseus. The BLA attacked the rail and pipeline nodes in Perseus north of Jimeta, with intelligence suggesting that other energy infrastructure will be targeted.

44. Erosion of Public Confidence. With the crisis ever more evident, signs are beginning to show of erosion of public confidence in the Aurigan Government.

45. Appeals for International Assistance. Alarmed by the rise in military tensions, both Auri-ga and Perseus have voiced their concerns in the UN and asked for further assistance. Indeed, Perseus is increasingly anxious that Vulpecula may see any escalation in the level of violence as grounds for military intervention and that this would lead to a military response from Aquila, with Perseus becoming the arena for combat.

46. The Risk of Wider Conflict. Although not directly involved in armed conflict with either Auriga or Perseus, Vulpecula is covertly but clearly stage-managing the level of violence. Vulpe-cula has threatened to intervene and has moved sufficient forces into the region to make good on its threats. Vulpecula has also made it clear on a number of

occasions that it opposes any international intervention and has deployed additional maritime, air and air defence forces, as well as medium-range surface-to-surface missiles (MR SSM) to the northwest to underscore this point. The further deployment of maritime forces from its Red Sea fleet to the Kama Sea will add to its current show of force in the region. Intelligence now suggests that the terrorist attack on the Em-bassy of an Alliance member in Boötes was in fact a further message from Vulpecula to stay out of the region. Aquila's position remains unequivocal — any intervention by Vulpecula would be unacceptable and Aquila will respond with force if necessary.

47. The International Response. International reaction to events in the Zoran Sea Region has continued to mount. The United Nations Security Council has long condemned the violence but has continued to debate how best to deal with the instability and the complex threats to the security of the region and the interests of the international community. However, following the attacks on Capella IAP, the Security Council's focus centred on the immediate need to reopen Ca-pella International Airport in case of closure and to restore security in Auriga.

48. Alliance Consultation. Following initial contacts with the UN Secretary General, the Alli-ance heads of state and government met in Budapest and agreed in principle to support the UN ef-forts. The Alliance Council asked the Commander of the Alliance Strategic Command (COMASC) for a Strategic Military Assessment (SMA) of the situation. COMASC deployed a Military Assess-ment Team (MAT) to the region to investigate the situation. COMASC then presented his SMA to the Council.

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