

Incompatible Systems of Logic: Why Design Should Integrate the Mechanistic, Reductionist, and Linear Logic of Military Detailed Planning

**A Monograph
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Abstract

INCOMPATIBLE SYSTEMS OF LOGIC: WHY DESIGN SHOULD INTEGRATE THE MECHANISTIC, REDUCTIONIST, AND LINEAR LOGIC OF MILITARY DETAILED PLANNING by MAJ Ben E. Zweibelson, USA, 82 pages.

This monograph addresses how humans think and make sense of the world, and whether the current logic used by the U.S. military is still useful for understanding and influencing a world where complexity continues to increase. Drawing from elements of organizational theory, general systems theory, political science, and post-modern philosophy, this monograph presents a logic model to explain how the military currently makes sense of the world, and how Design offers a different and potentially more useful approach to complex systems. Design represents a paradigm shift in thinking, and functions under an entirely distinct logic that conflicts with many elements of traditional military detailed planning. Many of the ongoing tensions within the military over how to incorporate Design into doctrine and practice reflect this monograph's thesis. Detailed planning logic is becoming increasingly problematic in making sense of the world in the 21st century when used alone. Design offers a novel and potentially more useful logic for the military, and many still relevant elements of detailed planning logic are useful for the military after integration with Design's overarching methodology. In order to apply Design, the military must first understand how it currently thinks about the world, and why that methodology proves problematic when dealing with complex systems. There are numerous elements within Design's unique logic that proves challenging for the military, as this monograph will explain in terms of vocabulary, institutional tenets, and the tensions concerning procedures and processes that fundamentally define military operations. Design alone is not a 'silver bullet' for the military and does not destroy detailed planning entirely; Design represents a distinct way of thinking and provides the military with new approaches to influencing an increasingly complex world.

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Hypothesis and Research Question

Design represents a paradigm shift in understanding the world.¹ Understanding the world has to do with thinking; this monograph uses the concept ‘system of logic’ to explain how humans think about the world. Design uses a system of logic that makes sense of the world in potentially different ways over the current military method of thinking that relies on mechanistic and reductionist theoretical concepts and detailed planning procedures.² Design and detailed planning appear to be incompatible due to paradoxes in logic and differences in language, content, and form. The current military approach to codifying Design theory into procedures and doctrine within detailed planning may also be problematic due to the apparent tensions between Design and detailed planning logic. Are logic conflicts potentially taking a backseat to institutional self-preservation and concerns over tradition?³

This monograph initially seeks to explain what systems of logic are, how they function, and how they interact with each other from a military organizational perspective. Next, the monograph examines how the U.S. Army prefers a thinking process that emphasizes description and functions within a mechanistic and reductionist conceptual framework. Although this way of understanding the world put

¹ The term ‘Design’ is used interchangeably with ‘conceptual planning’ and other similar terms within military Design theory; however U.S. Army doctrine selected ‘Design’ as the official term to describe “a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them.” United States Army Training and Doctrine Command, *Field Manual 5-0; The Operations Process* (Headquarters, Department of the Army, 2010), Glossary-4. This paper uses the doctrinally accepted term of ‘Design’ for purposes of simplification.

² Martin Kilduff, Ajay Mehra, and Mary Dunn, *From Blue Sky Research to Problem Solving: A Philosophy of Science Theory of New Knowledge Production*, (Academy of Management Review, Vol. 36m No. 2, 2011) 297. Kilduff, Mehra, and Dunn use a term similar to ‘system of logic’ that they call ‘logics of action.’ They define these as organizing principles that shape ways of viewing the world by “providing social actors with vocabularies of motive, frameworks for reasoning, and guidelines for practice.” This monograph adapts a variation of ‘logics of action’ called ‘system of logic.’

³ Carl H. Builder, *The Masks of War; American Military Styles in Strategy and Analysis*, (Baltimore: The John Hopkins University Press, 1989) 142; See also: Scott Winter, Fixed, Determined, Inviolable; Australian Army Journal For the Profession of Arms, Volume VI, Number 3 (Duntroon: Land Warfare Studies Centre, 2009) 63. Winter uses the term ‘military conservatism’ to explain how during peacetime, Australian military organizations protect “the baby of tradition- the ‘fighter spirit’ and established and proven doctrine;”

men on the moon and made America the dominant superpower in the 20th century, the 21st century presents increasing complexity as this paper will demonstrate. Has the world become too complex for this reductionist and mechanistic thinking for military operations in the 21st century? This monograph proposes that the tensions and abnormalities generated by detailed planning system logic triggered a paradigm shift that provoked the emergence of an alternative method of thinking called Design.⁴ Design's incompatible system of logic requires entirely new vocabulary, new theoretical concepts that abandon mechanistic and linear processes, and Design's narratives are incompatible with detailed planning doctrine and procedures.⁵ All three elements of vocabulary, non-linear and non-mechanistic theoretical concepts, and Design doctrine ultimately seek to answer the overarching question of whether the Army should transition from the current way of thinking about the world towards a different way to recognize and influence the growing complexities of the 21st century world.

⁴ Mats Alvesson, Jorgen Sandberg, *Generating Research Questions Through Problematization*, (Academy of Management Review, Vol. 36, No. 2, 2011) 254. Alvesson and Sandberg use the term 'in-house assumption', 'root metaphor', and 'field assumption' to explain how organizations employ a logic that contains theoretical concepts that are 'unproblematic' and are often deeply tied to organizational values and identity. When these theories fail to explain the world, the organization continues to view the theory as unproblematic instead of applying critical thinking to the logic itself.

⁵ Gary Jason, *Critical Thinking: Developing an Effective System Logic*, (San Diego State University: Wadsworth Thomson Learning, 2001) 83. Jason discusses the pitfalls of language by exploring 'verbosity and jargon' in chapter six. A tension exists between using the right terminology to express complex or technical thoughts accurately without obscuring clarity by attempting to sound more profound or impressive.

Literary Review

Design takes a fundamentally different approach to thinking about the world. In order to gain better understanding of how the Western world, specifically the U.S. Army thinks about the world, many non-Western sources were used in research, as well as literary works that fall outside the very logic that supports reductionism, mechanistic approaches, and linear processes. Although Eastern philosophical works and atypical western works such as Anatol Rapoport provided asymmetric perspectives, military-specific works such as Qiao Liang and Wang Xiangsui's *Unrestricted Warfare* helped bound Western military logic and clarify those theoretical concepts that fuel western reductionism, mechanistic processes, and linear procedures.⁶

Design is an emerging system of logic that falls under modern organizational theories such as General Systems Theory, post-modern philosophy, complexity theory, and organizational theories.⁷ Several military organizations developed Design methodologies under various frameworks and varying degrees of sophistication. The front-runner of Design for military applications is Systemic Operational Design (SOD) developed originally by the Israeli Defense Force in the 1990s. The U.S. Army and Australian Army both created variations of Systemic Operational Design that are currently undergoing difficult integrations into their military institutions.⁸ The Australian Army titled their Design as

⁶ Anatol Rapoport (editor), *Editor's Introduction to On War*, Carl Von Clausewitz, *On War*, (Penguin Books, 1968). A Games Theorist, Rapoport takes a decidedly non-western approach by framing Clausewitzian logic as a political theory of war that is incompatible with various other rival war theories; he describes early Soviet theory as 'messianic eschatological' while later Cold-War Soviet became 'global cataclysmic eschatological.' Rapoport lays the groundwork for understanding extremist religious war theories as 'divine messianic eschatological.' This work proved useful in framing western military logic with theoretical concepts such as Clausewitz and Jomini.

⁷ Ludwig von Bertalanffy, *General System Theory; Foundations, Development, Applications*, (New York: George Braziller, 1968) 19. Ludwig von Bertalanffy describes open systems in *General System Theory* as entities consisting of "parts in interaction. The prototype of their description is a set of simultaneous differential equations which are nonlinear in the general case." See also: Gilles Deleuze, Felix Guattari, (translated by Brian Massumi) *A Thousand Plateaus; Capitalism and Schizophrenia* (Minneapolis: University of Minnesota Press, 1987) 398.

⁸ United States Army Training and Doctrine Command, *Field Manual 6-22; Army Leadership*, (Headquarters, Department of the Army, 2006), 11-5. Army leadership doctrine addresses leadership at the operational level as an indirect influencing process where leaders "rely more heavily on developing subordinates and empowering them to

‘Adaptive Campaigning’ while the U.S. Army took the more ambiguous title of ‘Design.’⁹ The United States Marine Corps also integrated ‘Design’ in a slightly different format into their conceptual planning doctrine, while the U.S. Air Force is currently considering how and what Design will integrate into Air Force planning processes.¹⁰ Out of all of these military applications, Australian ‘Adaptive Campaigning’ is potentially the most flexible doctrine and functions closer to Design theory, while U.S. Army and Marine Design reflects a rigid Design doctrine that subscribes to detailed planning vocabulary and procedures instead of retaining the Design system of logic found in Design theory.¹¹ The Israeli Defense Force lacks doctrine for Systemic Operational Design; however, SOD founding fathers such as BG (retired) Shimon Naveh continue to advance SOD theory despite current Israeli Defense Force resistance to SOD.¹² The large fields of post-modernism philosophy, organizational management and business applications for complexity theory present the most active areas for military organizations to draw from and adapt new Design processes.¹³ This monograph provides extensive footnotes that provide the reader with additional sources and relevant conceptual products that cover the broad range of sources that Design logic draws from. From ancient Greek philosophy through French post-modernism, from

execute their assigned responsibilities and missions...organizational leaders spend more time than direct leaders thinking and reflecting about what they are doing and how they are doing it.”

⁹ Alex Ryan, *The Foundation For An Adaptive Approach*; 71. “However, the abstract and general language used in complex systems has a crucial advantage over traditional scientific discourse.”

¹⁰ United States Marine Corps, Department of the Navy, *Marine Corps Doctrinal Publication (MCDP) 5, Planning*, (Headquarters, United States Marine Corps, Washington D.C. July 1997), 22-23. “War is an intrinsically chaotic phenomenon that denies precise, positive control over events...within the context of the complex environment of war we fully recognize it as one of the most challenging intellectual activities in which we can engage.”

¹¹ Mick Ryan, *Measuring Success and Failure in an ‘Adaptive’ Army*; *Australian Army Journal For the Profession of Arms*, Volume VI, Number 3, (Duntroon: Land Warfare Studies Centre, 2009) 29. Ryan discusses the Australian military and their application of Design theory (Adaptive Campaigning).

¹² Shimon Naveh, *Operational Art and the IDF: A Critical Study of a Command Culture*, (Center for Strategic & Budgetary Assessment (CSBA), contract: DASW01-02-D-0014-0084, September 30, 2007). Naveh explains the rise of Systemic Operational Design (SOD) as a theory for the Israeli Defense Force in the 1990s up through the 2006 Hezbollah War.

¹³ Donald A. Schon, *Educating the Reflective Practitioner*, (San Francisco: Jossey-Bass, 1987); See also: Peter Checkland and John Poulter, *Learning for Action; A short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers, and Students*, (England: John Wiley & Sons Ltd, 2006); See also: Fritjof Capra, *The Web of Life*, (New York: Doubleday, 1996).

organizational theory through economic and architectural platforms, Design logic emphasizes learning, learning to learn, and persistent creativity.

Current U.S. Army Design resides in one primary form of doctrine, Field Manual FM5-0, Operations; specifically under Chapter 3, Design. This monograph will attempt to demonstrate how this Design doctrine is not an example of Design's system of logic, but is merely Design window dressing that serves as an important example of how detailed planning logic dismantles Design into senseless procedures and a confusing medley of words.¹⁴

This monograph also draws from the United States Marine Corps efforts in Design, as well as Australian 'Adaptive Campaigning' applications of Design. Just as Design theory draws from a broad range of theories and fields, military Design applications span various military services as well as societies and cultures. How the Israeli, Australian, and American militaries understand the world remains unique and therefore imply variations within Design logic.

This literary review also distinguishes between official military Design doctrine and Design theoretical works as distinct in relation to how the military institution approaches their content and form. When draft or unpublished doctrine is used, this monograph addresses that distinction in the associated footnote. While the military does distinguish Design doctrine from Design theory due to the emphasis on following doctrine, this monograph uses literary sources that embrace the variety of fields, branches, and theories that holistic thinking requires.

¹⁴ Gary Jason, *Critical Thinking: Developing an Effective System logic*, (San Diego State University: Wadsworth Thomson Learning, 2001) 319. "A hypothesis is a proposed explanation. We also often use the term *theory* to mean hypothesis..." which differentiates the nature of theory and doctrine. Theory proposes explanation while doctrine stipulates rigid and uniform action. Theory is open to change; doctrine cannot be questioned without breaking down uniformity and hierarchical structures.

Significance

The U.S. Army is at an intellectual crossroads at the dawn of the 21st Century. Although reductionist and mechanistic detailed planning thinking served the military institution through much of the 19th and 20th centuries in various forms and procedures, it has accumulated an increasing number of abnormalities, tensions, and institutional friction for military organizations. There is an American flag on the moon because reductionism and mechanistic methodologies do work to recognize the world and aid humans in influencing it. However, many ancient human societies accomplished great things such as the Sistine Chapel, written language, and citywide plumbing using systems of logic that understood the world as flat.¹⁵ Therefore, some systems of logic transform over time, while many obsolete or inferior ways of thinking seem to work under unique conditions. Human advances such as the Scientific, Industrial, and Information Revolutions transformed the world into a more complex and dynamic system.¹⁶ The intellectual underpinnings of detailed planning continue to apply mechanistic, reductionist, and linear processes in military conflicts where this traditional military thinking methodology grows increasingly incapable of recognizing and influencing the world.¹⁷ Detailed planning alone appears to be growing increasingly insufficient in providing a method for thinking about the world for military organizations to plan and execute operations in the 21st century.

¹⁵ Jared Diamond, *Guns, Germs, and Steel; The Fates of Human Societies*, (New York, W.W. Norton and Company, 2005) 215. "Of course, some peoples (notably the Incas) managed to administer empires without writing, and 'civilized' peoples don't always defeat 'barbarians,' as Roman armies facing the Huns learned." Diamond makes the point that a society does not need the most advanced logic or technology to defeat another one, or achieve significance in history.

¹⁶ Ryan, *The Foundation For An Adaptive Approach*, "With the industrial revolution, the planning and decision-making process gradually built up a well-oiled machine to reduce reliance on individual genius." See also: Michael Fullan, *Leading in a Culture of Change*, (San Francisco: Jossey-Bass, 2001) 135-136.

¹⁷ Francois Jullien (translated by Janet Lloyd), *A Treatise on Efficacy Between Western and Chinese Thinking*, (Honolulu: University of Hawai'i Press, 2004), 19. "the parts [can] be worked out, actually, logically, and mathematically, and then be put together...an equation describing the behavior of the total is of the same form as the equations describing the behavior of the parts."

While Design thinking represents the paradigm shift that this monograph argues is a superior system of logic for military organizations, the core values and tenets within the military's traditional mechanistic and reductionist thinking methodology currently rejects Design and marginalizes it through faulty vocabulary and incomprehensible Design doctrine.¹⁸ In other words, as long as the U.S. Army views Design with confusion and contempt, the longer it retains detailed planning methodologies that may not make efficient sense of a world that differs from the past. Although this monograph will present Design as a potentially more useful way of thinking about the world that offers greater utility for the military, Design also features elements that are problematic for the military. Before addressing detailed planning or Design logic, the case for what 'systems of logic' really means must be undertaken first. Thinking about thinking is a challenging process that requires careful use of vocabulary, metaphor, and theory as this monograph's claim will next address.

¹⁸ Naveh, Schneider, Challans, 88. According to Shimon Naveh, Army Design doctrine demonstrates repetitive *tacticization* where military institutions "are inclined to apply knowledge they have acquired from their tactical experiences to their operational functioning sphere. In such cases, they either reduce the operational inquiry of potential opposition into a mechanical discussion or completely reject the need for a distinct learning operation;" See also: Mats Alvesson, Jorgen Sandberg, *Generating Research Questions Through Problematization* (Academy of Management Review, Vol. 36, No. 2, 2011) 261. "Members have (1) beliefs (2) about attributes of the organization and (3) that these attributes are distinctive, central, and enduring."

Claim: Defining a ‘System of Logic’

How does the military understand the world? Since armies are composed of humans, perhaps a better meta-question would ask how human societies attempt to think about the world. If humans are only capable of partially understanding reality due to its complexity and human cognitive limitations, then are some viewpoints better than other ones? This monograph presents the concept of ‘system of logic’ as a way of visualizing and explaining the coherent framework of empirical material and conceptual processes that humans organize to make sense of the world. Everyone thinks in order to make sense of the world around him or her, whether that logic relies on theoretical concepts that are Clausewitzian, or follows a unique ideological framework that employs radically different logic.¹⁹

This monograph contends that the majority of Western culture and the U.S. Army embrace a Clausewitzian war philosophy that is a key building block within the theoretical concepts comprising the military’s preferred methodology for making sense of the world.²⁰ This paper uses the term ‘detailed planning’ thinking methodology because the U.S. Army appears to make sense of the world through these reductionist and mechanistic concepts that result in an emphasis on description and rigid procedures.²¹

When an organization such as the U.S. Army uses a system of logic to attempt to understand the world,

¹⁹ Anatol Rapoport (editor), *Editor’s Introduction to On War*, Carl Von Clausewitz, *On War*, (Penguin Books, 1968) 12-15. Rapoport claims that Clausewitz’s work represented one philosophy on war, while there are three comparable yet separate war theories. Rapoport explains alternate political, eschatological, and cataclysmic war philosophies that each present a distinct non-Clausewitzian explanation of warfare.

²⁰ Carl H. Builder, *The Masks of War; American Military Styles in Strategy and Analysis*, (RAND Corporation: John Hopkins University Press, 1989) 38. “But something happened to the Army in its passage through World War II that it liked; and it has not been able to free itself from the sweet memories of the Army that liberated France and swept victoriously into Germany...part of the Army is trying to revert to its traditional, historical role; and part is hanging on to an image of the Army at its finest year, the last year of World War II.”; Francois Jullien (translated by Janet Lloyd), *A Treatise on Efficacy Between Western and Chinese Thinking*, (Honolulu: University of Hawai’i Press, 1996) 11. “Clausewitz set about thinking through warfare...according to a ‘model’ form, as an ideal and pure essence, “absolute warfare”...limitless use of force.”

²¹ Qiao Liang, Wang Xiangsui, *Unrestricted Warfare*, (Beijing: People’s Liberation Army Literature and Arts Publishing House, February 1999) 19. Liang and Xiangsui take an eastern perspective on western warfare. “We still cannot indulge in romantic fantasies about technology, believing that from this point on war will become a confrontation like an electronic game, and even simulated warfare in a computer room similarly must be premised upon a country’s actual overall capabilities...”

the success or failure of that logic with regard to how the world behaves becomes the source of confusion and tension for the military. Societies accepted the world as flat and the center of the universe for centuries, but eventually other superior ways of thinking replaced the flat worldview, just as militaries developed better systems of logic for waging war.²² If a system of logic fails to make sense of an increasingly complex world for the military, how does it adapt a new methodology for thinking?

Before discussing why and how detailed planning thinking fails to perform for the military, the meta-theory for this paper concerning ‘systems of logic’ and their components require further explanation. Figure 1 below provides a graphic depiction of the ‘system of logic’ theory that maps a cognitive template for how humans attempt to recognize the world. This methodology relies on three building blocks that subsequently generate narratives that use the logic to attempt to explain the world and consider how one may influence the future. Humans do this instinctively; hence, thinking *about* thinking is a challenge in itself.²³

The first building block, ‘empirical material’, represents the essential elements of matter, actors, and tangible things that compose the world.²⁴ This monograph argues that every system of logic should address the actual physical components of the world in some fashion. The second building block, ‘theoretical concepts’, provides “abstractions of empirical phenomena.”²⁵ Theoretical concepts include language, mathematics, ideologies, and other intangible processes that interact with empirical material in

²² Vladimir Slipchenko, *Future War Lecture Series: For What Kind of War Must Russia Be Prepared?* (Polit.ru Public Lecture Series transcript C47, November 11, 2004) 20-21. Slipchenko takes a non-western position on the evolution of warfare and argues that six generations of evolution describe the technological evolution of all recorded warfare. Although a techno-centric theory, Slipchenko makes the argument that as a new military advantage became a significant advantage, a transition period occurred where all militaries adapted some variation of that item or concept.

²³ Valerie Ahl and T.F.H. Allen, *Hierarchy Theory: A Vision, Vocabulary, and Epistemology*, (New York: Columbia University Press, 1996) 18. “Meaning, and explaining the “why” of a phenomenon, come from the context. The lower-level mechanics, the “how” of the phenomenon, have nothing to say about “why.”

²⁴ Eva Boxenbaum, Linda Rouleau, *New Knowledge Products as Bricolage: Metaphors and Scripts in Organizational Theory*, (Academy of Management Review, Vol. 36, No. 2, 2011) 274-275.

²⁵ Ibid. 275.

direct or indirect ways.²⁶ The third building block, ‘metaphors,’ consist of creative transfer processes where metaphors act as “tools for understanding” that promote new and multiple ways of explaining and understanding the world through that method of thinking.²⁷

Regardless of the logic system, humans use metaphors to make sense of the world by thinking and then communicating the results to others. Cultures and societies build upon shared values and theoretical concepts such as language, history, ritual, and an overarching shared methodology for thinking about the world.²⁸ Together, these processes within a thinking methodology generate narratives that infuse patterns of logic within the system and define a worldview for humans to apply to reality.²⁹ Narratives are the products of a system of logic’s synergy of theoretical concepts, metaphors, and empirical material that ultimately explain the world within a method of thinking and also anticipate how the world will react to one’s actions.

²⁶ Gary Jason, *Critical Thinking: Developing an Effective System Logic*, (San Diego State University: Wadsworth Thomson Learning, 2001) 86. Jason discusses vocabulary problems when an organization blurs the boundaries of a word. See also: Hayden White, *Tropics of Discourse; Essays in Cultural Criticism*, (Baltimore: The John Hopkins University Press, 1978) 1. “Our discourse always tends to slip away from our data...the data always resists the coherency of the image which we are trying to fashion of them.”

²⁷ Boxenbaum, 275; See also: Paul Ricoeur (translated by Kathleen Blamey and David Pellauer), *Time and Narrative, Volume 3*, (Chicago: University of Chicago Press, 1985) 107. “We would be not able to make any sense of the idea of a new event that breaks with a previous era, inaugurating a course of events wholly different from what preceded it.”

²⁸ Diamond, *Guns, Germs, and Steel*, 454. “Europe’s fragmentation did, and China’s utility didn’t, foster the advance of technology, science, and capitalism...” Diamond argues that unique conditions based on bio-diversity, caloric yields of available plants, and domesticated animal selection provided advantage and encouraged one society’s advance over another. Culture and values relate to how a society understands the world around them, to include what is available, but not what is unknown to them.

²⁹ Ervin Laszlo, *The Systems View of the World; A Holistic Vision for Our Time*, (New Jersey, Hampton Press, 1996) 16. “Systems thinking gives us a holistic perspective for viewing the world around us, and seeing ourselves in the world.”

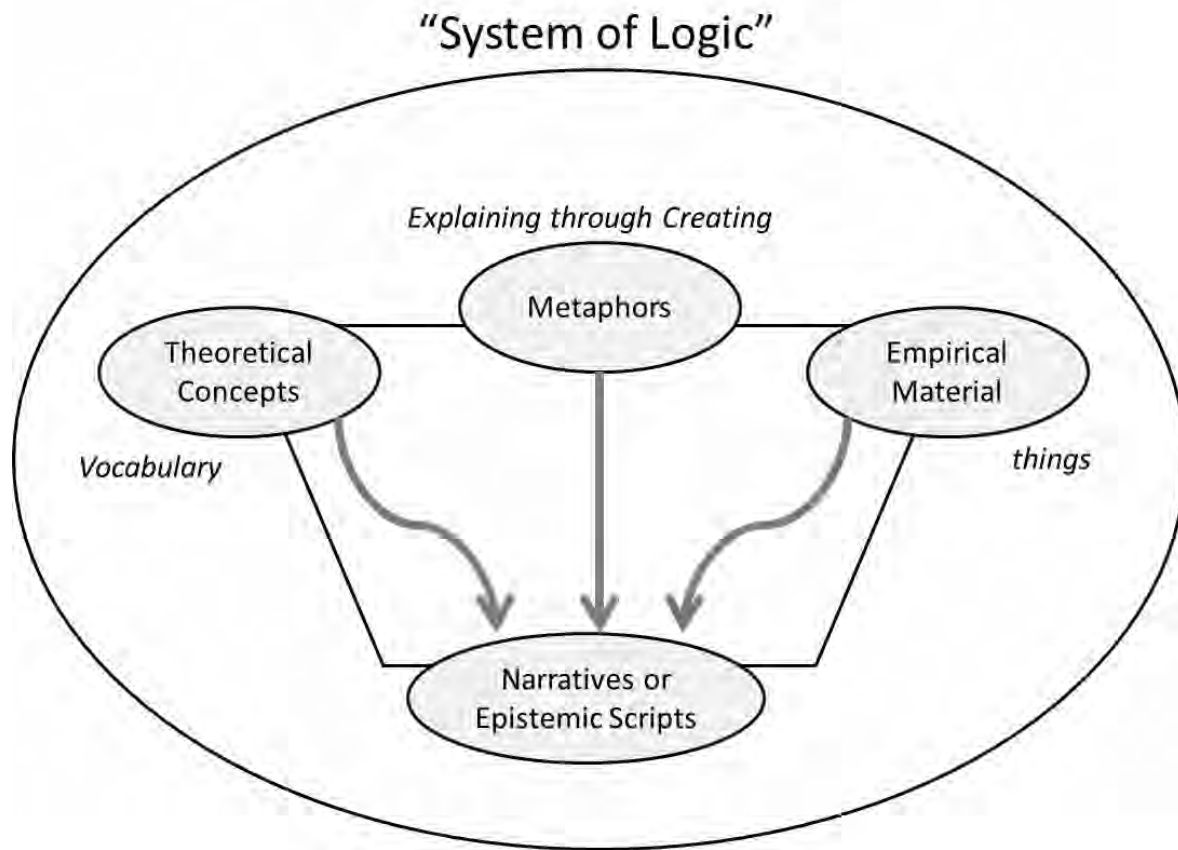


Figure 1: System of Logic

This paper uses the theory of ‘system of logic’ depicted above as the basis for how groups attempt to recognize the world around them. There is a ‘method for everyone’s madness’ in how organizations and societies interact with the world.³⁰ In all systems of logic, the empirical material remains the same ‘things’, yet how those materials are contemplated in their complexity is significantly different. For example, a Muslim, Christian, and Atheist each agree on the physical existence of a book such as the Bible, yet the theoretical content with that item changes with the individual’s logic. Humans

³⁰ Liang, Xiangsui, 8. Liang and Xiangsui take an eastern perspective on understanding how the world uses technology and warfare by using vivid metaphors that are uncommon in western discourse about warfare. “Technology is like ‘magic shoes’ on the feet of mankind, and after the spring has been wound tightly by commercial interests, people can only dance along with the shoes, whirling rapidly in time to the beat that they set.” Without understanding the importance of metaphor in eastern culture, it is easy to dismiss Liang and Xiangsui’s position on technology and society as ‘mad’ or ‘illogical.’ When we use our own logic to disregard others, we are using ‘madness’ as an excuse to ignore the alternate methods that their logic employs.

use metaphors to create new understanding by associating known things and notions with unknown or novel materials and concepts. “Primarily on the basis of linguistic evidence, we have found that most of our ordinary conceptual system is metaphoric in nature...we act according to the way we conceive of things.”³¹

How a system of logic synergizes metaphors, empirical material, and theoretical concepts to produce narratives is essentially how humans attempt to recognize and influence the world around them. Some thinking methodologies work effectively under the necessary circumstances, while others work poorly at the expense of the humans applying it. As this paper will argue, detailed planning methodology may reflect an increasingly problematic system of logic that is one source of confusion and friction concerning military actions within complex conflict environments. Due to these tensions and abnormalities that the current system logic generates through detailed planning, these tensions provoked the emergence of an alternate system of logic called Design.³² The thesis of this paper proposes that Design recognizes the world differently than detailed planning. Potentially, the military could move to incorporate relevant aspects of detailed planning into the Design system of logic *instead* of the current backwards approach of inserting snippets of Design into chapters of detailed planning doctrine and practice. Thomas Shelling uses the useful metaphor of ‘salami slices’ of gradual erosion in *Arms and Influence* that works here to describe how military detailed planning methodology is dismantling Design

³¹ George Lakoff and Mark Johnson, *Metaphors We Live By*, (Chicago: The University of Chicago Press, 2003), 3-5; Justin Kelly and Mike Brennan, *OODA Versus ASDA: Metaphors at War; Australian Army Journal For the Profession of Arms, Volume VI, Number 3*, (Duntroon: Land Warfare Studies Centre, 2009) 43. All metaphors are “incomplete and only partially appropriate representation of the phenomenon it purports to characterize.”

³² Mats Alvesson, Jorgen Sandberg, *Generating Research Questions Through Problematization*, (Academy of Management Review, Vol. 36, No. 2, 2011) 254. Alvesson and Sandberg use the term ‘in-house assumption’, ‘root metaphor’, and ‘field assumption’ to explain how problematization takes on the assumptions within a system of logic once abnormalities occur in a logic’s narrative. When the world does not behave the way military detailed planning logic anticipates it to, critical thinking must target those theoretical concepts within that logic that are ‘in-house assumptions’ and contribute to the abnormality of the logic. Nothing within the logic is ‘sacred’ or ‘off-limits’ to problematization.

logic and corroding it into a reductionist procedure.³³ The military may require some critical thinking about how it makes sense of the world, and whether that logic retains the same level of efficiency that it did in previous generations.

³³ Thomas Schelling, *Arms and Influence*, (New Haven, Yale University Press, 1966) 66-68. "One tests the seriousness of a commitment by probing it in a noncommittal way, pretending the trespass was inadvertent or unauthorized if one meets resistance..."

Section 1: Design and Detailed Planning: Rival Systems of Logic

Remembering always what the World-Nature is, and what my own nature is, and how the one stands in respect to the other- so small a fraction of so vast a Whole- bear in mind that no man can hinder you from conforming each word and deed to that Nature of which you are a part. - Marcus Aurelius³⁴

The U.S. Army employs a series of organizing principles that this paper defines as the ‘detailed planning’ system of logic.³⁵ Detailed planning logic attempts to understand the world with a series of patterns that use theoretical concepts, metaphors, and empirical material to build narratives that explain the world within a unique thinking methodology.³⁶ When one or more of the components of the logic are in friction with reality, the organization experiences abnormalities that the system of logic cannot resolve. According to Thomas Kuhn, these abnormalities trigger a paradigm shift where essentially a new system of logic emerges out of the necessity to resolve abnormalities and tension between a faulty thinking methodology and reality.³⁷

The U.S. Army’s detailed planning thinking confronts abnormalities when dealing with the dynamic nature of complex systems- the world does not function the way the military expects it to within mechanistic and reductionist logic.³⁸ Conflicts begin, occur, and terminate in generally confusing and unexpected ways, which in turn causes the military to waste resources, lives, and time on faulty

³⁴ Marcus Aurelius Antoninus, *Meditations*, (New York: Penguin Classics, 1964) Book Two, section 9.

³⁵ Valerie Ahl and T.F.H. Allen, *Hierarchy Theory: A Vision, Vocabulary, and Epistemology*, (New York: Columbia University Press, 1996) 1. “Contemporary society has ambitions of solving complex problems through technical understanding...the first strategy is to reduce complex problems by gaining tight control over behavior. It is a mechanical solution in the style of differential equations and Newtonian calculus;”

³⁶ Boxenbaum, Rouleau, 272-296. Boxenbaum and Rouleau argue that knowledge production of organizational theories use a combination of concepts, empirical material, and metaphors. This paper uses their work as an inspiration for ‘system of logics’ function for organizations that attempt to understand the world.

³⁷ Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 3rd ed, (Chicago: University of Chicago Press, 1996).

³⁸ Alvesson, Sandberg, 255. Alvesson and Sandberg use the term ‘ideological assumptions’ that “include various political-,moral-, and gender-related assumptions about the subject matter.”

decisions.³⁹ Due to the tensions between existing detailed planning patterns of logic and the complexities of reality, this provoked the emergence of a new paradigm called Design. Design operates with a different and incompatible system of logic that does not follow detailed planning thinking. Ultimately, leaders should understand how systems of logic function, why detailed planning appears to face greater tensions in making sense of the world for the military force, and how detailed planning and Design systems of logic appear incompatible.⁴⁰ Iraq's descent into civil war in 2004, Afghanistan's loss of momentum in 2008, and the unanticipated revolutions from Egypt to Libya in 2011 are just three examples where U.S. military action enters a conflict with 'end-states' that quickly become irrelevant.

Unlike previous eras when detailed planning thinking could leverage military action to accomplish strategic aims, today's conflict environment appears confusing and adaptive; adversaries as well as the environment seem to stay one-step ahead of the military. Historian Brian Linn criticizes the military's unyielding logic in *Echo of Battle* of resisting change, maintaining "intellectual rigidity, a propensity to mistake slogans for strategic thinking, and the dogmatic belief in itself as the 'best trained, best armed, best led force' that has ever existed."⁴¹ The days of Napoleonic individual genius appear to be decreasing in likelihood as modern conflict continue to exhibit greater patterns of complexity,

³⁹ Naveh, *In Pursuit of Military Excellence*. 2. "The methodological difficulties mentioned above are compounded by the lack of precise terminology and definitions for the specific laws and phenomena within the operational level of war..." Naveh argues that the military does not recognize the world, and uses the wrong language, concepts, and procedures to attempt to change it.

⁴⁰ Liang, Xiangsui, 10. Liang and Xiangsui criticize western emphasis on techno-centric logic with, "people have long been accustomed to blindly falling in love with the new and discarding the old...the endless pursuit of new technology has become a panacea to resolve all of the difficult questions of existence...In this way, the irrational expansion of technology causes mankind to continually lose his goals in the complex ramifications of the tree of technology, losing his way and forgetting how to get back."

⁴¹ Brian M. Linn, *The Echo of Battle; The Army's Way of War*, (Cambridge: Harvard University Press, 2007) 232; See also: Scott Winter, *Fixed, Determined, Inviolable; Australian Army Journal For the Profession of Arms, Volume VI, Number 3*, (Duntroon: Land Warfare Studies Centre, 2009) 59. Winter analyzes the Australian Army; however, they share many similarities in logic that the U.S. Army uses in conflict framing. "Military conservatism and traditionalism tend to take the form of 'dogmatic doctrine.'"

adaptation, and self-organization.⁴² Only simple scenarios match expected outcomes, while complex environments appear confusing despite the increased ability to collect more information.⁴³ While a vast lexicon emerged to describe the phenomenon, words such as ‘irregular’, ‘asymmetrical’, ‘ill-structured’, and ‘messy’ merely describe these abnormalities that plague detailed planning explanations of how the world should function, but does not. Forcing the logic of linear causality, reductionism, and mechanistic theory to make sense of non-linear, complex systems appears to becoming a larger institutional problem for the military in the 21st century.⁴⁴

Detailed planning employs a thinking methodology that appear to be paradoxical to Design logic, and tensions between these methodologies are a primary source of confusion within military organizations attempting to recognize and influence a complex world. Design approaches complex systems with a method of thinking that challenges detailed planning’s collective logic of how the world supposedly works, and possibly threatens its relevance. While some aspects of detailed planning are beneficial for assimilation into the Design system of logic, there appear to be institutional resistance to any attempts at trimming down traditional procedures and components that reflect core values.⁴⁵

⁴² Ryan, *The Foundation For An Adaptive Approach*, 70. “With the industrial revolution, the planning and decision-making process gradually built up a well-oiled machine to reduce reliance on individual genius.” See also: Michael Fullan, *Leading in a Culture of Change*, (San Francisco: Jossey-Bass, 2001) 135-136.

⁴³ Gerald M. Weinberg, *Rethinking Systems Analysis and Design*, (Boston: Little, Brown and Company, 1982) 12. “If our previous experience with systems analysis proves anything, it proves that anyone who tries to use *all* the information- even about the simple systems existing today- will be drowned in paper and never accomplish anything...The synthesist is someone who makes very specific plans for action, and more often than not stays around during the execution of those plans to adjust them to ongoing reality.”

⁴⁴ Jeff Conklin, *Wicked Problems and Social Complexity*, (CogNexus Institute, 2008). <http://cognexus.org/wpf/wickedproblems.pdf> (accessed 05 January 2011) 4-5. “This is the pattern of thinking that everyone attempts to follow when they are faced with a problem...this linear pattern as being enshrined in policy manuals, textbooks, internal standards for project management, and even the most advanced tools and methods being used and taught in the organization.”

⁴⁵ Liang, Xiangsui, 13-14. “Some of the traditional models of war, as well as the logic and laws attached to it, will also be challenged. The outcome of the contest is not the collapse of the traditional mansion but rather one portion of the new construction site being in disorder.” Liang and Xiangsui present a non-western perspective on how a paradigm shift in military thinking in the 21st century does not destroy the old entirely, but reorganize an old structure into a new one; some parts remain useful while others go to the intellectual scrap heap.

In the interests of institutional self-preservation of a preferred system of logic, the military struggles with Design and appears to marginalize it by reducing it into a supplement to detailed planning methodology. This process of knowledge production, defined as “bricolage” in organizational theory circles, turns one into ‘a handyperson who, rather than inventing a new theory or a new paradigm, repairs or remodels existing theories by combining various theoretical concepts.’⁴⁶ This paper charges that Design critics that espouse, “Design is nothing but the Military Decision Making Process (MDMP) on steroids,” or “Design is just Effects Based Operations (EBO) with a new name” are acting as ‘bricoleur’ and potentially ignoring the incompatibility of system logics or simply do not understand either of them.⁴⁷

More alarmingly, the latest position for Design malcontents is to attempt to overlap Design methodology everywhere within detailed planning, often illustrated by placing the word ‘Design’ at the center of a graphic describing a particular detailed planning process. “Design occurs throughout this entire process”⁴⁸ appears to be a popular slogan throughout the professional military education field. However, organizations must be cautious to avoid ‘branding’ a concept without fully realizing the impact it poses upon an institution that is traditionally resistant to radical change.

Design operates on an entirely different and unique system logic that should not be ‘salami sliced’ into existing detailed planning methodology. Design does not fit neatly into an expansion package that supports existing military planning methodologies, nor does it lend itself to procedures or processes that involve reproducible steps and formats- Design resists compartmentalization and efforts to reduce it down to a replicating procedure. For lack of a better word, Design functions on a dissimilar system logic

⁴⁶ Boxenbaum, Rouleau, 280-281. See also: Thomas Schelling, *Arms and Influence*, (New Haven, Yale University Press, 1966) 66-68. Schelling’s work dates from the 1960s and is a Cold War document concerning nuclear deterrence; however his concept on ‘gradual erosion’ that he captures in his salami slice metaphor also applies to what detailed planning is doing to dismantle Design.

⁴⁷ Boxenbaum, Rouleau, 280-281. A ‘bricoleur’ is a person that conducts ‘bricolage’ with new knowledge production.

⁴⁸ *Field Manual 5-0*. 1-5, 1-6, 3-1.

for military methodologies; it sees and understands the world in a fundamentally different way that is in many ways incompatible with detailed planning's reductionist and mechanistic worldview.

These attempts at assimilating portions of Design's system of logic into detailed planning thinking potentially confuse the military, and may eventually cause the force to disregard it entirely. Detailed planning plays on many institutional biases that reinforce the system logic; the military wants the world to behave in a manner that 'makes sense' according to the concepts and values associated with the thinking methodology of choice.⁴⁹ Due to the mechanistic nature of detailed planning, the Army invests heavily into techno-centric and tactical training considerations because they make sense to the organization's logic and worldview. Better weapon systems provide western societies with more lethal and precise military instruments of power; this establishes the linear causality that a stronger military delivers a more predictable victory- this seems like a logical conclusion from the detailed planning worldview.⁵⁰ Detailed planning uses a teleological approach where the entire process is purpose driven; the 'ends' is determined first and then directed by action (ways) with means.⁵¹ This type of thinking potentially oversimplifies complex systems and sets up the military organization for tactical success with

⁴⁹ Naveh, Schneider, Challans, 88 Army Design doctrine demonstrates repetitive *tacticization* where military institutions "are inclined to apply knowledge they have acquired from their tactical experiences to their operational functioning sphere. In such cases, they either reduce the operational inquiry of potential opposition into a mechanical discussion or completely reject the need for a distinct learning operation."

⁵⁰ Liang, Xiangsui, 140-141. Liang and Xiangsui argue that over the last 20 years, the world has grown more complex, yet the military ignore the increased complexity of war and instead focus "on the level of weapons, deployment methods and the battlefield, and the drawn-up war prospects are also mostly only limited to the military domain and revel in it."

⁵¹ James J. Schneider, *Theoretical Implications of Operational Art; On Operational Art*, (Washington: Center of Military History, 1994) 25-29. Schneider takes a teleological and techno-centric view of Operational Art in his conclusion. "The future of operational art depends on today's officer corps understanding the historical and theoretical basis of the concept. Only by knowing what has gone before can it hope to build a doctrine for the future which takes full advantage of the fruits of technology;" See also: *Romjue*, 48-49. TRADOC's précis, titled '*The Evolution of Doctrine for the Strategic Army of the 1990s and Beyond*,' was directed by General Frederick M. Franks, Jr. and when disseminated to the military community received a strong reaction. "The strong reaction to the précis was *also a reaction to the mechanistic, operations-by-stages concept* of the AirLand Operations pamphlet, with its emphasis on the operational continuum of military actions (emphasis added)."

strategic failure because the world is not as malleable as the detailed planning expects it to be.⁵² The challenges of modern military conflict appear to exceed in complexity what prior generations dealt with. Cyberspace and space present new geographies, while globalization and technological advances are making the physical world increasingly interconnected and interdependent. Figure 2 below graphically depicts the detailed planning system of logic using the previous conceptual framework explained in figure 1.

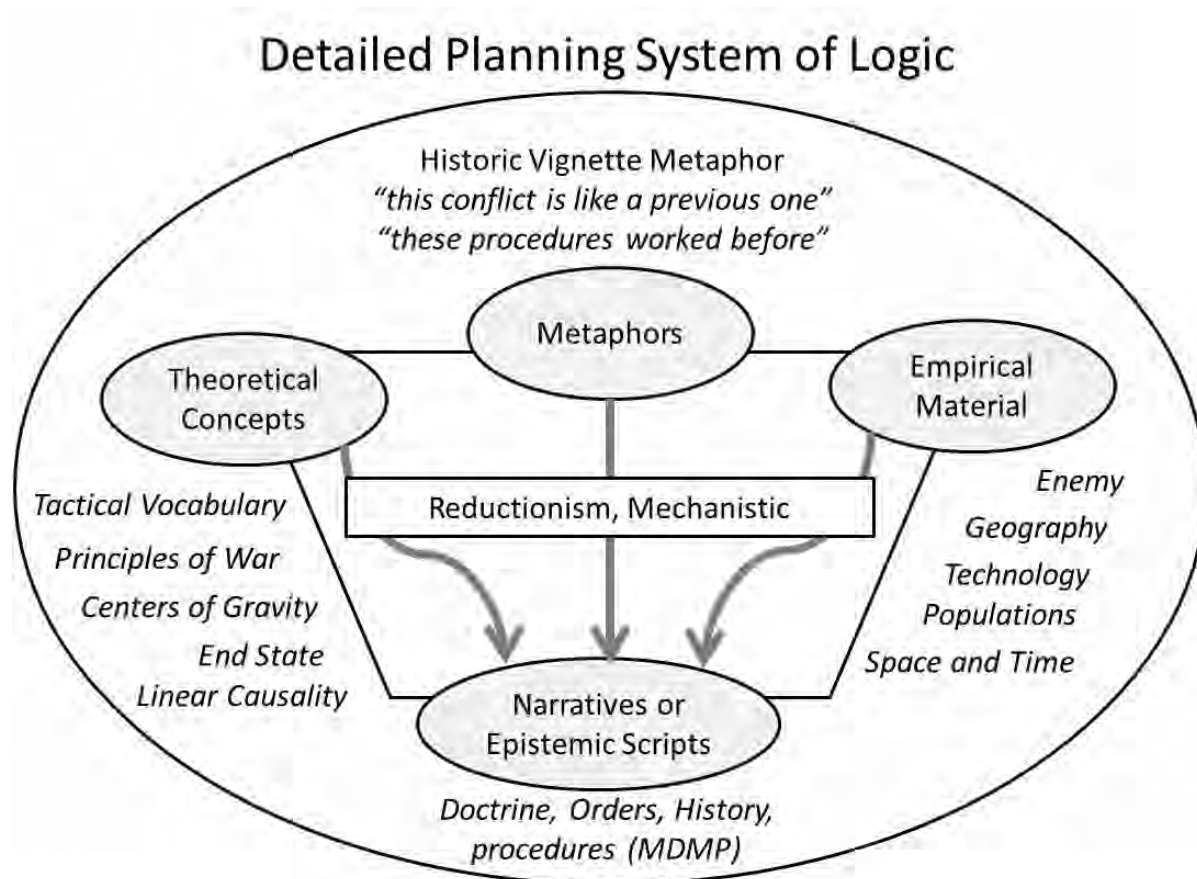


Figure 2: Detailed Planning System of Logic

⁵² Liang, Xiangsui, 141. "The enemy will possibly not be the originally significant enemy, and the weapons will possibly not be the original weapons, and the battlefield will also possibly not be the original battlefield. Nothing is definite. What can be ascertained is not definite. The game has already changed, and what we need to continue is ascertaining a new type of fighting method within various uncertainties."

The subsequent four sections of this paper will expand upon how detailed planning logic, as depicted above, is potentially inadequate and likely incompatible with Design's thinking methodology. The emphasis on reductionist and mechanistic thinking cause the military to prefer description to explanation, and reduction of complexities instead of holistic comprehension. As the second building block, detailed planning metaphors are generally limited to historical vignettes and patterns of linear causality where future conflicts correlate to earlier ones. Historian Carl H. Builder argues in *The Masks of War* that military institutions are generally motivated towards institutional survival, evoking 'golden eras' of past wars, and the continued idolization of self-defining behaviors, traditions, and structures.⁵³ The third building block comprising empirical material is self-explanatory, yet detailed planning theoretical concepts use vocabulary and frameworks that relate back into reductionism and mechanistic methodologies. Each of these building blocks leads to detailed planning narratives that take the familiar form of doctrine, prescriptive principles of war, and highly integrated procedures such as MDMP.⁵⁴ Figure 2 depicts how the military applies the detailed planning system of logic to attempt to make sense of the world, and each section of this paper will refer back to figures in this section for further elaboration.

Military organizations struggle today with complexity. The 21st century world is unpredictable, chaotic, and unresponsive to the reductionist and mechanistic narratives generated by the detailed planning system of logic. This provoked the emergence of Design's system of logic that the military

⁵³ Carl H. Builder, *The Masks of War; American Military Styles in Strategy and Analysis*, (Baltimore: The John Hopkins University Press, 1989) 11,17; See also: Anne-Marie Grisogono, Alex Ryan, *Adapting C2 To The 21st Century; Operationalising Adaptive Campaigning*, (Edinburgh: Australian Department of Defence, Defence Science and Technology Organization, 2007) 3.

⁵⁴ Nassim Nicholas Taleb, *The Black Swan*, (New York: Random House, 2007), 16. "Categorizing always produces reduction in true complexity." See also: Fritjof Capra, *The Web of Life*, (New York: Doubleday, 1996), 29. "In the analytic, or reductionist approach, the parts themselves cannot be analyzed any further, except by reducing them to still smaller parts." See also: United States Army Training and Doctrine Command, *Field Manual 3-0; Operations*, (Headquarters, Department of the Army, 2001), 4-11. Most of the current principles of war found in U.S. Army Field Manual FM 3-0, Operations (2001) espouse the same doctrine and war methodology first penned by Jomini in the wake of the Napoleonic Wars. The principles of war are also listed in Joint Publication 3-0, Joint Operations, II-2.

recently attempted to assimilate into design doctrine. Figure 3 depicts Design's different and incompatible thinking methodology below and follows the conceptual framework outlined in figure 1.

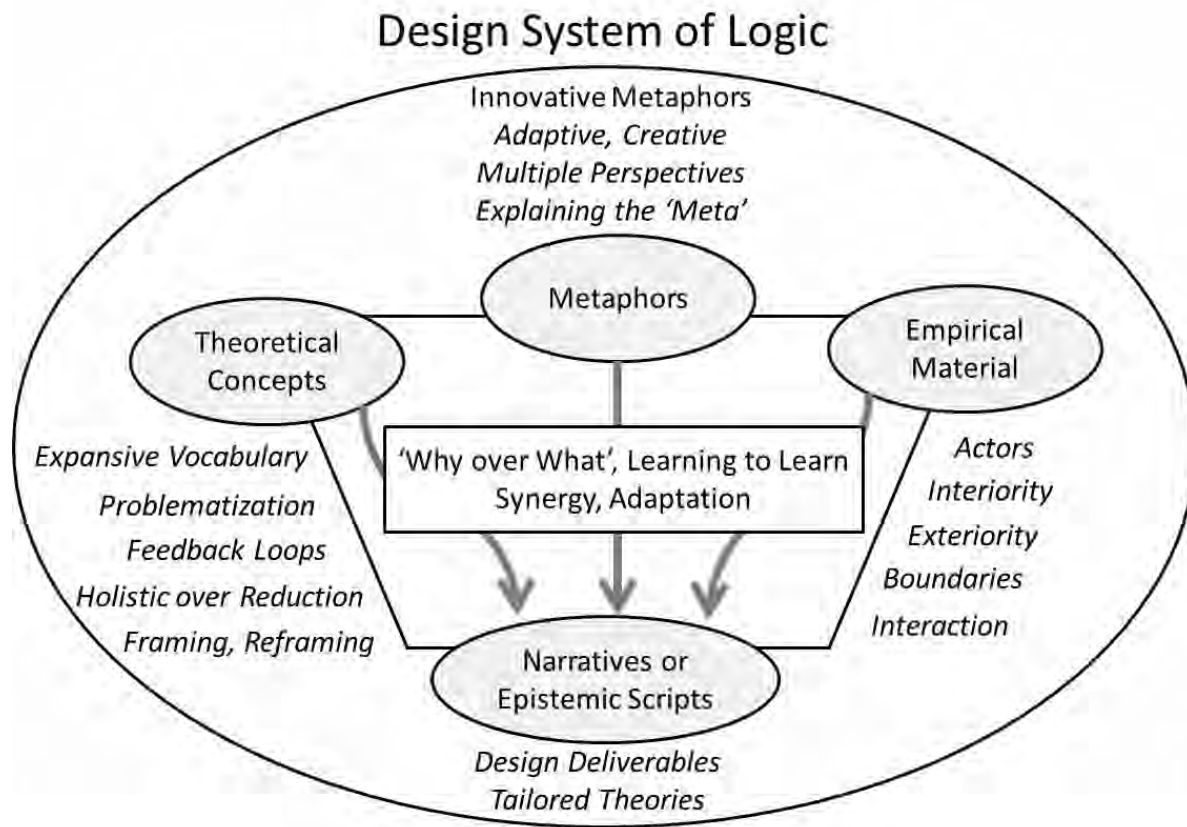


Figure 3: Design's System of Logic

Figure 3 demonstrates how Design applies an incompatible system of logic in recognizing how the world functions when compared to detailed planning in figure 2. This monograph will explain in subsequent sections how and why each of the building blocks of metaphors, theoretical concepts, and empirical material interact within a different logic to produce unique narratives. These narratives serve as design deliverables that explain the world in ways that lack the abnormalities and friction that detailed planning results frequently generate.⁵⁵ Design's system of logic represents an entirely different and

⁵⁵ Azeem Ibrahim, *Afghanistan's Way forward Must Include the Taliban*, (Los Angeles Times Opinion Online; 09 December 2009; <http://articles.latimes.com/2009/dec/09/opinion/la-oe-ibrahim9-2009dec09>) (accessed February

incompatible methodology for making sense of a complex and dynamic world, but Design faces four major obstacles that prevent military organizations from using a new thinking methodology in any meaningful way.⁵⁶

The first significant obstacle preventing the military from benefiting from Design is perhaps the most obvious. Due to institutional bias and prominent societal pressures, the military will not abandon the detailed planning thinking methodology and attempt to understand the world in an incompatible one such as Design.⁵⁷ As Liang and Xiangsui remark in *Unrestricted Warfare*, “it must go beyond all of the fetters of politics, history, culture, and ethics and carry out through thought. Without thorough thought, there can be no thorough revolution.”⁵⁸ The next section of this paper casts the leader of a military organization as the central architect who can foster educational reforms and coach soldiers to adapt Design thinking.⁵⁹

Design is not taught in a series of classes, through fifteen pages of Design doctrine, or through some sort of military ‘rubber stamp’ certification process.⁶⁰ Changing from the detailed planning system of logic to Design requires significant self-introspection, critical thinking, and becomes a life-long

2011) Ibrahim quotes General McChrystal’s opinion on how the American military had spent the last decade fighting in Afghanistan, “looking at the war in simplistic Manichaeian terms—save as many good guys as possible while taking out as many bad guys as possible—was a mistake.”

⁵⁶ Alvesson, Sandberg, 255. “A key task is...to enter a dialectical interrogation between one’s own and other metatheoretical stances so as to identify, articulate, and challenge central assumptions underlying existing literature in a way that opens up new areas of inquiry.”

⁵⁷ Naveh, Schneider, Challans, 8-9. See also: Linn, 8. “For Heroes, war is simply battle- an extension of combat between individuals on both the physical and moral plane. The side whose commanders and soldiers exhibit superior courage, strength, discipline, martial skills, honor, and so forth will inevitably secure victory...”

⁵⁸ Liang, Xiangsui, 143.

⁵⁹ United States Army Training and Doctrine Command, *Field Manual 3-0; Operations*, (Headquarters, Department of the Army, 2008), 4-8. “Leaders provide purpose, direction, and motivation in all operations;” See also: United States Army Training and Doctrine Command, *Field Manual 5-0; The Operations Process*, (Headquarters, Department of the Army, 2010), 3-30. “Leaders are the central figure in Design. Generally, the more complex a situation is, the more important the leader’s role is in Design.”

⁶⁰ Naveh, Schneider, Challans, 72. Naveh, Schneider, and Challans also make a distinction between what they consider *designers* and military planners. Military planners are “confined to the ‘shackles’ of inferiority determined by institutional paradigm, doctrine, and jargon...[they] are cognitively prevented, by the very convenience of institutional interiority...because the ‘shackles’ of ritual hold them in place.”

journey. Without leaders guiding their organizations along this challenging journey, Design will potentially remain a misunderstood and rejected system of logic for making sense of reality.

The second major obstacle preventing the military from using Design has to do with the theoretical concepts outlined in figures 1-3. Design requires unique and innovative vocabulary and Design concepts instead of rigid terms and words that construct the detailed planning lexicon. The third section of this paper explains the importance of unique Design vocabulary as a critical component of Design thinking methodology.

The third significant obstacle concerning Design and the military deals with another theoretical concept in tension between figure 2 and figure 3; detailed planning relies on linear causality as part of its logic while Design expands to include non-linear approaches to understanding complexity. The fourth section of this paper demonstrates how Design's application of non-linear processes such as 'swarming' and lack of precise end-states potentially prepares the military to adapt to complexity and influence a system holistically in shorter time periods.

The fifth section of this paper addresses the final major obstacle that prevents Design thinking from taking hold within the military institution. Detailed planning's propensity to codify narratives into rigid doctrine and structured procedures such as MDMP are incompatible with Design's narratives and deliverables. Instead of forcing Design into doctrinal formatting associated with the detailed planning system of logic, Design requires a fundamentally different and incompatible format. While this paper continues to use the term 'doctrine' as a form for Design's theories and processes to be template within, Design's entire system of logic appears to be incompatible with nearly all aspects of detailed planning doctrine. Design 'doctrine' has nothing in common with detailed planning doctrine other than the word itself. Additionally, leaders must prevent 'cross-contamination' of detailed planning terms, procedures, and doctrinal tenets from distorting Design narratives.

This paper does not argue that the military should 'throw the baby out with the bath water' on the entire detailed planning way of making sense of the world. Instead, the military must take those relevant processes out of detailed planning's 'bath water' and dump them into the new bath of Design's system of

logic. There are many still useful components of detailed planning thinking that will continue to provide the military with the tools to think about the world; Design provides a new foundation from which a new framework can grow.⁶¹ Design also features several disadvantages that do not function within the military institution, as subsequent sections of this paper will explain. Some of these recommendations fundamentally challenge military institutional tenets inherent within the detailed planning system of logic. However, this section on rival systems of logic ends with the same meta-question from the beginning. If some systems of logic prove to be advantageous when making sense of complexity, can the Army recognize institutional barriers that resist accepting and employing a different logic?

⁶¹ Liang, Xiangsui, 13-14. "Some of the traditional models of war, as well as the logic and laws attached to it, will also be challenged. The outcome of the contest is not the collapse of the traditional mansion but rather one portion of the new construction site being in disorder." Some elements of detailed planning logic are now no longer useful in the 21st century, while others should remain. The military ultimately determines which elements are still valid. This monograph suggests that doctrine, linear causality, reductionism, mechanistic procedures, and the overemphasis on western theories such as Clausewitz and Jomini require revision and editing.

Section 2: Leadership and Education- How Design is Not a 'Paint-By-Numbers' Process

Tactics operates in a system that can be assumed “closed” within a time frame of planned tactical actions...strategy operates in a system that we must assume to be “open” within the time frame we are exploring.⁶²

-Huba Wass de Czege

The problem is that thinking is the tool of leadership, which involves being effective by doing the right thing. To be truly successful the military has to combine both activities...the challenge is knowing when and how to transition between planning and thinking.⁶³

-Richard King

The military leader at an operational and tactical level must function as the primary teacher and coach to guide his organization between different system logics. The leader is also responsible for educating his organization to distinguish different thinking processes and ensure their application demonstrates cohesion over friction.⁶⁴ This is no easy job since Design employs a different logic that is incompatible with traditional military education processes.

With Design, education is more than memorization, adherence to doctrine and templates, or mechanistic exercises that promote uniformity of action.⁶⁵ Design logic encourages adaptation, creativity,

⁶² Huba Wass de Czege, *Thinking and Acting Like an Early Explorer: Operational Art is Not a Level of War* (Small Wars Journal, <http://smallwarsjournal.com/blog/2011/03/operational-art-is-not-a-level/> (accessed: 28 March 2011), 1.

⁶³ Richard King, *How the Army Learned to Plan but Forgot How to Think*, (Australian Army Journal, Volume V, Number 3, 2011), 5.

⁶⁴ Deleuze, Guattari, 351. Deleuze and Guattari discuss their concept of ‘the war machine’ and differentiate two rival forces that are “at once antithetical and complementary, necessary to one another...their opposition is only relative; they function as a pair.”

⁶⁵ Ibid, 353. Deleuze and Guattari use a ‘Chess and Go’ game theory analogy for their internal and external concepts of ‘the war machine.’ “Chess is indeed a war, but an institutionalized, regulated, coded war, with a front, a rear,

and novel learning- a distinct paradigm shift from what military institutions employ through detailed planning's narratives that include doctrine, orders, historic metaphors, and rigid procedures such as MDMP.⁶⁶ To educate his organization on Design thinking, a leader should approach education from outside the logic that supports the detailed planning perspective on the world. In other words, one does not teach Design from applying a process that teaches a soldier how to fire a rifle, memorize the principles of war, or earn the Expert Infantryman's Badge. A different system of logic requires an equally different educational approach that matches Design's reasoning of the world.

Design requires greater flexibility with time considerations due to several unique factors. Unlike tactical mechanistic processes that rely upon repetition or 'muscle memory' for superior performance, Design logic does not use mechanistic methodologies to link empirical material with theoretical concepts that support detailed planning metaphors, as illustrated in figure 2.⁶⁷ Repetition promotes rigidity and eliminates adaptation- precisely what a leader wants when he needs a *predictable and repeatable action* to occur across time and space within a large organization. The tactical vocabulary that functions as a theoretical concept within detailed planning logic means that the entire military generally agrees on how an attack is different than a raid, and enemy forces are graphically depicted with red while friendly forces are done in blue.⁶⁸ Yet Leaders cannot apply the logic that works for mechanistic military hierarchies

battles." They correlate the rigid structure of the chess game to how linear tactical processes of the state and the military institution prefer obedience, hierarchical control, and repetition.

⁶⁶ Peter Northouse, *Leadership: Theory and Practice, Third Edition* (California: Sage Productions, 2004) 69-70, 77-78. Northouse outlines the 'authority-compliance' style of leadership in theory and provides a case-study called 'A Drill Sergeant at First' which implies some valid generalizations on the majority of military professional education methods. This style "places heavy emphasis on task and job requirements...this style is results driven, and people are regarded as tools to that end. The [authority-compliance] leader is often seen as controlling, demanding, hard-driving, and overpowering."

⁶⁷ Richard Hughes, Robert Ginnett, Gordon Curphy, *Leadership; Enhancing the Lessons of Experience, Fourth Edition* (McGraw-Hill Irwin, 2002) 292-293. Hughes outlines the *Tuckman's Developmental Stages of Groups Theory*, which uses the rhyming components: forming, storming, norming, and performing.

⁶⁸ Liang, Xiangsui, 181. Americans "would rather treat war as the opponent in the marathon race of military technology and are not willing to look at it more as a test of morale and courage...they believe that as long as the Edisons of today do not sink into sleep, the gate to victory will always be open to the Americans."

when exercising Design.⁶⁹ One system of logic does not replace another, and inserting an educational block on military Design doctrine into company and field-grade professional military education systems will not make the U.S. Army better at recognizing the world through a different system of logic.

Reductionist and repetitive tasks such as teaching a company of infantry soldiers to enter and clear a room or zero the optics of their weapon systems generally take the form of a bell-curve of performance (figure 2). Although Nassim Taleb makes an outstanding argument against the fallacy of the bell-curve, the system logic of detailed planning understands the world through bell-curves for a reason. As Taleb explains, “[it] is not a property of the world, but a problem in our minds, stemming from the way we look at it.”⁷⁰ Taleb explains the logic of detailed planning here, and how the results do not always make sense for a reason. The bell-curve demonstrates the mechanistic and linear logic that provides structure for detailed planning methodology. Leaders cannot exercise the different way of thinking about the world in Design and expect to find any bell-curves. They simply do not exist, just as centers of gravity, the principles of war, ‘end-states’, and other theoretical concepts associated with the

⁶⁹ Azeem Ibrahim, *Afghanistan’s Way forward Must Include the Taliban*, (Los Angeles Times Opinion Online; 09 December 2009; <http://articles.latimes.com/2009/dec/09/opinion/la-oe-ibrahim9-2009dec09>) (accessed February 2011) Ibrahim quotes General McChrystal’s opinion on how the American military had spent the last decade fighting in Afghanistan, “looking at the war in simplistic Manichaeian terms—save as many good guys as possible while taking out as many bad guys as possible—was a mistake.”

⁷⁰ Taleb, 245-252. Taleb makes the argument that the reductionist system logic employs a fallacy by seeking to explain reality through the ‘bell curve’- for this paper his position supports this author’s thesis that the detailed planning system logic operates as a rival to Design; while tactical methodology may have a foundation of false pretenses such as ‘bell-curves,’ the *problematizing* nature of Design offers the potential to expose these fallacies and create new processes within the detailed planning construct.

detailed planning logic do not transfer over into Design.⁷¹

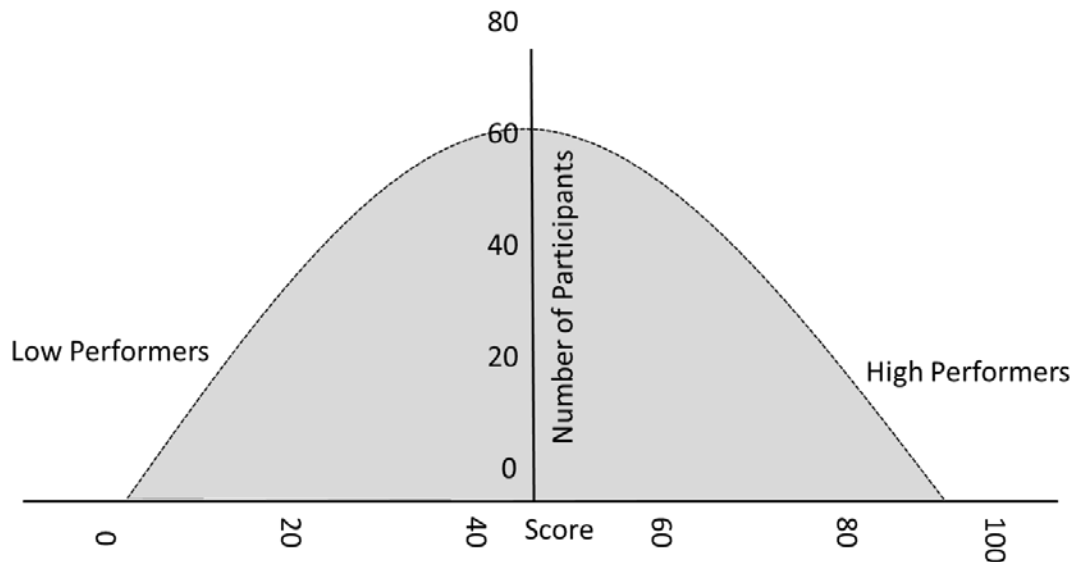


Figure 4: Example Performance Bell Curve

Returning to the fallacy of the bell-curve, the detailed planning system of logic narrates that a majority of a company will perform at any quantifiable military task within expected areas of tolerance, hence the ‘bell’ shape. A smaller group will perform poorly and require additional retraining, while another smaller group will excel at the task and exceed educational expectations. The performance bell-curve in educational processes is an example of how detailed planning logic works in hierarchical institutions that favor uniformity and reliability.⁷² The form, function, and sheer numbers of personnel

⁷¹ Jeff Conklin, *Wicked Problems and Social Complexity* (CogNexus Institute, 2008). <http://cognexus.org/wp/wickedproblems.pdf> (accessed 05 January 2011) 4-5. “This is the pattern of thinking that everyone attempts to follow when they are faced with a problem...this linear pattern as being enshrined in policy manuals, textbooks, internal standards for project management, and even the most advanced tools and methods being used and taught in the organization.” See also: John Shy, Jomini, Peter Paret (editor), *Makers of Modern Strategy; From Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986) 144. “Jomini’s approach to war was “abstracting it from its political and social context, emphasizing decision-making rules and operational results, turning warfare into a huge game of chess, [that] has been surprisingly durable.”

⁷² Michael Krause, Cody Phillips, *Historical Perspectives of the Operational Art*, (Center of Military History, United States Army, 2007) 440. “Most senior American leaders of Desert Storm had little exposure to the operational art in the Army educational system;” See also: John Nagl, *Learning to Eat Soup with a Knife*;

involved in most tactical applications explain how high frequency repetitive educational models are predominant.⁷³ Yet complex systems defy the mechanistic thinking of detailed planning, and leaders are disappointed to expect a bell-curve but sometimes discover unexpected and confusing shapes instead.⁷⁴ Why are bell-curves relevant to this topic? Leaders should examine every aspect of their understanding of education and recognize that the majority of military educational processes are built upon detailed planning logic that appears unable to make sense of complex systems.

Athletes such as boxers, basketball players, and distance swimmers spend thousands of hours of training focused on repetition. Although there is some truth to being a ‘natural athlete’, every Olympian that competes carries with them a long history of years of practice. Soldiers that conduct detailed planning and tactical execution reflect a similar methodology and educational structure. Repetition builds infantry squads that can rapidly perform battle drills in much the same way professional football offensive lines execute complicated plays that put the football in the end zone. Repetition remains a cornerstone for military institutions because it is remarkably effective. When an organization expects reproducible and reliable actions whether on the battlefield or a football field, repetition is the most efficient process available.

Counterinsurgency Lessons From Malaya and Vietnam (Chicago: The University of Chicago Press, 2002) 9. “Military organizations often demonstrate remarkable resistance to doctrinal change as a result of their organizational cultures. Organizational learning, when it does occur, tends to happen only in the wake of a particularly unpleasant or unproductive event.”

⁷³ Richard Hughes, Robert Ginnett, Gordon Curphy, *Leadership; Enhancing the Lessons of Experience, Fourth Edition* (McGraw-Hill Irwin, 2002) 19. Refer to the section titled Myth: The Only School You Learn Leadership from Is the School of Hard Knocks; See also: Deleuze, Guattari, 390. On numerical organization, “some people...denounce it as a military or even concentration-camp society where people are no longer anything more than deterritorialized ‘numbers.’”

⁷⁴ Jeff Conklin, *Wicked Problems and Social Complexity*, (CogNexus Institute, 2008). <http://cognexus.org/wp/wickedproblems.pdf> (accessed 05 January 2011) 6. Conklin describes the ‘jagged line’ of cognitive activity for non-linear problem solving; See also: Taleb, 236-240. Taleb’s thesis separates repetitive closed systems from dynamic open systems through his terms ‘Mediocristan’ and ‘Extremistan.’ Bell curves function in closed systems, but fail to function in uncertain and adaptive complex systems. Using a bell curve with an open system is akin to “focusing on the grass and missing out on the (gigantic) trees. Although large deviations are rare, they cannot be dismissed as outliers because, cumulatively, their impact is so dramatic.”

Football is a well-defined game with rules, known actors, and is an example of a closed system. While not even Las Vegas knows who will win a game or what the score will be, the rules do not change mid-game, and new opponents do not spring from the crowd. That does not sound like football, but it does begin to sound like counterinsurgency operations and ‘hybrid war’ discussions.⁷⁵ Open systems with complexity follow different patterns, and the frustration that a football team would have with rules changing mid-game would likely echo the complaints that the military voices when facing ill-structured conflict environments.⁷⁶

Painters, fiction writers, sculptors, and other artists are different from athletes and soldiers. While successful artists often require many hours of painting, writing, or sculpting to achieve professional status, one cannot link repetition and imitation to success. If this were the case, tribute bands and local karaoke clubs would be hotbeds of future star talent for the music industry. Fortunately, they are not. Artists require creativity, and generally resist uniformity and repetition.⁷⁷ Design employs a method of thinking that that artists often demonstrate. Unfortunately, Design requires creativity and innovation at the expense of uniformity and repetition. Some humans are gifted with more creativity than others, and a military institution cannot teach a soldier to be more creative any more than a Fine Arts program at a university can mass-produce Pablo Picassos. Leaders should thus consider how Design requires educational considerations that differ from detailed planning and execution repetition and uniformity of

⁷⁵ Ahl, Allen, 1. “Contemporary society has ambitions of solving complex problems through technical understanding...the first strategy is to reduce complex problems by gaining tight control over behavior. It is a mechanical solution in the style of differential equations and Newtonian calculus;” See also: Fritjof Capra, *The Web of Life* (New York: Anchor Books, 1996) 29. “In the analytic, or reductionist, approach, the parts themselves cannot be analyzed any further, except by reducing them to still smaller parts. Indeed, Western science has been progressing in that way;”

⁷⁶ Liang, Xiangsui, 95. “It is not so much that war follows the fixed race course of rivalry of technology and weaponry as it is a game field with continually changing direction and many irregular factors.”

⁷⁷ Bryan Lawson, *How Designers Think; The Design Process Demystified*, 4th Edition, (Oxford: Architectural Press, 2008) 20-21. “While we are used to the idea that physical skills like riding a bicycle...must be learned and practiced, we are less ready to recognize that thinking might need similar attention.” See also: United States Marine Corps, Department of the Navy, *Marine Corps Doctrinal Publication (MCDP) 5, Planning*, (Headquarters, United States Marine Corps, Washington D.C. July 1997), 65. The USMC observes that maneuver warfare “emphasizes planning as a continuous learning and adapting process rather than as a scripting process.” The Marines explore this tension of ‘process versus procedure’ throughout their planning doctrine.

action.⁷⁸ Some members of an organization may work better with Design logic, while others are better utilized under the detailed planning methodology.

Design emphasizes ‘learning to learn’ and is process-driven instead of result-driven.⁷⁹ This does not apply well to military conflicts where there is little time available for learning and high risk for the organization. Repetition builds natural reflexes for an organization; this benefits the military where Design seeks to critically think about how one even approaches a conflict. Repetition works for many military processes, but it does not work with Design. If a leader allows detailed planning thinking to attempt to codify Design into a repetitive procedure for his unit, they will likely imitate earlier Design examples instead of create new approaches.⁸⁰ In other words, when a leader recognizes that all Design deliverables that his military organization produces during Design all appear *procedurally* identical regardless of the ill-structured problem confronted, his organization has applied the logic of mechanistic procedures and ‘lock-step imitation’ instead of the logic of creation and innovation.⁸¹

Leaders face a challenging tension between educating Design without confusing the organization as it switches between two distinct manners in thinking about the world.⁸² The tendency to apply

⁷⁸ Richard Hughes, Robert Ginnett, Gordon Curphy, *Leadership; Enhancing the Lessons of Experience, Fourth Edition*, (McGraw-Hill Irwin, 2002) 45. “A leader may need to respond to various followers differently in the same situation. A leader may need to respond to the same follower differently in different situations.”

⁷⁹ Naveh, *Between the Striated and the Smooth: Asymmetric Warfare, Operational Art and Alternative Learning Strategies*, (unpublished, provided to author by Shimon Naveh in January 2011 in hardcopy), 5. Naveh writes of the Israeli 35th Para Brigade and how they applied Systemic Operational Design to the planning leading up to the 2006 Hezbollah War. “Unlike our idealistic tradition which, perceived war in binary terms, this campaign is going to be a very long one, and end, in the far future, in a kind of new equilibrium rather than decisive results.”

⁸⁰ Deleuze, Guattari, 363. Deleuze and Guattari discuss ‘royal science’ that aligns with this paper’s thesis on detailed planning methodologies. “Royal science only tolerates and appropriates perspective if it is static, subjected to a central black hole divesting it of its heuristic and ambulatory capacities.”

⁸¹ United States Marine Corps, 25. The Marines warn that a planning pitfall is “the tendency for institutionalized planning methods to lead to inflexible or lockstep thinking and for planning and plans to become rigid and overly emphasize procedures...attempts to [institutionalize planning] will necessarily restrict intuition and creativity.”

⁸² Lawson, 156-157. Lawson discusses rival theories on Design education; whether students learn better by tackling theory and reading about other Designers, or by applying Design and learning from trial by error. “Design education, then, is a delicate balance indeed between directing the student to acquire this knowledge and experience, and yet not mechanizing his or her thought processes to the point of preventing the emergence of original ideas;” See also: Gary Yukl, *Leadership in Organization, Sixth Edition*, (New York: University of Albany, Pearson, 2006) 411. “Learning acquired from one approach can facilitate or enhance learning from other approaches.” Yukl

traditional mechanistic and repetition-based educational models is a deeply entrenched element that defines the U.S. Army; continued relevance as a military instrument of power in future conflicts further reinforces this institutional bias.⁸³ Sometimes, even strong organizations can make processes worse when collaboration inadvertently reinforces each other's ineffective practices.⁸⁴

The need for volumes of information by military organizations reflects the desire for 'description' which is a process within the detailed planning system of logic.⁸⁵ Like bell curves, description works under the conceptual framework of reduction and mechanistic approaches to recognizing the world. Hayden White offers similar criticism of human and social sciences propensity for description in *The Content of the Form*: "For this tradition, if man, society, and culture are to be objects of disciplined inquiry, the disciplines in question should aim at understanding these objects, not at explaining them."⁸⁶ Liang and Xiangsui criticize American reductionism and techno-centric approaches to war in *Unrestricted Warfare* with, "observing, considering, and resolving problems from the point of view of technology is typical American thinking."⁸⁷ The U.S. Army should consider the fallacy of description concerning complex systems that defy description and instead seek explanation through Design's system of logic.

explores systems perspectives on leadership development by addressing systemic integration of multiple learning approaches.

⁸³ Antoine Bousquet, *The Scientific Way of Warfare; Order and Chaos on the Battlefields of Modernity*, (New York: Columbia University Press, 2009) 60. Bousquet describes the widespread deployment of doctrine and disciplinary practices throughout seventeenth and eighteenth century fielded forces as a consolidation of power and loyalty. "Drill and the associated surveillance of troops helped ensure political obedience and greater reliability of the military instrument for purposes of both internal rule and the settling of disputes with other states."

⁸⁴ Michael Fullan, *Leading in a Culture of Change*, (San Francisco: Jossey-Bass, 2001) 67. Fullan discusses relationships in an educational setting between teachers and administrative leaders; yet his observations are ideally compatible with the military professional development processes discussed in this paper.

⁸⁵ Gerald M. Weinberg, *Rethinking Systems Analysis and Design*, (Boston: Little, Brown and Company, 1982) 12. "If our previous experience with systems analysis proves anything, it proves that anyone who tries to use *all* the information- even about the simple systems existing today- will be drowned in paper and never accomplish anything... The synthesist is someone who makes very specific plans for action, and more often than not stays around during the execution of those plans to adjust them to ongoing reality."

⁸⁶ Hayden White, *The Content of the Form*, (Baltimore: The John Hopkins University Press, 1987) 59-60.

⁸⁷ Liang, Xiangsui, 114.

If the theoretical concepts and the educational approaches associated with the detailed planning system of logic serve as a disadvantage when confronting adaptive and complex systems, then how does a military leader introduce Design's system of logic and institute educational reform in his organization? The first step a leader needs to make is to distinguish between each system of logic and prevent the traditional educational processes inherent in detailed planning from corrupting any Design initiatives.

At the same time, leaders cannot risk shocking their organization when transitioning between incompatible logics. He must avoid 'upsetting the apple cart' by applying deliverables to the different system logic of detailed planning.⁸⁸ Design uses a different and potentially confusing vocabulary, as the next section explains. Military organizations rely on simple and direct terms and words to convey directives under short time constraints. Design requires longer periods of discourse and explanation which serve as a disadvantage when attempting to disseminate over a wide audience a brief and simple idea. Some elements of detailed planning resist Design's logic for good reason- they potentially require more time to understand and convey. Conversely, there are some apple carts that need to be tipped when an organization steadfastly holds to what organizational theory refers to as "rational myths."⁸⁹

Rational myths are narratives that a system of logic produces which perform poorly in explaining how the world functions, yet organizations hold onto them because the myths relate to core values and beliefs.⁹⁰ The military possesses numerous rational myths that persist within the framework of detailed planning thinking. This paper addresses rational myths concerning vocabulary, linear and non-linear

⁸⁸ Michael Fullan, *Leading in a Culture of Change*, (San Francisco: Jossey-Bass, 2001) 116. "Unsettling processes provide the best route to greater all-round coherence...the leader's coherence-making capacity, in this sense, is a matter of timing. There is a time to disturb and a time to cohere."

⁸⁹ Boxenbaum, Rouleau, 281-289. Boxenbaum and Rouleau use the organizational theory term 'rational myths' to explain how organizations create new knowledge by mixing scientific knowledge with 'mythical knowledge.' This author adapts their term to explain how military organizations hold to institutional tenets and core beliefs despite them often being faulty. To prefer false methodologies reflects the prominence of rational myths within an institution.

⁹⁰ Liang, Xiangsui, 120. "What all those military people and politicians harboring wild ambitions of victory must do is expand their field of vision, judge the hour and size up the situation, rely upon adapting the major warfare method, and clear away the miasma of the traditional view of war- Go to the mountain and welcome the sunrise."

concepts, and narrative in the form of doctrine in the subsequent sections of this paper. For this first section on education, military leaders that approach educational reform with their organization must first recognize how their people think about the world, and what rational myths persist within that system of logic that will become intellectual roadblocks to any institutional reform.⁹¹ Reforming an organization includes accepting the paradigm shift from detailed planning logic to Design thinking, but the stronger a correlation between core tenets and values, the more pervasive the rational myth entrenches into how the organization prefers to recognize and influence the world.⁹² In other words, the world was flat for a very long period in human history, despite best efforts of the enlightened minority.

The next section addresses how a separate and distinct Design vocabulary aids a leader with fostering the ideal environment for his organization to decouple from the detailed planning system of logic and assume Design methodology in some form. Words form the conceptual containers that people use to describe the world through their system of logic; how an organization defines its vocabulary also defines the logic of their methodology. In order to communicate educational reform through adaptation and novel thought, new vocabulary is required. While change threatens the relevance many components within a threatened methodology for thinking about reality, one cannot expect to use the same lexicon and procedures to describe and explain the changing world around them. Taken literally, automobiles are not referred to as ‘horseless carriages’ anymore because the outdated concept and vocabulary associated with horse-drawn transportation was eclipsed. Where even the horse’s integral role on center stage for human transportation for thousands of years faded with the arrival of the internal combustion engine, the military must remain carefully aware that no doctrine, methodology, lexicon, or concept is exempt from being

⁹¹ Peter Northouse, *Leadership: Theory and Practice, Third Edition*, (California: Sage Productions, 2004) 169, 173, 183; See also: Richard Hughes, Robert Ginnett, Gordon Curphy, *Leadership; Enhancing the Lessons of Experience, Fourth Edition* (McGraw-Hill Irwin, 2002) 315. “Senior-level leaders may resist changing the organizational systems for a number of reasons, including having a vested interest in maintaining the status-quo.”

⁹² Builder, 142. “That concept of war is most harmonious with the Army’s aspirations for the future, its perceptions of today’s realities, and its remembrance of yesterday’s glories;” See also: Winter, 63. Winter uses the term ‘military conservatism’ to explain how during peacetime, Australian military organizations protect “the baby of tradition- the ‘fighter spirit’ and established and proven doctrine.”

replaced. Things and ideas change, and humans develop new words to explain them. Leaders do not need to jump on every new fad or buzz word, but they also should realize when one system of logic is preventing another from making necessary transformations within the organization.⁹³ Some concepts, including the prominence of horse transportation, remain within a system of logic because rational myths keep them participating in the logic. In other words, how much *horsepower* does your car have? The next section continues with leaders and ‘Design vocabulary’ to explain the rational myths associated with detailed planning vocabulary and terms.

⁹³ Michael Fullan, *Leading in a Culture of Change*, (San Francisco: Jossey-Bass, 2001) 107. “You don’t have to become Dr. Changelove to realize that living on the edge means simultaneously letting go and reining in;” See also: Gary Yukl, *Leadership in Organization, Sixth Edition*, (New York: University of Albany, Pearson, 2006) 94. “Thus, the leader may have to use a sequence of different decision procedures with different people at different times before the matter is resolved.”

Section 3: Leaders and Design Vocabulary- ‘Words from One Logic Raise Havoc in Another’

“It’s not the language the client *doesn’t* understand that kills you.
It’s what the client *does* understand, but in some other way.”⁹⁴
- Gerald Weinberg

Costello: “Well then who’s on first?”
Abbott: “Yes.”
Costello: “I mean the fellow’s name.”
Abbott: “Who.”
Costello: “The guy on first.”
Abbott: “Who.”
Costello: “The first baseman.”
Abbott: “Who.”
Costello: “The guy playing...”
Abbott: “Who is on first!”
Costello: “I’m asking YOU who’s on first.”
Abbott: “That’s the man’s name.”⁹⁵

The above ‘Who’s on First’ routine makes clear that both individuals in a discussion must not only agree upon the form of the word but also the *content*. Essentially, Abbott and Costello are working with different systems of logic and are confused on how the meaning of a word changes depending upon which thinking methodology they apply. Although not nearly as entertaining, many military organizations struggle in similar ways when they attempt to discuss Design with vocabulary used in detailed planning methodology. Every military organization already is fluent in detailed planning vocabulary and terminology; the linguistic bedrock for the U.S. Army centers on a mechanistic, linear and teleological system logic.⁹⁶ From a vocabulary perspective, detailed planning understands its own method of thinking

⁹⁴ Weinberg, 67-68;

⁹⁵ Excerpt of classic exchange between comedians Bud Abbott and Lou Costello (<http://www.baseball-almanac.com/humor4.shtml>) (accessed 28 December 2010).

⁹⁶ Builder, 142; See also: Winter, 63. Winter uses the term ‘military conservatism’ to explain how during peacetime, Australian military organizations protect “the baby of tradition- the ‘fighter spirit’ and established and proven doctrine;” See also: Chris Smith, *Solving Twenty-First Century Problems with Cold War Metaphors*; *Australian Army Journal For the Profession of Arms*, Volume VI, Number 3, (Duntroon: Land Warfare Studies Centre, 2009)

because it understands the associated vocabulary. Again, detailed planning uses words that worked remarkably well when paired with repetition and complicated tasks involving a large organization. The Normandy invasion on D-Day in World War II succeeded even with allied military forces speaking different languages because they all agreed upon fixed military vocabulary such as ‘objective’, ‘main effort’, and ‘supported unit.’

Referring back to figure 2, the tactical vocabulary that uses terms such as ‘center of gravity’ and ‘decisive point’ link theoretical concepts and metaphors within a reductionist theory such as Carl Von Clausewitz’s *On War*.⁹⁷ Essentially, Clausewitz explains the interaction of empirical material such as politicians, the military, and the people with metaphors such as duels and trinities, and the military synthesizes this within the detailed planning thinking to produce narratives such as U.S. Army doctrine.⁹⁸ This doctrine contains words that correlate to Clausewitzian theory and the mechanistic logic that detailed planning uses to influence the world.⁹⁹ Thus, airplanes drop bombs on specific targets that are linked with concepts such as ‘center of gravity’ or ‘critical vulnerability’ that predict a future where a military end-state is reached.¹⁰⁰ To misapply the vocabulary of one system of logic such as detailed planning to

94. Smith discusses Australian doctrine and their over-reliance on linear concepts and mechanical metaphors. “This linear tendency is, by and large, a by-product of the US Army’s post-Vietnam catharsis and its subsequent rediscovery of operational art in the 1980s, when mechanical systems were a dominant paradigm.”

⁹⁷ Builder, 38. “But something happened to the Army in its passage through World War II that it liked; and it has not been able to free itself from the sweet memories of the Army that liberated France and swept victoriously into Germany...part of the Army is trying to revert to its traditional, historical role; and part is hanging on to an image of the Army at its finest year, the last year of World War II.”; Jullien, 11. “Clausewitz set about thinking through warfare...according to a ‘model’ form, as an ideal and pure essence, “absolute warfare”...limitless use of force that, logically, tends to lead it, in reaction to attack, to extremes (that envisaged total destruction);”

⁹⁸ FM 5-0, 3-59. Army Design doctrine refers the reader to Appendix B for further information on lines of effort when considering the Operational Approach. Since Appendix B deals entirely with detailed planning (the Military Decision Making Process) that requires linear causality and mechanistic structure, this implies that Design requires an operational approach that functions in a similar linear and mechanistic fashion.

⁹⁹ Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity*; second edition, (Elsevier: Butterworth-Heinemann, 2006) 10; the term ‘mindless mechanistic systems planning’ does not imply that tactical practitioners are in any way empty-headed or foolish. Gharajedaghi uses the term ‘mindless’ to reflect the linear causality logic inherent in Jominian military processes- applying specific principles of war with military units in precise direction will yield specific results. Mindless systems are closed and do not react, adapt, or learn.

¹⁰⁰ John Warden, *The Air Campaign; On Operational Art*, (Washington: Center of Military History, 1994) 85-87. Warden, a retired USAF Colonel, makes a uni-minded argument centered on Joint Doctrine ‘Operational Art’ and

Design's different and incompatible methodology reflects a significant intellectual roadblock for leaders attempting to educate their organization on Design.

The March 2010 edition of *Field Manual FM5-0; The Operations Process* features Chapter 3 entitled *Design*, and represents the Army's first major attempt at educating the force on Design through official doctrine.¹⁰¹ Composed of merely fifteen pages and riddled with confusing vocabulary and concepts, this initial Design product is an excellent example of the tension between two incompatible systems of logic. Due to aforementioned rational myths on doctrine, education, and detailed planning theoretical concepts, this current attempt to introduce Design into the military is an intellectual stillborn. Military centers, professional journals, and leadership from the field are struggling with how, where, and why to use design.¹⁰² Military organizations are comfortable with the mechanistic and linear system logic associated with detailed planning, and these intellectual barriers continue to reject Design as an incompatible method for thinking about the world.¹⁰³ According to General Systems Theorist Ervin Laszlo, knowledge is usually "pursued in depth in isolation...Rather than getting a continuous and coherent picture, we are getting fragments- remarkably detailed but isolated

'effects-based-operations' principles that link a central 'brain' with the actions of the system rival. "Capturing or killing the state's leader has frequently been decisive...all actions are aimed against the mind of the enemy command...at the operational level, the first ring or center of gravity is the commander himself."

¹⁰¹ FM 5-0; See also: United States Army Training and Doctrine Command, *Field Manual-Interim 5-2; Design (Draft)*, (draft under development-Headquarters, Department of the Army, 2009), unpublished. FMI 5-2 reflects the source document from which FM 5-0 chapter 3 emerged from.

¹⁰² Huba Wass de Czege, *Thinking and Acting Like an Early Explorer: Operational Art is Not a Level of War*, (Small Wars Journal, <http://smallwarsjournal.com/blog/2011/03/operational-art-is-not-a-level/>) (accessed: 28 March 2011). Wass de Czege attempts to explain Design using an 'explorer' metaphor at Small Wars Journal (SWJ). SWJ features a host of professional military articles on Design; the volume of such articles further illustrates the confusion over current U.S. Army Design doctrine.

¹⁰³ W.T. Singleton, *Man-Machine Systems*, (edited by Open Systems Group), *Systems Behavior*, 3rd edition (London: Harper & Row Publishers, 1981) 121. "At the scientific level research workers have become more and more specialized to the point which is proving self-defeating." Singleton criticizes psychologists with this point, however military over-specialization is isomorphic to this example when considering American military emphasis on greater forms of technology and precise violence.

patterns.”¹⁰⁴ Leaders already are fluent in the language of detailed planning; they spend the majority of their careers immersed in the worldview that espouses a mechanistic and linear system of logic. When a military practitioner claims, “my job is to do X, not that,” he is likely uncomfortable with a contradiction in the preferred system of logic that promotes institutionalization. Generations of subsequent reinforcement of the detailed planning system of logic ties core military tenets and values to powerful rational myths; how the military attempts to recognize the world reflects the strong influence that mechanistic and linear system logic still possesses. The future contains many scenarios where mechanistic and linear logic will continue aid the military in making sense of the world, but what will happen when this logic is misapplied to scenarios that resist reductionism?

Until recent human advances such as globalization, the Industrial, Scientific, and Information Revolutions, the mechanistic and linear methodology of detailed planning thinking functioned for all military requirements.¹⁰⁵ In other words, the world could be flat, and time could exist in a local setting without time zones because the environments of those eras did not require them to understand the conflict. For much of human history leading up through the Industrial Revolution and the evolution of the operational level of warfare, these immediate tactical perspectives worked within the framework of mechanistic and linear logic.¹⁰⁶ Essentially, military organizations employ a mechanistic and linear logic

¹⁰⁴ Ervin Laszlo, *The Systems View of the World; a Holistic Vision for Our Time*, (New Jersey, Hampton Press, 1996) 2; See also: Ahl, Allen, 1. “In all ages humanity has been confronted by complex problems. The difference between then and now is that contemporary society has ambitions of solving complex problems through technical understanding;” See also: Gary Jason, *Critical Thinking: Developing an Effective System logic*, (San Diego State University: Wadsworth Thomson Learning, 2001) 337. “People tend to compartmentalize: they divide aspects of their lives into compartments and then make decisions about things in one compartment without taking into account the implications for things in another compartment.”

¹⁰⁵ FM 3-0, 4-11. Current western military doctrine still devotes considerable attention to the mechanistic and linear principles of Antoine Henri de Jomini; most of the current principles of war found in U.S. Army Field Manual FM 3-0, Operations (2001) espouse the same doctrine and war methodology first penned by Jomini in the wake of the Napoleonic Wars.

¹⁰⁶ Michael Krause, Cody Phillips, *Historical Perspectives of the Operational Art*, (Center of Military History, United States Army, 2007) 333. “The U.S. fought its wars for more than 200 years without needing an ‘operational level.’ *Strategy* and *tactics* were good enough for Clausewitz and Jomini- and for our fathers and grandfathers as they fought the biggest wars known to man.”

that subsequently formed the institutional bedrock for most military traditions, values, and education.¹⁰⁷

For example, the development of the railroad provided the military with rapid transfer of troops and equipment over tremendous distances; time zones became necessary at the same time that true operational art emerged.¹⁰⁸ Mechanistic and linear thinking produces narratives that explained the world sufficiently for military organizations in previous eras; however, the abnormalities that Kuhn warned of now provoked the emergence of Design's alternate system of logic.¹⁰⁹ Detailed planning struggles with 'asymmetric threats' and 'irregular warfare' against 'non-state actors' because the world does not wage war under the logic of earlier and less complex periods.¹¹⁰ For leaders attempting to break out of the mechanistic and linear system of logic, they should consider not only why the military struggles with complexity today, but also reflect on how military professionals develop as leaders.

Most military professionals spend the vast majority of their careers conducting detailed planning at the tactical level or low operational level.¹¹¹ MDMP, JOPP, and the universal five-paragraph operations order all focus organizations towards a linear 'ends, ways, and means' structuring where they solve the identified problem through a series of actions resulting in the desired end-state; this represents

¹⁰⁷ Weinberg, 121. "Reduction is but one approach to understanding, one among many. As soon as we stop trying to examine one tiny portion of the world more closely and apply some close observation to science itself, we find that reductionism is an ideal *never* achieved in practice." See also: Hayden White, *Tropics of Discourse; Essays in Cultural Criticism*, (Baltimore: The John Hopkins University Press, 1978) 6. "Rational or scientific knowledge was little more than the truth yielded by reflection in the prefigurative modes raised to the level of abstract concepts and submitted to criticism for logical consistency, coherency, and so on."

¹⁰⁸ James J. Schneider, *Theoretical Implications of Operational Art; On Operational Art*, (Washington: Center of Military History, 1994) 20. "Together the railroad and the telegraph would become the bones and nerves of operational art sustaining the first great manifestation of distributed free maneuver in 1864;" See also: Romjue, 10-11. "The specific requirements and conditions of each of the wars [in the 18th and 19th centuries] in which the Americans were involved additionally shaped evolving Army tactical doctrine. So, too, did the rapid technological and weapon developments of the industrial age;"

¹⁰⁹ Alvesson, Sandberg, 256. "Problematization cannot be reduced to a mechanical or even strictly analytical procedure, since it always involves some kind of creative act."

¹¹⁰ Liang, Xiangsui, 41. "All of the prevailing concepts about the breadth, depth, and height of the operational space already appear to be old-fashioned and obsolete. In the wake of the expansion of mankind's imaginative powers and his ability to master technology, the battlespace is being stretched to its limits."

¹¹¹ Michael Krause, Cody Phillips, *Historical Perspectives of the Operational Art*, (Center of Military History, United States Army, 2007) 440. "Most senior American leaders of Desert Storm had little exposure to the operational art in the Army educational system."

the detailed planning system of logic illustrated in figure 2.¹¹² As a building block within the detailed planning system of logic, description rests on propositional knowledge and asks questions dealing with ‘what.’ Military institutions have a strong propensity for describing an open system because this allows the detailed planning system of logic to pursue many processes and procedures that rely on massive amounts of detail. This is often not a bad thing. Description leads to greater knowledge about a complicated system. Measures of performance, information collection processes, ‘village atmospherics’, biometrics, body counts, and decision points all are examples where the military craves description.¹¹³ Description aids under some conditions, but potentially overwhelms an organization in others. John Lewis Gaddis remarks in *The Landscape of History* that while a historian could fill volumes with what Napoleon did while getting dressed on the morning of Waterloo, a historian must balance detail with brevity.¹¹⁴ When the military relies too much upon description, it potentially reinforces reductionist concepts that do not work as well with complex systems. While the ‘description’ rational myth reinforces a preferred capabilities-centric perspective for the military; it potentially comes up short in explaining why complex systems behave as they do. Detailed planning narratives create many abnormalities and tensions between what the military anticipates and what the world actually does with respect to complex systems.¹¹⁵

Philosopher Francois Jullien acknowledges the myth of description with, “the West, with its own kind of theoretical equipment, which is of a formalizing and technical nature, has proven itself to be

¹¹² FM 5-0, 2-87; See also: FM 3-0, 4-11. The principles of war are also listed in Joint Publication 3-0, Joint Operations, 6-17; See also: Jack Kem, *Campaign Planning: Tools of the Trade*, (Department of Joint, Interagency, and Multinational Operations, U.S. Army Combined Arms Center, Fort Leavenworth, Kansas, 2009) 15-24; See also: Jeffrey Reilly, *Operational Design: Shaping Decision Analysis through Cognitive Vision*, (Department of Joint Warfare Studies, Air Command and Staff College, Maxwell AFB, Alabama, 2009) 14-23.

¹¹³ Weinberg, 22. “Very recently, man invented science to increase that control, and he has been so fascinated by the quick and easy success that he has not paid much attention to consequences outside his analyses and averages;” See also: Bousquet, 56. “As the Enlightenment and Scientific Revolution took hold, reason and scientific method were recruited for the study and organization of all fields of natural phenomenon and human activity, including a quest for the discovery of the fundamental laws governing warfare.”

¹¹⁴ John Lewis Gaddis, *The Landscape of History: How Historians Map the Past*, (Oxford, New York, 2002) 27.

¹¹⁵ Alvesson, Sandberg, 257. Alvesson and Sandberg identify ‘field assumptions’ as theoretical concepts within an organization’s logic that are “difficult to identify because “everyone” shares them, and, thus, they are rarely thematized in research texts.”

singularly inept at thinking about the conduct of warfare, taking account only of *secondary matters* (preparations and material data) and failing to consider the phenomenon itself.”¹¹⁶ From a vocabulary perspective, this is where tactical vocabulary that supports detailed planning thinking fails to function within the Design system logic- and why existing Design doctrine must abandon incompatible terms such as ‘problem’, ‘end-state’, ‘principles of war’, and other detailed planning theoretical concepts. Returning to the ‘Who’s on First’ metaphor, Costello must realize that a baseball team may have last names that also function as common English pronouns; in order to understand the baseball line-up he needs to change his method of thinking about the world.

The literal application of vocabulary just scratches the surface of how Design’s system of logic is fundamentally incompatible with detailed planning methodology. Words relate to concepts, and the concept forged within one system of logic does not endure within another. General Systems Theorist Peter Checkland uses the analogy of an apple to convey how emergent properties are meaningless when used in the language appropriate to a lower level of organization, or another thinking methodology. “The shape of an apple, although the result of processes which operate at the level of the cells, organelles, and organic molecules which comprise apple trees...*has no meaning* at the lower levels of description.”¹¹⁷ In other words, at the cellular level, it does not matter whether the apple is round, pear-shaped, or even square. Organizing processes at a higher level do not affect the tree’s cellular components; at the atomic level, the round shape of the apple does not affect similar processes involving the molecules comprising apple cells. What constitutes a ‘problem’ within the detailed planning system of logic does not when an organization switches to Design logic.¹¹⁸

¹¹⁶ Jullien, 24.

¹¹⁷ Peter Checkland, *Systems Thinking, Systems Practice*, (New York: John Wiley and Sons, 1981) 78.

¹¹⁸ Deleuze, Guattari, 362. “The problem is not an ‘obstacle;’ it is the surpassing of the obstacle, a pro-jection, in other words, a war machine...the *problemata* are the war machine itself and are inseparable from inclined planes, passages to the limit, vortices, and projections.”

Essentially, Design is now a relevant system logic for the military because reductionist science has been too successful. Putting men on the moon required tremendous scientific accomplishments, yet with the advancements came the complexities associated with a world with more interconnection and a wider array of actors. Human societies are not prepared to deal with how complex the world has become, and appear to continue to seek explanation through traditional scientific reductionism and mechanistic procedures.¹¹⁹ Military organizations that fail to acknowledge the paradigm shift in logic from detailed planning to Design will continue to solve problems *right* while not necessarily solving the *right* problem.¹²⁰ Design takes a different perspective on making sense of the world, starting with the words used within the logic.

Design's thinking methodology requires a distinct and adaptive vocabulary that is entirely unrelated to the logic of detailed planning methodology.¹²¹ Design vocabulary is not static; metacognition and 'learning to learn' stimulates paradigm shifts in determining what system of logic the military applies. Through constant creative and adaptive praxis, Designers discover novel ideas and attain higher levels of critical synthesis. Why is this relevant? With new ideas, new words are often required.¹²² Yet while Design emphasizes innovation with vocabulary, the process of learning includes learning from

¹¹⁹ Weinberg,3; See also: Australian Head Modernisation and Strategic Planning- Army, *Australian Army's Future Land Operating Concept*, (Australian Army Headquarters, Canberra, September 2009) 3.5 footnote 59. Australian doctrine stresses the difference between *complicated* and *complex* problems; that point should be reinforced here as well. "Complicated is a word which includes the Latin ending 'plic', meaning 'to fold.' Thus a system which is complicated can be unfolded into simpler components which can be more easily understood...complex on the other hand ends in the Latin 'plex', meaning 'to weave.' A crucial element for a system to be considered complex [in lieu of complicated] is the presence of nonlinear interacting feedback loops between variables."

¹²⁰ Shimon Naveh, *The Australian SOD Expedition: A Report on Operational Learning*, (unpublished, provided to author by Shimon Naveh in January 2011 in hardcopy), 11. Naveh defines 'learning aesthetics' as "the pattern of learning employing form to appreciate logic, and constructing logic to make form sensible and functional."

¹²¹ Hayden White, *Tropics of Discourse; Essays in Cultural Criticism*, (Baltimore: The John Hopkins University Press, 1978) 4. "A discourse moves "to and fro" between received encodings of experience and the clutter of phenomena which refuses incorporation into conventionalized notions of "reality," "truth," or "possibility"...it is always as much *about* the nature of interpretation itself as it is about the subject matter which is the manifest occasion of its own elaboration."

¹²² Liang, Xiangsui,158. "At the same time, as one of the forms of structure of the system of symbols corresponding to the objective world, it seems to suggest to us something lawlike which goes beyond the scope of language."

failure. Therefore, many new words that ultimately work in explaining complexity require previous failures in vocabulary to occur first. This puts Design at a disadvantage with the military because new vocabulary takes time to implement and codify in doctrine. Once conveyed throughout the force, it becomes difficult to replace terms and procedures. For example, forces in Iraq from 2005 to 2009 officially referred to the Awakening Movement of Sunni Insurgents as ‘Concerned Local Citizens (CLCs)’, mercenaries, ‘Very Worried Iraqis (VWIs)’, as well as a host of other local terms until the military settled on ‘Sons of Iraq(SOIs).’¹²³ With significant confusion over a tangible item such as SOIs, how much more confusing will Design’s holistic conceptual terms be for the military force? The military needs to avoid Design creating a ‘Who’s on First’ conversation between soldiers using different systems of logic.

On the day that Abbott and Costello discussed the baseball line-ups, the logic required both men to understand that ‘Who’ is not a pronoun, but the first baseman on a particular team. Yet complex systems continue to adapt and transform, so Abbott and Costello’s vocabulary must change with it. Tomorrow, they will have another unique conversation tomorrow with an entirely different series of names in the line-up. The first baseman may be named ‘First’ which would create a different but equally humorous conversation. Design vocabulary is dynamic, adaptive, and appears impossible to codify or standardize. As Shimon Naveh related in a conversation with this author, “once you invent new words to explain new things, you cannot return to older words...and words created today may be outdated for newer concepts tomorrow.”¹²⁴ Out of many Design theoretical concepts in circulation, this paper will next use one of the most relevant Design terms for explaining Design logic. That critical word is ‘problematization.’

¹²³ This author deployed to Iraq in support of Operation Iraqi Freedom IV from June-December 2006 where all of these terms were used in official military briefings, documents, and memorandums to describe the same group of local nationals. With each name change, military organizations struggled to ‘unlearn’ the previous name.

¹²⁴ This author met with Shimon Naveh in February 2011 at Fort Leavenworth, KS to discuss Design. During the conversation,

‘Problematization’ is a difficult word to use, even within Design discourse. Why is that word relevant to this monograph? As a challenging Design word to understand and employ, it represents the quintessential ‘new’ vocabulary that creates friction within military organizations. Many Design critics ask whether words like ‘problematize’ are even necessary, or whether they cause more confusion than they are worth.¹²⁵ By explaining just one Design-centric term, this monograph seeks to demonstrate how Design logic cannot function as effectively by ignoring ‘problematization’ and relying upon detailed planning lexicon only.

In a series of lectures at Berkeley in 1983, Postmodernist Michel Foucault provided an excellent example of Design logical processes entitled *Discourse and Truth: The Problematization of Parrhesia*.¹²⁶ *Parrhesia* appeared in Greek philosophical discourse in the works of Euripides [c.484-407 BC] and essentially meant ‘to speak the truth freely.’¹²⁷ In philosophical discourse between Greeks, this concept put significant value on a combination of truth, brevity, and absolute communication of the message from speaker to the audience. From a Design theory perspective, FM 5-0 Chapter 3 Design essentially paraphrases ‘*parrhesia*’ when it calls Design a “methodology for applying critical and creative thinking to *understand*, visualize, and *describe* complex, ill-structured problem (emphasis added).”¹²⁸ This important Greek philosophical term conveys the critical relationship between understanding and concise explanation

¹²⁵ Milan Vego, “A Case Against Systemic Operational Design,” *Joint Forces Quarterly* (issue 53, 2nd Quarter 2009, <http://www.google.com/search?hl=en&q=a+case+against+systemic+operational+design&aq=f&aql=g1&aql=&oq=> accessed 18 April 2011)73. Vego criticizes the Israeli Defense Force in the 2006 Hezbollah War and their use of Design. “Other officers could not understand why the old system of simple orders and terminology was replaced by one that few could understand. For example, new terms such as *strategic directive*, *strategic purpose*, *system boundary*, *operational boundaries*, *campaign organizing theme*, and *rival system rationale* were overused in place of traditional military terms.”

¹²⁶ Michel Foucault, *Discourse and Truth: The Problematization of Parrhesia*, (originally covered in six lectures given by Michel Foucault at the University of California, Berkeley in October-November, 1983. Published online at: <http://foucault.info/documents/parrhesia/> (accessed 16 December 2010).

¹²⁷ Ibid, 2.

¹²⁸ FM 5-0, 3-1.

to others, but it also contains another distinct meaning that is critical for considering how Design's system of logic operates.¹²⁹

"*Parrhesia* is a form of criticism, either towards another or towards oneself...[it] is linked to courage in the face of danger...in its extreme form, telling the truth takes place in the 'game' of life or death."¹³⁰ Therefore, this concept of questioning for truth has a component of heresy in it; seeking understanding and meaning requires one to explore a line of questioning that may go against institutional norms, doctrine, and values.¹³¹ As Naveh, Schneider, and Challans explain in *The Structure of Operational Revolution*, the military resists heretical thinkers because questioning core beliefs are socially subversive. By challenging the reductionist linear system of logic, the Design heretic "offers a novel logic that becomes the basis for a new paradigm."¹³² Problematization infers a process of creation and destruction that deals with the building blocks of a system of logic. As designers question their observations as well as their own values and institutional processes, they dismantle outdated boundaries and processes dealing with the empirical material in figure 3. New metaphors replace obsolete ones, and expansive theoretical concepts build new terms and processes to learn and adapt with the complex system. As designers make "cognitive movement from descriptive understanding to higher levels of critical synthesis," they also destroy previous inadequate or antiquated observations, vocabulary, structures, and

¹²⁹ Foucault, 44. Foucault explained in his lecture *Discourse and Truth* that the Cynic tradition, these Greek philosophical terms incorporated Cynic principles that differed from Platonic, Aristotelian, and Stoic traditions. The Cynics did not rely on doctrine and text, but on "exemplary lives... [where] personal examples became the starting point for Cynic reflection and commentary;"

¹³⁰ Foucault, 4.

¹³¹ Deleuze, Guattari, 363. Deleuze and Guattari discuss 'royal science' that aligns with this paper's thesis on detailed planning methodologies. They discuss how heretical thinkers in history feature a "special situation of these savants whom State science used only after restraining or disciplining them, after repressing their social or political conceptions."

¹³² Naveh, Schneider, Challans, 26; See also: Richard Hughes, Robert Ginnett, Gordon Curphy, *Leadership; Enhancing the Lessons of Experience, Fourth Edition*, (McGraw-Hill Irwin, 2002) 298. "Preserving a comfortable, harmonious group environment becomes a hidden agenda that tends to suppress dissent, conflict, and critical thinking."

values.¹³³ This destructive aspect provides an organization the greatest opportunity for transformation, but also threatens institutional tenets, self-relevance, and traditions that support the incompatible system of logic for detailed planning.

Problematizing implies a risky game where the institution may reject the results of Design logic if the results generate abnormalities or if the recommendations threaten core institutional values and tenets.¹³⁴ The word ‘problematize’ is an extremely useful Design term, yet the utility of such lexicon is quickly lost when misapplied to an incompatible system of logic such as detailed planning.¹³⁵ In other words, Designers must thoroughly understand how this term functions in the system logic of Design while also acknowledging that the mechanistic and linear methodology of detailed planning rejects any attempts to challenge its system logic.

The most heretical truth that Design can offer is when designers in military uniform offer a solution not involving actors donning the same uniforms! While this is a painful pill to swallow, leaders must at least be aware of the true heretical nature of problematization and that Design *does not dictate to the complex system how it will function*. Only mechanistic logic inherent in detailed planning attempts to reverse engineer reality with end-states, lines of effort, and decisive points that target a ‘center of gravity.’¹³⁶ Design logic holds a different and incompatible worldview when considering reality. Design

¹³³ Shimon Naveh, *The Australian SOD Expedition: A Report on Operational Learning*, (unpublished, provided to author by Shimon Naveh in January 2011 in hardcopy), 3. Naveh describes the learning evolution of an Australian Special Operations planning group as they progress through a Design exercise and break free from traditional tactical system logics.

¹³⁴ Naveh, Schneider, Challans, 9. “Finally, there is the institutional assault on theory. This is expressed in the military through a fairly unabashed anti-intellectualism.”; See also: Alvesson, Sandberg, 256. Alvesson and Sandberg discuss ‘root metaphors’ within an organization and how these assumptions can expose flawed logic, or inadvertently suppress them.

¹³⁵ Weinberg, *Rethinking Systems Analysis*, 65. Weinberg uses a similar conceptual term ‘meta-question’ in lieu of ‘problematization.’ “One of the most effective anthropological techniques that I’ve observed is the *meta-question*. A meta-question is a question that directly or indirectly produces a question for an answer.” Weinberg’s *meta-question* continues with ‘why’ instead of ‘what’ processes of query.

¹³⁶ Liang, Xiangsui, 20. Liang and Xiangsui criticize the techno-centric aspects of American military planning; however, their argument that “fighting the kind of battle that fits one’s weapons” should also span the doctrine and planning methodology of that nation as well. If doctrine demands one to project an end-state in the future with

logic does not value institutional tenets, tradition, or self-preservation of an organization at the expense of understanding reality for how it actually behaves.¹³⁷

Successful Design involves creating new words, and novel concepts that are alien to existing doctrine, experience, and institutional knowledge.¹³⁸ Although operational lexicon changes based upon critical synthesis of Design practitioners, this paper provides the evolution of ‘problematization’ as a relevant example for leaders to use when considering theoretical concepts and metaphors under the Design system of logic.

This section on vocabulary opened with the comedic routine of ‘Who’s on First’ because this humorous exchange acts as a metaphor for how the military has created confusing Design doctrine through improper vocabulary nested within the incompatible system logic of detailed planning. Design presents a paradigm shift in understanding a complex world, and the abnormalities and confusion that the reductionist methodology of detailed planning triggered this need for a better logic for recognizing the world.¹³⁹ Instead of moving relevant aspects of detailed planning logic into the new logic of Design, the U.S. Army has undertaken a backwards approach and has forced the incompatible logic of Design into doctrine, procedures, and professional education of the military.

centers of gravity and lines of effort with decisive points leading back to the present, then that nation will fit the conflict to their planning methodology and apply these concepts whether they exist or not.

¹³⁷ Builder, 17. Builder describes service personalities through “alters of worship, concerns with self-measurement, preoccupation with toys versus the arts...and insecurities about service legitimacy and relevancy.” See also: Russell F. Weigley, *The American Way of War*, (New York: Macmillan Publishing Co., 1973) 391. On MacArthur’s heretical exclamation that there was ‘no substitute for victory,’ he was “voicing a view of the nature of war that was not only a commonplace among Americans since the Civil War and the Indian wars but that could readily seem a reasonable extension of the American military’s own now customary strategy of annihilation.”

¹³⁸ Deleuze, Guattari, 378. “The necessity of not having control over language, of being a foreigner in one’s own tongue, in order to draw speech to oneself and “bring something incomprehensible into the world.” Deleuze and Guattari quote Kleist, “On the Gradual Formation of Ideas in Speech.”

¹³⁹ Alvesson, Sandberg, 258. Alvesson and Sandberg argue that assumptions within a system of logic that are ripe for problematization are those theoretical concepts and processes that do not “contribute significantly to a “good” understanding of the subject matter but is still broadly shared within a research area.” In military applications, those elements of the military system of logic that contribute little to understanding the world should face critical thinking instead of preservation. If ‘centers of gravity’ do not work anymore in explaining military action and foreign policy, then the overarching framework of Clausewitzian logic requires critical inquiry.

Vocabulary is just the first intellectual barrier for the military to adapt and understand a new system of logic. The next section of this paper deals with how non-linear approaches threaten traditional mechanistic and linear thinking, yet Design offers narratives through non-linear concepts that make better sense of the complex world. Design does feature some disadvantages due to an emphasis on creativity over repetition, and the additional time and education requirements for implementing lexicon that innovates and changes. Any assimilation of detailed planning processes into Design logic requires careful consideration on how the military wants the force to communicate with one another. Vocabulary represents the theoretical cornerstone for how a system of logic conducts discourse within an organization. As the next section will explore, theoretical concepts such as non-linear approaches rely on Design vocabulary to attempt to explain complex systems in different ways than detailed planning uses linear processes. Although linear causality within reductionist logic launched Americans into space and propelled the United States to superpower status in the 20th century, does Design provide a different and possibly better logic for approaching the complexities of the 21st century?

Section 4: Leading through Non-Linear Processes- ‘How Swarms of Bees Differ From Falcons Hunting Mice’

Doctrine had to come to terms with the new geometry of the battlefield. Were diagrams useful in describing an intellectual concept? And should an intellectual concept be doctrine at all? [General Frederick M. Franks, Jr.] viewed the old standard, and dichotomy, of linear versus nonlinear warfare as a shibboleth, now without meaning...Franks thought no graphic was necessary for such a visualization...Doctrine was needed that would jolt the Army out of the old geometry of the battlefield. ¹⁴⁰

- John Romjue

The import of ‘not-locally-made’ theories of operational warfare not only hinted that [Israeli Defense Force] generals were not performing their duties appropriately, but also sent them back to school to study their very profession the hard way, by abstract meditation, profound reading, and reflective learning- activities that the majority of them had managed to avoid for generations. ¹⁴¹

- Shimon Naveh

Design’s system of logic encourages non-linear approaches; therefore, it is no surprise that U.S. Army Design doctrine incorporates numerous references to non-linearity. Unfortunately, the Army provides contradictory guidance to leaders on how non-linear approaches can work within a logic that is incompatible with detailed planning, as this section will demonstrate. The fifteen pages of Design doctrine in Field Manual 5-0 introduce non-linear open system concepts while paradoxically recommending traditional linear methodology for transforming these dynamic open systems into the desired state. Referring back to the concept of ‘bricolage’, detailed planning logic has incorporated

¹⁴⁰ Romjue,84. Romjue cites H.O. Malone, Jr. Chief Historian’s notes on a Fort A.P. Hill meeting on 16 September, 1992. The subject of the meeting: FM 100-5 Off-Site Conference.

¹⁴¹ Shimon Naveh, *Operational Art and the IDF: A Critical Study of a Command Culture*, (Center for Strategic & Budgetary Assessment (CSBA), contract: DASW01-02-D-0014-0084, September 30, 2007) 3. Naveh describes how *Systemic Operational Design (SOD)* was not well received by the Israeli military institution due to similar anti-intellectualism and self-preservation processes.

Design into doctrine by reducing it to an eclectic medley of contradictions infused with tactical procedures and vocabulary.¹⁴²

The military institution promotes hierarchy and the detailed planning thinking even when introducing Design into doctrine. While the first eleven pages of *FM 5-0 Chapter 3, Design* discuss open systems and their inherent tendencies to learn, adapt, and resist mechanistic action, section 3-58, *The Operational Approach*, resorts back to the logic of linear causality by recommending lines of effort as a method to depict transforming the system.¹⁴³ Once again, Army Design doctrine suffers an identity crisis in which the different logic of Design clashes with an institutional preference for tacticizing everything under detailed planning methodology.¹⁴⁴ Based on generational knowledge and institutional adherence to traditional procedures, can the U.S. Army describe or explain a military operation without a linear process?¹⁴⁵ Although tactical actions require linear direction due to time and space considerations, can operational level campaigns and major operations direct an organization without depicting the concepts in

¹⁴² Boxenbaum, Rouleau, 280-281. Bricolage is “an assembly of readily available elements.” Although detailed planning logic currently attempts to use bricolage methods to dismantle Design logic and assimilate some components, the reverse is actually what the military should pursue; See also: The students of Seminar 1, School of Advanced Military Studies Class 10-01, posted blog entries concerning design doctrine and how the Army as an institution is significantly confused on how to apply FM 5-0. <http://usacac.army.mil/blog/blogs/sams/archive/2010/02/04/improving-the-army-s-design-approach.aspx> ((accessed 03 January 2011)).

¹⁴³ FM 5-0, 3-59; See also: Alex Ryan, *The Foundation For An Adaptive Approach*; *Australian Army Journal For the Profession of Arms*, Volume VI, Number 3 (Duntroon: Land Warfare Studies Centre, 2009) 72. Ryan discusses feedback and how scientists applied linear methods to complex non-linear systems which “only works up to a point.”

¹⁴⁴ Naveh, Schneider, Challans, 88; Naveh, *In Pursuit of Military Excellence*, 43. Naveh explains how Clausewitzian theory tied linearity to destruction in warfare. “To guarantee the occurrence of the integral battle the strategy must be both linear and offensive;” See also: Jeff Conklin, *Wicked Problems and Social Complexity* (CogNexus Institute, 2008. <http://www.cognexus.org> (accessed 05 January 2011) 4. “Traditional thinking, cognitive studies, and the prevailing Design methods all predicted that the best way to work on a problem like this was to follow an orderly and linear ‘top-down’ process, working from the problem to the solution.” Conklin addresses business and Design approaches to complexity, yet his study transfers effectively to military operations.

¹⁴⁵ Glen James, *Chaos Theory; The Essentials for Military Applications*, (Newport: Naval War College, Center for Naval Warfare Studies, Newport Four article series on Army Design Number Ten, October, 1996) 13. A linear system may appear to be complex and non-linear such as a swinging pendulum; however, “the equation of motion-like the system itself- is called *linear* because the equation consists of only *linear operations*.”

linear and sequential form? More specific to the military leader, can they visualize and direct a Design process without starting with a line?

True non-linear processes are different because they function within a unique and incompatible system of logic. Non-linear systems appear chaotic, but are *partially* explainable through Design's ontological approaches to complexity. Chaos mathematician Glenn James uses a dripping water faucet in *Chaos Theory; The Essentials for Military Applications*. Since fluid dynamics resist even the simplest modeling, they can only be measured through a variety of parameters such as time intervals between drops; "by isolating and controlling *one key parameter* and making one straightforward measurement, we can still come to understand...a very complicated system."¹⁴⁶ Complex systems are capable of dynamically changing as fast as one can act upon it.

Non-linear systems resist short-term prediction, and various phenomena within the system often act chaotically which leads to emergent behaviors and new patterns.¹⁴⁷ Since non-linear systems resist linear explanations, it is counter-productive for military professionals to apply linear lines of effort and expect to transform a complex system into a desired end-state.¹⁴⁸ Yet current Army Design doctrine fails to make this case to military leaders; in fact, it recommends linear processes from another system of logic as a starting point for Design, as this monograph explains next.

Current U.S. military doctrine use physical lines of operation and logical lines of operation in detailed planning. The U.S. Army adds another linear term to operational lexicon with *lines of effort*, as

¹⁴⁶ James, 16-17. See also: Michael Fullan, *Leading in a Culture of Change* (San Francisco: Jossey-Bass, 2001) 45. "Living systems [like businesses] cannot be *directed* along a linear path."

¹⁴⁷ Anne-Marie Grisogono, Alex Ryan, *Adapting C2 To The 21st Century; Operationalising Adaptive Campaigning*, (Edinburgh: Australian Department of Defence, Defence Science and Technology Organization, 2007) 5.

¹⁴⁸ Weinberg, *Rethinking Systems Analysis*, 24. "No single 'approach' will suffice in a complex world, so stay open to new information and don't fall in love with the latest fad;" See also: Mick Ryan, *Measuring Success and Failure in an 'Adaptive' Army; Australian Army Journal For the Profession of Arms, Volume VI, Number 3*, (Duntroon: Land Warfare Studies Centre, 2009) 23.

recommended in *FM5-0 Chapter 3 Design*.¹⁴⁹ All of these methodologies have in common the fundamental adherence to linear causality that denotes the detailed planning thinking methodology. The world appears to make sense when a series of decisive points lead along a line of effort and target the critical vulnerabilities of an enemy ‘center of gravity’ that, when destroyed, leads to accomplishing one’s end-state.¹⁵⁰ While this process yields results within the detailed planning method for making sense of the world, Leaders should take a critical look at why linear causality is preferred and why reductionist thinking resists the holistic and non-linear approaches of Design logic.

Linear causality is a historic concept that remains deeply entrenched in the human psyche. Its origins draw back to Aristotle’s *Metaphysics* where “there are principles and causes which are generable and destructible without ever being in course of being generated or destroyed.”¹⁵¹ In other words, A will exist if B occurs, and B will exist if C occurs. This linear causality established the benchmark for the mechanistic and reductionist system of logic during the Scientific Revolution in the sixteenth and seventeenth centuries. Through nearly all military history and theory, linear causality functioned in tandem with how human societies explained their system logics and why things were as they appeared.¹⁵²

The notion that “the catastrophe could have been averted by removing that specific cause”¹⁵³ reflects a core human desire to live in a world that is more predictable and explainable. This reductionist approach reflects a logic that rests upon the great successes of the Scientific and Industrial Revolutions,

¹⁴⁹ FM 5-0, 2-102, 2-103, B-97; See also: FM 3-0, 6-28, 6-40, 6-60-6-65, 6-72; See also: Joint Publication 3-0, *Joint Operations* (17 September 2006 incorporating Change 2 Final Coordination 02 October 2008) V-17; See also: Jack Kem, *Campaign Planning: Tools of the Trade* (Department of Joint, Interagency, and Multinational Operations, U.S. Army Combined Arms Center, Fort Leavenworth, Kansas, 2009) 48-59.

¹⁵⁰ FM 5-0, 2-87; See also: FM 3-0, 4-11.

¹⁵¹ Aristotle, *The Works of Aristotle: Volume 1, Metaphysics*, (Great Books of the Western World: University of Chicago, 1952), 549.

¹⁵² John Shy, Jomini, Peter Paret (editor), *Makers of Modern Strategy; From Machiavelli to the Nuclear Age*, (Princeton: Princeton University Press, 1986) 164-165. “By isolating strategy from its political and social context, Jomini helped to foster a mode of thinking about war that continues to haunt us...central to Jomini’s argument that there are immutable ‘principles’ of war...is his emphasis on ‘lines of operations.’”

¹⁵³ Taleb, 9.

yet reductionism cannot explain systems ontologically when its logic demands system dismantlement. “Meaning, and explaining the “why” of a phenomenon, comes from the context. The lower-level mechanics, the “how” of the phenomenon, have nothing to say about “why.”¹⁵⁴

Linear progression defaults to the preferred structure of military planning and execution methods because non-linear processes are so difficult to understand, especially when clouded by applying the detailed planning system of logic to a complex system. As Nassim Taleb remarked in *The Black Swan*, “Linear relationships are truly the exception; we focus on them in the classrooms and textbooks because they are easier to understand.”¹⁵⁵ By acknowledging institutional preference for making sense of the world through linear constructs, a military organization can potentially let go of these predilections when contemplating a complex system and explore Design’s alternative logic.

Breaking free of linear causality during Design lets the leader and his design teams consider non-linear processes such as swarming, self-organization, and open system adaptation. These three elements of non-linear approaches are just the tip of the iceberg for creative and novel approaches to complexity that do not rely upon linear causality. They are potentially confusing for a military force because they break with traditional perspectives. This places Design at a disadvantage once again because it takes more time and education to explain and convey to a diverse organization a concept that is novel or unexpected. “Our conception of time patterns our ideas, and different conceptions of time, used on different occasions, can be powerful tools for changing our points of view.”¹⁵⁶ Although alien to detailed planning’s familiar way of making sense of the world, these asymmetric organizing principles reflect creativity, learning, and persistent innovation for designers. This paper presents the problematic state of military institutionalism

¹⁵⁴ Ahl, Allen, 18; See also: Peter Northouse, *Leadership: Theory and Practice, Third Edition*, (California: Sage Productions, 2004) 36. Northouse discusses the ‘three-skills approach’ in leadership theory that emphasizes technical skill at lower levels of management, whereas at higher levels, technical competencies are not as essential. The inverse occurs with conceptual skills; there are parallels with this and how Design functions at the operational level of war for the military.

¹⁵⁵ Taleb, 89.

¹⁵⁶ Weinberg, 194.

as a significant barrier to intellectual reform and incompatible systems of logic. ‘Swarming’ is one of several novel and non-linear concepts that military organizations may consider when approaching complex systems that resist linear concepts. Swarming represents one such approach.

Steven Johnson explains the concept of swarming through the myth of ant colonies in *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*. Like bees, ants work in colonies where a vast number of very simple creatures function through decentralization and only an awareness of their immediate surroundings. “The queen is not an authority figure. She lays eggs and is fed and cared for by workers. She does not decide which worker does what...it would be physically impossible for the queen to direct every worker’s decision about which task to perform and when.”¹⁵⁷ The ant queen does not attempt to direct the colony in the same manner that general officers should have no expectation that complex systems are susceptible to linear actions that produce specific and timely end-states.

Soldiers are not ants, and military operations are not equivalent to ant colonies; however, both share many similarities that challenge conventional military dogma about understanding complexity and how military action functions within it. Ant colonies operate in a decentralized manner that demonstrates emergent self-organizing behavior. An ant colony collectively ‘learns’ and adapts to conditions so that the colony finds food sources, defends against threats, and continues colony existence without any leadership or linear processes. “*Local* turns out to be the key term in understanding the power of swarm logic...they think *and* act locally, but their collective action produces global behavior.”¹⁵⁸ Essentially, non-linear approaches help Designers create and destroy multiple logic frames that iteratively set heuristic conditions for them to gain deep understanding of a complex system. Swarms of ants do not translate into swarms of military forces, and should not be taken literally. Instead, leaders might consider how non-

¹⁵⁷ Steven Johnson, *Emergence; The Connected Lives of Ants, Brains, Cities, and Software*, (New York: Scribner, 2001) 31.

¹⁵⁸ Ibid, 74.

linear approaches rely upon theoretical concepts that break with traditional ‘end-states’ and linear sequences of decisive points targeting center-of-gravity critical vulnerabilities.

A non-linear approach starts without a well-defined end-state. “General systems laws will never be used for precise conclusions without checking the insights they provide.”¹⁵⁹ Unlike simple problems or *hard systems* where there is “at the onset...a clear definition of the objectives,” ill-structured problems and complex systems face challenges where the “goals are often obscure.”¹⁶⁰ Leaders might conduct Design without the restriction that a specific military ‘end-state’ exists for the organization- provided that the conflict reflects a complex system and not a closed one. Whereas establishing a naval blockade to prevent piracy along the Somali coastline may promote linear approaches effectively, establishing a ‘no-fly zone’ over Libya while aiding insurgent forces and attempting humanitarian relief efforts without ground forces may encourage non-linear approaches without clear ‘end-states.’

Any military approach not only relies upon vocabulary as the previous section discussed, but also often relies upon narratives such as military doctrine to synchronize action. While Design logic espouses non-linear approaches to complexity as alternatives to reductionist linear ones, current Army doctrine does not entirely commit to the non-linear concept. FM 5-0 suggests that Design determine operational approaches “using lines of effort that provide a graphic to articulate the link among tasks, objectives, conditions, and the desired end-state.”¹⁶¹ This paper will explore options in the next section on how Design doctrine can be refined in future formats that acknowledge more non-linear concepts that follow Design logic instead of returning to reductionist and linear processes that define detailed planning. Linear processes, tactical vocabulary, and pre-determined end-states are all examples of the significant

¹⁵⁹ Weinberg, 41. “General system laws...are not Designed to yield *answers*; therefore, they can afford occasionally to be wrong.” Weinberg addresses the input-output experimentation through framing and reframing system transformation; Design requires a problematization methodology that emphasizes active learning and adaptation. See also: Deleuze, Guattari, 361. “The model is a vertical one; it operates in an open space throughout which things-flows are distributed, rather than plotting out a closed space for linear and solid things.”

¹⁶⁰ Peter Checkland, *Systems Thinking, Systems Practice*, (New York: John Wiley and Sons, 1981) 142, 149.

¹⁶¹ FM 5-0, 3-59.

disconnect that regenerates disruptive discourse within a military organization that are akin to 'Who's on First' comedic routines.

Section 5: Design and Doctrine- Putting a Fireplace in an Igloo

It is an unfortunate fact of history that selection and training have developed independently of Design problems. They are difficult enough for known machines and known tasks and it is only in very recent years that techniques have developed for task synthesis and extrapolation to skill descriptions.¹⁶²

- W.T. Singleton

Due to a traditionally non-systematic approach in the area of learning and assimilation of operational lessons, field leaders and staff officers lacked uniform conventions in both planning and analysis...in most cases the learning process focused exclusively on the tactical field and technical issues.¹⁶³

- Shimon Naveh

Two institutions rely upon ‘doctrine’ to synchronize their organizations and develop reproducible and uniform actions: military and religious institutions. Doctrine produces obedience and enforces conformity. Detailed planning uses narratives such as doctrine to successfully execute a diverse number of military actions under limited time, space, and cognitive conditions. This is not a bad thing, and military organizations benefit from many by-products of doctrine. Doctrine generally deals with procedures, reductionism, and standardization that resonate within detailed planning logic.¹⁶⁴ In terms of facts and known variables, doctrine writers emphasize what an organization accepts as a known variable, and frowns upon unknown elements or concepts that cannot be replicated and validated. Due to this reductionist logic, doctrine appears to limit itself to the interiority of a system for making sense of the

¹⁶² W.T. Singleton, *Man-Machine Systems*, (edited by Open Systems Group), *Systems Behavior*, 3rd edition (London: Harper & Row Publishers, 1981) 125. Singleton’s quote illustrates the repetitive condition the U.S. Army faces when preparing the military organization in peacetime for an expected conflict. More often than not, the war that the Army trained for is not the war the Army gets. Ineffective doctrine only reinforces this negative trend.

¹⁶³ Naveh, *In Pursuit of Military Excellence*, 220.

¹⁶⁴ Deleuze, Guattari, 360. “The State-form, as a form of interiority, has a tendency to reproduce itself, remaining identical to itself across its variations and easily recognizable within the limits of its poles...” Deleuze and Guattari’s ‘war machine’ correlates to this paper’s thesis that conceptual and detailed planning are rival methodologies. Yet they are compatible; “It is in terms not of independence, but of coexistence and competition *in a perpetual field of interaction...*”

world. In other words, military doctrine deals exclusively with what is ‘known’ and ignores the ‘unknown.’¹⁶⁵ ‘Interiority’ represents a post-modern approach to knowledge and works within Design logic as a theoretical concept on how humans make sense of the world and learn. How is ‘interiority’ relevant to this topic? Since Design uses philosophical concepts of interiority and exteriority as part of its unique and holistic system of logic, committing Design to rigid doctrine creates a paradox in logics. One cannot codify what is exterior- the unknown. Furthermore, whereas Design encourages learning through creating and destroying concepts, such actions resist codification into reproducible procedures or steps on a checklist. This also becomes a detriment to Design because the military disseminates information and synchronizes operations by using doctrine as a template. If Design resists codification, how can the military engage the entire force with Design processes? Before addressing that paradox, the logic of doctrine requires further explanation.

The invention of writing made standardization and conceptual control of information both possible and necessary as human civilizations passed experiences and values from one generation to the next.¹⁶⁶ “Writing makes possible the codification and systemization of assertion, and hence the birth of *doctrine*.”¹⁶⁷ Doctrine originally fused religious ritual with the exclusivity and power of literacy. The educated minority subsequently created effective models for controlling human action, and through both

¹⁶⁵ Deleuze, Guattari, 412-420. Deleuze and Guattari use their metaphors of ‘nomads’ to represent exteriority- this author interprets this to reflect Designers and the exteriority of a complex system; Deleuze and Guattari expand on their concept of interiority through further metaphors with ‘smiths’ and ‘merchants’ in their *Treatise on Nomadology-The War Machine* in these passages. Throughout their challenging work, they explain how smooth space (exteriority) and striated space (interiority) function and interact within a complex system.

¹⁶⁶ Diamond, 80. Diamond makes the case for how the Spanish explorers had significant military advantage over the Native Americans due to the benefits of written language. It is relevant to this section because writing, and later military doctrine, provides advantages over military adversaries that lack it. “In short, literacy made the Spaniards heirs to a huge body of knowledge about human behavior and history. By contrast, not only did Atahullpa have no conception of the Spaniards themselves...but he also had not even heard (or read) of similar threats to anyone else, anywhere else, anytime previously in history.”

¹⁶⁷ Naveh, Schneider, Challans, 25; See also: Keith Devlin, *The Language of Mathematics*, (New York: W.H. Freeman and Company, 2000) 8. “Indeed, the issue is a deep one, having to do with human cognitive abilities. The recognition of abstract concepts and the development of an appropriate language to represent them are really two sides of the same coin;” See also: Deleuze, Guattari, 357. “The concern of the State is to conserve. Special institutions are thus necessary to enable a chief to become a man of the State...”

access and knowledge of codified information, limit how the majority could deviate from them.¹⁶⁸

“Ritual...does not succumb to rational argument, erected in favor of political or economic expedients.

Religious ritual blunts rational objections in exactly this way.”¹⁶⁹ This paper does not focus on

ideological considerations; rather, the pattern of doctrinal codification by human organizations such as military and religious institutions is relevant with how the military reinforces a system of logic that uses doctrine as a core tenet. Leaders should attempt to understand how and why the military as an institution uses doctrine to convey learning and cohesion, and why Design does not reduce down into a series of procedures or checklists that support detailed planning methodologies.

From a reductionist scientific perspective, this disciplinary method of controlling and teaching human action has many benefits within the mechanistic reductionist system of logic. It reinforces past successful experiences of deceased generations “and conserves the effort of retracing their steps.”¹⁷⁰ Unfortunately, it also appears to suppress adaptation, creativity, and deviation from codified doctrine; such actions are expressly *heretical* in nature.¹⁷¹ This does not mean a military leader cannot make novel and adaptive decisions in combat. It does mean that when a scientist such as Einstein or Darwin present a new theory that rejects a scientific field’s core methodology, there is initially a great deal of resistance

¹⁶⁸ Henry Guerlac, *Vauban: The Impact of Science on War*, Peter Paret (editor), *Makers of Modern Strategy; From Machiavelli to the Nuclear Age*, (Princeton: Princeton University Press, 1986) 67. Guerlac explains the origins of military reform and how doctrine and mechanistic military philosophy integrated with changes in military form. “This cult of reason and order was not merely an authoritarian expedient, nor just an aesthetic ideal imposed by the prevailing classicism...it was the form in which the scientific revolution, with its attendant mechanical philosophy, first manifested itself in France.”

¹⁶⁹ Ahl, Allen, 7.

¹⁷⁰ Weinberg, x; See also: Deleuze, Guattari, 389. Deleuze and Guattari credit census, taxation, and election as the modern forms of the State for imperial bureaucracy and conjoined operations. Each of these forms generated the need for writing, and then doctrine to enforce.

¹⁷¹ Australian Head Modernisation and Strategic Planning- Army, *Australian Army’s Future Land Operating Concept* (Australian Army Headquarters, Canberra, September 2009) foreword. The Australian doctrine published in 2009 deserves significant praise in deviating from traditional military hubris. The foreword stresses *conceptual and philosophical framework* while the main body of the doctrine credits other military theory and doctrine, and provides extensive flexibility to operators attempting to apply Design to complex problems.

because of institutional self-preservation.¹⁷² Uniformity and repetition come at an expense to ingenuity. One cannot innovate and adapt if expected to obey and reproduce a predictable result.

Doctrinal codification has many advantages for the military profession as a methodology that needs repetition and uniformity in action across a large organization. Just as Greek Hoplites followed rigid procedures and employed repetitive tactics in ancient times, modern military forces continue indoctrination and repetitive training to achieve the same results with modern weapons and technology.¹⁷³ While most military conflict in human history manifests through tactical victories that secured strategic aims, once warfare evolved to the point that single battles could no longer provide strategic victory, the need for a different logic emerged. The aforementioned Scientific and Industrial Revolutions ushered in the 'Operational Era' of warfare. Yet despite this paradigm shift towards operational levels of warfare, military organizations continued to retain tactical system logic in most regards, including doctrine.¹⁷⁴ Numerous military historians identify the duality of military culture- the very principles of dedication and uniformity that make the military efficient work against organizational adaptation and creativity.

Historian Brian Linn criticizes the military in *Echo of Battle* of resisting change, maintaining “intellectual rigidity, a propensity to mistake slogans for strategic thinking, and the dogmatic belief in

¹⁷² United States Marine Corps, 25. The Marines warn that a planning pitfall is “the tendency for institutionalized planning methods to lead to inflexible or lockstep thinking and for planning and plans to become rigid and overly emphasize procedures...attempts to [institutionalize planning] will necessarily restrict intuition and creativity.”

¹⁷³ Maurice Matloff, *Allied Strategy in Europe, 1939-1945*, Peter Paret (editor), *Makers of Modern Strategy; From Machiavelli to the Nuclear Age*, (Princeton: Princeton University Press, 1986) 685. Matloff describes American war theory in the second World War, which reflects a traditional philosophy that espouses Jominian and Clausewitzian concepts. “They believed an American army of approximately 215 divisions was needed to win. Here was the core of the American theory of a war of mass and concentration. It reflected American optimism, confidence in its industrial machine to produce the military hardware, and the faith of its military in its ability to raise, equip, and train a large citizen army for offensive purposes.” Has that changed much by modern standards? This author views it as a constant in military wartime philosophy, with exception of the draft since Vietnam.

¹⁷⁴ Conklin, 4-5. “This is the pattern of thinking that everyone attempts to follow when they are faced with a problem...this linear pattern as being enshrined in policy manuals, textbooks, internal standards for project management, and even the most advanced tools and methods being used and taught in the organization.” See also: John Shy, *Jomini*, Peter Paret (editor), *Makers of Modern Strategy; From Machiavelli to the Nuclear Age*, (Princeton: Princeton University Press, 1986) 144. “Jomini’s approach to war was “abstracting it from its political and social context, emphasizing decision-making rules and operational results, turning warfare into a huge game of chess, [that] has been surprisingly durable.”

itself as the ‘best trained, best armed, best led force’ that has ever existed.”¹⁷⁵ Naveh, Schneider, and Challans also make a distinction between what they consider Designers and military planners. Military planners are “confined to the ‘shackles’ of inferiority determined by institutional paradigm, doctrine, and jargon...[they] are cognitively prevented, by the very convenience of institutional interiority...because the ‘shackles’ of ritual hold them in place.”¹⁷⁶ Codifying military practices into doctrine essentially prevents adaptation and learning to occur within the Design process because the very nature of military doctrine.

The system of logic for detailed planning builds doctrine from past conflicts and canonizing select patterns and observations as the prescriptive guidance for future action. “It’s just like that problem. Just do the same thing again.”¹⁷⁷ Again, there is clear value in writing doctrine based upon proven performance. Consider the prominence of historical vignettes in much of U.S. Army doctrine. The rationale is clear; military doctrine prescribes specific patterns of action because in previous conflicts, those patterns were effective.¹⁷⁸ This unfortunately does not work well with Design methodology due to the incompatibility in Design’s system of logic. If reductionist logic relies upon doctrine that deals only

¹⁷⁵ Linn, 232; See also: Australian Head Modernisation and Strategic Planning- Army, *Australian Army’s Future Land Operating Concept*, (Australian Army Headquarters, Canberra, September 2009) 4.15.d.3. Australian Design doctrine criticizes the techno-centric military hubris in favor of fostering a learning environment. “Often the most important lessons will come from early identification of people’s mistakes. Consequently, the Land Force needs to reject a ‘zero defects mentality’ in favour of a culture that embraces learning;” See also: Winter, 59. “Military conservatism and traditionalism tend to take the form of ‘dogmatic doctrine.’”

¹⁷⁶ Naveh, Schneider, Challans, 72.

¹⁷⁷ Conklin, 11. Conklin explains six ways that organizations attempt (erroneously) to ‘tame’ wicked problems; his fourth method observes an organization that will “cast the problem as ‘just like’ a previous problem that has been solved. Ignore or filter out evidence that complicates the picture.

¹⁷⁸ John Brown, (Edited by Michael Krause, Cody Phillips), *The Maturation of Operational Art; Historical Perspectives of the Operational Art*, (Center of Military History, United States Army, 2007) 442. “The 1986 edition of Field Manual (FM) 100-5, *Operations*, deployed an array of historical operational vignettes to make its points; such terms as Center of Gravity, Lines of Operation, and Culminating Point were recommended as key concepts for operational Design;” See also: Chris Smith, *Solving Twenty-First Century Problems with Cold War Metaphors; Australian Army Journal For the Profession of Arms, Volume VI, Number 3*, (Duntroon: Land Warfare Studies Centre, 2009) 92. Smith criticizes the Australian military for clinging to mechanical metaphors such as ‘center of gravity’ to attempt to solve complex problems; See also: David Fastabend, *That Elusive Operational Concept* (Army Magazine: Association of the United States Army, 2001, <http://www3.ausa.org/webpub/DeptArmyMagazine.nsf/byid/CCRN-6CCRXXQ> (accessed: 14 February 2011) 1. “Lacking a rigorous definition, operational concepts are best described through a survey of historical examples.”

with what is ‘known’, it may be problematic when confronting complex systems that generate unknown patterns. When a system produces an action or process that is unlike anything seen before, can doctrine that bases its logic upon known things make sense of it?

‘Deep understanding’, a central concept within Design’s methodology, often involves creating new concepts; this process of creation and destruction can challenge the very fabric that holds an organization’s traditions and methodologies together.¹⁷⁹ Leaders may conduct Design and develop processes and concepts that fall outside of existing narratives, or contradict it. In the case of forcing Design into doctrinal form, the very essence of Design’s logic loses out for the sake of uniformity. In doctrine, preservation often trumps ingenuity. At the same time, the ingenuity of Design works against unit cohesion because dynamic theoretical concepts that resist codification are notoriously difficult to teach.¹⁸⁰

If FM 5-0 Design doctrine is conceptually unwieldy due to the prescriptive nature of detailed planning methodology, what is the alternative? First, the military should consider how Design operates on a fundamentally different way of making sense of the world. The fifteen pages of Design doctrine are potentially inadequate because they reinforce detailed planning terms, concepts, and procedures. Design requires a different form that avoids the paradoxes that reductionist logic bounds doctrine to. For understanding and influencing complex systems, Design requires unique and innovative vocabulary, non-linear approaches to transforming a system, and extensive application of analogies to convey understanding of Design’s different system of logic to the target audience.¹⁸¹ There are disadvantages to

¹⁷⁹ This author employs the term ‘deep understanding’ while other Design theorists offer a variety of other terms that are often cited in this paper’s footnotes. Shimon Naveh uses ‘cognitive synergy’ and Donald A. Schon (*Educating the Reflective Practitioner*) uses ‘reflective practicing’ and other terms, while Jeff Conklin uses ‘cohesion’ in a similar format.

¹⁸⁰ This author’s personal experience with Design and the School for Advanced Military Studies reflects an institution that continues to struggle with how conceptual and detailed planning work together in a ‘combined planning’ methodology. As theory, doctrine, and practice continues, the Army continues to reconfigure how Design operates within the military institution.

¹⁸¹ Jeff Conklin, *Wicked Problems and Social Complexity*, (CogNexus Institute, 2008). <http://cognexus.org/wp/wickedproblems.pdf> (accessed 05 January 2011) 8. “There are so many factors and

Design narratives because any form used will need the ability to morph over time as the organization learns. Although discounted by academia, social production models such as Wikipedia reflect the dynamic and self-organizing narrative form that Design would potentially lend itself to instead of a formal codification.¹⁸² Clearly, social production models such as Wikipedia have inherent problems that hierarchical models avoid- but the traditional peer-reviewed processes and top-down management of information does not appear to move as fast or adapt as quickly as open-source or social production narratives.¹⁸³ Wikipedia generally is shunned by the academic fields for concerns over accuracy- yet some studies argue that Wikipedia is more accurate than the Encyclopedia Britannica. While this is highly debatable, the military could look at social production models for an example of how Design could better integrate into useable narratives within a military organization. Doctrine does not need to be hierarchical and held to rigid procedures to still be effective.¹⁸⁴

As social production models reflect a new form of knowledge production, Design narratives in an acceptable form could look unlike any other U.S. Army military manual- this is a good thing. In order to prevent continued tacticization of Design methodology and prevent the “Who’s on First” scenario from repeating within an organization, Design doctrine should clearly possess form and function entirely unlike existing field manuals. Therefore, Design doctrine would essentially be incompatible with detailed

conditions, all embedded in a dynamic social context, that no two wicked problems are alike, and the solutions to them will always be custom Designed and fitted.”

¹⁸² Paris Tech Review Editors, “It’s a Wiki Wiki World, Wikipedia and the Rise of a New Mode of Production,” *Paris Tech Review*, (<http://www.paristechreview.com/2011/02/18/wiki-world-wikipedia-new-mode-production/> accessed 19 April 2011). The editors of this article use the term ‘social production model’ to define how social networks collaborate anonymously to generate new knowledge in a self-organizing non-hierarchical fashion.

¹⁸³ Ibid. “In January 2001, Wikipedia published its first article. Ten years later, Wikipedia now carries 15 million articles, with more than 2 billion words, in more than 200 languages... Even more remarkably, Wikipedia was written and edited by more than 1 million people with nearly no planning, supervision, or professional editorial oversight—all working for free, for the greater good of the 365 million people who consult the site every month.”

¹⁸⁴ Daniel Terdiman, “Study: Wikipedia as accurate as Britannica,” *CNET News*, (December 15, 2005, http://news.cnet.com/2100-1038_3-5997332.html accessed 19 April 2011). “An expert-led investigation carried out by Nature--the first to use peer review to compare Wikipedia and Britannica's coverage of science,” the journal wrote, “suggests that such high-profile examples...are the exception rather than the rule.”

planning doctrine in much the same way Wikipedia differs from the Encyclopedia Britannica despite both of them serving a similar purpose. Physically, non-Design doctrine could remain on the shelf for the military, while Design's social production model would likely require a social media format with significant online presence. One can search and print out various articles on Wikipedia, but at over 15 million articles with daily contributions and self-editing, it appears impossible to really capture Wikipedia in a printed form such as a field manual.¹⁸⁵

Currently, detailed planning assimilates chunks of Design logic into chapters of Army doctrine and reduces Design theoretical concepts into procedures and checklists. Instead of detailed planning performing bricolage and assembling components of Design into detailed planning logic, the military might consider reversing this process and assimilating detailed planning concepts into the overarching framework of Design logic. Understandably, this is a bold recommendation and will face significant resistance due to institutional self-interests.¹⁸⁶ Detailed planning still works in many applications, and would continue to do so while incorporated into Design's holistic system of logic. The process of bricolage would subsequently reverse, and those relevant components of detailed planning doctrine would assemble within the Design system of logic. In other words, people can still own volumes of Encyclopedia Britannica in their house, while referring to Wikipedia online for other needs as the conditions warrant. The social production model of Design would perpetually adapt and change through self-organization and innovation like a swarm of ants. Within this conceptual framework, the military could continue to publish volumes of doctrine within the hierarchical and reductionist logic that supports linear approaches. Sometimes MDMP is still the most effective means to accomplishing strategic goals through tactical applications. However, Design's logic potentially provides the military a different and innovative process for making sense of highly complex and dynamic systems. While a new edition of a

¹⁸⁵ Refer to footnote 182 and 183.

¹⁸⁶ Alvesson, Sandberg, 259. Alvesson and Sandberg ask "how can assumptions be challenged without upsetting dominant groups, which hold them so strongly that they ignore the critique or even prevent one's study from being published?"

printed encyclopedia takes months, a newly observed concept or identified 'unknown' is quickly contributed to the collective through social production by anyone. There are strengths and weaknesses for both logics; military leadership need to think critically about whether the Army is able to do both, or is still preventing Design from functioning at the expense of detailed planning logic.

Conclusion: Design or Detailed Planning- There Can Be Only One Logic

Spengler: I have a radical idea. The door swings both ways, we could reverse the particle flow through the gate.

Venkman: How?

Spengler: [hesitates] We'll cross the streams.

Venkman: 'Scuse me Egon? You said crossing the streams was bad!

Stantz: Cross the streams...

Venkman: You're gonna endanger us, you're gonna endanger our client - the nice lady, who paid us in advance, before she became a dog...

Spengler: Not necessarily. There's definitely a very slim chance we'll survive.¹⁸⁷

- Ghostbusters

The above scene from the science fiction classic *Ghostbusters* provides a useful metaphor on how organizations, including the U.S. Army, can recognize the world around them with new systems of logic that integrate predeceasing methodologies while reducing unnecessary redundancies. In *Ghostbusters*, the main characters follow the rule of never crossing their proton streams due to their understanding that they risked their own destruction. At the climactic end of the movie, the scientist that gave them that procedure to follow had an epiphany and challenged his group's system of logic on proton beams. The rest, as they say, is history- New York is saved. Despite *Ghostbusters* being an example of fantasy and not reality, it illustrates that sometimes the main barrier for an organization attempting to influence the world to their advantage is the organization itself; their system of logic prevents them from making better sense of the world. Or, sometimes to win the game, one must break the rules.

¹⁸⁷ Harold Ramis, Dan Aykroyd *Ghostbusters* (final script, October, 1983 <http://www.scifiscripts.com/scripts/Ghostbusters.txt> (accessed: 02 April 2011). The link for this final script has slight differences with the on-screen performance of the movie *Ghostbusters*; however, due to significant actor improvisation during filming, this script is the only available source that comes close to the actual dialogue of the movie. The quotation above modifies the scripted lines with the actual lines spoken by Harold Ramis, Dan Aykroyd, and Bill Murray in the movie.

This monograph used the concept of ‘systems of logic’ to explain how humans attempt to recognize and influence the world. By explaining how the military employs a detailed planning system of logic that faces increasing difficulties in recognizing and influencing complex systems, this paper recommends that the military think critically about how it makes sense of the world. Design recognizes the world differently than detailed planning. It uses a different logic that employs different vocabulary, and uses theoretical concepts that approach complexity holistically and with an emphasis on learning. At the same time, Design routinely challenges deeply held values and tenets that are part of the military’s preferred detailed planning system of logic. Design has problems due to natural limitations within humans; some are more creative than others. For military organizations that require repetition and uniformity, they cannot expect all soldiers to possess similar mental attributes anymore than they should expect that every complex concept can reduce down to simple chunks.

Not all Design solutions involve the military, even when a Design team frames the system under the direction of their leader. This is a significant problem with Design logic, and why traditional military institutionalism has a difficult time with what Design deliverables might offer. In other words, when the senior political leadership of the United States reaches into the toolbox of national instruments of power, they often instinctively reach for the large and powerful military branches because each military service brings so many options to the planning table. Historically, military services constantly rival each other for continued relevance and desire to be the ‘tip of the spear’ as the primary actor in any proposed solution; Congress enacted the Goldwater-Nichols Act of 1986 to encourage military services to work together instead of against one another.¹⁸⁸ Design creates paradoxical circumstances with detailed planning logic because any potential explanation of a complex system may not center around the military at all. This is

¹⁸⁸ Builder, 11, 17; See also: Anne-Marie Grisogono, Alex Ryan, *Adapting C2 To The 21st Century; Operationalising Adaptive Campaigning*, (Edinburgh: Australian Department of Defence, Defence Science and Technology Organization, 2007) 3; See also: Winter, 58. Winter echoes Builder’s sentiment discussing Australian military culture. “It is therefore not a single or homogenous culture, but a culture of sub-cultures that defines a military. This ‘density’ of culture has a profound effect on the ability of armed forces to accommodate radical change, as this in turn relates to the bureaucratic aspect of military culture.”

blasphemy to senior military leadership, and reflects perhaps the most significant intellectual roadblock that prevents the military from accepting Design. What happens when the best approach really does not involve the military? Can senior political leadership accept Design logic and change foreign policy course without institutional friction?

Design's system of logic takes an ontological approach to understanding a complex system. Through adaptation and learning to learn, Designers operate in the exteriority of a system and disregard the procedures and 'lockstep' obedience inherent in the tactical reductionist logic of detailed planning. Therefore, the complex system dictates to Designers how a system functions, and if the Designers gain 'deep understanding', they then convey that explanation through narrative and other processes that form Design deliverables and provide detailed planners with deeper understanding of complex systems. The aforementioned misconception lies in whether the Design deliverable contains what military expects within the Design explanation- the solution needs to include the military service or organization conducting the Design, *usually as the lead actor*. This significant tension between detailed and conceptual system logics fuels the "Design just philosophizes the military out of the scenario" argument of Design detractors. The detractors make a valid point, but only get half of the issue at stake. When leaders reject the Design explanation, they do so because not only it puts them on the sideline which conflicts with institutional self-relevance, but more importantly because they misunderstand that Design logic cannot dictate to the complex system how to function.

Design's logic may work with social production models of new knowledge such as Wikipedia, but they also reflect the flaws of self-organization without hierarchical control measures. How does Design measure success or failure? Can the military control where Design logic moves the organization? What does the military do to prevent radical divergences into faulty logic? Additionally, how can the military teach and maintain standards and objectives in a self-organizing production model? These questions and others demonstrate the continued discourse that the military should pursue on how Design contributes to understanding complexity, and where detailed planning logic still maintains institutional relevance in the 21st century.

Many intellectual roadblocks litter the road between Design logic and the reductionist and mechanistic worldview. Reductionism, a preference for linear causality, and an emphasis on description over ontological explanation provide a framework for tactical vocabulary, educational processes, and planning logic that resists Design. Military doctrine such as FM5-0 Chapter 3 attempts no small feat in its brief fifteen pages, and the Army's decision to explore Design logic and attempt to write Design doctrine represents the acknowledgement that existing system of logic based in detailed planning is insufficient in the 21st century of warfare. Perhaps instead of writing Design in doctrine, the military could consider social production models as a future form for Design narratives and organizational discourse as recommended by this monograph.

Army doctrine's definition of Design implies that critical thinking is essential for understanding a complex system.¹⁸⁹ Instead of seeking a 'problem' with a corresponding 'end-state', Design teams should unshackle themselves from the linear and reductionist terminology and conceptual structures of detailed planning logic.¹⁹⁰ In order to become a critical thinker, one should consider that even hallmark processes and terminology of the host institution may potentially cause an organization to 'solve the wrong problem.' Sometimes, detailed planning alone will continue to function; however, applying it to all future challenges in the 21st century will increase the military's frequency of solving wrong problems effectively while missing the right problem entirely.

In order to communicate about Design within a new system of logic, the military should abandon the vocabulary restrictions of the obsolete and inadequate detailed planning system of logic. In other

¹⁸⁹ FM 5-0, 3-1.

¹⁹⁰ Gary Jason, *Critical Thinking: Developing an Effective System Logic*, (San Diego State University: Wadsworth Thomson Learning, 2001) 114. "There are good reasons for introducing new terminology. For one thing, a judicious use of new words can increase the readability of the writing, by shortening many of the sentences involved;" See also: Deleuze, Guattari, 374. "The ambulant sciences confine themselves to *inventing problems* whose solution is tied to a whole set of collective, nonscientific activities but whose *scientific solution* depends, on the contrary, on royal science and the way it has transformed the problem by introducing it into its theoretical apparatus and its organization of work." Deleuze and Guattari make the case that military institutions seek to label 'problems' based on familiar structures and containers that integrate with institutional practices. When military organizations face asymmetrical phenomena that reject or challenge these structures and containers, many institutions ignore them or misidentify them.

words, one cannot begin to talk about complexity when one lacks the very words to do so. The challenges of understanding and employing unique and appropriate operational language reflect an understated point of friction in U.S. Army doctrine concerning conceptual and detailed planning.¹⁹¹ Design requires unique and descriptive lexicon to foster greater understanding of complex adaptive systems, and the military should allow its lexicon to expand as needed for Design discourse.

When the military conducts detailed planning, they have every valid expectation that in the end, that unit (or subordinate unit) will *execute* the plan. This nests in the reductionist system logic of detailed planning, and caters to institutional self-preservation and relevance among rival military components and other instruments of power. Yet when the military conducts Design, the heretical nature of true problematization may result in operational approaches and Design deliverables that expand far beyond the limited boundaries of a military organization's sense of purpose, capacity, and capabilities. Design's holistic approach to dynamic and complex systems avoids the pigeonholing procedures that streamline detailed planning into precise action- while dismantling critical innovation and creativity. Design's system of logic delivers solutions that often are uncomfortable. Instead of rejecting them, military organizations should think critically about why the solutions are uncomfortable to begin with.

Design presents novel and asymmetric approaches to solving a complex problem that go out of an organization's boundaries and may incorporate actions and efforts of numerous actors within the system that hardly match the detailed planning task organization chart. At the same time, Design may marginalize or even eliminate military organizations from the lead role in execution, or recast their actions in unfamiliar and unorthodox processes that conflict with institutional relevance and identity. In closing, Design presents a different opportunity in gaining 'deep understanding' of a significant phenomenon of a complex system by explaining the propensity of observed rivals and phenomenon. This explanation comes with the danger that the practitioner may outrage the organization because the Design

¹⁹¹ White, 1. "It is here that discourse itself must establish the adequacy of the language used in analyzing the field to the objects that appear to occupy it." White's introduction on Tropology and discourse offer tremendous insight into how human beings understand and articulate meaning through various contents and forms.

deliverable does not take the familiar *form* that the organization identifies with. Again, the military could invite new forms such as social production models where self-organization, adaptation, and innovation generate persistent creativity and learning.

In closing, Design recognizes the world differently than detailed planning logic. There are positives and negatives associated with this, as this monograph has denoted through logic, vocabulary, theoretical concepts, and narrative production. At times, Design logic explains things that run contrary to institutional values, but the complex world is an adaptive and ever-changing place. The U.S. Army should move to accept the Design system of logic and think critically about whether the internal forces that comprise traditional tenets and values are preventing a different logic from making sense. Instead of detailed planning logic performing assimilation of Design logic, perhaps the inverse should occur? The military could move to enact Design logic as a core methodology for understanding the world, and subsequently integrate those many relevant components of detailed planning logic into Design's overarching methodology. As the holistic framework for thinking, Design requires novel educational processes to begin this paradigm shift, while Design vocabulary must grow and discard the current tactical vocabulary that FM 5-0 cast upon it. Design embraces non-linear theoretical concepts because the world does not operate in lines or according to linear causality and reductionism. Design requires narratives that fall outside of current expectations for what 'doctrine' should be. As social production models demonstrate, new knowledge can be produced quickly and efficiently through non-hierarchical processes that emphasize self-organization and adaptation. Design narratives should consider an innovative form that departs with reductionist and mechanistic logic. These changes represent a revolution in how the military could think, learn, and understand itself and the world- Design provides another path for understanding the increasing complexities of the 21st century if the military is willing to take a critical look at how it thinks, and how it does not think. Sometimes, in the end, an organization might just need to "cross the streams" to save New York City.

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