Bridging the Military Leadership Gap: Adapting Industrial Era Militaries for Knowledge Era Warfare

A Monograph

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2019

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
23-05-2019	Master's Thesis	JUNE 2018 – MAY 2019

4. TITLE AND SUBTITLE
Bridging the Military Leadership Gap: Adapting Industrial Era Militaries for Knowledge Era Warfare

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Major Thomas J. Prestella

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORG REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Advanced Military Studies Program

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

We live in a knowledge economy where knowledge equals wealth and complexity flourishes. In the knowledge economy, the ability to generate new knowledge and rapidly adapt denotes the best defense against obsolescence. This new social paradigm therefore demands a new kind of leadership, one that embraces uncertainty and capitalizes on instability by creating adaptive outcomes. Despite knowledge's leading role in organizational survival, the US military remains anchored to industrial economy leadership paradigms that favor hierarchy and predictability over creativity and experimentation. Linear planning models and the time-honored concept of hierarchical command suppress competing leadership paradigms and the necessary conditions for adaptation. To prevail in Knowledge Era combat, the US military must weaponize complexity with a new theory of leadership.

15. SUBJECT TERMS
Complexity Leadership Theory, complex adaptive systems, Knowledge Era, Industrial Era, leader, leadership, large-scale combat operations, multi-domain battle

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
					Maj Thomas J. Prestella
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			**19b. PHONE NUMBER** *(include area code)*
(U)	(U)	(U)	(U)	40	

Monograph Approval Page

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Monograph Title: Bridging the Military Leadership Gap: Adapting Industrial Era Militaries for Knowledge Era Warfare

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Abstract

Bridging the Military Leadership Gap: Adapting Industrial Era Militaries for Knowledge Era Warfare, by Maj Thomas J. Prestella, USAF, 40 pages.

We live in a knowledge economy where knowledge equals wealth and complexity flourishes. In the knowledge economy, the ability to generate new knowledge and rapidly adapt denotes the best defense against obsolescence. This new social paradigm therefore demands a new kind of leadership, one that embraces uncertainty and capitalizes on instability by creating adaptive outcomes.

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Acknowledgments

To my monograph director, Dr. Anthony E. Carlson, thank you for your guidance and for giving me the academic freedom to roam, unencumbered by timelines and directives. You typify complexity leadership. To my wife, Deanna, thank you for always priming the coffee pot, for corralling the kids when I was in the monograph zone, and for your unwavering love and support. To my girls, Hannah and JoJo, thanks for sharing daddy with SAMS. I owe you all the ice cream in the world. Lastly, thank you to all the academic professionals whose fingerprints are all over my development as a leader, and whose works I have built my argument upon in the following pages.

Acronyms

ADP	Army Doctrine Publication
ADRP	Army Doctrine Reference Publication
AFM	Air Force Manual
AFP	Air Force Pamphlet
FM	Field Manual
JP	Joint Publication
MDMP	Military Decision Making Process
TP	TRADOC Pamphlet
US	United States

Illustrations

Introduction

Old Economies

Three distinct eras of production demarcate the history of western economies. Within each era, the means of production defined the means of wealth. First among these, the Agrarian Era defined wealth in terms of land and labor.[1] In 1850, at the height of the Agrarian Era, roughly 64 percent of working Americans earned their livings through farming.[2] The transcontinental railroad sparked an explosion in industrial development and gave rise to the Industrial Era.[3] In this era, capital symbolized the means of wealth because it enabled the purchase of factories and equipment.[4] Along with the industrial era came an atmosphere of market competition. To promote streamlined efficiency, organizations became increasingly hierarchical, and the science of management expanded in search of new ways to maximize return on investment.[5] Today's Knowledge Era sprang from technological innovations in the latter half of the twentieth century. As part of this new era, an information technology revolution through computers and the world wide web created a "woven world," where the pace of communication and change easily outpaced the ability of governments to react and adapt.[6] In this era, human intellect – knowing

[1] Rian M. Gorey, David R. Dobat, "Managing in the Knowledge Era," *The Systems Thinker* 7, no. 8 (October 1996): 1.

[2] Walter R. Mead, "The Big Shift," *Foreign Affairs* 97, no. 3 (June 2018): 12.

[3] Ibid., 10.

[4] Rita McGrath, "Management's Three Eras: A Brief History," *Harvard Business Review Digital Articles* (July 30, 2014): 3.

[5] Rian M. Gorey, David R. Dobat, and Linda Booth Sweeney, "Managing in the Knowledge Era," *The Systems Thinker*, last modified February 28, 2016, accessed August 19, 2018, https://thesystemsthinker.com/managing-in-the-knowledge-era/.

[6] Daniel Yergin and Joseph Stanislaw, *The Commanding Heights: The Battle for the World Economy* (New York: Simon & Schuster, 2002), xiv.

who, what, when, where, why, and how – eclipsed all other forms of value and became the principal means of wealth accumulation.[7]

The New Economy

The information technology revolution made possible the rapid sharing of knowledge and gave rise to the modern knowledge economy. Regarding systems, cooperation from globally connected nodes now enables organizations to rapidly disseminate and capture knowledge, sparking massive gains in organizational value. Unlike previous economies that consumed raw materials, knowledge is a resource that cannot be exhausted. The more knowledge is shared, the more it grows, making it a truly infinite resource with boundless potential.[8] The knowledge economy is therefore fundamentally different than economies past, where managers and leaders coveted land, labor, and capital above all other aims. This understanding of knowledge as a limitless resource necessitates a reevaluation of the traditionally accepted leadership paradigms that governed previous economies.[9]

In short, the Knowledge Era is immensely and increasingly complex. Whereas previous economies sought optimizing behaviors and equilibrium stability, the dominant mode of operation in the knowledge economy is suboptimal behavior and disequilibrium.[10] Although we live in the Knowledge Era, many of the corporate structures, systems of governance, and

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[7] Gorey, Dobat, and Sweeney, 10.

[8] William E. Halal, "Knowledge: The Infinite Resource," *Executive Excellence* 16, no. 9 (September 1999): 18.

[9] William E. Halal, "The Infinite Resource: Mastering the Boundless Power of Knowledge," in *Twenty-First Century Economics: Perspectives of Socioeconomics for a Changing World*, ed. William E. Halal and Kenneth B. Taylor (New York: St. Martin's Press, 1999), 54-55.

[10] Sten A. Thore, "Enterprise in the Information Age," in *Twenty-First Century Economics: Perspectives of Socioeconomics for a Changing World*, ed. William E. Halal and Kenneth B. Taylor (New York: St. Martin's Press, 1999), 132.

incentive programs that dominate the business world remain mired in the Industrial Era.[11] Similarly, organizational structures within the US military reflect the previous period. Therefore, a complexity mismatch exists between the present economic era and the systems that govern it. Business academia writ large has allocated substantial attention and resources to adapting outdated leadership paradigms to Knowledge Era complexities. In contrast, the professional military community has done little to address the adaptive challenges posed by the post-Industrial Era.

Adaptive Challenges

Adaptive challenges lack known remedies. Therefore, overcoming adaptive challenges requires learning on behalf of the entity confronted with the problem.[12] The bureaucratic problem-solving models that dominated the Industrial Era are not suitable for overcoming Knowledge Era adaptive challenges because they do not generate creativity and new ideas.[13] Instead, Industrial Era hierarchies routinely seek to simplify adaptive challenges in the hopes of making the unpredictable seem predictable.[14] This simplification approach is typical of the problem-solving models laden throughout US military doctrine. In Industrial Era fashion, US military problem-solving models aim to reduce war to a set of linear rules in the hopes of making the chaotic seem predictable, instinctive, and orderly.[15] In the Knowledge Era, this approach will

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[11] Brook Manville and Josiah Ober, "Beyond Empowerment: Building a Company of Citizens," *Harvard Business Review* 81, no. 1 (January 2003): 48.

[12] Ronald A. Heifetz, *Leadership without Easy Answers* (Cambridge, MA: Belknap Press of Harvard University Press, 1994), 22.

[13] Mary Uhl-Bien, Russ Marion, and Bill McKelvey, "Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era," *The Leadership Quarterly* 18, no. 4 (August 2007): 300.

[14] Paul Cilliers, "Boundaries and Hierarchies in Complex Systems," *International Journal of Innovation Management* 5, no. 2 (June 2001): 136.

[15] Antoine J. Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity* (New York: Columbia University Press, 2009), 32.

inevitably fall short when the complexity of non-linear challenges exceeds the simplifying capacity of the US military's linear problem-solving models. This presents a significant vulnerability for industrial militaries, like that of the United States, when engaged in wars against enemies that have optimized their forces for knowledge-centric warfare. In the Knowledge Era, organizations must learn their way out of complex problems for which there are no models.[16] Therefore, adaptive challenges inherent in the knowledge economy require new methods of leadership for addressing them.[17]

A New Kind of Leadership

Complexity Leadership Theory draws on complexity science to promote a leadership framework suitable for navigating adaptive challenges.[18] By employing complex adaptive systems (units of analysis in complexity science) in existing hierarchical structures, Complexity Leadership Theory can cultivate an atmosphere of creativity, learning, and adaptability. This theory demands a pivot away from the prevailing administrative leadership paradigms of the Industrial Era, to a system of adaptive leadership capable of producing favorable, emergent change. In the Industrial Era, warfare mimicked the industrial society where efficiency reigned supreme. In factories, managers relentlessly sought and succeeded in finding new ways to increase outputs while minimizing inputs. Similarly, on the battlefield, commanders exploited technological advancements in weaponry to inflict as much death and destruction on the enemy as possible, for the least expenditure of risk to their manpower and material. When two or more industrialized militaries went to war with each other, the bloodletting on all sides rose to staggering levels. Tens of millions of soldiers died in World Wars I and II. In short, the industrial revolution increased battlefield fatalities to factory output levels. However, Knowledge Era

[16] Uhl-Bien, Marion, and McKelvey, 300.

[17] Heifetz, 187.

[18] Uhl-Bien, Marion, and McKelvey, 298.

technological advancements have perhaps made Industrial Era warfare somewhat obsolete, and large-scale combat operations between two or more uniformed militaries are becoming less and less likely ever to occur again.[19]

A New Kind of Warfare

The Knowledge Era has ushered in a new kind of warfare. Although the nature of war remains steadfast, the character of war has certainly changed. For the first time in the history of armed conflict, war has transcended the physical bonds of Earth into unseen domains. Whereas Industrial Era warfare remained yoked to the land, air, and sea domains, the Knowledge Era extended warfare to non-physical realms, including the electromagnetic and cyber domains. Cyber warfare allows militaries to attack each other from great distances in not only kinetic ways, but also in non-kinetic ways via cyber networks. Therefore, war may be no longer bounded by a military's operational reach or its ability to exert physical force across physical domains. This constitutes somewhat of an undoing of Clausewitz' axiom that "war is an act of force to compel our enemy to do out will," for at the time of Clausewitz' writings he could only have been referring to physical force inflicted on tangible battlefield targets.[20] Today, cyber acts of force can be anonymous and unseen, stopping short of physical harm to people and equipment, thus altering the character of warfare.

Although the means of applying military force in the Knowledge Era have expanded to encompass non-physical domains and non-lethal effects, the traditional metrics for evaluating combat effectiveness remain rooted in physical domains and physical effects. In other words, a contradiction exists between the character of modern warfare and the capabilities the joint force privileges in times of war. Namely, the industrial concept of lethality persists as the cornerstone

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[19] The US Army's renewed emphasis on large-scale combat operations will be discussed in Section III, Doctrine.

[20] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 75.

measurement of combat effectiveness, even though knowledge economy warfare has inaugurated less than lethal methods of engaging enemies and achieving national objectives.[21] The US Army defines lethality as "the ability to kill or cause physical destruction and is essential to fighting and winning battles."[22] In keeping with the industrial paradigm that lethality wins battles, and despite the Knowledge Era winds of change, lethality overmatch and the relentless pursuit of it remains a constant focal point for Army leaders in modern doctrine and future operating concepts.

TRADOC Pamphlet (TP) 525-3-1, *US Army Operating Concept: Win in a Complex World*, details how the US Army anticipates it will fight and win future wars in the years 2020 to 2040. To its credit, the title of TP 525-3-1 and the contents therein readily acknowledge complexity's centerstage role in modern and post-modern combat. However, it does not address how Army leaders should mobilize their human capital to solve complex problems. More to the point, the Army's future operating concept stresses innovation and adaptability as critical tenets for achieving campaign objectives, but it lacks instruction on how to innovate and adapt.[23] Almost as if insurance against innovation and adaptability shortfalls, physical lethality remains a crucial tenant of TP 525-3-1.[24] This assumes ordinance can solve most, if not all, complex problems in future conflicts. However, warfare in the knowledge economy has advanced beyond physical damage in physical domains. Therefore, Knowledge Era militaries must place an equally high premium on increasing and mobilizing human capital to innovate, adapt, and solve complex problems in any domain.

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[21] Michael D. Lundy, "Meeting the Challenge of Large-Scale Combat Operations Today and Tomorrow," *Military Review* 98, no. 5 (October 9, 2018): 118.

[22] US Department of the Army, *TRADOC Pamphlet (TP) 525-3-1, The U.S. Army Operating Concept: Win in a Complex World* (Washington, DC: Government Printing Office, 2014), 22.

[23] Ibid., 21-22.

[24] Ibid., 22.

With the advent of the information age, the bottom-up forms of adaptation associated with complex adaptive systems may very well replace the traditional forms of bureaucratic leadership that have monopolized change in the industrial economy.[25] Complexity Leadership Theory enables commanders and staffs to employ their human capital in ways that generate bottom-up learning and create capability wealth in their organizations. To overcome adaptive challenges, traditional bureaucracies, including the US military, must cultivate leadership practices that leverage the collective intelligence of their human assets in a manner that promotes faster learning and triggers emergent change.[26] The US military must fight complexity with complexity.[27]

Complexity Leadership Theory

Old Paradigms

We live in an era where knowledge is a core commodity, and the ability to rapidly generate knowledge, innovate, and adapt is imperative for organizational survival.[28] Despite the leading role of knowledge in organizational vitality, the efficiency-oriented leadership paradigms of the industrial economy remain a dominant theme in modern organizations.[29] Namely, much of leadership theory remains rooted in a bureaucratic mindset that places leaders at the top of organizations and overlooks the fact that leadership may emerge from the foot of the table.[30] This

[25] Robert Axelrod and Michael D. Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier* (New York: Basic Books, 2000), 29.

[26] John Child and Rita Gunther McGrath, "Organizations Unfettered: Organizational Form in an Information-Intensive Economy," *Academy of Management Journal* 44, no. 6 (December 2001): 1139.

[27] Uhl-Bien, Marion, and McKelvey, 301.

[28] Richard A. Bettis and Michael A. Hitt, "The New Competitive Landscape," *Strategic Management Journal* 16, no. S1 (1995): 7–19.

[29] Brook Manville and Josiah Ober, "Beyond Empowerment: Building a Company of Citizens," *Harvard Business Review* 81, no. 1 (January 2003): 48.

[30] Heifetz, 184.

top-down mindset charges leaders with setting goals and determining managerial practices for achieving those goals.[31] Bureaucratic leadership places the individual leader ahead of the group and focuses on how leaders can influence subordinates to achieve the organization's goals (the leader's goals) within existing hierarchical frameworks. In short, Industrial Era leadership posits that leaders are the horse and subordinates are the cart. Therefore, it is the responsibility of leaders to solve problems and pull subordinates in the direction of organizational goals.

To date, most leadership study has hinged on finding better ways to exert influence, or, pull the cart, without questioning the meaning of leadership itself. This quest for influential greatness supposes a perfect and enduring understanding of what leadership is – the ability to influence. Furthermore, cost savings encourage and incentivize organizational anchoring to formal authority and bureaucratic hierarchies. Mary Jo Hatch, a leading voice in modern organization theory, explains that the use of informal power at lower levels of an organization expends resources and erodes the overall power base, whereas formal power does not expend resources and has fewer costs.[32] That said, in the parochial leadership paradigms of the Industrial Era, formal authority embedded in hierarchies and the ability to influence denoted the marks of leaders. Leaders had to influence subordinates to accept and pursue a vision. If something went wrong or the leader's vision grew unattainable, the fault rested solely with the leader. During times of strain, subordinates looked to the leader for solutions, and thus leaders became single points of failure within organizations. This flight to formal authority was and remains dangerous for two reasons: it promoted work avoidance at the most critical times, and it crippled the collective resources of the group, the very resources necessary to accomplish adaptive work.[33] Complexity Leadership Theory proposes an alternative to top-down leadership.

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[31] Uhl-Bien, Marion, and McKelvey, 301.

[32] Mary Jo Hatch, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*, 4th ed. (Oxford: Oxford University Press, 2018), 288.

[33] Heifetz, 73.

A New Leadership Paradigm

Complexity Leadership Theory is a leadership framework that aims to increase the adaptive capacity of knowledge-producing organizations and relies on complex adaptive systems to enable learning and creativity. Organizations born of the industrial economy crafted rigid structures and processes to avoid instability and uncertainty.[34] In contrast, Complexity Leadership Theory seeks to harness complexity by provoking instability and "deliberately changing the structure of a system in order to increase some measure of performance," and by "exploiting an understanding that the system itself is complex."[35] Merging complexity with bureaucracy and informal emergence with top-down control denotes the main goals of Complexity Leadership Theory.[36] Moreover, Complexity Leadership Theory does not eschew instability. It encourages it.

Any argument for or against Complexity Leadership Theory must begin with a baseline understanding of systems and systems theory. Systems are groups of elements that when connected form a whole, with properties unique to the whole and separate from elements that contributed to it.[37] Another definition describes systems as a set of elements or parts that are coherently organized and interconnected in patterns or structures that produce characteristics and behaviors separate from the constituent parts, resulting in a function or purpose.[38] In short, a system is more than the sum of its parts.[39] Like hydrogen and oxygen combining to form water,

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[34] Anne Y. Ilinitch, Richard A. D'Aveni, and Arie Y. Lewin, "New Organizational Forms and Strategies for Managing in Hypercompetitive Environments," *Organization Science* 7, no. 3 (June 1996): 217.

[35] Axelrod and Cohen, 9.

[36] Uhl-Bien, Marion, and McKelvey, 304.

[37] Peter Checkland, *Systems Thinking, Systems Practice* (New York: John Wiley & Sons Ltd., 1981), 3.

[38] Donella H. Meadows and Diana Wright, *Thinking in Systems: A Primer* (White River Junction, Vt: Chelsea Green Pub, 2008), 188.

[39] Ibid.

with a taste and liquid texture separate and distinct from the two elements that created it, systems possess the ability to comprise something new and original.[40] Furthermore, systems are everywhere. Militaries, schools, churches, corporations, computer networks, economies, societies, governments, and galaxies all constitute systems. Systems can nest within other systems, creating systems of systems.[41]

Systems have a natural propensity for complexity. In the modern knowledge economy, endless advancements in technology spawn new systems and linkages for system to system interaction, compounding the complexity of systems with each passing moment. So innumerable are the problems that may arise from the unintended or spontaneous reorganization of systems and system sub-elements that a systems theory becomes not only necessary but essential for survival.[42] Like most theories that seek to enhance understanding of a phenomenon by identifying patterns, systems theory seeks to find common features of system organization.[43] These commonalities, or, invariances, form the foundation upon which further scientific study can hypothesize and experiment. Systems make up the world around us, and systems thinking helps us understand the complexities embedded in the world.[44] Furthermore, systems thinking allows humans to understand their place in the world and predict the outcomes of human influence on complex systems. Understanding complex systems allow us to create desired change. Moreover, system theory unlocks the possibility of forcing adaptation within an organization.

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[40] Checkland, 3.

[41] Donella and Wright, 11-12.

[42] Ludwig von Bertalanffy, *General System Theory: Foundations, Development, Applications*, rev. ed. (New York: Braziller, 2003), 4.

[43] Ervin Laszlo, *The Systems View of the World: A Holistic Vision for Our Time* (Cresskill, NJ: Hampton Press, 1996), 17.

[44] Checkland, 3.

Complexity Leadership Theory builds on the proposition that "much of leadership thinking has failed to recognize that leadership is not merely the influential act of an individual or individuals, but rather it is embedded in a complex interplay of numerous interacting forces."[45] Complexity Leadership Theory therefore suggests a fundamental change to the meaning of leadership and shifts the mark of leadership from influence to progress. This relatively new theory replaces the outdated idea that leadership means influencing the organization to follow a vision. In Complexity Leadership Theory, leadership means helping the organization solve its own problems.[46] The organization's ability to self-organize, adapt to challenges, and progress toward goals signifies the new mark of leadership. When viewed through this new lens, leadership is no longer a character attribute of an individual. In Complexity Leadership Theory, leadership is change that emerges from the interaction of complex adaptive systems.[47]

Complex Adaptive Systems

Complex adaptive systems are the primary unit of analysis in complexity science – a science that looks beyond the traditional bureaucratic leadership paradigms of the Industrial Era, and casts leadership as a complex iterative dynamic through which adaptive changes emerge.[48] Furthermore, complex adaptive systems form the neural-like networks that exist naturally in social systems. The continuous interplay of agents (people, structures, processes), the infinite overlapping combinations thereof, and the "spaces between" agents form the complex adaptive systems that comprise an organization.[49] When properly nurtured or manipulated, complex

[45] Uhl-Bien, Marion, and McKelvey, 302.

[46] Heifetz, 14.

[47] Uhl-Bien, Marion, and McKelvey, 302.

[48] Ibid., 314.

[49] Hilary Bradbury and Benyamin B. Lichtenstein, "Relationality in Organizational Research: Exploring the Space Between," *Organization Science* 11, no. 5 (September 2000): 551.

adaptive systems have the capability to solve problems and generate creativity.[50] Complexity Leadership Theory seeks to cultivate emergence in the forms of learning, creativity, and adaptability by harnessing the adaptive power of complex adaptive systems within existing hierarchies.[51]

One cannot fully appreciate the advantages proposed by complex adaptive systems without first understanding the concept of emergence. As the name implies, emergence occurs when something that did not previously exist comes into existence. Within the context of complex adaptive systems, emergence occurs when stability and order suddenly spring out of chaos and randomness.[52] Furthermore, emergence is never the cause of one thing. Rather, it is change that stems from the complex interactions of numerous variables.[53] This suddenness can take the form of creativity and learning, which can provide solutions to complex problems or unintended outcomes, also known as adaptive change.[54] Therefore, it follows logic to say that organizations can harvest greater amounts of adaptive change (emergence) by provoking instability and encouraging complexity.

Why is adaptive change so desirable? In the modern economy where knowledge is essential for survival, adaptive change is indispensable. Adaptive change is new knowledge that emerges from the clashing of interdependent variables within or between complex adaptive systems. Furthermore, knowledge equals capability wealth in the face of adaptive challenges. A familiar form of adaptive change (new knowledge) are those "aha" moments when two seemingly

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[50] Uhl-Bien, Marion, and McKelvey, 306.

[51] Ibid., 299.

[52] Russ Marion, *The Edge of Organization: Chaos and Complexity Theories of Formal Social Systems* (Thousand Oaks, CA: Sage Publications, 1999), 42.

[53] Ibid., 41.

[54] Uhl-Bien, Marion, and McKelvey, 303.

incompatible ideas from two interdependent individuals clash and form new and creative ideas.[55] By challenging and responding to each other's ideas, the two people in the example arrived at new knowledge that could not have emerged without their interaction. It is not accurate to say that the knowledge of one added to the knowledge of the other or vice versa, because the new knowledge is something that neither individual possessed before. The sum is greater than the parts that contributed to it, and it cannot be reduced to the elements that caused it.[56] Like two asteroids colliding and forming something new, adaptive changes create new knowledge that could not have existed previously without the interaction of complex adaptive systems. The change is permanent. Once new knowledge is created, it cannot be unlearned, just as the two asteroids cannot revert to their previous forms before the collision.

To exploit the benefits of complex adaptive systems, the Complexity Leadership Theory framework acknowledges and employs a dynamic mix of three leadership types: administrative, adaptive, and enabling. Administrative leadership is synonymous with the bureaucratic leadership philosophies widespread in the industrial economy. It refers to the actions of individuals in assigned managerial roles.[57] Traditionally, administrative leaders have had little influential bearing on creativity or innovation.[58] Their fundamental importance lay in planning and allocating resources to achieve set plans.[59] Adaptive leadership somewhat represents the antonym of administrative leadership. Adaptive leadership is "an informal emergent dynamic that occurs among informal agents (complex adaptive systems) and is not an act of authority." Adaptive

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[55] Uhl-Bien, Marion, and McKelvey, 307.

[56] Laszlo, 26.

[57] Uhl-Bien, Marion, and McKelvey, 305.

[58] Michael D. Mumford, Katrina E. Bedell-Avers, and Samuel T. Hunter, “Planning for Innovation: A Multi-Level Perspective,” in *Multi-Level Issues in Creativity and Innovation,* vol. 7, ed. Michael D. Mumford, Katrina E. Bedell-Avers, and Samuel T. Hunter (Bingley: Emerald Group Publishing Limited, 2008), 137.

[59] Ibid., 108.

leadership extends beyond managerial roles to everyday employees, and can occur anywhere in an organization, to include boardrooms, hallways, or a group gathered around the proverbial water cooler.[60] If left unchecked, adaptive leadership can have catastrophic consequences, as countless undesirable and irreversible outcomes emerge from the spontaneous and unceasing collisions of complex adaptive systems.

Enabling leadership lies in the adaptive space between an organization's operational and entrepreneurial systems.[61] The operational system drives an organization's natural tendency to seek structure and formality, whereas the entrepreneurial system strives for creativity and innovation.[62] Enabling leaders exploit the inherent tension in the adaptive space between the two systems by brokering connections that spark emergence.[63] By entangling administrative leadership in the operational system with the emergent dynamics of adaptive leadership in the entrepreneurial system, enabling leadership allows organizations to regulate creative output and tailor adaptability to the situation. In the same way hot and cold knobs are manipulated to produce a desired water temperature from the faucet, enabling leaders manage administrative and adaptive leadership to produce desired amounts of adaptive change.[64] This allows enabling leaders to manipulate complexity output levels along a continuum, with one end representing tight bureaucracy, and the other representing decentralization.[65] However, in formal organizations, to include militaries, it is impossible to completely disentangle bureaucracy from

[60] Uhl-Bien, Marion, and McKelvey, 305.

[61] Michael J. Arena and Mary Uhl-Bien, "Complexity Leadership Theory: Shifting from Human Capital to Social Capital," *People & Strategy* 39, no. 2 (Spring 2016): 22.

[62] Ibid., 23.

[63] Ibid., 24.

[64] Uhl-Bien, Marion, and McKelvey, 305.

[65] Christopher R. Paparone and George L. Topic Jr., "Mission Command: The Starfish and the Spider," *Army Sustainment* 46, no. 3 (June 5, 2014): 5.

complex adaptive systems (all hot or all cold).[66] Enabling leadership steps in to manage and coordinate oscillations between hierarchical dynamics and complex adaptive systems.[67] It represents a sort of strategic flexibility where enabling leaders balance the steady and fluid states of the organization.[68] Enabling leadership aims to spawn desirable, emergent outcomes by manipulating enabling conditions between complex adaptive systems and adaptive leadership.[69] In sum, enabling leadership allows adaptive leadership to thrive within the boundaries of a bureaucratic structure.

Complexity Leadership Theory makes a clear distinction between leadership and leaders. In Complexity Leadership Theory, leadership is "an emergent, interactive dynamic that is productive of adaptive outcomes."[70] In essence, Complexity Leadership Theory posits that leadership is a process, the output of which is something altogether new.[71] This understanding of leadership departs from traditional business and military interpretations which associate leadership with the influential prowess of individuals occupying prominent positions in bureaucratic hierarchies. Similarly, Complexity Leadership Theory's description of a leader diverges from conventional understandings of the term. The theory asserts that leaders are individuals who manipulate the interactive dynamic of a system to produce emergence.[72]

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[66] Paparone and Topic, 5.

[67] Katherine Thomas, Renata Kaminska-Labbé, and Bill McKelvey, *Managing the MNC and Exploitation/Exploration Dilemma: From Static Balance to Dynamic Oscillation*, vol. 22, Advances in Strategic Management (Bingley: Emerald Group Publishing Limited, 2005), 242.

[68] Michael A. Hitt, Barbara W. Keats, and Samuel M. DeMarie, "Navigating in the New Competitive Landscape: Building Strategic Flexibility and Competitive Advantage in the 21st Century," *Academy of Management Perspectives* 12, no. 4 (November 1998): 26.

[69] Uhl-Bien, Marion, and McKelvey, 309.

[70] Ibid., 299.

[71] Ibid.

[72] Ibid.

The above descriptions of Complexity Leadership Theory closely resemble what Ronald Heifetz terms, "leading without authority," which he describes as "engaging people to make progress on the adaptive problems they face." Heifetz further explains how making progress on problems requires new knowledge, and therefore leadership should promote acts to encourage, choreograph, and enhance organizational learning.[73] An added benefit of leading without authority is that it provides organizations with the experimental latitude to deviate from bureaucratic authority norms.[74] Freedom to roam outside the confines of bureaucratic structures increases the interactive potential of complex adaptive systems, thereby boosting the likelihood of emergence, or adaptive change.

Resistance to Change

The US military may have much to gain from Complexity Leadership Theory, although it continues to operate under the antiquated principals of the Industrial Era. Several possible factors explain the US military's indifference toward Complexity Leadership Theory principles. Important to note, each explanation assumes at the very least senior military leaders possess knowledge of Complexity Leadership Theory as a potential alternative to Industrial Era leadership philosophies.

There are many explanations for why the US military remains wedded to Industrial Era leadership paradigms. In *The Structure of Scientific Revolutions*, historian of science Thomas Kuhn describes paradigms as "universally accepted scientific achievements that for a time provide model problems and solutions to a community of practitioners."[75] In the context of the US military, the top to bottom rank and file system represents the dominant paradigm for finding

[73] Heifetz, 187.

[74] Ibid., 188.

[75] Thomas S. Kuhn, *The Structure of Scientific Revolutions*. 3rd ed. (Chicago, IL: University of Chicago Press, 1996), x.

solutions to problems, and it has served the United States well. In the minds of many military decision makers, wartime victories dating back to the American Revolution, coupled with the United States' current position atop the world balance of power, justify continued adherence to the current paradigm. Complexity Leadership Theory represents a threat to the paradigm that has afforded military practitioners unrivaled success in the past. From the perspective of military leaders, Complexity Leadership Theory is an anomaly that violates their methods for solving problems.

Anomalies stand out as violations of the current paradigms that govern normal science. Furthermore, current paradigms cannot explain anomalies.[76] Kuhn warns that when confronted with an anomaly that may potentially lead to the unlocking of a new paradigm, there will always be individuals who cling to old views. Therefore, outdated paradigms typically persist until the next generation of young practitioners replaces the incumbent generation and their paradigms.[77] In the meantime, dominant paradigms have a way of suppressing scientific narratives that run counter to their own. Scientific communities initially rejected Isaac Newton's theories of dynamics because they challenged the normal science of his time.[78] As Max Plank stated, "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opposition eventually die, and a new generation grows up familiar with it."[79] Perhaps no one explained this phenomenon more adeptly than Charles Darwin, who at the end of *Origin of Species* wrote,

> Although I am fully convinced of the truth of views given in this volume…, I by no means expect to convince experienced naturalists whose minds are stocked with a multitude of facts all viewed…, from a point of view directly opposite to mine…I look with confidence

[76] Khun, 52.

[77] Ibid., 18-19.

[78] Ibid., 148.

[79] Max Planck and Max Von Laue, *Scientific Autobiography and Other Papers* (New York: Philosophical Library, 1949), 33–34.

> to the future…, to young men and rising naturalists, who will be able to view both sides of the question with impartiality.[80]

Another potential explanation for the US military's resistance to Complexity leadership Theory principles stems from the fact that many military leaders do not consider their current paradigm lacking or insufficient to overcome wartime challenges. In other words, the leadership philosophy proposed by Complexity Leadership Theory and the military's existing leadership paradigm disagree that there is a problem that requires solving.[81] For US military leaders to entertain new leadership paradigms is to acknowledge that the current paradigm is somehow broken or lacking. Such an admission is unlikely for an organization steeped in a hierarchical command and control paradigm.

Assuming vulnerabilities do exist in the US military's leadership framework, a third explanation for the US military's indifference to Complexity Leadership Theory is simply that old habits die hard. People and organizations often cling to what worked in the past despite obvious changes in the environment.[82] This perhaps partially explains why Lieutenant General Michael D. Lundy, the Commanding General of the US Army's Combined Arms Center and Commandant of the Command and General Staff College at Fort Leavenworth, Kansas, has placed renewed emphasis on proficiency in large-scale combat operations against peer adversaries.[83] Large-scale combat operations yielded remarkable victories for the United States in World Wars I and II and Operation Desert Storm. Memories of these victories, as captured in art, literature, and film, invoke feelings of romanticism and pride within US military circles. On the other hand, the limited wars in Korea, Vietnam, and the global war on terror either ended in loss,

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[80] Charles Darwin, *The Origin of Species* (New York: Random House, 1993), 639.

[81] Kuhn, 148.

[82] Margaret Wheatley, "Good-Bye, Command and Control," in *Leader to Leader: Enduring Insights on Leadership from the Drucker Foundation's Award-Winning Journal*, ed. Frances Hesselbein and Paul M. Cohen (San Francisco, CA: Jossey-Bass, 1999), 152.

[83] Lundy, 112-118.

spurred feelings of bitter discontent, or, worse yet, both. Therefore, the natural tendency of successful organizations is to exercise the familiar practices that garnered their success in the first place and to avoid the discomforts associated with paradigm experimentation. The inherent danger in this approach is it assumes knowledge of how future wars will be fought. More specifically, emphasizing large-scale combat operations over all over forms of warfare assumes enemies will meet the United States in force on force battlefield engagements reminiscent of Industrial Era warfare. Therefore, to anticipate large-scale combat operations is to anticipate Industrial Era warfare, despite the obvious signs indicating that the Knowledge Era has changed the character of war.

A more complete answer regarding the US military's reluctance to adopt Complexity Leadership Theory centers on the issue of control. For decades leaders have sought prediction and control at the expense of creativity and spontaneity. To enhance control, leaders have designed their organizations and programmed their people to operate and behave like machines with machine-like predictability. The only thing left for leaders to do was provide the vision and intelligence to move the organization forward to the future.[84] To embrace Complexity Leadership Theory, a concept of leadership that emphasizes instability and encourages unpredictability must be adopted.

This monograph does not argue for the wholesale abandonment of military hierarchy. In any institution, there needs to be a boss or final authority who is accountable for the overall performance of the organization and can make decisions for subordinates to carry out.[85] There is no such thing as Colin Hales' "post-bureaucratic" organizations, absent of all hierarchy, rules, and divisions of labor.[86] All organizations are bureaucracies to some degree, and a baseline

[84] Wheatley, 151.

[85] Peter F. Drucker, "Management's New Paradigms," *Forbes* 162, no. 7 (October 5, 1998): 158.

[86] Colin Hales, "'Bureaucracy-Lite' and Continuities in Managerial Work," *British Journal of Management* 13 (March 2002): 52.

structure must always be present or the organization may collapse into complete chaos. This monograph readily acknowledges the need for structure but argues that the levels of bureaucracy and control be tempered to the complexity of the operating environment. During periods of environmental stability, it may be advisable to emphasize structure. During times of volatility, an organization may prefer to downplay structure and emphasize complexity.[87] This requires organizations to be ambidextrous, and balance the tension between exploiting current knowledge and exploring complexity in search of new knowledge.[88]

Doctrine

Joint Doctrine

Joint Doctrine does not prescribe definitions for leader or leadership. In the absence of higher-level doctrine, individual services freely assign definitions and meanings to these terms within the confines of their service-specific doctrines. Therefore, any worthwhile discussion regarding Complexity Leadership Theory and its potential application to the US military must begin with a clear understanding of commonly used terms as defined by each service. Section II provided a detailed analysis of Complexity Leadership Theory's definitions of leader and leadership. This section will examine the concepts of leader and leadership, as defined by Army and Air Force doctrines. Important to note, although the US Navy stresses the importance of leaders and leadership throughout its various doctrinal publications, the Navy does not have a dedicated leadership publication in its doctrine library. In the absence of Navy leadership doctrine, this research assumes that Army and Air Force leadership doctrines are representative of the greater Department of Defense. In consideration of the US Army's recent doctrinal pivot from

[87] Uhl-Bien, Marion, and McKelvey, 305.

[88] Michael L. Tushman and Charles A. O'Reilly III, "Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change," *California Management Review* 38, no. 4 (Summer 1996): 11.

limited and counterinsurgency warfare to great power conflict, this section will also examine the Army's doctrinal descriptions of large-scale combat operations and multi-domain battle. Lastly, in recognition that informal emergence (adaptive change) constitutes the primary goal of Complexity Leadership Theory, this section will conclude by examining Army and Air Force doctrinal methodologies for facilitating adaptation.

Army Doctrine

Army Leaders

Army Doctrine Publication (ADP) 6-22, *Army Leadership*, is the source doctrine for Army leadership concepts. Its primary audience is US Army leaders at all levels, to include enlisted soldiers and Army civilians.[89] Within ADP 6-22, The Leadership Requirements Model list the leadership attributes and competencies expected of Army leaders (see Figure 1). The three leadership attributes are character, presence, and intellect. The three competencies are leads, develops, and achieves.[90]

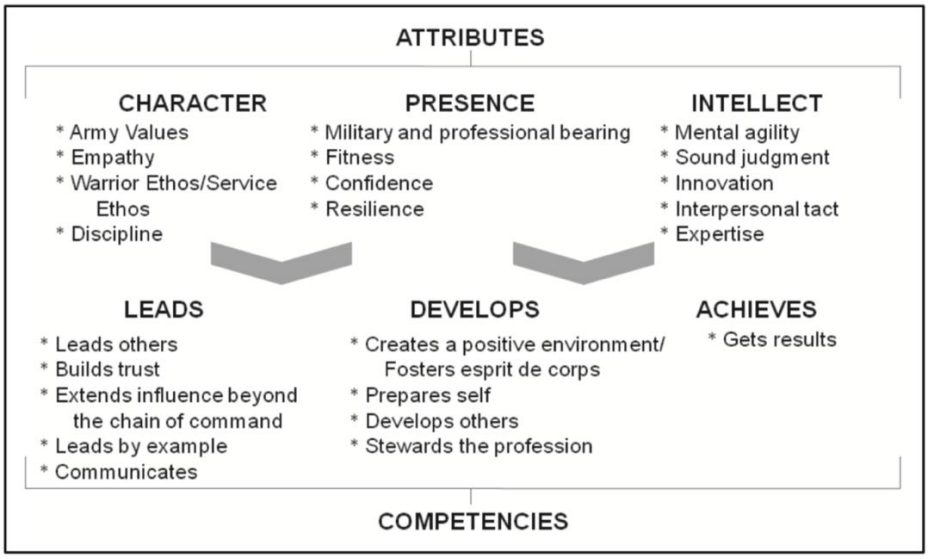

Figure 1. Army Leadership Requirements Model. Army Doctrine Publication (ADP) 6-22, *Army Leadership* 2012, 5.

[89] US Department of the Army, *Army Doctrine Publication (ADP) 6-22, Army Leadership* (Washington, DC: Government Printing Office, 2012), ii.

[90] Ibid., 5.

Who is an Army leader? ADP 6-22 states, "An Army leader is anyone who by virtue of assumed role or assigned responsibility inspires and influences people to accomplish organizational goals."[91] This definition points to a narrower audience than all soldiers, like the preface of ADP 6-22 broadly implies. If everyone is a leader, then no one is a follower, and organizational goals will stagnate. The Army definition of leader makes it clear that a prerequisite for becoming a leader is to occupy an assumed role with specific responsibilities therein. The definition further implies that occupying a position or office alone does not merit the title of leader. In addition to roles and responsibilities, individuals must inspire and influence others to accomplish unit goals. In this subtle way, the Army definition of leader makes a distinction between managers and leaders. Unlike managers who can leverage their titles and offices to demand results, Army leaders must shoulder the additional responsibility of inspiring and influencing subordinates to achieve unit goals.

Army Leadership

Leadership is the bridge between managers and leaders. ADP 6-22 defines leadership as "the process of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization."[92] Moreover, Army doctrine describes leadership as a learnable trait that can be developed over time.[93]

Levels of Army Leadership

Army Doctrine Reference Publication (ADRP) 6-22, *Army Leadership,* expands on the concepts presented in ADP 6-22, dividing leadership into three ascending levels: direct,

[91] US Army, ADP 6-22 (2012), 1.

[92] Ibid.

[93] Ibid.

organizational, and strategic.[94] The degrees of complexity and uncertainty within each level of leadership are directly proportional to the level itself. At the lowest level of leadership, the direct level, problems bare little complexity or uncertainty. Direct level leadership takes the form of face-to-face, front-line leadership, and typically occurs in organizations where subordinates routinely see their leader.[95] Organizational leadership represents the next higher level of leadership. At the organizational level, leaders indirectly influence several hundred to several thousand subordinates through the policies they set and the climates they create. Organizational leaders encounter problems that are more complex and more uncertain than challenges associated with direct level leadership.[96] Strategic leadership denotes the highest level of Army leadership. At the strategic level, leaders are responsible for large organizations ranging in size from several thousand to several hundred thousand personnel. Strategic leaders set the vision for their organizations, and then man, resource, and train their forces to execute that vision. They work in highly uncertain environments and deal with extremely complex problems.[97]

Since intellect is synonymous with wealth in the knowledge economy, it is worth mentioning that intellect plays a pertinent role as one of only three prescribed leadership attributes in Army doctrine.[98] ADP 6-22 states "intellect affects how well a leader thinks about problems, creates solutions, makes decisions and leads others."[99] The five sub-attributes that constitute intellect are mental agility, sound judgment, innovation, interpersonal tact, and

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[94] US Department of the Army, *Army Doctrine Reference Publication (ADRP) 6-22, Army Leadership* (Washington, DC: Government Printing Office, 2012), 2-4.

[95] Ibid

[96] Ibid., 2-5.

[97] Ibid.

[98] Laurie Bassi, "Human Capital Advantage: Developing Metrics for the Knowledge Era," *Line Zine*, accessed August 22, 2018, http://www.linezine.com/7.2/articles/lbhca.htm.

[99] US Army, ADP 6-22 (2012), 7.

expertise. Mental agility allows leaders to address changes and adapt to the dynamic nature of operations. Critical and innovative thought fuel leader adaptability. Lastly, sound judgment allows leaders to make the best decision with the information available to them. The five sub-attributes combine to create intellect, which is key to transforming knowledge into understanding and quality execution.[100]

The above doctrinal analysis of Army leadership concepts reveals that leading, exerting leadership, and possessing intellect are the responsibilities of individual officeholders with subordinates assigned to them. More to the point, Army doctrine indirectly advocates that leadership is a top-down enterprise. It goes without saying that any soldier, regardless of rank or position, has the potential to become or may already be an outstanding leader. However, from a purely doctrinal point of view, the Army appoints leaders and charges them with creating solutions, making decisions, and possessing the intellect and mental agility to address changes and adapt to the evolving nature of combat. This top-down leadership design mimics the widespread hierarchies that dominated Industrial Era factories and may create a natural barrier for bottom-up solutions to adaptive challenges.

Large-Scale Combat Operations

Published in 2017, Field Manual (FM) 3-0, *Operations*, represents the US Army's governing manual for combat operations employment. It defines large-scale combat operations as, "major operations and campaigns aimed at defeating an enemy's armed forces and military capabilities in support of national objectives."[101] This definition nests neatly within joint doctrine's definition of large-scale combat operations. Joint Publication (JP) 3-0, *Joint Operations*, defines large-scale combat operations as a campaign (or campaigns) with a series of related major operations aimed at achieving strategic and operational objectives within a given

[100] US Army, ADP 6-22 (2012), 7.

[101] US Department of the Army, *Field Manual (FM) 3-0, Operations* (Washington, DC: Government Printing Office, 2017), 1-1.

time and space.[102] Furthermore, FM 3-0 describes large-scale combat operations as intense, lethal, and grinding, placing them on the far right extreme of the conflict continuum (see Figure 2). Chaos, fear, violence, and uncertainty flourish in large-scale combat operations. In summary, doctrine proclaims that large-scale combat operations pose the greatest challenge for US Army forces.[103]

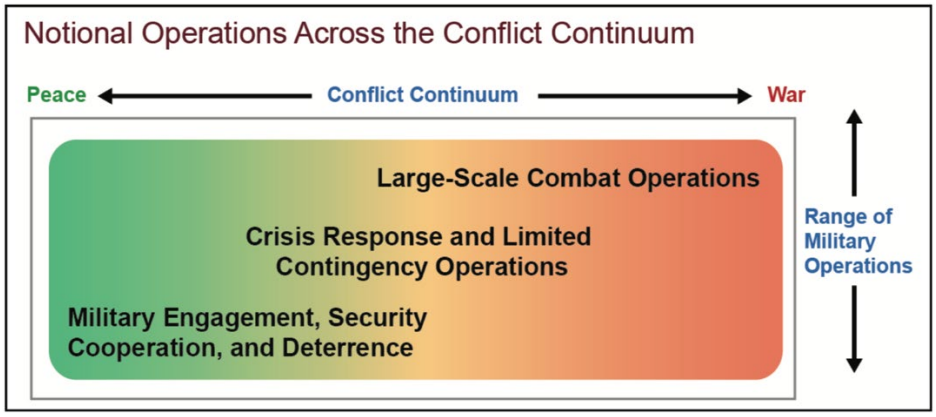

Figure 2. The Conflict Continuum and the Range of Military Operations. Field Manual (FM) 3-0, *Operations,* 2017, 1-1.

US military history is replete with large-scale combat experience. The Civil War, World Wars I and II, and many other conflicts all demonstrate that the US military is no stranger to large-scale combat operations. However, many high-ranking Army leaders fear that the concept of great power war against a peer adversary has somewhat faded from the US military's cultural memory. In the 2017 rewrite of FM 3-0, Lieutenant General Lundy attributes the Army's present unfamiliarity with large-scale combat operations to three decades of low-intensity conflict in the Middle East.[104] The manual emphasizes that during the Unites States' preoccupation with counterinsurgencies, state adversaries (China, Russia, North Korea, Iran) have studied the US

[102] US Department of Defense, Joint Staff, *Joint Publication (JP) 3-0, Joint Operations* (Washington, DC: Government Printing Office, 2017), VIII-1.

[103] Ibid.

[104] Ibid., ix.

military and adapted their militaries to counter American strengths and exploit weaknesses in every domain, to include space and cyberspace.[105]

Feeling the readiness pinch in the face of peer competition, Army leaders at all levels have placed renewed interest in making large-scale combat operations the focal point of training, doctrine, organization, and readiness. Monumental changes in the 2017 edition of FM 3-0 reflect the Army's perceived capability gaps in terms of unpreparedness for conducting large-scale combat operations. Perhaps the most significant change, the new manual stipulates that during large-scale combat operations, Army divisions will operate as formations and not only as headquarters - an increase in size over previous editions of the manual, which identified brigade combat teams as the highest tactical echelon of combat.[106] Lundy elaborated on this doctrinal change in the October 2018 edition of *Military Review*, when he stated, "Central to the idea of evolving the Army's Culture is re-enabling our division, corps, and theater armies to operate and fight as combat formations."[107] This statement harkens back to the time when massive formations, the likes of George S. Patton's Third Army, maneuvered multiple corps across vast distances and into combat against formidable enemies. Lundy expounded further on the change, stating, "Tactically-focused future divisions shape, dominate and win the close fight…This requires the future Army divisions to singularly focus on lethal, tactical warfighting; it is the principle tactical echelon above brigade."[108]

Multi-Domain Extended Battlefield

Underpinning the Army’s renewed focus on large-scale combat operations, Knowledge Era advancements in technology have expanded warfare to new domains. Army doctrine

[105] US Army, FM 3-0 (2017), ix.

[106] Ibid., 2-13.

[107] Lundy, 112.

[108] Ibid., 117-118.

describes the multi-domain extended battlefield as the interrelationship of the land, air, sea, space, cyberspace, information, and electromagnetic spectrum domains.[109] The increasing interconnectedness of each domain necessitates that commanders have a thorough understanding of the enemy's capabilities within each domain. For instance, the electromagnetic spectrum transcends all other domains.[110] If enemy capabilities in the electromagnetic spectrum exceed those of friendly capabilities in the same domain, the enemy can potentially deny, degrade, or defeat friendly capabilities in the space and cyberspace domains. Interruptions to friendly space and cyberspace capabilities would then cascade into the land, air, and sea domains. Suffice it to say, enemy overmatch in one domain can potentially weaken or deny friendly capabilities in all other domains.

Army Adaptability

Army FM 6-22, *Leader Development,* defines adaptability as an effective change in behavior in response to an altered or unexpected behavior.[111] In response to the rapid pace in which world events occur and continuously recast the geopolitical landscape, FM 6-22 stresses the importance of adaptability in military operations. The manual therefore encourages Army leaders to be keenly aware of their environment and to possess a mindset and knowledge that promote adaptation.[112]

The Army deems knowledge a key enabler of adaptation, and Complexity Leadership theorists would undoubtedly agree with the Army's assessment. Moreover, FM 6-22 states that adaptability at the individual level means having a "deep knowledge" and wide range of critical

[109] US Army, FM 3-0 (2017), 1-6.

[110] Ibid., 1-7.

[111] US Department of the Army, *Field Manual (FM) 6-22, Leader Development* (Washington, DC: Government Printing Office, 2015), 5-7.

[112] Ibid.

and creative thinking skills.[113] The manual further states that knowledge allows leaders to conceptualize unusual relationships, and the potential benefits and unintended consequences of actions applied to those relationships. Knowledge, therefore, enables leaders to think holistically, allowing them to see sets of relationships and interactions, and mentally simulate positive and negative outcomes of a decision.[114] With this, and although indirectly stated, the Army encourages leaders to take a systems approach to generating adaptation and solving complex problems. The greater the knowledge of the system, the higher the likelihood of adaptive success.

Not only does FM 6-22 emphasize the importance of adaptability, it also expounds on how Army leaders can increase their knowledge and boost their adaptive potential. The manual urges leaders to seek new sources of information, practice critical and creative thinking, practice repetition under challenging circumstances, reflect on experiences, seize opportunities to learn, and lastly create and maintain a culture of innovation and experimentation with freedom to fail.[115] With these tips for adaptive success, the Army goes beyond routine lip service to catchphrase concepts and galvanizes adaptability's place in doctrine as a legitimate goal for operational leaders.

Air Force Doctrine

Air Force Leaders

The source publication for Air Force leadership doctrine is Air Force Core Doctrine Volume 2, *Leadership*. Core Doctrine Volume 2 states, "Any Airman can be a leader and can positively influence those around him or her to accomplish the mission."[116] This description of leaders bypasses the Army prerequisite to occupy an assumed role or assigned responsibility,

[113] US Army, FM 6-22 (2015), 5-7.

[114] Ibid., 5-8.

[115] Ibid.

[116] US Department of the Air Force, Core Doctrine Volume II, *Leadership*, unpaginated, accessed September 15, 2018, https://www.doctrine.af.mil/Core-Doctrine/Vol-2-Leadership/.

presenting all Airmen with the opportunity to lead while at the same time refuting the notion that all Airmen are leaders. Furthermore, Core Doctrine Volume 2 clearly states: "Leadership does not equal command, but all commanders should be leaders."[117] The phrase “commanders should be leaders” suggests that not all commanders are leaders. Therefore, both Army and Air Force doctrine agree that positional authority alone does not equate to leadership. Where the Army and Air Force doctrine differ lies in who can be a leader. Air Force doctrine firmly asserts that any Airman can be a leader, whereas Army doctrine reserves the title of leader for individuals with assumed roles or assigned responsibilities.

Air Force Leadership

The Air Force's definition of leadership has evolved over time. However, a continuous theme links the Air Force's modern definition of leadership to the earlier doctrinal iterations. In 1948, one year after becoming an independent service, the Air Force released Air Force Manual (AFM) 35-15, *Air Force Leadership*. AFM 35-15 defined leadership as “the art of influencing people to progress with cooperation and enthusiasm toward the accomplishment of a mission.”[118] This definition of leadership persisted until 1985, when the Air Force released Air Force Pamphlet (AFP) 35-49, *Air Force Leadership*. AFP 35-49 defined leadership as “the art of influencing and directing people to accomplish the mission.”[119] The Air Force’s modern definition of leadership comes from Core Doctrine Volume 2, which explains “Leadership is the art and science of motivating, influencing, and directing Airmen to understand and accomplish

[117] US Air Force, Core Doctrine Volume II, unpaginated.

[118] US Department of the Air Force, *Air Force Manual (AFM) 35-15, Air Force Leadership* (Washington, DC: Headquarters US Air Force, 1948), 4, accessed December 16, 2018, https://babel.hathitrust.org/cgi/pt?id=uiug.30112106979450;view=1up;seq=8.

[119] US Department of the Air Force, *Air Force Pamphlet (AFP) 35-49, Air Force Leadership* (Washington, DC: Headquarters US Air Force, 1985), 1.

the mission."[120] Despite numerous doctrinal evolutions about leadership, influencing people to accomplish a mission has remained a constant theme of Air Force leadership since 1948.

Levels of Air Force Leadership

Like Army leadership doctrine, Air Force leadership doctrine divides leadership into three ascending levels: tactical expertise, operational competence, and strategic vision.[121] The leadership competencies required to accomplish an Airman's mission determine the level of leadership he or she operates in.[122] Each level of leadership is subdivided into three leadership competencies: personal, people/team, and organizational.[123] Personal competencies are most essential at the tactical expertise level of leadership, where face-to-face interactions between supervisors and subordinates are most common.[124] As Airmen ascend the levels of leadership, the requirement for personal competencies decreases and the requirement for organizational competencies multiplies. Emphasis on people/team competencies remains relatively constant throughout each level, decreasing only slightly from the tactical expertise to the strategic level.

The tactical expertise level encompasses small units where individuals perform specific tasks. These tasks contribute to the overall execution of operations at the operational level of war.[125] The tactical expertise level stresses technical proficiency in each Airman's primary assigned craft. Tactical tasks include everything from piloting an airplane, to treating a wound.[126] In addition to pursuing trade mastery, Airmen in the tactical expertise level hone their

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[120] US Air Force, Core Doctrine Volume II, unpaginated.

[121] Ibid.

[122] Ibid.

[123] Ibid.

[124] Ibid.

[125] Ibid.

[126] Ibid.

followership skills, assimilate into Air Force culture, and learn how to effectively communicate.[127] The tactical expertise level of leadership is the fertile soil from which operational and strategic leaders eventually germinate.

The operational competence level of leadership requires a balanced mix of all three institutional competencies. This level of leadership is synonymous with ADRP 6-22's description of operational level leadership. At the operational competence level of leadership, Airmen evolve past technical expertise in a particular craft and develop a broader understanding of Air Force operations.[128] Leaders at this level have less direct influence and more indirect influence over their subordinates. The operational competence level of leadership is where warfighting is executed and day-to-day Air Force operations are commanded and carried out.[129]

The strategic vision level of leadership represents the highest level of Air Force leadership. At this level, leaders boast a deep understanding of Air Force capabilities and know how to effectively integrate airpower into joint and multinational operations.[130] They possess an enterprise-wide perspective and an overall understanding of the capabilities of each subordinate organization, and how each organization interacts with one another. The Air Force's description of the strategic vision level of leadership mirrors what Army FM 6-22 describes as systems thinking: treating the factors of a situation as a system of interrelated parts with inputs, processes, outputs, and feedback.[131]

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[127] US Air Force, Core Doctrine Volume II, unpaginated.

[128] Ibid.

[129] Ibid.

[130] Ibid.

[131] US Army, FM 6-22 (2015), 5-6 – 5-7.

Air Force Adaptability

Similar to Army FM 6-22's emphasis on knowledge as a critical ingredient of adaptability, Air Force Core Doctrine Volume II lays out education as a primary means of enabling adaptability. Appendix C of Core Doctrine Volume II states that education is important when adaptive outcomes are desired.[132] This statement closely resembles Complexity Leadership Theory's description of the role knowledge plays in producing adaptive change, or emergence. Furthermore, Air Force doctrine contends that education aimed at enhancing critical thinking engenders creative solutions to new problems.[133] It further posits that "the fundamental aim [of education] is to develop individual talents to create successful outcomes in unfamiliar situations."[134] Again, this statement echoes the Knowledge Era idea that organizations must learn their way out of complex problems.[135] Although Air Force doctrine does not mention the Knowledge Era by name, it irrefutably testifies to the existence of a knowledge economy where education (knowledge) fuels adaptation.

In addition to education, Air Force doctrine indirectly acknowledges Knowledge Era complexities, prescribing a systems approach to solving complex problems. To facilitate system adaptation, the Air Force employs the Effects-Based Approach to Operations. The Effects-Based Approach to Operations is "an approach in which operations are designed, planned, executed and assessed in order to influence or change a system behavior to achieve desired outcomes."[136] The effects-based methodology closely parallels the concept of enabling leadership within Complexity

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[132] US Air Force, Core Doctrine Volume II, unpaginated.

[133] Ibid.

[134] Ibid.

[135] Uhl-Bien, Marion, and McKelvey, 300.

[136] US Department of the Air Force, Core Doctrine Volume III, *Command*, 18, accessed December 16, 2018, https://www.doctrine.af.mil/Core-Doctrine/Vol-3-Command/.

Leadership Theory, where ambidextrous leaders create and experiment with system linkages by acting as organizational connectors, in the hopes of generating emergence.[137]

Conclusions

Implications

In general, Army and Air Force leadership doctrines parallel each other. Both doctrines reserve the title of leader for those who employ the process of leadership and use their influence to inspire team members to achieve unit goals. In harmony with Complexity Leadership Theory and knowledge economy demands, both doctrines emphasize the importance of knowledge, intellect, and education in facilitating adaptation. The Army's Leadership Requirements Model promotes intellect as one of three essential leadership attributes. Army FM 6-22 emphatically touts knowledge as a critical enabler of adaptation. Similarly, Air Force Core Doctrine Volume II proclaims education is the key to creating successful outcomes to unfamiliar situations.[138] Like knowledge, both services indirectly acknowledge the merits of emergence from complex adaptive systems and advocate for a systems-based approach to developing creative solutions to complex problems. Army doctrine encourages leaders to conceptualize system relationships and the impacts of deliberately manipulating those relationships. Likewise, the Air Force's Effects Based Approach to Operations explicitly advocates for a systems approach to generating emergent, favorable, change by manipulating the system itself.

Where Army and Air Force leadership doctrines diverge in where they draw intellect from to facilitate adaptation. In the Army, intellect is a character attribute of Army leaders. Army doctrine emphasizes the intellect of influencers as a primary means of solving problems. Suffice

[137] Alva Taylor and Constance E. Helfat, "Organizational Linkages for Surviving Technological Change: Complementary Assets, Middle Management, and Ambidexterity," *Organization Science* 20, no. 4 (July 2009): 718.

[138] US Air Force, Core Doctrine Volume II, unpaginated.

to say, the US Army reserves intellect for the for those in positions of influence. Army leadership is, therefore, top-down focused, with the burden of responsibility to adapt and innovate placed on the intellectual shoulders of those with positional authority.

Although Army and Air Force leadership doctrines fair well when graded against Complexity Leadership Theory and Knowledge Era leadership demands, a rift exists between the leadership aspirations highlighted in leadership doctrine and the concept of command during planning and execution. In other words, operational doctrine does not practice what leadership doctrine preaches. Particularly within the Army, leadership doctrine and planning doctrine diverge over the relevance of enabling leadership in the planning and execution of operations. Army leadership doctrine advocates for a Knowledge Era approach to leadership, but operational doctrine encourages a more traditional form of Industrial Era leadership. Moreover, where the rubber meets the road during Army operational planning for complex adaptive challenges, leadership doctrine takes a back seat to the mission command philosophy and linear planning models rooted in Industrial Era paradigms.

ADP 6-0 defines the mission command philosophy as "the exercise of authority and direction by the commander using mission orders to enable disciplined initiative within the commander's intent to empower agile and adaptive leaders in the conduct of unified land operations."[139] By promoting adaptive leadership, the definition of mission command recognizes and supports a Knowledge Era approach to operations. However, the definition also elucidates that mission command is supportive of adaptive leadership if, and only if, it nests within the commander's intent, driving home the point that adaptive leadership is subordinate to command.

An array of linear planning methodologies illustrate the idea that adaptive leadership plays a secondary role to command. From the Operations Process to the Military Decision

[139] US Department of the Army, *Army Doctrine Publication (ADP) 6-0, Mission Command* (Washington, DC: Government Printing Office, 2012), 1.

Making Process (MDMP) to Army Design Methodology, doctrinal planning models cater to the commander and aim to simplify and reduce complex problems to manageable ends, ways, and means. In contrast to Army planning methodologies, Complexity Leadership Theory postulates that enabling leaders must increase complexity by decreasing bureaucracy when confronted with complex problems. Bureaucracy peeks during Army planning because the success of each planning methodology hinges on the staff's ability to help the commander understand, visualize, and describe the problem at hand so that he or she can identify operational objectives, lead soldiers by providing purpose and motivation, and assess progress towards achieving objectives.[140] Therefore, each Army planning process resembles Industrial Era leadership paradigms, placing the commander atop the decision-making hierarchy and overlooking the need for enabling leadership at lower levels. In short, Army planning methodologies make a clear distinction between leaders and commanders, with the latter elevated above the former.

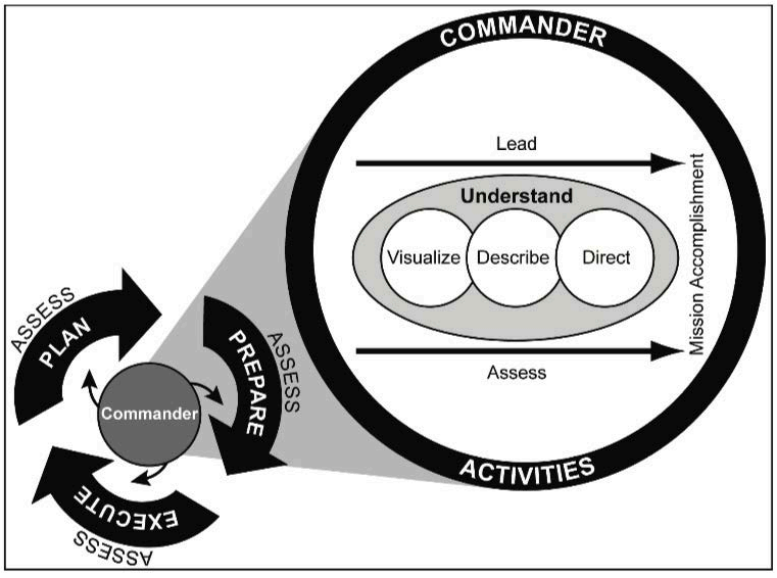

Figure 3. The Operations Process. Army Doctrine Publication (ADP) 5-0, *The Operations Process* 2012, 1.

[140] US Department of the Army, *Army Doctrine Publication (ADP) 5-0, The Operations Process* (Washington, DC: Government Printing Office, 2012), 2-4.

ADP 5-0, *The Operations Process*, represents the Army's bedrock doctrine for planning, preparing, and executing operations. The manual is clear that commanders, not enabling leaders, are the most important participants throughout the operations process.[141] ADP 5-0 states that commanders are the most important participants in effective planning.[142] Furthermore, 5-0 goes on to say that commanders "drive the operations process."[143] The MDMP, one of the Army's primary planning methodologies for producing operational plans, echoes ADP 5-0, stating that the commander is the most important participant throughout the seven-step process.[144] With this, Army planning doctrine leaves little room for interpretation; when it comes to operational planning and execution, the commander matters most, and industrial leadership flows unidirectionally from top to bottom.

Further propping up the idea that commanders are best suited to navigate complex problems, both Army and Air Force leadership doctrines associate complex problems with organizational and strategic-level leadership. This supposition reinforces the idea that only high-ranking officers at the upper echelons of military hierarchy possess the knowledge and ability to solve complex adaptive challenges. This is problematic for several reasons. First, bureaucracy-lined hierarchies consume precious time and present information with numerous opportunities for distortion as it travels through the chain of command to the commander's desk. Second, complex problems lack known remedies, even by experienced commanders, and therefore require new knowledge to successfully overcome them.[145] Lastly, senior decision makers are typically the furthest away from complex challenges and can lack the same level of understanding compared

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[141] US Army, ADP 5-0 (2012), 2.

[142] Ibid., 9.

[143] Ibid., 2.

[144] US Department of the Army, *Field Manual (FM) 6-0, Commander and Staff Organization and Operations* (Washington, DC: Government Printing Office, 2014), 9-2.

[145] Heifetz, 22.

with those closest to the problem. To quote Peter Drucker, "It took something like 20 years…for the U.S. Air Force to really understand who should have the last word as to whether a new aircraft was ready to fly. It turns out that the real boss was the sergeant crew chief, not the colonel who commands the repair crews."[146]

A Way Forward

Drucker's observation underpins a deep-rooted cultural flaw that transcends the Department of Defense and accentuates the salient point of this monograph. Commanders covet control and order and are uncomfortable with uncertainty. Despite the leading role of knowledge in organizational survival, the US military remains anchored to industrial leadership concepts that favor hierarchy and predictability over creativity and experimentation at lower levels. Furthermore, the time-honored chain of command may not create opportunities to manipulate the existing hierarchy to facilitate bottom-up knowledge creation, and it has a hard time believing that lower-level uniformed personnel would behave responsibly without direct control.[147] This explains the divergence between operational and planning doctrines that emphasize control and leadership doctrines that encourage creativity and adaptation. Direct control also explains why operational and planning doctrines remain wedded to industrial economy paradigms like increased lethality, large-scale combat operations, and command, despite the changing character of war in the Knowledge Era, as highlighted by Russian actions in Ukraine.

To focus training and doctrine on Industrial Era concepts is to overlook Knowledge Era influences that are changing the character war. No fixed leadership structure can have lasting relevance in a world of constant change.[148] In Knowledge Era combat, no amount of control,

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[146] Drucker, 161.

[147] William E. Halal, "The Infinite Resource: Mastering the Boundless Power of Knowledge," in *Twenty-First Century Economics: Perspectives of Socioeconomics for a Changing World,* ed. William E. Halal and Kenneth B. Taylor (New York: St. Martin's Press, 1999), 59.

[148] Ibid.

Napoleonic genius, or commander's *coup d'oeil* can surmount the complex challenges that commanders will undoubtedly face. Nor will the collective wisdom of a few individuals atop the military chain of command adequately contend with the adaptive capacity and dynamic nature of complex adaptive systems. In 1812, Napoleon himself failed to recognize Russian adaptations to his annihilation-based system of warfare, and he paid dearly for it.

The rapid pace of Knowledge Era combat will not slow to accommodate Industrial Era hierarchies. History has shown that some of the most effective military organizations have been those capable of minimizing bureaucracy and acting with relative autonomy.[149] During World War II, General Erwin Rommel minimized bureaucracy by running the 7th Panzer Division like a company-size unit.[150] At times, he deliberately turned off his radio to avoid orders from higher headquarters.[151] He enabled his subordinate leaders to press attacks without orders from him, and swift victories against the Polish and the French proved him right for doing so.[152] Flattening organizational hierarchies allowed the 7th Panzer Division to respond to challenges and adapt more rapidly than if it had to await decisions from a linear chain of command.[153]

Perhaps no other general officer in the last 100 years of military history typifies complexity leadership more than Field-Marshall Viscount William Slim. During World War II, Slim turned embarrassing allied defeat into overwhelming victory against Imperial Japanese forces in Burma. By exercising enabling leadership within the Fourteenth Army, Slim effectively

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[149] Charles C. Heckscher, "Defining the Post-Bureaucratic Type," in *The Post-Bureaucratic Organization: New Perspectives on Organizational Change,* ed. Charles C. Heckscher and Anne Donnellon (Thousand Oaks, CA: Sage Publications, 1994), 48.

[150] Gerhard Paul Gross and David T. Zabecki, *The Myth and Reality of German Warfare: Operational Thinking from Moltke the Elder to Heusinger* (Lexington, KY: University Press of Kentucky, 2016), 203.

[151] Ibid, ix.

[152] Ibid. 203.

[153] Heckscher, 48.

led a multinational coalition that spanned a 700-mile front through some of the densest jungle on earth. Having recognized the importance of timely information, Slim broke with his contemporaries and moved his headquarters almost 200 miles forward so that he could be close to the fighting areas.[154] Doing so increased his systems knowledge of the operating environment and allowed him to broker connections between subordinate units and rapidly adapt to complex situations.[155] He synchronized land and air power by co-locating his air forces and his headquarters.[156] Slim minimized bureaucracy by keeping his headquarters staff small.[157] He flipped hierarchy on its head by allowing the higher-ranking Lieutenant General Joe Stilwell to serve under his command in Fourteenth Army.[158] Furthermore, Slim gave Stilwell creative autonomy and promised not to bother him with a "spate of orders."[159] By operating in the adaptive space between administrative control and creative instability, Slim maximized the adaptive capacity of the Fourteenth Army and eventually defeated the Japanese.

Exploring differences between US military operational planning doctrine, leadership doctrine, and the leadership concepts proposed by Complexity Leadership Theory reveal gaps in the US military's ability to exploit complex adaptive systems and rapidly respond to adaptive challenges. The present situation warrants a comprehensive reexamination of operational doctrine and the linear planning models prescribed by Army and Air Force planning doctrines. When successfully operationalized, knowledge can radically change the competitive landscape in any

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[154] William J. Slim, *Defeat into Victory* (London: Macmillan, 1986), 199.

[155] Arena and Uhl-Bien, 23.

[156] Slim, 199.

[157] Ibid., 201.

[158] Ibid., 207.

[159] Ibid.

arena.[160] Therefore, the winners of future military competitions, including large-scale combat operations, will be those organizations who can flatten hierarchies, minimize bureaucracy, and employ knowledge to influence and exploit the systems embedded around them. To bridge the gap between Industrial Era and Knowledge Era warfare, the US military must weaponize complexity by embracing a new theory of leadership, one capable of employing the collective knowledge of the organization, rapidly generating new knowledge, and manipulating complex adaptive systems to generate adaptive change.

[160] Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity; a Platform for Designing Business Architecture*, 3rd ed. (Amsterdam: Elsevier, 2011), 22.

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