

Canadian
Forces
College

Collège
des
Forces
Canadiennes



MISSION COMMAND AND ARMY DESIGN: A COMPLEMENTARY APPROACH TO OPERATING IN COMPLEXITY

Maj B.P. Wadsworth

JCSP 43

Exercise Solo Flight

Disclaimer

Opinions expressed remain those of the author and do not represent Department of National Defence or Canadian Forces policy. This paper may not be used without written permission.

© Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.

PCEMI 43

Exercice Solo Flight

Avertissement

Les opinions exprimées n'engagent que leurs auteurs et ne reflètent aucunement des politiques du Ministère de la Défense nationale ou des Forces canadiennes. Ce papier ne peut être reproduit sans autorisation écrite.

© Sa Majesté la Reine du Chef du Canada, représentée par le ministre de la Défense nationale, 2017.

EXERCISE *SOLO FLIGHT* – EXERCICE *SOLO FLIGHT*

**MISSION COMMAND AND ARMY DESIGN: A COMPLEMENTARY
APPROACH TO OPERATING IN COMPLEXITY**

Maj B.P. Wadsworth

“This paper was written by a student attending the Canadian Forces College in fulfilment of one of the requirements of the Course of Studies. The paper is a scholastic document, and thus contains facts and opinions, which the author alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada and the Canadian Department of National Defence. This paper may not be released, quoted or copied, except with the express permission of the Canadian Department of National Defence.”

Word Count: 5171

“La présente étude a été rédigée par un stagiaire du Collège des Forces canadiennes pour satisfaire à l'une des exigences du cours. L'étude est un document qui se rapporte au cours et contient donc des faits et des opinions que seul l'auteur considère appropriés et convenables au sujet. Elle ne reflète pas nécessairement la politique ou l'opinion d'un organisme quelconque, y compris le gouvernement du Canada et le ministère de la Défense nationale du Canada. Il est défendu de diffuser, de citer ou de reproduire cette étude sans la permission expresse du ministère de la Défense nationale.”

Compte de mots: 5171

INTRODUCTION: THE CHALLENGE OF COMPLEXITY

Armed conflict has always presented a uniquely complex challenge for humanity, regardless of time period. From early hunter-gatherers to the post-industrial contemporary era, the intricacies resulting from the interaction of a wide variety of actors, relationships, technology, and other factors have existed side by side with the overriding need to ensure security for one's society. Despite this long history of complexity, the experience of the United States military in the post-September 11th era has been viewed as particularly challenging. Despite the commitment of the sweat of hundreds of thousands of troops, the blood of thousands of casualties, not to mention billions of dollars in treasure, the results the US has achieved have fallen far short of the desired aim. In this environment of frustration, and with an eye towards increasing uncertainty in the future, the US Army gained the institutional momentum necessary to examine altered theories of operation, oriented on restoring its ability to achieve results in the inherently complex environments of warfare. Mission Command and the Army Design Methodology (ADM) are the most important doctrinal concepts to emerge from this examination due to their underlying emphasis on uncertainty and potential to increase the Army's effectiveness when operating in complex and uncertain environments.

While mission command has been relatively well integrated into doctrine, ADM, and design-thinking concepts in general, have faced a tougher road to acceptance. Despite being recently formalized in doctrine, supported by senior leaders, and taught in staff colleges, these concepts are frequently misunderstood or outright resisted, limiting them from achieving their full operational potential. For the Army, the question thus becomes how can design be effectively implemented across the institution in order to ensure more

effective results in the inherently complex environment of military operations now and in the future? This essay will demonstrate that design must be utilized in a collaborative manner to create shared understanding between commanders at different echelons, with the goal of fully realizing the benefits of a mission command-approach to operations involving complex problems.

This essay will proceed in three major sections. First, the origins and theory of mission command, as well as its adoption into the US Army, will be presented. This discussion will demonstrate the suitability of the mission command-approach to uncertainty, establish that creating shared understanding is the most critical component of the concept, and that this understanding must reside at the lowest echelons of command to enable effective action. Next, the origins and theory of design as a concept are discussed, including the development and adoption of the Army Design Methodology. This section will demonstrate that understanding in complex environments is better developed through design processes than detailed planning, and that the US Army adopted ADM specifically to achieve the goal of enabling improved understanding and visualization of complex problems by commanders. Finally, mission command and ADM are discussed in terms of how they can best be integrated to ensure shared understanding and more firmly embed both concepts within Army culture.

MISSION COMMAND: ENABLING INITIATIVE IN COMPLEXITY

Although complexity is inherent in human conflict, for much of history the scope and scale of engagements, and even campaigns, meant that a military commander could typically personally observe and control the majority of their forces. Although

decentralized approaches to warfare could be used, they were not an imperative. With a rapid expansion in the scope and scale of warfare beginning with the adoption of gunpowder weapons in Europe, deliberate methods to ensure synchronization of forces became more important. Over time, two general responses to this issue continue to manifest themselves. Militaries can opt to use tactics and technology to ensure continued centralized control and attempt to eliminate as much uncertainty as possible. Alternatively, they can accept uncertainty on the battlefield as something which cannot be eliminated. This leads to a degree of accepted decentralization and development of the accompanying processes needed to maintain the minimum amount of control necessary to accomplish the aim. It is from this second conceptual school that the theories of mission command arise.

Mission Command Theory & Concepts

For this second school to initially take root, military cultural inertia had to be overcome through what is typically the most powerful driver of change, defeat. For the archetypally centralized Prussian army in the early 19th century, multiple defeats at the hands of Napoleon's corps system provided the motivation to examine a different approach, eventually leading to the concept of *auftragstaktik*. Already primed for reform by the pre-war writings and thinking of Scharnhorst, the twin defeats of Jena and Auerstadt provided the opportunity for the rise to prominence of the Prussian general staff and military academy, and with them, new military concepts.¹ Over time, the ideas of Carl von Clausewitz, Scharnhorst's protégé and later director of the staff college, emphasizing concepts such as uncertainty and the complex relationships of warfare—most famously

¹ Eitan Shamir, *Transforming Command: The Pursuit of Mission Command in the U.S., British, and Israeli Armies* (Stanford: Stanford University Press, 2011), 34.

the ‘wondrous trinity’—gained traction within the officer corps. Von Moltke the Elder in particular took to Clausewitz’s concepts, which combined with technological advances expanding the scope of conflict—railroads and mass armies—and the power of lower-level military echelons—breach loading rifles—served to cement the necessity of *auftragstaktik* as an operational concept. In Moltke’s own words, commanders “must judge the situation for themselves and must know how to act independently in consonance with the general intention...taking the initiative is of the utmost value.”² The spirit of *auftragstaktik* would continue on and prove its tactical usefulness through the German infiltration tactics of the Great War as well as the successful ‘blitzkrieg’ attacks of 1939 and 1940. Isolated from inclusion in operational and strategic level concepts, however, this mission command-style of operation was unable to deliver complete success.

With similar assumptions about the inherent nature of warfare, Soviet military thinkers were also pursuing mission command concepts during the inter-war period of the 1930s which would prove quite influential by the end of the Second World War. In large part constructed by Mikhail Tukhachevsky, the theory of deep operations placed a marked emphasis on actions by junior commanders in an environment which was expected to be defined by uncertainty, confusion, and a lack of technological capability to tightly control action.³ Guided by an understanding of the immediate mission, subsequent mission, and operational aim—in order of increasing importance—commanders were expected to rapidly assess their circumstances and then initiate appropriate action with

² Helmuth von Moltke, *Moltke on the Art of War: Selected Writings* ed. and trans. Daniel Hughes (Novato, CA: Presidio Press, 1993), 131.

³ Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass, 1997), 232-233.

the goal of disrupting the adversary's system in depth. Although sidelined as an operational theory in the Soviet Union for a critical five years due to purges within the officer corps, deep operations' subsequent application from late-1942 on led to decisive victories for the Red Army over Germany, demonstrating the usefulness of the approach when integrated at the operational level.⁴

Ultimately, both the German and Soviet concepts of mission command proved relatively successful, depending in large part on the degree of integration with higher level efforts. With assumptions about the nature of war being complex, uncertain, and to some extent, uncontrollable, these ideas have much in common with the understanding of mission command contained in US doctrine today. Indeed, the cognitive and situational match between concept and reality demonstrates the utility of this general approach as a response to complexity in warfare, and thus provides a solid theoretical foundation for doctrine.

Mission Command Adoption & Doctrine

Though in some ways the US is culturally compatible with the ideas of initiative and achieving results in uncertainty, the United States military's additional cultural preoccupation with technology and centralized control delayed the introduction of a mission command-style approach to operations until the 1980s. With time, this approach has continued to develop with an ever greater emphasis on mission command, at the expense of detailed command methods. As currently described in US Army doctrine, understanding is the most critical component to mission command and thus the

⁴ Ibid, 236-237.

operations process as a whole. Additionally, because mission command emphasizes pushing decision authority and resources down to the lowest level, adequate understanding must reside there in order for effective action to occur, resulting in the accomplishment of the mission's aim.

The initial US imperative for adopting a mission command approach was an extensive self-examination following defeat in the Vietnam War, along with increasing concerns about the capabilities of the Soviet Union in Europe. With the adoption of AirLand Battle doctrine in the US Army in 1982, and major refinement in 1986, operational art—based largely on the ideas of Clausewitz—and the operational level of war gained prominence. Less noticed is the initial inclusion of mission command concepts, which would in turn continue to grow in importance over the next twenty years. In one example, Field Manual (FM) 100-5 *Operations* states that the “chaos of battle will not allow absolute control. *As battle becomes more complex and unpredictable, decision making must become more decentralized.*”⁵ The clear implication in this case being the critical importance of understanding of the commander's intent through mission-type orders. Further development occurred with a revised FM 100-5 in 1993, which introduced the term *battle command* to indicate the Army's doctrinal vision of a mission command approach to operations.

This manual also introduced the beginnings of what would later become the commander's activities of the operations process, those tasks a commander performs in order to execute the mission command approach to operations. The importance of how

⁵ Department of the Army, *Field Manual 100-5: Operations* (Washington, D.C.: Department of the Army, 1982), 2-7.

the commander's activities are described in this construct is quite important due the centrality of leaders at all echelons in mission command. In 1993, the commander's activities consisted of visualizing the battlefield, assessing the situation, and directing appropriate actions in response.⁶ The next update to the manual in 2001, now termed FM 3-0, outlined the commander's activities as visualizing the operational environment, describing an intent, and directing action, all while continuously leading and assessing.⁷ Finally, the 2008 version of FM 3-0 added understanding as a commander's activity, a construction which persists in current doctrine, as shown in Figure 1. This understanding is oriented on developing a deeper knowledge of the operational environment, framing operational problems, and establishing context.⁸

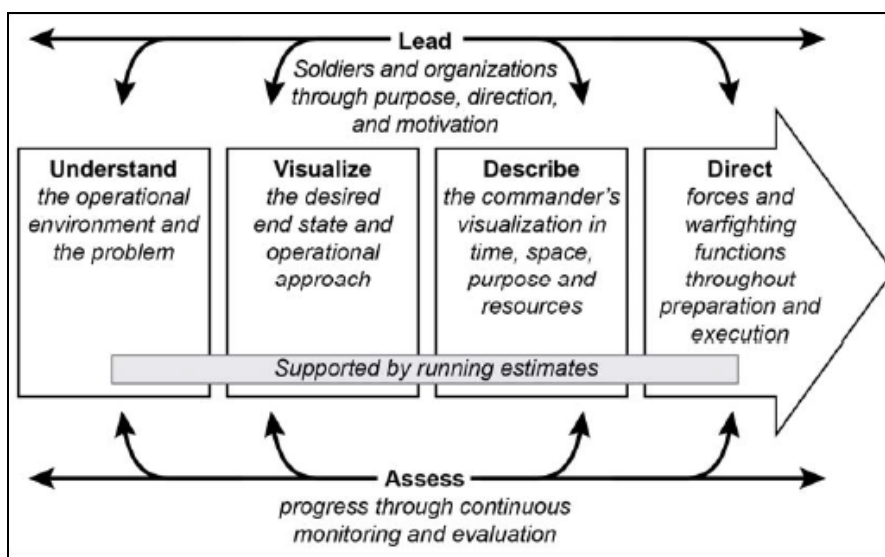


Figure 1 -- The Commander's Role in the Operations Process

Source: Department of the Army, *Army Doctrine Reference Publication 5-0: The Operations Process*, 5-4.

⁶ Department of the Army, *Field Manual 100-5: Operations* (Washington, D.C.: Department of the Army, 1993), 2-14.

⁷ Department of the Army, *Field Manual 3-0: Operations* (Washington, D.C.: Department of the Army, 2001), 5-4.

⁸ Department of the Army, *Field Manual 3-0: Operations* (Washington, D.C.: Department of the Army, 2008), 5-4.

This progression in the commander's activities mirrored an increase in the importance of mission command overall in US Army doctrine, as well as the complexity the organization faced in the operational environment. The first standalone doctrine on mission command was produced in 2003, in an attempt to synchronize the Army's understanding of the concept, which had previously been discussed across several manuals, sometimes at odds with one another.⁹ Part of the difficulty was that, until a complete overhaul of Army doctrine in 2012 which replaced all capstone doctrine, mission command conceptually co-existed with detailed command as an option for employment to command and control forces, reflecting a fundamental tension on the appropriate response to complexity.

This tension was resolved with the publishing of the new suite of nested capstone manuals in 2012, in which mission command became the only command and control approach described in doctrine.¹⁰ In settling on this single approach, doctrine began describing the concept in greater detail, particularly in terms of the importance of creating shared understanding. Although representing just one of six principles of mission command (Figure 2), shared understanding represents the most critical principle based on the accompanying text. Of the five other principles, four are directly enabled by the creation of shared understanding and the final principle, the use of mission orders, is itself an expression of the commander's understanding transformed into a guide for execution. As mission command advocates pushing the authority and resources for action to the lowest echelon possible, in an attempt to counter the uncertainty of warfare, it is

⁹ Shamir, *Transforming Command...*, 109.

¹⁰ Department of the Army, *Army Doctrine Reference Publication 6-0: Mission Command* (Washington, D.C.: Department of the Army, 2012), v.

apparent that shared understanding must exist at the lowest echelon for such an approach to succeed. How to best develop that shared understanding is where the integration of design for use by the US Army gains great importance.

- The six principles of mission command are—
- Build cohesive teams through mutual trust.
 - Create shared understanding.
 - Provide a clear commander’s intent.
 - Exercise disciplined initiative.
 - Use mission orders.
 - Accept prudent risk.

Figure 2 – The Principles of Mission Command

Source: Department of the Army, *Army Doctrine Publication 6-0: Mission Command*, 2.

DESIGN: ENABLING UNDERSTANDING IN COMPLEXITY

Much as complexity is inherent in human conflict, the process of design is an inherent aspect of human society. Broadly defined as “the art or action of conceiving of and producing a plan or drawing of something before it is made,”¹¹ design has arguably been in use conceptually since before recorded history. Originally quantified as a process in terms of non-military applications, the circumstances of increasing complexity and challenges in the environment led theorists to adapt design to improve the conception of operational approaches in the military sphere. For the US Army, the emergence of military design thinking coincided with frustrating operations in Iraq and Afghanistan, where traditional approaches to problems were not producing the desired effects. This situation, paired with the continued evolution of mission command to incorporate

¹¹ Oxford Dictionaries, “Design,” accessed 07 May 2017, <https://en.oxforddictionaries.com/definition/design>.

understanding, ultimately provided the impetus for the adoption of design as a doctrinal concept.

Design Theory & Concepts

Design as a discipline is often viewed as a confluence between art and science, with the relative proportions of each element a topic of serious debate.¹² What cannot be seriously debated is the idea that there is at least some degree of both art and science because design ultimately endeavors to bring something into being. Even if that ‘thing’ is something as abstract as understanding in the military context, there are scientific concepts which guide the transmission of that understanding to another or its refinement into an executable plan of action. This confluence of art and science has been present in design since at least pre-industrial, craft-oriented design which primarily utilized intuition as guide along with some scientific understanding.¹³ Some design writers, such as Nigel Cross, see a 40-year cyclic interplay between design and science where there is a movement to ‘scientise’ design, or reduce it to a series of objective rules, and the subsequent push-back to more of the art side of the spectrum.¹⁴ According to Cross, this cycle predicts a resurgence of what he calls ‘scientific design’ in the 2000s, which has been borne out as true.

From the early 2000s to today there has been an increased adoption of design principles outside of traditional design fields, such as architecture, and into other areas such as business. In this context, design is particularly harnessed as a driver of

¹² Not unlike the debate in the area of mission command arena the relative importance of the *art of command* and the *science of control*.

¹³ Nigel Cross, “Designerly Ways of Knowing: Design Discipline Versus Design Science,” *Design Issues* 17, no. 3 (Summer, 2001): 52.

¹⁴ *Ibid*, 49.

innovation, which Tim Brown describes as “powered by a thorough understanding, through direct observation, of what people want and need in their lives...”¹⁵ He goes on to further describe the discipline as one which “uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.”¹⁶ From these remarks, it is apparent that design, in a business sense, is viewed as a process which must have a practical result, is fueled by understanding, requires particular ‘sensibilities’ in its practitioners, and ultimately accomplishes a purpose.

This view of design has much in common with the military conception of design, including the fact that, in both circumstances, organizations are seeking advantage in a complex and competitive environment full of many actors and relationships. Early military concepts, such as the US Army’s campaign design construct in the 1980s, took an inherently reductionist approach to this process. Specifically, they attempted to take the factors of a given environment and quantify them in terms of pre-existing terminology and concepts such as centers of gravity, decisive points, and lines of operation, with the goal of linking strategy to tactical action. Other approaches to military design, developed more recently, took a constructivist approach in that they attempt to quantify the environment by examining it in depth and creating unique logic, metaphors, and language to describe it. Retired Israeli Brigadier General Shimon Naveh’s Systemic Operational Design (SOD) is among the most influential of these design methods.¹⁷

¹⁵ Tim Brown, “Design Thinking,” *Harvard Business Review* (June, 2008): 86.

¹⁶ Ibid.

¹⁷ Alex Ryan, “A Personal Reflection on Introducing Design to the U.S. Army,” 04 November 2016, <https://medium.com/the-overlap/a-personal-reflection-on-introducing-design-to-the-u-s-army-3f8bd76adcb2>.

Common to all the views of design presented above is an emphasis on the importance of understanding in a given environment. In the case of business it is “a deep understanding of consumers’ lives” that leads to the creation of value.¹⁸ Naveh’s SOD emphasizes the construction of the tools of explanation for a given system alongside the effort to quantify the system, thus building a knowledge base for later detailed planning.¹⁹ Even the operational art adopted for campaign design by the US Army in the 1980s— frequently criticized for its inadequacy in complex environments—emphasized the importance of developing an appropriate level of understanding to enable further planning.²⁰ This collective emphasis on developing and utilizing understanding is ultimately what makes design processes more useful in complex environments than detailed planning processes. To be clear, the preceding discussion is not meant to argue that the 1980s version of operational art is necessarily the best tool, or even sufficient, to provide adequate understanding for success in the complexity of contemporary operations. Instead, it aims to demonstrate the criticality of understanding to any design process. In simpler circumstances, such as conventional operations against Iraqi fielded forces, the campaign design process worked quite well, despite its limitations.

Design Adoption & Doctrine

Unfortunately for the US Army, the circumstances of the Gulf War and the initial invasion of Iraq in 2003 would provide a false sense of confidence in the abilities of campaign design to adequately respond to complexity. With an ongoing insurgency in

¹⁸ Brown, “Design Thinking,” . . . , 7.

¹⁹ Matthew Lauder, “Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity,” *Canadian Military Journal* 9 no. 4 (2009): 44-45.

²⁰ Department of the Army, *Field Manual 100-5: Operations* (Washington, D.C.: Department of the Army, 1986), 10.

Iraq and a resurgent Taliban in Afghanistan, the Army found itself unable to effectively apply campaign design to the complex problems it faced. To this end, the US Army explored design processes for incorporation into doctrine in order to enable greater understanding of complex environments and thus restored operational effectiveness.

In the context of a rapidly deteriorating security situation in Iraq, and the concurrent failure to develop an adequate understanding of what was occurring and why, it became apparent that new approaches to the problem might be necessary. Already introduced to Naveh's SOD through frequent interaction related to the history of the military art, the US Army School of Advanced Military Studies (SAMS) began to experiment with his design technique in 2005 to determine its utility for use in the US context.²¹ One seminar from the course, armed with SOD as a methodology, participated in the annual Unified Quest Wargame, an annual future study sponsored by the Chief of Staff of the Army to enable future force and concept development.²² The solution to the Unified Quest problem generated through the use of SOD recommended an indirect and non-military approach, which spurred further interest in SOD among participants as well as future SAMS students. Following participation in several more Unified Quest activities, the school was directed to integrate an introduction to design as a part of its core curriculum, leading to the production of a student text which would eventually form the basis for future design doctrine.²³ By 2010, a design methodology for the Army was outlined with the release of FM 5-0 *The Operations Process*, containing a 15-page chapter on design, which was defined as "a methodology for applying critical and

²¹ School of Advanced Military Studies, *Art of Design: Student Text, Version 2.0* (Fort Leavenworth, KS: School of Advanced Military Studies, 201), 1.

²² Army Capabilities Integration Center, "Unified Quest," accessed 07 May 2017, <http://www.arcic.army.mil/Initiatives/UnifiedQuest>.

²³ School of Advanced Military Studies, *Art of Design...*, 2-3.

creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them.”²⁴ The inclusion of the design concept in doctrine was a contentious topic within the SAMS faculty, reflecting diverging views on whether or not the concept could be captured in doctrine. Ultimately, with the Army at war and the view that the concept could help in some way, the decision was made to publish.²⁵

ADM was further formalized in doctrine as one of three planning methodologies, alongside the Military Decision Making Process (MDMP) and the Troop Leading Procedures (TLPs), in the new operations process doctrinal manual published during the overhaul of 2012.²⁶ Finally, ADM received its own doctrinal manual in 2015 with the release of Army Techniques Publication (ATP) 5-0.1 *Army Design Methodology*, consisting of approximately 50 pages of background information, process guidelines, and discussion of ADMs relationship with other doctrinal concepts. ADM is presented as a method which “enables commanders and staffs to think about the situation in depth” with the goal of developing a more informed approach to operations.²⁷ While it cautions that there is no one way of conducting ADM, it does describe that there are several activities associated with ADM including “framing an operational environment, framing problems, framing solutions, and reframing when necessary” with the resulting learning being used as a conceptual framework to drive detailed planning through the MDMP.²⁸ In this area, it is relatively easy to discern the influence of SOD, with emphasis on multiple frames

²⁴ Department of the Army, *Field Manual 5-0: The Operations Process* (Washington, D.C.: Department of the Army, 2010), 3-1.

²⁵ Ryan, “A Personal Reflection on Introducing Design to the U.S. Army,”...

²⁶ Department of the Army, *Army Doctrine Reference Publication 5-0: The Operations Process* (Washington, D.C.: Department of the Army, 2012), 2-4.

²⁷ Department of the Army, *Army Techniques Publication 5-0.1: Army Design Methodology* (Washington, D.C.: Department of the Army, 2015), 1-3.

²⁸ *Ibid*, 1-3 to 1-4.

and a caution against applying only one method of analysis. The doctrine additionally discusses the critical nature of collaboration and dialogue throughout the process.²⁹ Finally, the manual continuously emphasizes the importance of critical and creative thinking to develop the amount of understanding required to produce an effective operational approach as an output, the central point of adopting design into doctrine in the first place.

Is Adopting ‘Design Doctrine’ Self-Defeating?

Several writers on the military applications of design, including Shimon Naveh himself, have cautioned against the incorporation of specific design processes into doctrine due to the idea that design and doctrine are antithetical.³⁰ Ben Zweibelson, a SAMS graduate and prolific design writer, specifically argues against the incorporation of design into US Army doctrine using the example of the 2010 version of FM 5-0, which first featured the Army’s concept of design. He argues that “fifteen pages of doctrine does not begin to address the unique vocabulary essential for learning, applying, and communicating military design methodology...” and further seizes on the relative length devoted to topic as evidence that the Army is unenthusiastically adopting the concept, rather than really believing in it.³¹ While Zweibelson is correct in that the small extract of FM 5-0 is insufficient to enable the execution of design in the US Army, he disregards the fact that this is not the purpose of the chapter. Formally placing the new concept in doctrine, especially one as foreign to traditional military culture as design, was a major accomplishment for design advocates and set the stage for the continued integration that

²⁹ Ibid, 1-7.

³⁰ Ryan, “A Personal Reflection on Introducing Design to the U.S. Army,”...

³¹ Ben Zweibelson, “To Design or Not to Design: In Conclusion,” *Small Wars Journal*, 09 May 2011, 3, <http://smallwarsjournal.com/blog/journal/docs-temp/752-zweibelson.pdf>.

has occurred to the present. Alex Ryan and Stefan Banach—both SAMS faculty members at the time—jointly argued prior to the release of FM 5-0 that “for design to be useful in the military domain, it must complement and interact with existing planning doctrine.”³² This argument reflects the reality that in a large, centralized organization like the US Army, the only way for new concepts to take root and grow is to integrate where possible and thus change culture over time.

MISSION COMMAND & DESIGN: ENABLING EFFECTIVE ACTION

In the contemporary environment, a wide spectrum of perceived potential threats drives divergent opinions of mission command and design concepts. The resurgence of conventionally-capable near-peer competitors, as well as proliferating conventional capabilities to non-state actors present a threat reminiscent of those encountered during the Cold War. At the same time, protracted insurgencies, global terrorism, and unstable or failing states continue to drive the necessity for stability-type operations more in line with recent experience in Iraq and Afghanistan. Additionally, the combination of elements of both of these broad approaches to conflict, in the form of Hybrid Warfare, ensures that the complexity of military operations will certainly not decrease in the future. Ultimately, this context drives the need to better integrate mission command and design concepts—both organized around coping with uncertainty and complexity—to ensure military effectiveness in the future.

³² Stefan Banach and Alex Ryan, “The Art of Design: A Design Methodology,” *Military Review* 89, no. 2 (March-April, 2009): 106.

Gaps in the Flow of Understanding and Potential Solutions

The position of mission command within the US Army is relatively secure, as it is currently one of the four foundations of Army doctrine.³³ With design, however, and despite the fact that ATP 5-0.1 represents a major step forward in its integration into doctrine, there are certain areas in which it falls short of its full potential. Most notably, ADM is not fully linked with mission command and the detailed planning methodologies, leading to potential gaps in the flow of understanding. As currently constructed, understanding is ‘directed’ or passed from one echelon to another, which is not as useful for execution as mutually developing a shared understanding through design. This process must incorporate commanders at multiple echelons in order to ensure proper understanding at the level of mission execution, and thus obtain the maximum benefit integrating mission command and design.

One issue with current design doctrine is that ATP 5-0.1 is lacking discussion of how best to transfer understanding from the design team to the subordinate commanders who will ultimately execute portions of the operations, and potentially conduct their own design process. This lack of discussion is concerning, considering the manual explicitly discusses that limited commander involvement risks “that the potential benefits of ADM are unrealized and [thus] outcomes have limited impact. Commanders not engaged in the process find it difficult to understand the logic behind the understanding developed during ADM.”³⁴ If this is true, then certainly subordinate echelons may find it difficult to

³³ Department of the Army, *Army Doctrine Publication 1-01: Doctrine Primer* (Washington, D.C.: Department of the Army, 2014), 3-3.

³⁴ Department of the Army, *Army Techniques Publication 5-0.1: Army Design Methodology...*, 2-3.

grasp the understanding gained through design and successfully execute operations in a complex environment.

This issue can potentially be addressed through use of Papparone's modified-Heifetz situational typology. In it, Papparone explains that as situations move from more familiar to less familiar, "direction must shift away from relying on those in formal military positions of authority to a more dispersed power arrangement."³⁵ Although discussed in terms of the mechanics of the design team, in practice the relationship between commanders and staffs of different echelons can be treated in the same way. In addition to supporting the mission command principle of shared understanding, this approach also supports the construction of cohesive teams, building the trust necessary for implementing disciplined initiative in execution.

Another issue with design doctrine is that while the interrelationship between ADM (conceptual planning) and MDMP (detailed planning) is explicitly discussed throughout ATP 5-0.1, the Troop Leading Procedures—the detailed planning methodology for company-level units and below—are mentioned only to note that "small-unit leaders use troop leading procedures as their planning and preparation methodology."³⁶ With company-level and below units representing the major source of combat power for the US Army, the lack of discussion on how ADM relates to these units is concerning, especially given the chosen mission command approach to operations. Should the reader imply that company commanders are incapable of executing design, or that design is not of interest or necessary at this level? This doctrinal

³⁵ Chris Papparone, *The Sociology of Military Science: Prospects for Postinstitutional Military Design* (New York: Bloomsbury Academic, 2013), 85.

³⁶ Department of the Army, *Army Techniques Publication 5-0.1: Army Design Methodology...*, 1-3.

omission carries with it the implication that if junior officers do not conduct or participate in design that they do not need to understand or be educated in it either. For design as a concept to persist, and support the execution of mission command, it must be utilized by junior leaders, including at the company level and below, so they can build proficiency in the necessary skills through experience.

This view is held in common with the writings of Donald Schön when it comes to design, specifically the concept of reflection-in-action. A form of natural learning by doing, reflection-in-action consists of discovering a problem in the course of a task, inventing procedures to solve the problem, and continuing iteration until the problem is solved.³⁷ A further development of this concept for educating design is reciprocal reflection-in-action, where the process of design is guided by a coach or mentor, with the result being that the student learns design, and both parties develop a greater understanding of working with each other.³⁸ Using Kolb's framework of professional knowledge, this process also produces accommodative knowledge, which is gained from concrete experience and experimentation. This, in turn, can then be refined into convergent knowledge, knowledge which is collectively acquired and thus can be more easily shared to other professionals.³⁹ Obviously these outcomes are positive for the implementation of both design and mission command, but require design collaboration at an early enough point in a leader's career to ensure well-developed design skills by the time they need to execute design at a higher level.

³⁷ Donald Schön, *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions* (San Francisco: Jossey-Bass, 1987), 27.

³⁸ *Ibid.*, 101-102 and 117-118.

³⁹ Chris Papparone and George Reed, "The Reflective Military Practitioner: How Military Professionals Think in Action," *Military Review* 88, no. 2 (March-April 2008): 68.

This discussion of professional knowledge, in line with the theories of Kolb, introduces another benefit of the incorporation of design into doctrine. In Paparone and Reed's analysis of Kolb, with reference to the military institution, they describe doctrine as a form of assimilative knowledge. This form of knowledge comprises convergent knowledge which has been transformed into an institutional object, and thus can be used to modify the culture and values of the professional community.⁴⁰ In this way, doctrinal design concepts, if used to generate additional knowledge and understanding of design, will continue to reinforce effective use over time. For this reason, design doctrine should be continuously revisited, to avoid "relying on the dogma of received wisdom founded on closed epistemic evaluations [which] ultimately could serve to de-professionalize the military through chauvinism."⁴¹

Does Collaboration Matter When Design Turns to Detailed Planning?

Some writers on military design may argue against the merits of increased collaboration and design coaching if all participants are operating within the same linear-planning oriented paradigm. For example, Zweibelson contends that "if an organization subscribes to a Clausewitzian logic, their narratives will likely feature centers of gravity while the storyline and plot will relate back to a timeless tension between governments, the masses, and military instruments of power."⁴² By this reasoning, even with design concepts incorporated into doctrine, as long as the classical elements of operational art remain a part of the professional language, design solutions will trend towards these paradigms of a linear system. While this is certainly a possibility, this urge is not

⁴⁰ Ibid.

⁴¹ Ibid, 70.

⁴² Ben Zweibelson, "Design Theory and the Military's Understanding of Our Complex World," Small Wars Journal, 07 August 2011, 5, <http://smallwarsjournal.com/sites/default/files/826-zweibelson.pdf>.

irresistible, particularly if leaders are educated in design and doctrine continues the trend of softening the so-called 'requirements' of doctrine. The incorporation of design doctrine, and its refusal to describe *exactly* how to do it or provide detailed examples is an indicator of this trend. In the meantime, coaching to teach design and collaboration to execute it remain the best ways to continue to influence US Army culture in a direction that allows the maximum benefit of integrated mission command and design concepts.

CONCLUSION: SUCCEEDING IN COMPLEXITY

This essay presented evidence that demonstrates several key conclusions. First, that mission command as a concept contains key assumptions about the nature of warfare including uncertainty, unpredictability, and the limits of control in warfare which make its use a suitable response to complex environments. Second, that the most critical portion of the US Army's adopted version of mission command is the creation of shared understanding between leaders, and that this understanding must exist at the level of execution to achieve the greatest effect. Third, design processes are, by their nature, better suited to developing understanding than detailed planning and it was for this reason that the Army Design Methodology was adopted into doctrine. Fourth, the understanding developed through design is best shared through collaborative production rather than simple passing of products from one echelon to another.

Combined together, these conclusions demonstrate that design must be utilized in a collaborative manner to create shared understanding between commanders at different echelons, and in the process achieve the goal of fully realizing the benefits of a mission command-approach to operations involving complex problems. When compared to the

current state of design doctrine in the US Army, this thesis drives the need for a more robust system of formal and informal design education for junior leaders emphasizing experiential learning. Collaboration between echelons using design to solve complex problems is one method to begin achieving this goal immediately, and additionally serves to reinforce the Army's mission command approach to operations. With enough time, practice, and reflection on results and method, design processes can eventually help drive Army culture in the direction needed to ensure continued effectiveness in the complexity of warfare now and in the future.

BIBLIOGRAPHY

- Army Capabilities Integration Center. "Unified Quest." Accessed 07 May 2017.
<http://www.arcic.army.mil/Initiatives/UnifiedQuest>.
- Banach, Stefan, and Alex Ryan. "The Art of Design: A Design Methodology." *Military Review* 89, no. 2 (March-April, 2009): 105-115.
- Brown, Tim. "Design Thinking." *Harvard Business Review* (June, 2008): 85-92.
- Cross, Nigel. "Designerly Ways of Knowing: Design Discipline Versus Design Science." *Design Issues* 17, no. 3 (Summer, 2001): 49-55.
- Lauder, Matthew. "Systemic Operational Design: Freeing Operational Planning from the Shackles of Linearity." *Canadian Military Journal* 9 no. 4 (2009): 41-49.
- Moltke, Helmuth von. *Moltke on the Art of War: Selected Writings*. Edited and translated by Daniel Hughes. Novato, CA: Presidio Press, 1993.
- Naveh, Shimon. *In Pursuit of Military Excellence: The Evolution of Operational Theory*. London: Frank Cass, 1997.
- Oxford Dictionaries. "Design." Accessed 07 May 2017.
<https://en.oxforddictionaries.com/definition/design>.
- Paparone, Chris, and George Reed. "The Reflective Military Practitioner: How Military Professionals Think in Action." *Military Review* 88, no. 2 (March-April 2008): 66-76.
- Paparone, Chris. *The Sociology of Military Science: Prospects for Postinstitutional Military Design*. New York: Bloomsbury Academic, 2013.
- Ryan, Alex. "A Personal Reflection on Introducing Design to the U.S. Army." 04 November 2016. <https://medium.com/the-overlap/a-personal-reflection-on-introducing-design-to-the-u-s-army-3f8bd76adcb2>.
- Schön, Donald. *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions*. San Francisco: Jossey-Bass, 1987.
- Shamir, Eitan. *Transforming Command: The Pursuit of Mission Command in the U.S., British, and Israeli Armies*. Stanford: Stanford University Press, 2011.
- United States. Department of the Army. *Army Doctrine Publication 1-01: Doctrine Primer*. Washington, D.C.: Department of the Army, 2014.
- . Department of the Army. *Army Doctrine Publication 6-0: Mission Command*. Washington, D.C.: Department of the Army, 2012.
- . Department of the Army. *Army Doctrine Reference Publication 5-0: The Operations Process*. Washington, D.C.: Department of the Army, 2012.

- . Department of the Army. *Army Doctrine Reference Publication 6-0: Mission Command*. Washington, D.C.: Department of the Army, 2012.
- . Department of the Army. *Army Techniques Publication 5-0.1: Army Design Methodology*. Washington, D.C.: Department of the Army, 2015.
- . Department of the Army. *Field Manual 100-5: Operations*. Washington, D.C.: Department of the Army, 1982.
- . Department of the Army. *Field Manual 100-5: Operations*. Washington, D.C.: Department of the Army, 1986.
- . Department of the Army. *Field Manual 100-5: Operations*. Washington, D.C.: Department of the Army, 1993.
- . Department of the Army. *Field Manual 3-0: Operations*. Washington, D.C.: Department of the Army, 2001.
- . Department of the Army. *Field Manual 3-0: Operations*. Washington, D.C.: Department of the Army, 2008.
- . Department of the Army. *Field Manual 5-0: The Operations Process*. Washington, D.C.: Department of the Army, 2010.
- . School of Advanced Military Studies. *Art of Design: Student Text, Version 2.0*. Fort Leavenworth, KS: School of Advanced Military Studies, 2010.
- Zweibelson, Ben. “Design Theory and the Military’s Understanding of Our Complex World.” *Small Wars Journal*. 07 August 2011. <http://smallwarsjournal.com/sites/default/files/826-zweibelson.pdf>.
- . “To Design or Not to Design: In Conclusion.” *Small Wars Journal*. 09 May 2011. <http://smallwarsjournal.com/blog/journal/docs-temp/752-zweibelson.pdf>.