Systems Thinking and Design: Making Learning Organizations a Reality in the U.S. Army

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Our findings determine that current doctrine encourages and is broadly consistent with the requirements of the learning organization. However, the concept of the learning organization is not explained in any detail. The necessary components of a learning organization are distributed across multiple field manuals, and no integrating explanation of how commander and staff processes contribute to organizational learning is provided.

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Abstract

SYSTEMS THINKING AND DESIGN: MAKING LEARNING ORGANIZATIONS A REALITY FOR by Major Matthew B. Dennis, U.S. Army, 46 pages.

This monograph examines whether the addition of design to U.S. Army doctrine, along with other changes, can clarify the concept of the learning organization and make it more achievable by operational units at the battalion and brigade levels. While there have been prior studies of the U.S. Army as a learning organization, they have focused on the whole Army as a monolithic entity, rather than investigating organizational learning at the operational level. Systems thinking, a common component of design and of learning organizations, is explored in depth to determine methods best suited for military application within the current operations process.

Our findings determine that current doctrine encourages and is broadly consistent with the requirements of the learning organization. However, the concept of the learning organization is not explained in any detail. The necessary components of a learning organization are distributed across multiple field manuals, and no integrating explanation of how commander and staff processes contribute to organizational learning is provided.

If institutionalizing organizational learning at the operational level is a desirable goal for the U.S. Army, then minor changes in training and operations doctrine could help to realize this potential. We recommend several targeted improvements to current doctrine to better articulate the concept and explain the essential linkages with commander and staff processes. Finally, as theoretical research cannot improve Army practices on its own, a pilot study is recommended to test the recommendations on a sample of operational units.

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Introduction

Historically speaking, the Western way of war has been predominately concerned with militarily disarming one's adversary so that political will could then be imposed. This competition of sorts would be constrained to the battlefield and its outcome would set the conditions for the political process to resume through either negotiation or dictation of terms.[1] The current operational environment has changed. Under the U.S. Army's new doctrine of full spectrum operations, the military aspect of war is now inextricably linked with the other elements of national power. Furthermore, military commanders must consider how to employ and synchronize military, interagency, multi-national, and non-governmental forces in a coherent manner to achieve goals and objectives. The method used by commanders to achieve this synchronized effort is known as Battle Command.[2] The process through which a commander exercises Battle Command is known as the Operations Process.[3]

This paper explores the Operations Process to determine whether changes could be made that would make operational units within the Army more adaptive. The Army Capstone Concept mentions on several occasions a *campaign of learning*, and states that the Army will operate under conditions of complexity and uncertainty.[4] With the emphasis on learning and adapting in the presence of complexity and uncertainty, this paper specifically looks at whether operational

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[1] David Lai, *Learning from the Stones a GO Approach to Mastering China's Strategic Concept, Shi* (Carlisle, PA: Army War College, Strategic Studies Institute, 2004), 5.

[2] United States Department of the Army, *Mission Command: Command and Control of Army Forces* (Washington, DC: Headquarters, Department of the Army, 2003), 4-24.

[3] United States Department of the Army, *The Operations Process* (Washington, DC: Headquarters, Department of the Army, 2010), vi.

[4] United States Army Training and Doctrine Command, *The Army Capstone Concept. Operational Adaptability: Operating Under Conditions of Complexity and Uncertainty in an Era of Persistant Conflict 2016-2028* (Fort Monroe, Va.: Department of the Army, Headquarters, United States Army Training and Doctrine Command, 2009).

units in the Army have a better chance of becoming *learning organizations* if the Operations Process is modified.[5]

The paper contains four major areas of emphasis. These four areas are logically broken into their own sections so that they can be discussed in detail. The first area of focus is the theoretical and conceptual underpinning of current Army doctrine. Army doctrine is written and continually updated in an iterative manner. It is therefore important to understand the foundational ideas upon which new ideas and concepts are added. From this understanding it is then possible to later assess whether new ideas and their accompanying theory create tension or conflict with the older ones. Tensions and/or conflicts become potential targets for clarification or modification.

The next area of emphasis is the concept defined by Peter Senge as the learning organization. Several articles have been written on the topic of the Army as a learning organization from different perspectives. Army *Field Manual 6-22, Army Leadership* goes as far as calling the Army a learning organization.[6] This section will explore the specific areas or "disciplines" Senge attributes to learning organizations. An assessment of the Army Operations Process in light of these attributes and the doctrine's theoretical underpinnings can then determine whether or not it is consistent with the concept of the learning organization.

One particular attribute or discipline common to learning organizations is *systems thinking*. In fact, this attribute is so crucial to the existence of a learning organization that Senge titled his seminal work, *The Fifth Discipline*, after this all-important integrating concept.[7] Multiple versions or schools of thought exist on the subject of systems thinking. This paper

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[5] Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization* (New York: Doubleday/Currency, 2006), 3.

[6] United States Department of the Army, *Army Leadership: Competent, Confident, and Agile* (Washington, DC: Headquarters, Department of the Army, 2006), 8-2.

[7] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 11-12.

examines a few that the author feels are best integrated within the Army Operations Process. Some older, less applicable, versions are also included to highlight the dangers of generalizing all ideas within the field of systems thinking into one homogeneous whole.

The last major area of emphasis is the newest addition to the Army Operations Process, design. "Design is a methodology for applying critical and creative thinking to understand, visualize, and describe ill-structured problems and develop approaches to solve them."[8] With any new concept, various perspectives emerge on implementation. This section examines design from the perspective of how it may be implemented across domains to further enable the ability of operational units to become learning organizations.

The final section summarizes the findings of the previous sections in order to logically support a determination of whether modifications to the Army Operations Process can enhance the ability of operational units to become learning organizations. Recommendations are then presented along with explanations of their purpose and utility. Finally, as this paper is conceptual, areas for further research are suggested that support the practical implementation of the findings in this monograph.

Underpinnings of Army Doctrine

Richard Swain provides a good explanation of what doctrine is and what it does. He emphasizes the importance of ideas. "Born or adopted in particular historical circumstances, they affect man's understanding of the world and, therefore, influence behavior."[9] Using a systems analogy, Swain describes the formation of ideas into concepts, which are merged to create systems for achieving specific purposes.[10] This section explores the particular ideas that underpin

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[8] United States Department of the Army, *The Operations Process*, 3-1.

[9] B. J. C. McKercher and Michael A. Hennessy, *The Operational Art: Developments in the Theories of War* (Westport, Conn.: Praeger, 1996), 147.

[10] Ibid.

Army doctrine. We'll examine the historical circumstances in which they evolved, and identify the purposes of the systems within which they existed.

United States Army doctrine as we currently know it came into being after the Vietnam War. An effort to professionalize the Army was underway and leaders saw codified doctrine as part of that professional force.[11] The driving force behind this so-called doctrinal renaissance was General William Depuy.[12] During the period from 1974 to 1986 the foundation of the Army's modern doctrine was laid.[13]

During the Vietnam years, the Army was under unprecedented civilian control under Secretary of Defense McNamara. McNamara had experience as a strategic bombing analyst during World War II, was trained at Harvard Business School, and before assuming duties as the Secretary of Defense ran the Ford Motor Company.[14] From his formal schooling, experience in industrial war, and running a mass production-based business, McNamara was firmly rooted in the ideas that had made him successful. Those ideas were systems analysis, operations research, and quantification.[15]

Secretary of Defense McNamara had little faith in the managerial abilities of General Officers. One officer that stood out, however, was Depuy. "Depuy, always a logical thinker, was pleased to learn the new game of operations research and systems analysis…"[16] Like McNamara, Depuy's experience as a battalion commander in World War II and the success he enjoyed while

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[11] General William Depuy was the first commander of the U.S. Army Training and Doctrine Command (TRADOC) from 1973-1977. Ibid., 148

[12] Ibid., 147

[13] Ibid.

[14] Henry G. Gole, *General William E. Depuy: Preparing the Army for Modern War* (Lexington: University Press of Kentucky, 2008), 217.

[15] Ibid.

[16] Ibid., 215

working as the Assistant Vice Chief of Staff of the Army undoubtedly reinforced his belief in the value of systems analysis and operations research.[17]

Now that Systems Analysis and Operations Research have been identified as critical ideas, an explanation of them is in order. Operations research is a mathematical discipline concerned with making mathematical models of systems and their behavior to promote efficiency and optimization. Systems analysis compliments operations research by providing the objective empirical data on which the models can be made, including economic data to enable cost benefit analysis. Together, these disciplines are suited well to describing in detail the components of a system along with their capabilities and physical characteristics.[18] McNamara's ORSA approach permeated all facets of government following its "success" in DoD. In our current context and complex operational environment the ORSA approach alone may seem inadequate, but as Swain reminds us, the historical circumstances are important as well.[19]

The era in which our modern doctrinal foundation was laid was one of relative stability. This relative stability was in large part due to the Cold War, which pitted two superpowers against one another but was restrained by the threat of nuclear war. It was in this environment that Depuy found himself responsible for rebuilding the capability and reputation of the post-Vietnam Army.[20] In the Summer of 1973, when Depuy assumed command of the newly created U.S. Army Training and Doctrine Command (TRADOC), he had three major goals in mind. He wanted to change the way the Army trained in a revolutionary way. He wanted to clarify doctrine, and he wanted to integrate training, doctrine, and combat developments (weapons systems).[21]

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[17] Ibid., 214

[18] Frederick S. Hillier and Gerald J. Lieberman, *Introduction to Operations Research* (Oakland, Calif.: Holden-Day, 1986), 6.

[19] McKercher and Hennessy, *The Operational Art: Developments in the Theories of War*, 147.

[20] Gole, *General William E. Depuy: Preparing the Army for Modern War*, 213.

[21] Ibid., 239.

Depuy believed that the previous doctrine was too abstract. Swain tells us that the pre-Depuy doctrine combined theoretical and historical sources of inspiration with field trials.[22] Depuy aimed to simplify doctrine into a series of "how to fight" manuals in order to "bring order to chaos, to the extent that it was possible."[23] Depuy put General Paul Gorman in charge of developing the training system, while he focused on the doctrine.[24] Depuy's version of doctrine was based on weapons systems as a point of entry. Specifically, Depuy's doctrine optimized friendly weapons systems against enemy weapons systems. The tactics were recorded in doctrine in a "how to fight" manner, and the then disassembled into the specific tasks that would have to be performed by each individual Soldier in the training manuals.[25]

Depuy acknowledged that there was an ongoing debate on the separation of training and education, and consciously decided to influence the school system towards the training aspect.[26] "In Shorthand, training tells us "what and how;" education tells us "why" and even "whether."[27] The following excerpt from Depuy's oral history sums up much of what has been discussed above:

> You buy a Toro lawn mower and you get a little booklet that tells you how to put it together and how to operate the thing. I think that the field manuals on the combat operations of a platoon, or a company, or a battalion, are, in fact, the operator's manuals, and the lieutenant colonels, or the captains, or the lieutenants, or the sergeants, need to be trained to get the most out of the mechanisms they have inherited.[28]

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[22] McKercher and Hennessy, *The Operational Art: Developments in the Theories of War*, 148.

[23] Gole, *General William E. Depuy: Preparing the Army for Modern War*, 240, 245.

[24] Ibid., 244.

[25] General Gorman was given the task of reorienting the school system towards training as opposed to education. William E. DePuy et al., *Changing an Army: An Oral History of General William E. DePuy, USA Retired* ([Carlisle Barracks], Pa.; Washington, D.C.: U.S. Military History Institute; U.S. Army Center of Military History, 1988), 185, 189.

[26] Ibid., 186.

[27] Ibid.

[28] General Depuy felt that the previous doctrine was too abstract and dedicated his efforts to making it more prescriptive and concrete. Ibid.

Though the version of *FM 100-5* that Depuy was responsible for was later revised in 1982 and again in 1986 into what became known as Air Land Battle, the style and tone of doctrine that Depuy set remained largely intact. Army doctrine was a system made up of tactics, based on the ideas of systems analysis and operations research. The system was conceived to have its component parts optimized and specialized for efficient purposeful action against a known Soviet enemy, with known equipment and tactics, on known European ground.

The current Operations process found in *FM 5-0* traces its roots to 1984 when it emerged as *FM 101-5*. That manual was the first codified version of the Military Decision Making Process (MDMP) that is still in use today. The MDMP is a rational decision making model designed to select the most efficient course of action composed of tactical tasks found in *FM 7-15, The Army Universal Task List*. It is analytic in nature and is the perfect compliment for the doctrine that it was designed along side of.[29] In later sections, new ideas, new concepts, and new additions to the Operations process are introduced, but it is important to understand that the foundation of modern doctrine is still firmly rooted in the work started by Depuy and his successors. In order to gain a deeper appreciation for the roots of our doctrine, it is necessary that we go deeper than Depuy. The next section will explore, in a more philosophical manner, the western character of our doctrine.

Deeper than Depuy: The Influence of Epistemology on Doctrine

Brigadier General (Retired) Huba Wass de Czege, identifies a split between Chinese and Greek thinking in correlation with a requirement for design to permeate to the lowest ranks in our

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[29] J. B. Vowell, *Between Discipline and Intuition: The Military Decision Making Process in the Army's Future Force* (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College School of Advanced Military Studies, 2004).

Army.[30] Though Wass de Czege is by no means the first to identify this split, the context in which he determines its criticality is central to this paper. The processes an Army, or nation, uses in war must be determined by the character of the war, the nature of the enemy, and the conditions within which the war is fought. By making this distinction in his article, Wass de Czege is identifying a need to consider multiple ways of thinking.[31] Wass de Czege's article is most compelling perhaps because he was largely responsible, along with L.D. Holder, for writing the Air Land Battle doctrine under General Donn Starry and no doubt influenced the processes that accompanied it. However, Wass de Czege now questions Cold War experience, doctrine, and paradigms; "This comfortable situation has eroded over the past two decades under the pressure of complex mission demands."[32] By examining the rough course of events that lead to the evolution of our current processes, this paper intends to identify its epistemology. Then, after identifying alternative sources of epistemology, we'll determine whether our processes are flexible enough to allow for a multidisciplinary application.

The term epistemology will be used frequently for the remainder of this paper as we explore differing ways of gaining knowledge. For the sake of clarity, it is important that a common definition is understood. Using a common online dictionary, one finds that epistemology is defined as "a branch of philosophy that investigates the origin, nature, methods, and limits of human knowledge."[33] For the purposes of this paper, epistemology is a source of knowledge. Just as the fields of social science have struggled with this concept, so has our doctrine. In answering what counts as knowledge, the physical sciences largely served as the model, and only empirical evidence is considered. As social scientists struggled with this concept, there has increasingly

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[30] Brigadier General (Ret) Huba Wass de Czege, "Winning Complex Contests of Power and Influence Requires Effective Learning and Adapting," *The Azimuth* 6, no. 1, January (2010).

[31] Ibid., 5.

[32] Ibid., 1.

[33] "Epistemology | Define Epistemology at Dictionary.Com, " http://dictionary.reference.com/browse/epistemology (accessed 5/17/2010).

been acceptance of alternative sources of knowledge beyond the empirical.[34] This paper will show a similar trend in military thinking, rooted in systems theory as a result of social problems.

The Greek and Chinese split referred to by Wass de Czege will from here on be referred to as Western and Eastern. In this paper we will use the categorization of Western epistemology formulated by Mary Jo Hatch.[35] Western epistemology has its roots in the Greek debates between philosophers, particularly Socrates, Plato, and Aristotle. Aristotle's epistemology reigned supreme until the 18th Century, when the German philosopher Imannuel Kant synthesized the rational and empirical philosophies of Descartes, Plato, and Hume into what is now known as early modern epistemology.[36] Modernist thinking was predominant during the Enlightenment and is marked by a belief that scientific knowledge would give people control over their environment.[37] To find the linkage of modern epistemology to U.S. Army doctrine, it is worth noting that Clausewitz was heavily influenced by Kant. Because the alternative Western epistemologies discussed below did not develop until the mid 20th Century and were not prevalent in the field of organizational theory until the 1980's, Modern epistemology is generally thought of as the Western way of thinking.

Another Western epistemology according to Hatch is symbolic-interpretive. While modernists base knowledge on what can be attained by the five human senses, symbolic-interpretive thinkers consider other factors such as emotion, intuition, and experience.[38] Meaning and understanding may only be considered true or relevant within the context within which it is

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[34] Alexander Rosenberg, *Philosophy of Social Science* (Boulder, Colo.: Westview Press, 1995), 56, 87.

[35] Mary Jo Hatch and Ann L. Cunliffe, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives* (Oxford; New York: Oxford University Press, 2006), 14.

[36] "Epistemology - Early Modern - Defining the Modern Tradition: Cartesian Beginnings, Nature as Mechanism, Theory of Sense Perception, Skepticism and the Cartesian Framework ," http://science.jrank.org/pages/7665/Epistemology-Early-Modern.html (accessed 5/17/2010, 2010).

[37] Hatch and Cunliffe, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*, 36.

[38] Ibid., 15.

observed.[39] The influence of symbolic interpretive epistemology on U.S Army doctrine is more subtle, but can be found in *FM 3-0, Operations*. "Commanders continually combine analytic and intuitive approaches to decisionmaking to exercise battle command…[I]ntuitive decisionmaking is the act of reaching a conclusion that emphasizes pattern recognition based on knowledge, judgment, experience, education, intelligence, boldness, perception, and character."[40] This combination of analytic and experiential decisionmaking is supported by Paret's introduction to *On War*. "According to Clausewitz, experience went a long way, but in the end appropriate guides for conduct could only grow out of a comprehensive and scientific analysis."[41] While the majority of doctrine is biased towards more analytical methods, *FM 3-0* also states that even the most analytic of processes still have their boundaries set by intuition.[42]

A third Western epistemology is post-modern. The post-modern perspective refuses to acknowledge that truth can be attained by any source of knowledge, because post-modernists deny that language is capable of representing or corresponding to reality. In this view, truth claims are only an attempt to have one source of knowledge prevail over another for the purpose of power or domination.[43] Some post-modernists even reject the idea that formal epistemology is useful at all because knowledge is relative and communicating knowledge is bound by linguistic constraints.[44] The author has found no evidence of post-modernism in current U.S. doctrine and as such it is not mentioned much hereafter. One practice belonging to the post-modern school is worth noting, however. Deconstruction is a practice of reading and re-reading text to uncover

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[39] Ibid., 15.

[40] United States Department of the Army, *Operations* (Washington, DC: Headquarters, Department of the Army, 2008), 5-2.

[41] Carl von Clausewitz, *On War* (New York: Knopf, 1993), 16.

[42] United States Department of the Army, *Operations*, 5-3.

[43] Hatch and Cunliffe, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*, 16.

[44] Richard Rorty, "Stanford Encyclopedia of Philosophy," http://plato.stanford.edu/entries/rorty/#2 (accessed 9/22/2010).

different interpretations, and therefore different meaning.[45] The post-modern theory of linguistic interpretation holds that, "[m]eaningful action shares the constitutive features of the text; it becomes objectified by its inscription, which frees it from its agent; it has relevance beyond its immediate context; and it can be read like an 'open work'."[46] This is a useful idea for planners and analysts that can have utility in learning about complex problems.

Of the three Western epistemologies discussed, our current doctrine is most heavily influenced by the modern. The empirical and analytical character of the doctrine developments from 1976 up to the Gulf War were a conscious effort initiated by Depuy to shift away from the abstract. Depuy did not take this approach because he was simple-minded. On the contrary, he recognized the existence of feedback loops and the havoc they create with linearly constructed systems.[47] In the era he operated in, however, the threat was a monolithic, technologically advanced modern Army. The sheer destructive capabilities of modern war created conditions that Depuy thought pushed the limits of the human ability to cope on the battlefield. Because of these conditions, Depuy's approach intended to leverage superior technology to minimize the human factor to the greatest extent possible.

Absent of the conditions of the Cold War, the U.S. Army found that it had optimized and specialized for a specific threat. Perhaps the most glaring example is in the Millennium Challenge exercise. The U.S. military, at the pinnacle of technology, was embarrassed by an OPFOR commander that refused to play to the strengths of his enemy.[48] The "scientific way of war" that

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[45] Hatch and Cunliffe, *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*, 53.

[46] Barbara Czarniawska, "The Narrative Turn in Social Studies," Sage Publications, http://www.sagepub.com/upm-data/9690_023494Ch1.pdf (accessed 8/24/2010).

[47] Gole, *General William E. Depuy: Preparing the Army for Modern War*, 256-257.

[48] This exercise intended to validate the digital transformation of the U.S. Army and showcased cutting edge technology and information systems. The OPFOR refused to play into these strengths and had success using low technology solutions. Julian Borger, "Wake-Up Call | World News | the Guardian," http://www.guardian.co.uk/world/2002/sep/06/usa.iraq (accessed 4/28/2010).

the West was so comfortable with was about to face a kind of enemy it had not dealt with since Vietnam; one that thought and fought by different rules (or no rules at all).[49]

In order to counter an enemy that attacks our weaknesses and avoids our strengths it is necessary to understand how the enemy thinks. Once that is accomplished, their strategy must be understood. Only then can we begin to negate the effects of the enemy's tactics and implement our own strategy. Simply wining tactical engagements or battles is useless unless the victories directly contribute to strategy.[50] The Western style of war, influenced by Jomini and Clausewitz , which sought decisive action on the battlefield and relied on science and technology to achieve victory is not effective in wars among the people where objectives include popular support and the advancement of ideas.[51] Power and influence manifest themselves in social needs, political agendas, and relationships. A different way of thinking is required.

The fundamental difference in classical Eastern and Western thinking is the Western belief that an ideal can be described or modeled in theory and then achieved in practice. "Even if the correct mean varies, since it relates to both circumstances and to individuals, it is always what we set our sights (skopos) on, and its perfection is established as a norm that we must then embody in facts."[52] Current doctrine captures the essence of this when discussing assessment of an operation towards an end state.[53] Attainment of the ideal is achieved by force of an "iron will" that "overcomes all obstacles."[54] The Eastern way of thinking never conceived of an ideal form.

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

[50] Paul Von Riper, "Frontline: Rumsfeld's War: Interviews: Paul Van Riper | PBS," http://www.pbs.org/wgbh/pages/frontline/shows/pentagon/interviews/vanriper.html (accessed 5/28/2010).

[51] Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (New York: Vintage, 2008), 5.

[52] François Jullien, *A Treatise on Efficacy: Between Western and Chinese Thinking* (Honolulu: University of Hawai'i Press, 2004), 3.

[53] United States Department of the Army, *Operations*, 5-16, 5-17.

[54] Jullien, *A Treatise on Efficacy: Between Western and Chinese Thinking*, 48.

For them, the intersection of theory and practice does not exist.[55] Instead of imposing a plan with "iron will" to achieve the ideal, the Chinese rely on the "potential inherent in the situation."[56] The 2010 edition of *FM 5-0*, with a discussion of tendencies and potentials is perhaps the first inclusion in Army capstone doctrine of ideas traced to Eastern epistemology.[57]

While the West has dedicated its efforts to careful and detailed planning in order to achieve a predetermined end state, the East weights its effort on evaluation and assessment of conditions. "The general must start by making a painstaking study of forces present. This will enable him to assess which factors are favorable to each of the two camps, for these are the factors from which victory will stem."[58] Interestingly, while Clausewitz stressed scientific analysis, he felt that "non-utilitarian analysis concerned solely with gaining a deeper understanding, might bring about improvements in operational and strategic performance." [59]

Differences also exist in where knowledge of strategy resides. According to some, in the West "parts" (tactics and operations) are integrated into the whole, while in the East, the whole governs the parts.[60] Poole argues that in the East, the lowest ranking soldiers are made completely aware of the friendly and enemy strategy. Every action taken by individuals or large units must either further the friendly strategy or attack the enemy strategy. To this end, armed with knowledge and understanding, subordinates are given ample flexibility to assess the tactical situation and act accordingly.[61]

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[55] Ibid., 15.

[56] Ibid., 16.

[57] United States Department of the Army, *The Operations Process*, 3-10.

[58] Jullien, *A Treatise on Efficacy: Between Western and Chinese Thinking*, 20.

[59] Clausewitz, *On War*, 16.

[60] H. J. Poole , *Phantom Soldier: The Enemy's Answer to U.S. Firepower* (Emerald Isle, NC: Posterity Press, 2001), 18.

[61] Ibid., 19.

To conclude this section and move on to the next it is necessary to capture the main ideas. Between World War II and the end of the Vietnam War, the U.S. Army engaged in many conflicts against varying threats. The doctrine of this era was broad and abstract. At the conclusion of Vietnam, the U.S. Army was in poor shape professionally and found itself in a rapidly escalating Cold War. In light of these conditions, General William Depuy took necessary steps to instill discipline, train for fighting a known adversary and exploit the scientific and technical advantage enjoyed by the West. The result was "performance-oriented training" and doctrine that was based on operations research, systems analysis, and modern epistemology. Through exercises such as the Millennium Challenge and combat experience in Iraq and Afghanistan the Army has realized that purely analytical methods, a single source of epistemology, and tactics divorced from strategy are no longer adequate. The addition of design to Army doctrine reflects multiple sources of epistemology and goes beyond the formal categorizations towards what Schön calls the "epistemology of practice."[62] Army doctrine is moving beyond its tilt towards the empirical; however changing the mindset of the institution takes time. General Petreaus has called our enemy a "learning organization".[63] In the next section, the concept of a learning organization is examined. The question of whether or not U.S. Army operational units can be learning organizations is also addressed.

Learning Organizations

General Gordon Sullivan was perhaps the first to conceive of the Army as a learning organization. In the early 1990's General Sullivan argued that the Army is and must be a

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[62] Donald A. Schön, *Educating the Reflective Practitioner* (San Francisco: Jossey-Bass, 1990), 35.

[63] Joseph G. Cote, "NH's Petraeus on Point - NashuaTelegraph.Com," http://www.nashuatelegraph.com/news/684627-196/nhs-petraeus-on-point.html?i=1 (accessed 5/12/2010).

learning organization.[64] As discussed in the previous section with specific reference to systems analysis and operations research, the Army borrows ideas from the business management world on a regular basis with the goal of improving its organization.[65] In the late 1980s and early 1990s, Total Quality Management (TQM) and Learning Organizations were emerging as leading methods and ideas in the business world. The Army was interested in both concepts. TQM and its principles were immediately useful to the Army given that its organization was optimized and specialized in much the same way manufacturing plants were (no accident given McNamara's experience in Ford motor company). The Army even published *AR 5-1, Total Army Quality Management* in an effort to infuse TQM into Army processes.[66] Less understood was the concept of the learning organization, and although *FM 6-22* states that the Army is a learning organization, most studies have concluded that it is not.[67] This paper looks at what a learning organization is and briefly examines how the Army operations process and supporting doctrine either foster or impede operational units from achieving its ideal.

Chris Argyis and Peter Senge are the most widely known proponents of the learning organization. For the purposes of this paper, Senge provides a more useful framework with which to compare to the Army operations process. Senge uses five disciplines that contribute to three core learning capabilities.[68] Through the descriptions of these capabilities and disciplines, we can determine whether or not they have complements in our doctrine.

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[64] M. J. Wheatley, "Can the US Army Become a Learning Organization?" *The Journal for Quality and Participation*, no. 3 (1994), 1.

[65] The flow of ideas between the military and management fields goes both ways.

[66] Department of the Army, *Management: Total Army Quality Management* (Washington, D.C.: Headquarters Department of the Army, 2002).

[67] United States Department of the Army, *Army Leadership: Competent, Confident, and Agile*, 8-2.

[68] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, xiii.

Senge describes the "prevailing system of management" as introduced to him by W. E. Deming. Senge's description of this system is also useful in comparison to Army processes, especially because the prevailing system – much to W. E. Deming's disgust – is largely based on the methods and tools of TQM that Deming fathered.[69] Deming saw the management model that he invented reduced to a "superficial label for tools and techniques" aimed at "short-term performance improvements." The true intent of Deming, much to Senge's delight, was much closer to the learning organization Senge envisioned.[70]

A good working definition of a learning organization is found on the first page of *The Fifth Discipline* where Senge calls them "organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together." [71] With creativity identified as a basic requirement for operational commanders, it is understandable that the learning organization is desired.[72] The requisite characteristics of the learning organization, which Senge calls disciplines are as follows.[73]

Systems Thinking

Personal Mastery

Mental Models

Building Shared Vision

Team Learning

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[69] Ibid., xii.

[70] Deming intended TQM as a holistic approach to management. In practice, many reduce it to a checklist of fixes divorced from long term goals. Ibid.

[71] Ibid., 1.

[72] Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London; Portland, OR: Frank Cass, 1997), 12.

[73] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 6-9.

Over the next few pages, these disciplines are briefly explained. To achieve the ideal described in the definition, the disciplines must all be present and integrated.

Systems thinking, listed first, is actually what Senge refers to as the fifth discipline. Embedded in this term are several concepts. One concept, mentioned above, is that the five disciplines must be integrated into one complete system or ensemble. Any of the disciplines by themselves may bring about short term performance gains, but will not foster a learning organization. Another aspect of systems thinking is a shift of mind from people thinking of themselves as individuals to thinking of themselves as part of an emergent whole that is larger than them.[74] Finally, systems thinking is a technique for understanding the complexity inherent in the interaction of living systems.[75] Multiple methods exist for applying this technique and are discussed in the next section.

The remaining four disciplines are considered the core learning disciplines. First among these is personal mastery. Senge describes personal mastery as the ability to understand what we truly desire in life combined with the ability to get there. A careful reading of this concept shows parallels with ancient Chinese thinking. Personal mastery is not about using "iron will" to manipulate conditions to conform to a model, but the use of creative tension to merge reality with vision. Creative tension becomes the driver for learning. In order for the learning organization to be realized, it requires individuals with personal mastery.[76]

Personal mastery cannot be confused with a high level of proficiency at a task. *FM 7-0, Training for Full Spectrum Operations* explains that mastery is the goal of training.[77] According to this doctrinal manual, "Mastery comes with practice under varying conditions and by meeting

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[74] Ibid., 11-12.

[75] Ibid., 71.

[76] Ibid., 129-131.

[77] United States Department of the Army, *Training for Full Spectrum Operations* (Washington, DC: Headquarters, Department of the Army, 2008), 2-8.

the standards for the task trained."[78] *FM 7-0* goes on to say that mastery is accomplished through repetition.[79] The use of the term mastery in current doctrine is related strictly to achieving standards of performance in explicitly detailed tasks. From an epistemological view, this is a good example of the western ideal of a concrete intersection between theory and practice. In order to achieve the personal mastery Senge describes, one must not conflate these terms.

The second core discipline of a learning organization is the use of mental models. In many ways, mental models are the genesis for systems thinking in that they provide the initial frame from which discussion can begin. Mental models are a problem however when they remain in our sub-conscious and guide our actions without reflection. Senge provides an example of U.S. automotive manufacturers' assumptions about their customers. These unquestioned assumptions guided business decisions and resulted in a large loss of market share to foreign manufactures.[80] The way out of this trap is to become aware of our assumptions and expose our mental models. Balancing advocacy with inquiry is a technique to expose differing mental models.[81] The aim is to conduct a non-competitive discourse by stating one's view along with the assumptions behind it and then inquiring as to the views of others and discussing assumptions associated with the alternate views as well.[82] The obvious purpose of this method is to achieve consensus or shared vision, but Senge cautions that this is not necessary. Individuals may have differing mental models. What is important is that the team assists whatever individual or section that is the lead of a particular function to develop the best mental model for that function.[83] Already we can see the

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[78] Ibid., 3-2.

[79] Ibid., 4-4.

[80] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 165.

[81] Chris Argyris and Donald A. Schön, *Organizational Learning: A Theory of Acton Perspective* (Reading, Mass.: Addison-Wesley, 1978), 130.

[82] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 184.

[83] Ibid., 187.

relation between personal mastery and mental models, as the creative tension between reality and vision is expressed in terms of the mental model.

One deeply rooted mental model held by individuals within the Army is its hierarchical structure and associated functions. Rank plays a role as well. Senge addresses "the basic diseases of the hierarchy" in his chapter on mental models. "The healthy corporations will be the ones which can systematize ways to bring people together to develop the best possible mental models for facing any situation at hand."[84] A recent news article entitled, "The new leaders, collaborative, not commanding" echoes the same sentiment. This article describes how the "old guard of hierarchical leaders" that relied on command and control are being replaced with leaders who use a more "empowering, collaborative style." [85] *FM 6-22* calls this "shared leadership," and describes a process where "leaders contribute combined knowledge and individual authority to lead an organization toward a common goal or mission."[86] The recent addition of design to Army doctrine is inclusive of this concept as well. According to *FM 5-0*, design "enables commanders to view a situation from multiple perspectives, drawing on varied sources of situational knowledge, and leverage subject matter experts while formulating their own understanding."[87] Sources of situational knowledge can also be read as sources of epistemology.

Building shared vision is the third of the four core disciplines. As noted in the paragraph above, shared vision is not a shared mental model. It is not a shared idea. Shared vision is deeper. Let us be reminded that the explanation of personal mastery has to do with getting the results people truly desire in life. To achieve personal mastery an individual uses the creative tension

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[84] Ibid., 171.

[85] Bill George, "The New Leaders: Collaborative, Not Commanding - WSJ.Com," http://online.wsj.com/article/SB10001424052748703580904575131783515866878.html?mod=WSJ_latestheadlines (accessed 6/10/2010).

[86] United States Department of the Army, *Army Leadership: Competent, Confident, and Agile*, 3-9.

[87] United States Department of the Army, *The Operations Process*, 3-1.

between vision and reality and learn and merge the two. Vision, then, is the representation of

what people aspire for. It is deeper than an idea. It is closer to a purpose. A group of individuals

with shared vision may each have a unique reality based on their position and responsibilities, and

therefore may use different mental models. The power is that each individual is managing the

creative tension between their unique reality and a shared vision so that convergence of purpose

occurs.[88]

Army leadership doctrine mentions vision in various places. One such mention found in

FM 6-0, Mission Command, is reproduced below.

> Ultimately command reflects everything the commander understands about the nature of
> war, warfighting doctrine, training, leadership, organizations, materiel, and soldiers. It is
> how commanders organize their forces, structure operations, and direct the synchronized
> effects of organic and allocated assets toward their visualized end state. Command is built
> on training and mutual understanding by all soldiers within that command about how it
> operates. It is the expression of the commander's professional competence and leadership
> style, and his translation of his vision to the command. However, command alone is not
> sufficient to translate that vision and to assure mission accomplishment; control, the
> subject of chapter 3, is also necessary.[89]

Another mention of vision is made in *FM 6-22*. Here vision is described as a means to

communicate purpose. It states that "visions refer to an organizational purpose" which is

promising, but then states that "leaders carefully consider how to communicate their vision."[90]

Implied in this statement is that the vision belongs to the leader. The doctrine goes on to address

functions of organizational leaders in establishing vision and in endorsing higher vision.[91] Senge

describes a process for creating shared vision from personal visions.[92] While the doctrine does not

preclude a leader from creating shared vision as described by Senge, it leans heavily towards a

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[88] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 191-192.

[89] United States Department of the Army, *Mission Command: Command and Control of Army Forces*, 6-9.

[90] United States Department of the Army, *Army Leadership: Competent, Confident, and Agile*, 1-2.

[91] Ibid., 3-7, 3-9.

[92] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 197-199.

model that is based on compliance instead of synergy. A good measure of compliance is indeed needed in military organizations; however shared vision need be not inconsistent with military requirements for good order and discipline. The usage of shared vision in doctrine most consistent with Senge's description is found in the 2010 version of *FM 5-0*. Here the discussion is centered around design and how it leads to shared understanding and visualization among organizations.[93]

The last of the core disciplines is team learning. Team learning, unlike the other core disciplines, cannot exist on its own without the others. Team learning is the synergistic product of the other disciplines. Personal mastery on the part of the team members accounts for individual realities. As members experience the creative tension between their own reality and the shared vision, they begin to merge the multiple realities into the common purpose. In doing so, it becomes necessary for the members to communicate with each other as the actions they take as a system contribute to the problems they face.[94] In this manner, the uniquely living capabilities of thinking and learning seemingly transfer from the individuals and give the organization a life of its own. Senge calls this phenomenon "alignment," and it is characteristic of learning organizations.[95]

Team learning requires communication. Multiple individuals hold unique perspectives on reality based on differing mental models. Quality communication is needed in order to effectively identify the various mental models and understand the unique perspectives in a way that produces shared vision. The primary methods of communication used in team learning are discussion and dialogue. Dialogue involves free expression of thought about the complex issues experienced by an individual while the remainder of the team suspends its judgment and listens to gain

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[93] United States Department of the Army, *The Operations Process*, 3-1.

[94] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 216-219.

[95] Ibid., 217.

appreciation. Discussion, on the other hand, introduces multiple views and competing ideas in search of the best decisions to support the shared vision of the team.[96]

The author can find no explicit reference to team learning in Army doctrine, however evidence of the concept is identifiable in *FM 6-0* in a discussion on decision making. The Observe, Orient, Decide, Act (OODA) cycle is introduced a method for commanders to make decisions during execution. Although decision responsibility is placed solely on the commander, "[c]ollaboration, discussion, and sharing knowledge" are acknowledged as means.[97] *FM 6-22* states that a subordinate has an obligation to challenge a plan provided by a superior if it will mean failure for the team. "Disagreement can lead to a better solution."[98] *FM 6-22* also makes reference to good leaders achieving success through the empowerment of subordinates to exercise initiative when executing intent-based orders. It goes on to say that weak leaders feel they cannot empower subordinates because the team cannot accomplish the mission without them at every step.[99] This adds weight to Senge's argument that empowering individuals who are not aligned only adds to the team's problems as it gets pulled in multiple directions.[100]

In this section, the term learning organization has been defined according to the definition provided in *The Fifth Discipline*, by Peter Senge, who is a recognized expert on the concept. The component parts, or disciplines, have been explained and how they interrelate has been discussed. While *FM 6-22* states that "[l]earning organizations create a climate that values and supports

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[96] Ibid., 220.

[97] United States Department of the Army, *Mission Command: Command and Control of Army Forces*, A-3.

[98] United States Department of the Army, *Army Leadership: Competent, Confident, and Agile*, 3-10.

[99] Ibid., 3-11.

[100] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 217.

learning in its [sic] leaders and people," it fails to capture the entire concept.[101] Using similar language, *FM 5-0* mentions learning organizations twice.[102] *FM 5-0* refers to learning organizations as being enabled by design but once again fails to unpack the concept of the learning organization. The author found no overt evidence of personal mastery in doctrine. Mental models are not mentioned *per se*, however Senge's discussion of their application does have parallels in doctrine. Shared vision is not precluded by doctrine, but is far from explicit. Team learning is not mentioned as a concept and has no analogous term, but aspects of it are addressed. Finally, systems thinking is the integrating "fifth discipline," and will be addressed in a separate section below due to its importance. This monograph is not the first study of the learning organization concept with regard to the Army. The next section will briefly cover some previous studies and their findings.

Past Studies of the Army as a Learning Organization

Margaret Wheatley, an expert on organizations, was invited by the Army to observe its change efforts in 1993. The concept of the learning organization was emerging and Army senior leaders were interested in knowing if the Army could become one. Wheatley had no prior military experience and was impressed by what she saw. She stopped short of calling the Army a learning organization, but did think it had some consistent practices.[103]

Wheatley used the Army as one entity to define the organization. Based on the variables of information, relationships, and self-reference, Wheatley made here assessment. Given those variables, Wheatley concluded that the Louisiana Maneuvers (LAM) program, battle labs, and the After Action Review (AAR) process were good examples of innovations for change and learning.

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[101] United States Department of the Army, *Army Leadership: Competent, Confident, and Agile*, 8-3.

[102] United States Department of the Army, *The Operations Process*, 1-6, 3-1.

[103] M. J. Wheatley, "Can the US Army Become a Learning Organization?" *The Journal for Quality and Participation*, no. 3 (1994).

She noted however, that the AAR process was the only one of the three innovations she observed that reached throughout the entire Army.

Although Wheatley's landmark study applies the concept of the learning organization to the U.S. Army, it is not directly useful to the operational level leader because it looks at the Army as one monolithic organization. It does however establish that the Army has been interested in the concept of the learning organization for quite some time.[104]

A recent revisit of Wheatley's article is found in the first quarter, 2010 edition of *Joint Forces Quarterly*. Its author, like this one, questions why the Army has been interested in the concept of the learning organization for so long. At times the Army calls itself a learning organization, yet our senior leaders continually stress the importance of changing the Army to achieve characteristics inherent to the concept. To illustrate this point, Dibella points out that General Sullivan called the Army a learning organization after the completion of Wheatley's study and contrasts that with General Petreaus' comments that there is a need for continuing learning and adaptation and that we must "strive to ensure our units are learning organizations."[105] Dibella points to perspective as one cause for this apparent disconnect. While General Sullivan was concerned with force structure, General Petraeus is primarily concerned with strategy and tactics.[106] Dibella later concludes that, "[t]he Army is not and will never be one monolithic learning organization."[107]

Dibella argues that a failure to define the concept of the learning organization is another cause for failure to meet the ideal. While Peter Senge is recognized by many for having one of the most complete and understandable models, many dismiss his concept and redefine it for

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[104] Ibid.

[105] Anthony J. DiBella, "Can the Army Become a Learning Organization? A Question Reexamined," *Joint Force Quarterly*, no. 56 (2010), 118.

[106] Ibid.

[107] Ibid., 122.

themselves.[108] Unfortunately, by not defining the concept of the learning organization with reference to its theoretical foundation, practitioners are able to make claims of achievement with any rational justification using the combined words of 'learning' and 'organization."

Finally, Dibella challenges Wheatley's research question; Can the Army become a learning organization? Dibella asserts that the question is redundant. To Dibella, all organizations learn, it is more a matter of harnessing the learning process and identifying any learning disabilities to be dealt with.[109] Interestingly, Senge identifies several learning disabilities in his work.[110] With that in mind, he lays out a model to help leaders recognize and tap into the learning capabilities of their organization. This monograph takes a similar approach, and looks at design as a means for leaders to create learning organizations.

Another study done by Lieutenant Colonel Stephen Gerras looks at learning organizations within the Army focused at the operational unit staff level. In doing so, Gerras limits his scope to a manageable level and presents meaningful analysis. Citing some of the same documents that this monograph does, Gerras points out that the Army "… has espoused a goal of becoming a learning organization but in practice has no system in place to identify and reward leaders that attempt to achieve this espoused goal."[111] Where this monograph examines design as a path towards a solution, Gerras focuses on the officer evaluation system.[112] In reality, to achieve the espoused goal a comprehensive effort will be necessary.

All of the studies mentioned above point to the fact that the Army has a long history of interest in the concept of the learning organization, but has failed to clearly define the concept.

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108 Ibid., 118.

109 Ibid., 118-119.

110 Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 17-26.

111 Stephen J. Gerras, *The Army as a Learning Organization* (Carlisle Barracks, PA: U.S. Army War College, 2002), 3.

112 Ibid., 16.

Further, the Army has not designed processes to recognize and reward leaders who are able to achieve this espoused goal. Finally, the processes that are in place (planning, promotion, etc.) are largely relics of previous management concepts with almost random references to characteristics of learning organizations. While these references enable the informed leader wishing to transform his or her unit, they by no means serve as a coherent guide to achieving the ideal of the learning organization. In closing, we may be able to apply a statement in *Military Misfortune* as we reflect on our current processes; "That system was itself a product of a different age and a different army, and was no longer appropriate to the circumstances."[113]

Systems Thinking

> [I]t is critical to consider the systemic look—that is, the relationship between all of the aspects of the system. This is a different approach than the traditional systematic, or reductionist approach of the past. While a reductionist approach can work for complicated problems, it is unlikely to be effective in a complex situation, with which most campaigns deal with.[114]

A quick glance at any literature forecasting the future of military operations generally leaves the reader with some enduring themes. The future for our warfighters will be one of "persistent conflict." The problems they will face will be of increasing complexity from an adaptable foe.[115] One way the Army is preparing for this future is with modifications to its time-tested operations process. The inclusion of design as a method of critical and creative thinking to gain understanding and organize the activities of battle command is purported to assist with dealing with the complexities mentioned above.[116] Chapter 3 of *FM 5-0* introduces design as a methodology consisting of three major activities intended to help with creative and critical

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[113] Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York; London: Free Press; Collier Macmillan, 1990), 13.

[114] U.S. Army War College, *Campaign Planning Handbook, AY 10* (Carlisle Barracks, PA: U.S. Army War College, 2010), 36.

[115] United States Department of the Army, *Operations*, forward.

[116] United States Department of the Army, *The Operations Process*, forward.

thinking. Inside the activities outlined in the field manual however, there is no introduction to new methods of organizing or conducting the critical and creative thought. Systems thinking, the integrating discipline of learning organizations, and a method for dealing with complexity is not introduced in any detectable manner. As a result, the full benefit of design may not be realized as practitioners use older analytic processes to organize the details of the problem facing them.

Critical thinking is listed as one of the five fundamentals of design.[117] Complex problems, however, present traps for unstructured critical thinking. Egocentric thinking can cause a thinker to have a narrow point of view and to ignore facts or problems that do not support his proposed solution.[118] Heuristics are another potential problem that can lead to a solution that does not consider or is not informed by all of the relevant information. Rational decision making processes like the MDMP are prone to heuristic traps.[119] A common example of heuristics is applying lessons learned from Iraq to Afghanistan where in spite of superficial similarities, below the surface the problems are completely different. Gerras, in a monograph on critical thinking, puts forth a model that contains six elements.[120] The model is essentially Paul and Elder's critical thinking framework tailored for the military context.[121] The six elements are:

Clarify concern

Point of view

Assumptions

Inferences

Evaluation of information and implications

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[117] Ibid., 3-5.

[118] Stephen J. Gerras, *Thinking Critically about Critical Thinking: A Fundamental Guide for Strategic Leaders* (Carlisle Barracks, PA: U.S. Army War College, 2006), 9.

[119] Ibid., 12.

[120] Ibid., 4.

[121] Richard Paul and Linda Elder, *Critical Thinking: Tools for Taking Charge of Your Learning and Your Life* (Upper Saddle River, N.J.: Prentice Hall, 2001), xx.

This author concurs with Gerras' assessment on the need for a critical thinking model and the inadequacy of rational decision making models like MDMP in preventing cognitive traps. However, the model proposed by Gerras does not integrate well with the existing Army operations process. A significant effort would be required to identify how, when, and where to apply Gerras' model and then modify existing doctrine. Adopting a model of systems thinking addresses the faults identified by Gerras and can easily be integrated with the current design doctrine introduced with the 2010 *FM 5-0*.

The term system has multiple divergent definitions connected with different epistemologies. While there is no single agreed upon definition, certain common features of systems can be identified. Systems have emergent properties.[122] This is to say that the parts of the system, when assembled, have properties that are not explained by the sum of the parts considered in isolation. The system has a purpose, or performs purposeful action.[123] The next key idea of openness as a property of systems is important to military problem solvers. This is the idea that the system can only be understood in the environment it exists in because an open system has porous boundaries that permit interaction between the system and its environment.[124] In addition to openness Peter Checkland uses the terminology of *worldview* to express the idea that the system and its purpose exists differently from different perspectives.[125] This is particularly important for the kinds of social systems that the U.S. Army is interested in, which

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[122] Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture* (Amsterdam; Boston: Elsevier, 2006), 29.

[123] Ibid., 29; Peter Checkland and John Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students* (Hoboken, NJ: Wiley, 2006), 8-9.

[124] Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture*, 30.

[125] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 10.

Checkland refers to as human activity systems. Openness also means that all systems are part of some larger system and cannot be isolated.[126] This idea is useful for systems thinkers who can gain depth of understanding by scaling in on subsystems once the parent system is understood.

Scaling allows us to break complexity into manageable chunks. In this manner, we can capitalize on the number of things our brains can consider at one time (3-9 depending on theorist) by trading complexity for scale.[127] Systems thinking as a discipline allows us to see situations as systems that are made up of actors, each with their own purpose and perspective, that interrelate with each other and the environment adding to our understanding. As a process where mapping the system is performed, systems thinking prevents us from ignoring aspects that our human nature and heuristic traps would prevent us from seeing. According to Senge, "…systems thinking is needed more ever because we are becoming overwhelmed by complexity."[128]

Various models are available for systems thinkers. Here, we'll take a look at what makes them different, and identify some that are useful for military planners. Systems thinking became recognized as an interdisciplinary scientific movement in the 1950's.[129] Gharejedaghi provides a detailed account of the evolution of thought concerning systems thinking that is beyond the scope of this paper, but the categories he uses are useful. Some of the first systems thinking used mechanical metaphors to view systems. An example of this is early automotive manufacturing lines. Later, biological models came in. These assumed a "uniminded" system. Systems were viewed as living creatures and as such an organization had one intellectual center that determined the actions of the body. Living systems theory is an example of this line of thinking and is

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[126] Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture*, 30; Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 8.

[127] Yaneer Bar-Yam et al., *Making Things Work: Solving Complex Problems in a Complex World* (Cambridge, MA: NECSI, Knowledge Press, 2004), 54-55.

[128] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 69.

[129] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 21.

explored later in this paper. Finally, sociocultural systems assume a multiminded system. These are the complex systems current military planners find themselves dealing with in COIN environments. [130] Although the multiminded and uniminded theories may be more applicable to forming dynamic solutions to complex problems, the mechanistic models have value as well.

Operations Research was introduced above. It was the analytical method preferred by McNamara and Depuy and set the tone for much of the doctrine of that era. While Operations Research does acknowledge interdependence of variables within a system it fails to account for openness and adaptation. As such, optimal solutions are created based on analysis and mathematical formulation.[131] In a fluid and dynamic environment this method is least valuable. The underlying analysis done on the variables within the system, however, remains valuable for gaining understanding and is perhaps best replicated in our doctrine in the Intelligence Preparation of the Operational Environment (IPOE) process.

Using Systems Thinking to See the Problem

Multiminded systems theory is perhaps the best start point for thinking about the complex civil-military problems associated with counterinsurgency or stability operations. Gharajedaghi lays out a methodology in chapter 5 of his book *Systems Thinking*. In quick summary, his process aims to understand a system in terms of its structure and functions. Included are the feedback loops. Mapping this system as it is understood is essential. Then the tendencies or potential of the system are described. From here the desired state is determined and potential solutions are tested against the model.[132] The method of mapping the system described and illustrated by Gharajedaghi, while useful for the individual doing the work, is hard to understand and follow for

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[130] Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture*, 10-12.

[131] Ibid., 21.

[132] Ibid., 107-130.

those not directly involved. The methodology described above is consistent with chapter 3 of *FM 5-0*. The discussion on design speaks to the need to identify the "actors and relationships within a system."[133] Also, just as was pointed out above, the prevailing method of mapping these systems, perhaps most widely known by what Stephen Colbert coined the " Afghandyland" example, is hard to understand.[134] *FM 5-0* states, "such diagrams may become so complicated…that they impart only limited insight and inhibit critical and creative thought…"[135] Current doctrine is clearly aware of the danger of using complicated maps to communicate understanding about systems.

Soft Systems Methodology (SSM) shares the essential elements of Gharajedaghi's method, but we will argue here that it is much more suited for military applications. In this flexible but organized method, practitioners start by drawing a "rich picture" from a declared worldview of the "problematical situation" they are part of. By constructing purposeful action models, and acting according to these models, the foundation for learning or "reflecting in action" is laid.[136] By using the idea of layering, or that every system is comprised of small systems and is part of larger systems, the system can be mapped, or depicted in rich pictures in a scale that does not overwhelm the observer and can lead to depth of knowledge as one scales in and out.[137] Additionally, SSM, by using declared worldviews, helps deal with uncertainty as described in *FM*

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[133] United States Department of the Army, *The Operations Process*, 3-9.

[134] Rogene Fisher, "Finding Victory in a Plate of Pasta? - NYTimes.Com," http://atwar.blogs.nytimes.com/2009/12/03/finding-victory-in-a-plate-of-pasta/ (accessed 9/3/2010).

[135] United States Department of the Army, *The Operations Process*, 3-10.

[136] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 6-11; Bryan Lawson, *How Designers Think: The Design Process Demystified* (Oxford; Burlington, MA: Elsevier/Architectural, 2006), 299.

[137] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 8, 46; Bar-Yam et al., *Making Things Work: Solving Complex Problems in a Complex World*, 54-55.

5-0.[138] By considering the social and political aspects of the situation along with the practical,

SSM also requires the use of differing epistemologies associated with each field of inquiry.

Soft Systems Methodology began as a research project aimed at discovering how the

principals of 'hard systems' theories like Operations Research could be applied to management

problems and social problems.[139] One of the earliest departures from the hard systems approaches

that had proven successful in the engineering field was the failure in the ability to state a clear

problem for which an optimal process could be created to solve.[140] Military thinkers can relate to

this dilemma in much the same way as Checkland wrestled with it. In his example he talks about

a simple problem of how to export a product from one place to another by the most efficient

means as compared to a problem of what to do about inner city schools.[141] One can easily relate

to a Center of Gravity analysis conducted against a purely military problem as compared to a

Counterinsurgency scenario where the Center of Gravity is usually the population.[142]

Constructing an optimal course of action to destroy the enemy's ability to sustain itself is much

different than constructing (much less achieving) a set of goals to accomplish with regards to a

society. These are the types of problematical situations SSM was developed to deal with.

What makes SSM different from the hard approaches is its theory of social reality. The

hard systems theories developed as a result of experience gained during World War II and

adopted by large portions of the business world in the 1960s had a theory of social reality based

on goal seeking and optimizing. In this theory human beings "define precise objectives…then

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[138] United States Department of the Army, *The Operations Process*, 1-2.

[139] Peter Checkland, *Systems Thinking, Systems Practice* (New York: J. Wiley, 1981), 149-150.

[140] Ibid., 154.

[141] Ibid.

[142] United States Department of the Army, *Counterinsurgency* (Washington, DC: Headquarters, Department of the Army, 2006), 3-13.

organize activity to achieve the optimum state…"[143] SSM uses a broader theory of social reality based on sustaining relationships and learning which subsumes the previous theory.[144] Goal seeking is a special case of sustaining relationships and optimizing is a special case of learning. In more simple terms, SSM shifted from a theory where social reality could be definitively mapped and modeled, to one that was dynamic, constantly being constructed and reconstructed.[145] Interestingly, the operations research field is also advancing to include this broader theory, where it is referred to as soft operations research. Though not explicitly linked, this is reminiscent of the critical difference in Western and Eastern thinking talked about previously in this paper.

SSM, due to its flexibility, blends nicely with the Army Operations Process. The methodology consists of four main activities:[146]

Finding out

Model building

Discussion/debate

Defining/taking action

The finding out activity is broken into several other activities. Based on the knowledge of the situation a rich picture is drawn depicting the stakeholders, their perspectives, and their roles and relationships within the system. Corresponding statements and narratives accompany this rich picture, which blends very well with constructing the environmental frame in the Army design methodology.[147] Expanding on the knowledge of the system and the desired state, the next step is called "analysis one" in SSM terminology and is the intervention itself. This describes what the

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[143] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 172-173.

[144] Ibid., 173.

[145] Ibid.

[146] Ibid., 14.

[147] Ibid., 24-26; United States Department of the Army, *The Operations Process*, 3-8, 3-9.

client's problematical situation is both in text and drawing and lashes up with the requirement in design to frame the environment.[148] The final steps in the finding out activity are identifying the social and political aspects of the situation. This adds critical information to the environmental narrative in design and may be an invaluable exercise in guiding strategic communication and Information Operations planning.[149]

The second activity in SSM, model building, can be seen as representing the gap between the current and the desired state. In this activity, models for action are constructed and informed by the analysis done in the finding out step. By using the rich pictures, some common heuristic traps may be avoided as interrelated aspects of the system are easily viewed. Checkland describes several memory aids that relate to components of a good model for activity.[150] These components are easily translated into elements of operational design and can, as such, lead to the creation of a mission narrative as an output of design.[151]

The last two activities in SSM, discussion/debate and defining/taking action, are consistent with developing the operational approach in design, course of action comparison in MDMP, and the actual assessment of ongoing operations. Once the first three activities in SSM are complete, the basis for meaningful discussion in order to select or modify prepared models of activity is much richer than the belt, box, or avenue in depth methods created for major combat operations.[152] Included in the modeling activity is the development of criteria to measure

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[148] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 27-30; United States Department of the Army, *The Operations Process.*, 3-10.

[149] Checkland and Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioner, Teachers, and Students*, 31-38.

[150] Ibid., 38-48.

[151] United States Department of the Army, *The Operations Process*, 3-12.

[152] Ibid., B-26.

performance which is also consistent with the Army operations process.[153] Though perfectly suited for major combat operations, in COIN and stability environments, the belt, box, and avenue in depth methods may not provide the necessary framework to adequately assess a proposal. Both discussion/debate, and taking action in the system triggers learning that leads to constant re-framing and adaptation to achieve the desired state. This is consistent with the Army's design doctrine and the concept of the learning organization.

In order to deal with the complexity inherent in the current operational environment, systems thinking is a valuable technique nested within the broader application of critical and creative thinking. Any method for systems thinking can prove useful to aid individual understanding. It is the author's view, however, that Soft Systems Methodology is an established and codified methodology that is fully consistent with activities already required in the Army operations process.

Using Systems Thinking to See Yourself

Seeing ourselves as a system is equally as important as seeing our problems as systems.[154] If complex problems or situations are best seen as multiminded systems, we are at least a uniminded system within the problem environment. In contemporary joint, interagency, intergovernmental, multinational, and commercial operating environments, who "we" are is also often best viewed as a multiminded system. SSM is clear about including ourselves in the situation, but few references talk of the idea of seeing one's own organization as a system.[155] One of the keys of systems theory is that adaptation is necessary to deal with complexity.[156]

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[153] Ibid., Appendix H.

[154] Alex Ryan et al., *Art of Design Student Text, Version 2.0* (Fort Leavenworth, KS: Command and General Staff College, 2010), 210.

[155] Lawson, *How Designers Think: The Design Process Demystified*, 28.

[156] Ryan et al., *Art of Design Student Text, Version 2.0*, 210.

Understanding our own organizations as systems may help foster more rapid adaptation leading to both enhanced effectiveness in combat and organizational learning.

Living systems theory is based on a uniminded biological metaphor in which an organization is a living body controlled by one brain. Naturally there are organ systems and body parts that perform functions, but these separate parts cannot decide to up and leave the body to operate on their own.[157] This is a useful construct for a battalion or brigade when viewing itself as a system. Command relationships and military culture bind the unit into a coherent whole based on task organization for combat. The actual function of the system and how the parts interrelate to perform its function vary widely depending on mission variables. The commander and his staff, however, provide the brain function and are informed by all senses represented by the unit's specific organization.

Interestingly, the Army commissioned a study of living systems theory in 1984 to see whether it could explain the variance in performance of good units, and those that weren't so good. Additionally, General Donn Starry, then the TRADOC commander, wanted to know if living systems theory could be understood by soldiers and officers in tactical units and applied to increase performance. The study looked at 41 U.S. Army battalions in a garrison training environment. The findings were that Soldiers and officers could easily understand the theory and implement it in their units. Those that applied the theory saw statistically significant improvement. Another interesting finding of the study was that the model template used to provide initial structures and functions had to be modified based on human dynamics within each unit and the particulars of the units' missions and problems. The study provides solid evidence

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[157] Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture*, 11.

that systems thinking applied to our own organizations both improves performance and fosters adaptation.[158]

Without systems thinking, according to Senge, the other elements of a learning organization won't interrelate in a way that achieves the ideal. So far in this monograph we have identified that the Army views itself as a learning organization as is evidenced in doctrine, but has only passive references to systems or systems thinking. This section has provided examples of how systems thinking can be applied to the operations process and how it actually was applied to the training management system with documented success. Systems thinking provides a means to deal with complexity. Its multi-disciplined application of critical and creative thinking fosters adaptiveness and lays the foundation for becoming a learning organization.

Design

According to retired Israeli Brigadier General Shimon Naveh, an Army cannot have one universal doctrine.[159] What Naveh means by this statement is that no universal operational concept will work in all situations. Furthermore, against a human enemy, no concept will work indefinitely before it is effectively countered. Once any concept or model is put to use, it must be immediately and continuously adapted and modified in order to maintain the initiative or the upper hand because the model is based on a snapshot of observed reality and the actual system continues to change (even more so when we act inside or against it).[160] The legacy operational concept of Air Land Battle (ALB) discussed in the first part of this monograph was a single operational concept that our doctrine and training was based on. Because of the single known threat and known terrain associated with ALB combined with the exceptionally long period of

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[158] Gordon C. Ruscoe et al., "Comprehensive Technical Report of the Inquiry into the Application of Living Systems Theory to 41 U. S. Army Battalions: Executive Summary. Volume 1."

[159] Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, 177.

[160] John R. Boyd, *Destruction and Creation* (Fort Leavenworth, Kan.: U.S. Army Command and General Staff College, Center for Army Tactics, 1987).

time we faced this threat without implementing the concept it would seem that the U.S. Army did have one singular doctrine. Our newest doctrine, Full Spectrum Operations, is devoid of any singular operational concept. Instead, the basic elements of offensive, defensive, stability, and civil support operations must be combined and tailored with an appropriate force package and simultaneously executed in response to any situation.[161] One output of design is the broad operational concept in the form of the mission narrative that conveys the commander's understanding and visualization.[162] Thus, the operational concept is unique for each situation. Design provides the shared understanding necessary in a learning organization and lays the foundation for effective mission command.[163]

The term "design" has been present in U.S. Army doctrine for quite some time. At least as early as 1986, design was present in the *FM 100-5* (the predecessor to *FM 3-0*). Here, we'll look at the 1993 version of 100-5 and its description of operational design. In this manual campaign design and operational design are both used frequently. Operational design is described as integrating and linking tactical battles to achieve the strategic aim.[164] In essence, operational design is said to be a translation of strategic goals into purposeful tactical actions using a commonly understood lexicon. The lexicon consists of the elements of operational design originally called "Concepts of Theater and Operational Design."[165]

The concepts of operational design in 1993 consisted of center of gravity, lines of operation, decisive points, sequencing, and deception. Using these universally understood doctrinal concepts, operational artists could communicate ideas to subordinates. In much the same

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[161] United States Department of the Army, *Operations*, 3-1, 3-7.

[162] United States Department of the Army, *The Operations Process*, 2-8.

[163] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, chap. 10; United States Department of the Army, *Operations*, 3-6.

[164] United States Department of the Army, *Operations* (Washington: U.S. Government Printing Office, 1993), 6-2.

[165] Ibid., 6-7.

way as hard systems theory assumed the existence of clearly defined problems with definite

objectives, *FM 100-5* described the essence of operational art as the ability to mass effects against

the enemy center of gravity. As such, plans would be constructed to optimize activity in pursuit of

this goal. The hard systems theory is clearly evident in early operational design.

Shimon Naveh as a military practitioner realized the inadequacy of the strict adherence to

hard systems theory. Naveh developed a methodology called "systemic operational design"

(SOD). His methodology reflected the latest developments in systems theory with respect to its

model of social reality, and was heavily influenced by Naveh's own exploration of alternative

(post-modern and Eastern) philosophy. As such, "Systemic operational design focuses on

transforming the relationships and interactions between entities within a system."[166] While this

paper is not about SOD, it is important to recognize that the latest manifestation of design in

chapter 3 of *FM 5-0* is essentially based on Naveh's original idea which "includes the socio-

cultural view of a multi minded system" consistent with the evolution of soft systems theory.[167]

Conducting multiple inquiries from differing worldviews (using associated sources of

epistemology) also marks a departure from previous doctrine and is again consistent with soft

systems. Finally, Naveh's model accounts for continuous learning or reframing as operations

unfold and systems adapt.[168] SOD is said to be commander centric, where a commander selects

from his staff a small team in order to conduct the inquiries and discourses.[169]

Command and control (C2) is the doctrinal term used to describe how commanders and

their assigned staffs coordinate the actions of their units. "Through C2, commanders initiate and

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[166] Ketti C. Davison, *Systemic Operational Design (SOD): Gaining and Maintaining the Cognitive Initiative* (Fort Leavenworth, Kansas: U.S. Army Command and General Staff College, School of Advanced Military Studies, 2006), 31.

[167] Ibid., 30.

[168] Shimon Naveh, Jim Schneider, and Jim Challans, *The Structure of Operational Revolutions: A Prolegomena* (Leavenworth, KS: Booz Allen Hamilton, 2009), 77.

[169] Davison, *Systemic Operational Design (SOD): Gaining and Maintaining the Cognitive Initiative*, 31.

integrate all military functions and operations toward a common goal–mission accomplishment."[170] The Army conceptualizes how commanders and staffs execute C2 with a term called Battle Command. The concept of Battle Command consists of a framework of activities a commander and his staff executes in order to ensure all warfighting functions are integrated towards mission accomplishment. The activities in Battle Command are understand, visualize, describe, direct, lead, and assess. [171] "Design is a way of organizing the activities of battle command within an organization."[172] While not prescriptive in the formation of a design team, *FM 5-0* holds with the idea that design is commander centric, stating that design underpins battle command.[173] Design, consistent with SSM, also allows a commander to view problems from multiple perspectives and "draw on various sources of situational knowledge." In short, design is an evolution in the application of systems theory to military problems that subsumes the previous hard systems-based approaches, considers multiple sources of epistemology, and is the commander's tool to structure learning. However, this is largely implicit in current doctrine and can only be discerned by a careful reading informed by an understanding of design's theoretical context.

Mission command is the preferred method of C2 for Full Spectrum Operations.[174] Mission command emphasizes decentralized control and focuses on providing purpose thus enabling commanders with freedom of action to achieve the mission within the higher intent. "Mission command requires an environment of trust and mutual understanding."[175] The discipline of personal mastery in learning organizations is directly applicable to successful mission

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[170] United States Department of the Army, *Mission Command: Command and Control of Army Forces*, x.

[171] Ibid., chap. 2.

[172] United States Department of the Army, *The Operations Process*, 3-1.

[173] Ibid.

[174] United States Department of the Army, *Operations*, 3-6.

[175] Ibid.

command. The subordinate commander must hold his own vision of his situation and reconcile the creative tension between his mission and the higher mission and intent. [176] Mission orders are one component of how the commander and subordinate commanders direct in battle command.

Mission orders do not preclude a staff from doing detailed planning. Integrating the warfighting functions simultaneously to achieve mission success requires as much science as it does art. The detailed analysis and calculations for logistics, communications, reporting, and assessment among others must take place in order for our own system to function smoothly. Much of the science of operations is not entirely unique to a given situation. Because of this, the effective use of mental models or heuristics can aid the planning effort. Here then, we see that detailed planning is not separate from design, but is a requirement to communicate the design effectively to those who must execute. Using Lawson's architectural example, this is like the architect's conceptual drawing being translated into blueprints for a construction crew. Keep in mind however, that the construction crew provides feedback to the architect as issues arise that require modification of the original concept.[177] Also note that the use of mental models in this step is consistent with the requirements for a learning organization.[178] Even archetypal models such as Senge's are useful in gaining a quick appreciation for the generic characteristics of a situation.[179] As the military has learned from Boyd, however, no model survives indefinitely.[180]

While design harnesses creative and intuitive processes to form a concept, it should not be thought of as a separate process from MDMP. Instead MDMP can be conceived as a necessary piece of the design process which, as noted above, is a framework for the activities of battle command. *FM 5-0* is not clear on this concept. Chapter two talks about the interface between

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[176] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 136, 139.

[177] Lawson, *How Designers Think: The Design Process Demystified*, 26.

[178] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 163.

[179] Ibid., 389-400.

[180] Boyd, *Destruction and Creation*, 5.

design and MDMP as if they are two processes instead of activities within the integral whole of battle command or operational art.[181] Again, in chapter 3 of *FM 5-0*, the outputs of design are listed which leads the reader to believe that design and MDMP constitute the "great divide" in planning between conceptual and detailed.[182] It is not until the last section in chapter 3 of *FM 5-0*, which discusses "reframing" that we are reminded that design carries on into execution and assessment.[183]

Once subordinates and superiors achieve shared vision, mission orders are issued, and detailed planning is complete, then operations begin. With the model for purposeful action in mind, units begin to learn about the system through enactment which causes changes in the system.[184] Schön calls this the exploratory experiment.[185] Built into how our system operates, however, are processes for sharing assessments of our actions. Through these processes team learning occurs.[186] Through the reflection on and in action and team learning, reframing is possible.[187] In this manner, our model continuously evolves as both we, and the system we are acting in, redefine themselves. Design, then, is both a useful framework for organizing the activities of battle command as well as a framework for achieving the concept of the learning organization.

Design is a necessary concept in order to produce the operational approach for a given situation under the doctrinal idea of full spectrum operations. The preceding section has shown

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[181] United States Department of the Army, *The Operations Process*, 2-8.

[182] Henry Mintzberg , *The Rise and Fall of Strategic Planning* (New York [u.a.]: Free Press [u.a.], 1994), 78.; United States Department of the Army, *The Operations Process*, 3-12.

[183] Ibid., 3-12.

[184] Karl Weick, "Leadership when Events Don't Play by the Rules," *Reflections: The SoL Journal* 4, no. 1 (2002), 30.

[185] Schön, *Educating the Reflective Practitioner*, 70.

[186] Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, 216.

[187] Lawson, *How Designers Think: The Design Process Demystified*, 299.

that the activities of design integrate with the activities of battle command and the disciplines of the learning organization. Commanders use battle command to perform operational art. Just as Senge acknowledges that systems thinking is the most critical discipline required to integrate the other disciplines, systems thinking is the foundation of operational art as well. Naveh was perhaps the first to articulate this idea when he stated, " …[O]perational theory constitutes the military version of the Gestalt philosophy or the theory of general systems."[188] Schneider also states, "The hallmark of operational art is the integration of temporally and spatially distributed operations into one coherent whole."[189] Slight modifications to Army doctrine could effectively build on these ideas and make the concept of the learning organization better understood by our operational units. Realization of this concept throughout Army formations can provide the flexible, adaptive force called for under the construct of full spectrum operations.

Conclusion

At the beginning of this research project, the aim was to determine if Army operational units at the battalion and brigade levels could become learning organizations if doctrine were modified in order to better explain the concept. By exploring the development of the operations process, the concept of the learning organization and the field of systems thinking, these areas have been determined to be linked. As written, current Army doctrine contains traces of all of the elements of a learning organization either explicitly or in parallel.

Systems thinking is the integrating discipline of the learning organization. Researching whether systems thinking could be adopted by doctrine in a more explicit way than it is currently uncovered interesting implications. The concept of operational design prior to the 2010 version of *FM 5-0* is based on the application of operations research and systems analysis applied to military

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[188] Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, 3.

[189] James J. Schneider, "The Loose Marble–And the Origins of Operational Art," *Parameters*, U.S. Army War College, Volume 19, Number 1, March 1989, 87.

problems. This is a hard approach to systems thinking. The new addition of design in chapter 3 of *FM 5-0* traces its lineage to Naveh's systemic operational design and is based on later evolutions in systems theory that conceive of a broader model of social reality. The model used by the latter is based on building relationships and learning.

Soft Systems Methodology was developed to deal with problems using the model of social reality discussed above as its core. Constructing models for human activity systems using this method involves inquiry using varied sources of knowledge about the system from multiple perspectives. A careful reading of chapter 3 in *FM 5-0* reveals that these same principles are already present in design but are much more explicit in Naveh's SOD.

Design requires interaction with the system – as part of the system – in order to learn about it. A crosswalk of design as a framework for organizing the activities of battle command revealed that the two are entirely consistent. Doctrine identifies the learning organization as the ideal for Army units. Therefore design can also be applied as a framework for the concept of the learning organization within the Army, with systems thinking at the core, and applied in both the operations process and in training management. The research initially intended to link these three concepts actually uncovered common theoretical underpinnings and already existing linkages. Capturing these linkages in a more explicit manner in doctrine would greatly increase the chances of operation units achieving the ideal of the learning organization.

Recommendations

The disciplines of the learning organization are all consistent with current Army doctrine and all have representation in various places in the capstone manuals. Although the term "learning organization" is mentioned in *FM 6-22* and *FM 5-0*, the concept is not explained in a way that conveys its meaning or identifies its components. Commanders can hardly be expected to achieve this ideal if they are not given the means to understand the concept. By adding

additional text in *FM 6-22* that describes the learning organization in accordance with Senge's concept commanders would, in one place, be able to grasp it.

Systems thinking is a way to deal with complexity and the integrating discipline of the learning organization. While systems thinking is a tenant of design according to the School of Advanced Military Studies' student text on design, only vague references are made to it in *FM 5-0*. While critical and creative thinking are mentioned, systems thinking as a method for conducting them is not. A short discussion on systems thinking in chapter 3 of *FM 5-0*, and the addition of an annex on Soft Systems Methodology, could increase efficiency and effectiveness in the conduct of battle command. A discussion on systems thinking with regard to training in *FM 7-0* could increase the aptitude for this skill and has already been proven effective through the living systems theory study in 1984.

Finally, design must be clarified so that it is understood as the framework for organizational learning and battle command. More attention must be given to a re-write of chapter 3 in *FM 5-0* that links design with learning organizations and dispels the idea that it is simply a compartmentalized conceptual planning activity. Tension does exist in the pre-design portions of doctrine and the new design concepts that have been added. Specifically, both are based on systems theory, but use different models of social reality. While the previous model emphasized the empirical, design emphasizes a multi-disciplinary approach. With this in mind, a future iteration could smooth out some of the contradictions.

Further research should be conducted in much the same way that the living systems theory study was done in 1984 with regard to design and learning organizations. This author recommends selection of a sample of units to be taught the concepts of learning organizations, design, and systems thinking. Using similar methodology to the 1984 study, the adaptiveness of units can be studied and compared to others that have not been exposed to and trained on these concepts.

Modifying the doctrine to include the clear linkage between learning organizations, systems thinking, and design alone will not produce the effects the Army is looking for. The doctrinal changes do however constitute the first step. By taking this first step, training and education, as well as practical application in operational settings are more likely to follow. The Army is on its way towards making learning organizations at the operational unit level a reality.

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