



Seven Design Theory Considerations

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An Approach to Ill-Structured Problems

MILITARY AND GOVERNMENT leaders at the strategic, operational, and tactical level often struggle to fuse design theory with military planning procedures and doctrine.¹

In the field, the office, and the classroom, Western military institutions use “conceptual planning” that often proves problematic to integrate into traditional military decision making, doctrine, and professional military education.² Although this advanced sense-making and conceptual planning approach receives a variety of labels from nations and their defense forces, many include the term “design” to distinguish the approach from traditional military decision making and planning. This article intentionally uses the more generic and unaffiliated term “design theory” instead of another institution-specific phrase from the lexicon.³

Design theory is challenging for a variety of reasons, not the least of which is inspiring military professionals to reflect on how their organization thinks. Design theory also encourages us to reflect on how our organization does not think, and why this tends to occur.

In this article, I present seven interrelated design theory phenomena that seem to occur regularly when fusing design theory with military decision making in complex environments. Military leaders at the tactical, operational, and strategic levels may find some or all of these phenomena useful as they contemplate military operations in complex, uncertain future environments. These observations reflect my own experiences applying design theory with military planning in Afghanistan from 2011 to 2012 in a variety of joint planning activities while assigned to NATO Training Mission-Afghanistan at the operational level.⁴ These considerations apply to military organizations as well as governmental and business management disciplines where planning efforts confront complex, uncertain environments. Design theory seeks to avoid set procedures and sequences. However, to begin with the concept of a “problem” is useful in conversing about design theory applications.

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PHOTO: U.S. Army 1LT Spencer Tadken, right, reviews aiming techniques with an Afghan soldier during training at Forward Operating Base Shank, Logar Province, Afghanistan, 13 March 2012. (U.S. Army, SPC Tia Sokimson)

1. To Appreciate the Game of Chess, Stop Thinking So Much About the Pieces

Leaders attempting to fuse design theory with military planning efforts should distinguish between the logics that various groups and organizations prefer to employ, and the vocabulary and concepts associated with them.⁵ Military organizations will benefit from considering what a “problem” means, what it does not mean, and why this is. Are all military problems definable, explainable, and solvable? Does a problem have to be tangible for us to apply military tools to “attack” it? What happens to the planned solution to a problem when the problem changes over time? If you identify something as a problem, target it, and achieve your objective only to find that the problem became something different, are you focused on the problem or merely on the symptoms of something larger?⁶

When we chase tactical problems and discover larger core issues beyond them, we usually associate uncertainty with these concepts. Design theorists use the helpful term “meta-problem” to address complex issues that go beyond tactical and linear problem sets. By tacking the prefix “meta” onto concepts like “problem,” “question,” and “narrative,” we change the meaning of the words from something specific into something broad, holistic, and often answered with yet deeper questions.⁷ Did you notice that many of the questions posed on “problems” in the previous paragraph led to more questions instead of answers? With design theory, that is actually a good thing!

I prefer to use the term “phenomenon” instead of “problem” to differentiate between tactical, tangible elements easily labeled as problems, and the more elusive, self-organizing meta-issues or core tensions that endure and evolve over time within a complex environment, but regardless of the terms one uses, as long as there is sound logic underpinning an organization’s common language, it can communicate effectively.⁸ Words are important; they reveal more about how an organization prefers to seek understanding, and what it refuses to see.⁹ This becomes critical when an organization commences planning. Miss the meta-problem or core issues, and you may commit blood and treasure towards the wrong objectives.¹⁰

Tactical problems are attractive to military organizations because they can integrate them readily with quantifiable metrics, bell-curves, and mathematical analysis and reduce uncertainty in an environment.¹¹ However, the more complex and adaptive an environment is, the more some of these planning approaches fail to explain or reduce uncertainty.¹² This is where military and government institutions prefer to seek short-term successes and codify them into general procedures, often in doctrinal form.¹³ Hence, problem solving leads to “proceduralization.” Powerful forces within the military institution canonize lessons learned into doctrine and universal application.¹⁴

While problem solving through traditional military decision making often leads to proceduralization, design theory appreciates how deeper phenomena often lead to emergent processes within a complex, adaptive system.¹⁵ Emergent processes are different from procedures. Design theory resists the rigid “paint-by-numbers” methodology that procedure-based logic enforces. Consider two opponents in a chess game. The staff of an organization that prefers to think with procedure-based logic will likely develop procedures that focus entirely on the chess pieces. The procedures can resemble sports-team playbooks with intricate turn-based moves and elaborate linear methodologies for winning. Enemy chess pieces may feature “jackpot” targeting. These approaches are useful in subsequent detailed planning and execution, but usually fail to support much subsequent action. Considering only the chessboard, the chess pieces, and the rules of the game prevents an organization from realizing what lies beyond the chessboard. This approach may lock your staff into an endless loop of description and categorization that never recognizes the actual phenomena at work.¹⁶

To lead your staff to consider deeper phenomena and emergent processes, you must get them to stop thinking about the chessboard. Meta-processes and emergent phenomena exist above the chessboard. Movements of the chess pieces are indications of larger forces in motion. Reductionist and tactical thinking focuses on particular opponent chess pieces or spaces, while design theory encourages the staff to contemplate the phenomenon of “skill” (Figure 1). It asks us to consider how the opponent’s chess skill is an emergent tension that affects the

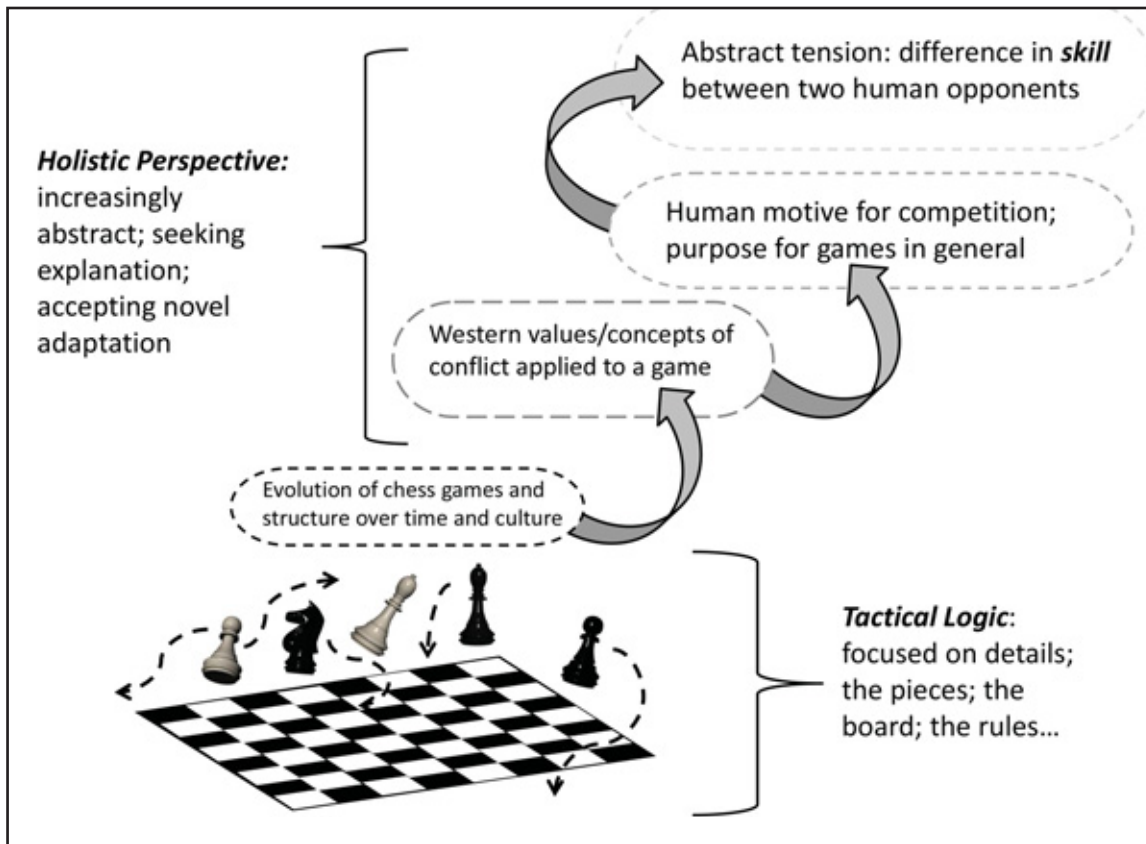


Figure 1
Design Encourages Thinking “Above the Chess Board”

entire environment. Such thinking can lead the staff to improvise and adapt to overcome skill disadvantages to influence transforming the system to a future state more advantageous to the organization.¹⁷ Ultimately, the goal may not even be to win a particular chess game, but something beyond that. Yet, tactical problem solving and proceduralization will lock a staff’s energies and outputs into chess-piece-centric approaches. Getting the staff’s focus off the chess pieces and onto the area above the board is often critical to transforming design thinking into military planning.

2. Know How to Wash Babies Before Throwing Out the Bathwater

Some worry that design tends to disregard doctrine and “throw the baby out with the bathwater.” I find most doctrine rather inhibiting for critical and creative thinking, but doctrine’s utility is

undeniable. Perhaps one of the bigger hurdles for military organizations to clear is the stranglehold that doctrine has upon military professionals.¹⁸ (Many businesses model their planning and decision making along similar lines.) Military organizations self-identify as groups that can consistently produce universal results in diverse conditions. To do this, Western military institutions produce narratives that become the bedrock of doctrine, policy, procedures, and language. However, this comes at a cost.

To properly apply design theory, a leader must appreciate that doctrine influences how our military prefer to think. Doctrine’s primary weaknesses are inflexibility, the inability to improvise, and resistance to any change that threatens the relevance of the organization that is the proponent for the doctrine.¹⁹

Leaders should understand doctrine by understanding not only its content, but also its *context*, the military institution’s approach in conflict environments. This includes critical and contrary thinking

that explores contradictory perspectives. Only then can leaders collaborate to use design theory to safely disregard doctrine (when necessary) and substitute knowledge from various other fields, concepts, or theories.

Design practitioners often use the term “*bricolage*” to convey this concept.²⁰ To bricolage within a hybrid planning effort, a leader may infuse elements of swarm theory, post-modern philosophy, inter-service conceptual planning, and business-modeled scenario planning into war game sessions while still using many doctrine-centric military terms, concepts, and processes. If a discipline or field adds value regardless of its origin, it deserves legitimate consideration. To disregard a concept or methodology and maintain intellectual honesty, one must understand what the concept or methodology does or does not contribute to solving the problem at hand. Ultimately, some doctrine may help, and we should put some of it back on the shelf for another time.

3. In Complex Environments, Nosebleed Seats Often Trump the 50-Yard Line

Design theory seeks holistic appreciation of complex dynamic environments through abstraction. Leaders face significant challenges when trying to change the staff’s perspective from one that isolates, reduces, and categorizes to one that takes a broad and often ambiguous position.²¹ Getting your staff to shift gears is not easy. How many targeting processes and working groups within a brigade combat team occur weekly? Is the staff predisposed to further isolate and reduce information through iterative planning and targeting sessions?²² The proclivity for “stove-piping” information is unquestionably present.²³

For leaders, one useful approach for guiding a staff toward abstract thinking involves “what” versus “why” questions.²⁴ When a product, narrative, or output appears to seek to answer “what-centric” questions, the staff is likely employing reductionist logic that continues to isolate and categorize information into smaller and seemingly more controllable chunks. We do this routinely with virtually all aspects of detailed planning from special operations jackpots to left-handed Afghan

female police officers in the Wardak province. “What-centric” questions lead to reductionist answers, or further analysis that isolates and fragments complex systems.

On the other hand, “why-centric” questions generate different outcomes. “Why” questions often lead to abstraction and holistic appreciation and produce more questions (and fewer answers), which makes military organizations uncomfortable due to an increase in uncertainty. “Why” questions tend to push the staff away from reductionist logic to appreciation of a system’s dynamic actors and phenomena, leading a deep understanding of complexity without any misconceptions about how uncontrollable it is.

To integrate design in military planning, operate as a synthesist not an analyst. “Synergy” is distinct from what-centric analysis in that while an analyst might produce volumes of data on individual bicycle parts, the synthesist will instead assemble them into a bicycle and address why someone seeks to ride it.²⁵ Synergy occurs when the whole is greater than the sum of the parts. Synthesists question why over what, and view complex systems holistically instead of attempting to isolate and reduce them into measurable entities for categorization.²⁶ The analyst collects neat piles of bike parts. The design synthesist runs a bicycle repair shop.

4. When Your Organization Wants to Kill You, It is Not Always A Bad Thing

We frequently use the term “critical thinking” in the military, but do we really know how far to take it? Philosopher Michel Foucault provided an explanation of how critical thinking denotes risk with his term “problematization.”²⁷ Foucault used the example of an ancient philosopher summoned by an emperor as a metaphor for his problematizer. The emperor summons fools and jesters to him for their wit, but he seeks out philosophers for wisdom, insight, and critical thinking.

While the fool risks his future employment, and at times his life on whether he entertains, the philosopher risks failing and offering faulty advice to the emperor. Both the philosopher and the fool also reap benefits when they supply entertainment or advice that benefits the emperor. The military

professional becomes the problematizer when he provides the emperor (the senior leader) valid and useful advice that displeases him due to its critical nature. Sometimes our organization's senior leaders may not want to hear the truth because it hurts. The emperor might still kill the philosopher even when he provides sound advice if it threatens the institution's core tenets or values.

The problematizer faces yet another risk, which comes from not the emperor, but the institution at large. If the problematizer critically addresses something within the institution and this threatens to destroy or marginalizes something deeply cherished, it may not matter if the advice benefits the institution in the long-term. Collectively, the institution may lash out and silence or destroy the problematizer as an act of self-preservation. Many reformers in history met this fate. The fool has only to entertain and win applause to make his living, but the problematizer risks death at the hands of the institutional forces that shape our collective logic and group dynamics. Being wrong will kill you, and being right can do so as well!

In modern times, an institution "kills" a military professional through marginalization, obstructionism, or even employment termination. Leaders who employ design theory face similar risks, in that the institution would rather continue to do things a certain way and fail instead of transforming into a more successful but less familiar form.

5. Flawed Concepts in Military Planning are Like Uninvited Relatives at Thanksgiving

Design theory benefits strategic, operational, and tactical leaders despite their inability to always influence complex environments. Strategic-level leaders may gain deep understanding of a wicked problem that forces them to appreciate national, political, and even international phenomena that the military organization is unable to influence directly. Operational and tactical-level leaders in the same organization may learn to appreciate the same phenomena, and others within the military organization may come to similar awareness. Our military really struggles with things it cannot fully understand and struggles to predict future action or change. A design practitioner cannot influence

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many things, yet by simply appreciating the many phenomena within a complex system, he gives the leader the opportunity to influence his organization more effectively. "Thinking about how your organization thinks" is a process of critical reflection that offers great potential.

For instance, Operation Enduring Freedom has spanned over a decade for the U.S. military, yet given unit deployment and redeployment cycles, one might consider that instead of a single decade-long conflict, our military has actually fought 11 separate one-year conflicts in the same region. Nearly every organization that enters the cycle inherits the plan and associated concepts that the outgoing unit and its predecessors advanced earlier. A tactical or operational commander might, within any of the yearly cycles of forces entering and leaving Afghanistan, come to see that the concept for securing the Afghan civilian population and establishing nationally cohesive security is a faulty concept. Even if absolutely correct, how successful would a brigade or division commander be in any attempt to upset the apple cart on long-term coalition counterinsurgency planning? The military hierarchy generally does not respond well to "reframing" the entire operational logic for a military campaign, regardless of how persuasive the logic may be to do so.²⁸ If design application potentially puts a leader into that situation, what options are there?

As a planner, I was unimpressed with centers of gravity in the joint military planning discipline known as "operational design." I found that I disagreed with the logic of it, yet I could not disregard it in our final design deliverable. It felt like having unwelcome family houseguests. Sometimes you are stuck with shortcomings that design thinking has helped highlight for you, but the organization is

unwilling to let go of them. When your crazy uncle tends to drop by for Thanksgiving, you have to plan the day with him factored in. If your organization demands planning concepts that do not fit your understanding of the problem, or tries to employ procedures that lack utility, it is always better to appreciate why and how your organization uses them so that you may develop ways to take action within the system despite their presence.

6. Orchestra Sheet Music is Linear; Improvisational Jazz is Nonlinear

The nonlinear versus linear planning debate has confused the current generation of military professionals while explaining very little about how “nonlinear” functions within military decision making. Army doctrine describes ill-structured problems as “the most interactive; they are also complex, nonlinear, and dynamic—and therefore the most challenging to solve.”²⁹ Yet neither our doctrine nor our professional military education system really explains what nonlinear means as opposed to traditional linear planning. Few buzzwords have gained similar status in the modern military lexicon as the words “nonlinear,” yet as an institution we routinely fail to understand or describe what nonlinear is, especially at the operational and strategic levels.

To humans, linear processes are instinctual. They correspond to a time and place where one event leads to another. U.S. Army Field Manual 5-0, *The Operations Process*, warns of the pitfalls of linear thinking with respect to complex adaptive systems. “The first pitfall is *attempting to forecast and dictate events too far into the future. This may result from believing a plan can control the future.* People tend to plan based on assumptions that the future will be a linear continuation of the present.”³⁰ This is sound advice, but our doctrine never effectively

When your crazy uncle tends to drop by for Thanksgiving, you have to plan the day with him factored in.

distinguishes between linear and nonlinear planning, leaving leaders high and dry.

Consider a large orchestra, with its wide variety of instruments and musicians. The composer is similar to the planning team, and the conductor is the commander. Like the orchestra’s sheet music, the military organization’s linear planning efforts routinely follow a similar pattern where the team works out in advance the complicated interactions of its instruments over time, and reduces it to written notes distributed to the players. Over multiple rehearsals, the orchestra, led by the conductor, learns to work together to produce music instead of chaotic noise. This works for simple and closed systems such as a symphony hall where clearly defined objectives are achievable through linear planning.

However today’s military institution tends to substitute “nonlinear” with this linear thinking and attempts to do so while confronting ill-structured problems. Instead of acknowledging complexity’s adaptive, emergent nature, we use linear causality logic and reverse-engineered planning concepts to construct intricate campaign plans that flow backward from predetermined end states and cement them with preconceived actions set along lines of efforts.³¹ An orchestra does not play music backward, yet we usually plan backward.

Design theory considers true nonlinear approaches to be free of the shackles of the linear planning construct. “A” does not lead to “B,” nor should a branch plan “C” occur when the organization reaches “B.” Unlike an orchestra tied to predetermined sheet music, a group of jazz musicians without any sheet music improvises along to the beat of the drummer and plays off each other’s adaptations and riffs. Their music emerges in a linear form over time, but follows no rigid path and relies instead upon sense-making and intuitive decisions as the complex environment transforms. The audience of the orchestra does not influence its music, but the crowd around a jazz band likely influences the band’s improvisations. The jazz band will adjust course, yet still follow no set script, to allow creativity and exploration to discover even more effective improvisations that please the crowd. Trial and error drive this process, and so does divergent thinking. Yet military operations are not jazz concerts, and we will not solve ill-structured military problems through actions that follow no set plan.

Design theory should not subscribe to linear planning, yet design deliverables must become linear constructs to aid the force in detailed planning and execution. What becomes critical is striking the right balance and having a tailored approach for each environment.³²

When leaders establish their design teams and consider approaches to planning, they need to remember that planners tend to think and explore using traditional linear constructs, and encourage deviation instead. Appreciating a complex system requires a planning team to invest far more time in exploring the system instead of trying to “solve it.” Instead of considering the desired end state and attempting to force the complex system into obedience by structuring their plan in reverse fashion, design practitioners ought to investigate why the system behaves as observed, and how they can influence it as it transforms over time.

Instead of rigidly applying a future state that a planned line of effort must follow, planners might explore a wide range of future states that acknowledge the high degree of uncertainty inherent in ill-structured problems. This needs to go beyond branch plans and sequels and consider military action that improvises over time as the system’s emergent state becomes clearer and observed phenomena transform



U.S. Army SSG Marcus Emilio, right, communicates through an interpreter with a counterpart from the Afghan National Civil Order Police while on patrol in the Maiwand District, Kandahar Province, Afghanistan, 24 February 2012. (U.S. Army, SPC Jason Nolte)

as they interact and adapt to our actions. Although military organizations cannot conduct detailed planning “off-script,” we can think critically about how we understand time and space, and explore ways of envisioning conceptual planning that break free of the simplistic linear causality associated with traditional campaign planning. When it is time to transform design deliverables into products for linear detailed planning, a final critical planning hurdle occurs.

7. Emergent Drawings and Collaborations are Not Design Results

Perhaps one of the most damaging things that design practitioners do to harm design theory is to present emergent products as the result of design work. I use the term “emergent products” to describe the many complex, often engrossing drawings, whiteboard sessions, and PowerPoint slides that planning teams build during their journey to understand and appreciate a complex problem. These design products usually contain language, concepts, and graphics that resonate for the planning team, but they also come with a price. The products are also often impossible for the larger audience and the decision maker to understand when a planning team has only 15 to 30 minutes to brief the decision maker. This is where we confuse the role of emergent products with design deliverables. They are interrelated, but not interchangeable.

Design deliverables require a higher level of sophistication in that they should eventually become simplistic, not complex. Design deliverables should achieve a fine balance between a deep understanding and the ability to explain it in the organization’s preferred language. The deliverable must be compatible with detailed planning and tactical execution.

Leaders should view such products as explorations in learning, not intended for briefing to an audience beyond the planning team. As planning teams break through barriers to deeper understanding, they will gain affinity toward those products they create, especially if they invest time and significant effort into them. The great artist Michelangelo once said, “Every block of stone has a statue inside it and it is the task of the sculptor to discover it.” Military planning teams should not attempt to show their intellectual journey of discovery by presenting their in-house

conceptual products; it should focus on the statue (deliverable) instead. Design deliverables must stand alone and make sense to the audience. Furthermore, “brevity is beauty.” To reduce a design deliverable to a simple five-bullet PowerPoint slide is a challenge, but a design team that deeply understands a problem can learn to do this. Dazzling an organization with overly complex presentations and highly intricate graphics only demonstrates the presenter never got past admiring the problem and never gained the cognitive synergy to explain it to his unit.

There are no Steps—Even When We Swear There are Steps

Fusing design with military planning confronts homogeneity and heterogeneity on many levels, and it is difficult to do when facing unfamiliar problems.³³ Therefore, leaders must balance two completely dissimilar disciplines that feature often contradictory organizing logics, language, and values under the most difficult and uncertain circumstances.³⁴ No

wonder Armed Forces professionals are perplexed!³⁵ Military planning values uniformity, repetition, and the utility of hierarchical structures: our doctrine implies procedures that worked in one conflict environment should work in others, with minor alterations.

Design’s approach is more heterogeneous. It is a holistic appreciation of adaptive systems, discredits repetition, and considers improvisation and adaptation far more useful for complex problem solving. One logic revels in chaos, while the other constantly tries to either prevent chaos or control it.³⁶ Military leaders must fuse these almost alien disciplines in some constantly fluctuating relationship while facing ill-structured problems. Perhaps this is one reason why our military struggles with learning how to “do this,” and our professional military education system struggles with how to “teach this.”³⁷

Part of how we learn is understanding how we think and how we think about our thinking. I have intentionally titled this article “Seven Design Theory

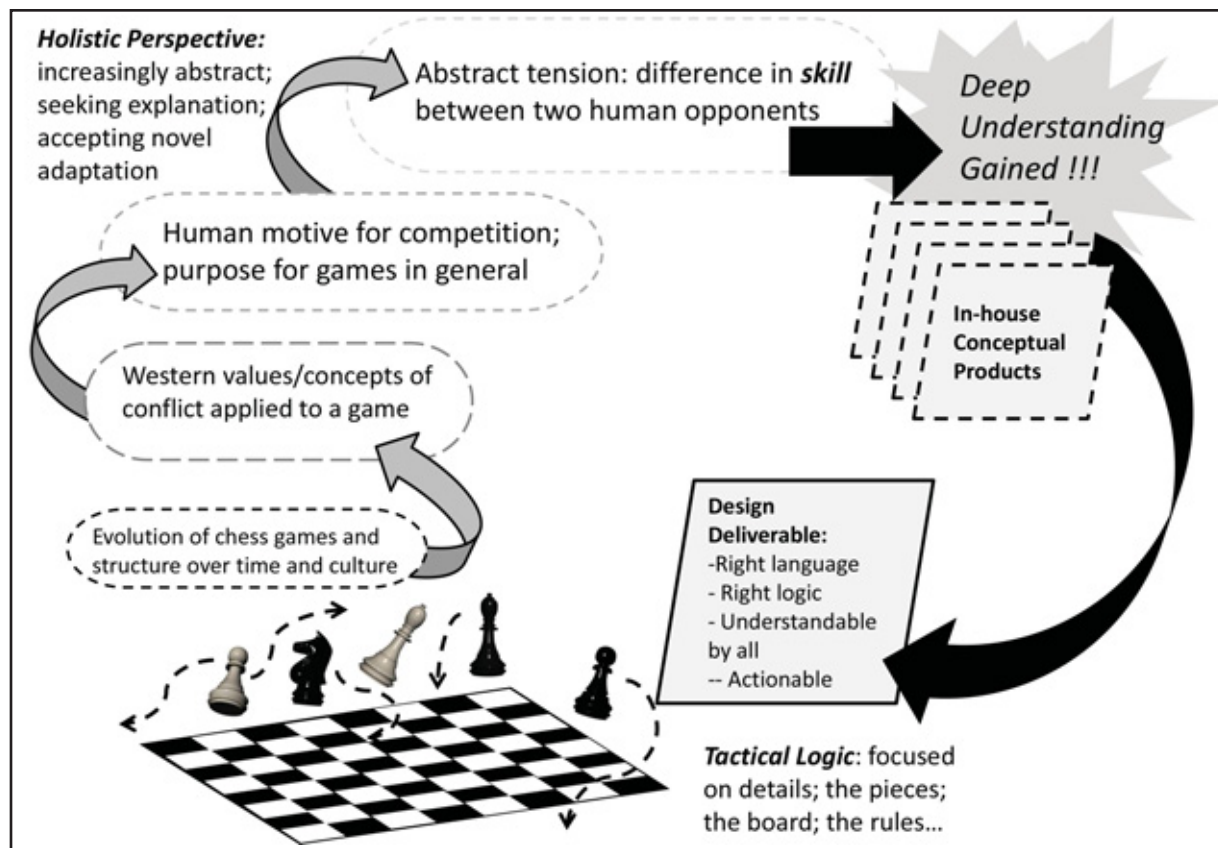


Figure 2
Developing Design Deliverables Brings Deep Understanding Back to the Board

Our own refusal to think critically about ourselves and our organizations often prevents us from even recognizing what that guidance ought to be.

Considerations for Military Planning” because many military leaders take comfort in metrics and tangible procedures that appear to reduce uncertainty. When we ask for examples of design theory fused with military decision making, we are usually asking for a step-by-step checklist we can refer to when we face an ill-structured problem. Sequential steps on how to perform anything difficult is deceptively attractive to us. Unfortunately, complex systems refuse to play by those rules. There really are no steps in design, just as no seven design theory considerations are more useful than thousands of other ones out there. Although I consider the seven discussed here rather valuable for fusing design into the military decision making process, they represent the tip of an iceberg that continues to change its size and composition. In the end, leaders can only rely on their wits, experience, and ability to think critically to be creative.

Creativity is mostly about discovering novel or emergent concepts that possess value for an organization. Yet we often do not realize whether something is valuable until after we implement it. Trial and error will not go away with increased

technology or refinements in doctrine, and the next conflict will likely be something our current military is not prepared for or even looking for.³⁸ For leaders to equip their staffs with the necessary guidance to fuse design with military planning, they must take risks and immerse themselves in the uncertainty of an ill-structured problem while remembering how their own organization thinks about problems.

Divergent and creative thinking flourish in the right environments. Leaders must foster this through their guidance in their planning approach. Our own refusal to think critically about ourselves and our organizations often prevents us from even recognizing what that guidance ought to be. This may be why we spend too much time attempting to solve a problem and not enough time trying to understand what the problem actually is.³⁹ Military organizations hunger for progress and have a significant fear of failure, or “starting over” on something, including conceptual planning efforts. We are certain there are seven days in the week, just as there are seven steps in the military decision making process—but can we practice design without knowing how many steps to take? **MR**

NOTES

1. Army Doctrine Publication (ADP) 3-0; *Unified Land Operations* (Washington, DC: Government Printing Office [GPO], October 2011), 11. Army Doctrine Publication 3-0 states that when the U.S. Army faces unfamiliar problems, finding “executable solutions typically requires integrating the design methodology and the MDMP (military decision making process).”

2. Refer to the following Joint and U.S. Army planning doctrine for additional information on traditional military decision making: Field Manual 5-0, *The Operations Process* (Washington, DC:GPO, 2010); See also: Department of Defense, Joint Publication 5-0, *Joint Operation Planning* (26 December 2006).

3. The U.S. Army recently changed their term from simply “Design” to “Army Design Methodology” while the Israeli Defense Force experimented with “Systemic Operational Design” leading up to the 2005 Hezbollah War. The Australian military coined the term “Adaptive Campaigning” while the British prefer “Decision Making and Problem Solving” in their most recent conceptual planning doctrine. Other organizations use terms such as “Conceptual Planning,” “Complex System Planning,” and “Military Design” as well to identify a generally similar discipline.

4. In several planning events, we not only used Joint Planning doctrine and methodologies, but our planning teams were composed of a variety of coalition and inter-service military and law enforcement professionals.

5. Martin Kilduff, Ajay Mehra, and Mary Dunn, *From Blue Sky Research to Problem Solving: A Philosophy of Science Theory of New Knowledge Production* (Academy of Management Review, Vol. 36m No. 2, 2011) 297. Kilduff, Mehra, and Dunn term “logics of action” defined as organizing principles that shape ways of viewing the world

by “providing social actors with vocabularies of motive, frameworks for reasoning, and guidelines for practice.”

6. Qiao Liang, Wang Xiangsui, *Unrestricted Warfare* (Beijing: People’s Liberation Army Literature and Arts Publishing House, February 1999), 120. “What all those military people and politicians harboring wild ambitions of victory must do is expand their field of vision, judge the hour and size up the situation, rely upon adapting the major warfare method, and clear away the miasma of the traditional view of war- Go to the mountain and welcome the sunrise.”

7. Gerald M. Weinberg, *Rethinking Systems Analysis and Design* (Boston: Little, Brown and Company, 1982), 65. “One of the most effective anthropological techniques that I’ve observed is the *meta-question*. A meta-question is a question that directly or indirectly produces a question for an answer.”

8. George Lakoff and Mark Johnson, *Metaphors We Live By*, (Chicago: The University of Chicago Press, 2003). Lakoff and Johnson explore the importance of how culture and human values influence language and the learning process through metaphoric content.

9. On the concepts of narratives, history, and language, see: Paul Ricoeur, Translated by Kathleen Blamey and David Pellauer, *Time and Narrative*, vol. 3 (Chicago: University of Chicago Press, 1985); See also Peter Novick, *That Noble Dream* (New York: Cambridge University Press, 1988); See also Hayden White, *The Content of the Form* (Baltimore: The John Hopkins University Press, 1987). How human societies construct language and consider history becomes critical in understanding why two societies perceive the same event as completely different in meaning and context.

10. Azeem Ibrahim, *Afghanistan's Way Forward Must Include the Taliban* (Los Angeles Times Opinion Online, 9 December 2009), <<http://articles.latimes.com/2009/dec/09/opinion/la-oe-ibrahim9-2009dec09>> (February 2011). Ibrahim quotes GEN McChrystal's opinion on how the American military had spent the last decade fighting in Afghanistan, "looking at the war in simplistic Manichean terms—save as many good guys as possible while taking out as many bad guys as possible—was a mistake."

11. Fritjof Capra, *The Web of Life* (New York: Anchor Books, 1996) 29. "In the analytic, or reductionist approach, the parts themselves cannot be analyzed any further, except by reducing them to still smaller parts. Indeed, Western science has been progressing in that way."

12. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 3rd ed. (Illinois: University of Chicago Press, 1996). Kuhn's theory of "paradigm shifts" illustrates the ever-growing errors and flaws that a theory might generate until eventually an entirely novel theory destroys and replaces it while answering those flaws and errors effectively.

13. Shimon Naveh, Jim Schneider, Timothy Challans, *The Structure of Operational Revolution: A Prolegomena* (Booz, Allen, Hamilton, 2009), 72. Military planners are "confined to the 'shackles' of inferiority determined by institutional paradigm, doctrine, and jargon . . . [they] are cognitively prevented, by the very convenience of institutional inferiority . . . because the 'shackles' of ritual hold them in place."

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

15. For more on complex adaptive systems, see: Ludwig von Bertalanffy, *General System Theory* (New York: George Braziller, 1968); see also: Walter Buckley, edited by Open Systems Group, *Society as a Complex Adaptive System* (Systems Behavior, 3rd edition: London, Harper & Row Publishers, 1981).

16. Liang and Xiangsui, *Unrestricted Warfare*, 19. Liang and Xiangsui take an eastern perspective on Western warfare. "We still cannot indulge in romantic fantasies about technology, believing that from this point on war will become a confrontation like an electronic game."

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

18. Grant Martin, "On Counterinsurgency: Thoughts on the Re-write of Field Manual 3-24" *Small Wars Journal* (March 2012), <<http://smallwarsjournal.com/jrnl/art/on-counterinsurgency-thoughts-on-the-re-write-of-field-manual-3-24>> (20 March 2012). Martin argues the value of doctrine, but warns of the many errors in misapplication and misinterpretation that doctrine routinely causes with respect to counterinsurgency theory.

19. Mats Alvesson, Jorgen Sandberg, *Generating Research Questions Through Problemization* (Academy of Management Review, vol. 36, no. 2, 2011), 254. Alvesson and Sandberg use the terms "in-house assumption," "root metaphor," and "field assumption" to describe organizational resistance to change.

20. Eva Boxenbaum, Linda Rouleau, *New Knowledge Products as Bricolage: Metaphors and Scripts in Organizational Theory*, *Academy of Management Review*, vol. 36, no. 2, 2011, 280-81.

21. Laszlo, *The Systems View of the World; a Holistic Vision for Our Time*, 2. Laszlo states that knowledge is usually "pursued in depth in isolation . . . Rather than getting a continuous and coherent picture, we are getting fragments—remarkably detailed but isolated patterns." See also Gary Jason, *Critical Thinking: Developing an Effective System Logic* (San Diego State University: Wadsworth Thomson Learning 2001), 337. "People tend to compartmentalize: they divide aspects of their lives into compartments and then make decisions about things in one compartment without taking into account the implications for things in another compartment."

22. A typical Brigade Combat Team ranges in size from 3,000 to 5,000 personnel or greater. In multiple combat deployments and evaluations of over 12 brigades at the Joint Readiness Training Center, this author witnessed at various staff levels an overwhelming frequency of targeting meetings, working groups and other compartmentalized planning efforts that generated tremendous staff work, yet often seemed to isolate and fracture unit cohesion in the process.

23. To "stove-pipe" is military jargon for developing a plan without collaborating or seeking input from the rest of the organization or those directly impacted by the planning result. A useful metaphor, smoke rises up the pipe in complete isolation and emerges at the top in a manner akin to an organization getting surprised by a leader's decision on a concept or plan that only a few ever knew about.

24. Valerie Ahl and T.F.H. Allen, *Hierarchy Theory: A Vision, Vocabulary, and Epistemology* (New York: Columbia University Press, 1996), 18. "Meaning, and explaining the 'why' of a phenomenon, comes from the context. The lower-level mechanics, the 'how' of the phenomenon, have nothing to say about 'why.'"

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

26. Nassim Nicholas Taleb, *The Black Swan* (New York: Random House, 2007), 16. "Categorizing always produces reduction in true complexity."

27. Michel Foucault, *Discourse and Truth: The Problematicization of Parrhesia* (originally covered in six lectures given by Michel Foucault at the University of California, Berkeley in October-November, 1983, published online at <<http://foucault.info/documents/parrhesia/>> (22 February 2012).

28. John Nagl, *Learning to Eat Soup with a Knife: Counterinsurgency Lessons From Malaya and Vietnam* (Illinois: The University of Chicago Press, 2002), 9. "Military organizations often demonstrate remarkable resistance to doctrinal change as a result of their organizational cultures. Organizational learning, when it does occur, tends to happen only in the wake of a particularly unpleasant or unproductive event."

29. Field Manual (FM) 5-0, *The Operations Process* (Washington, DC: GPO, 2010), 2-23. Out of over 111,000 words in this doctrine, the word "nonlinear" appears three times, with very limited context and explanation.

30. FM 5-0, 2-82. Army doctrine attempts to mitigate these concerns by recommending further linear planning in the form of branch plans and sequels associated with the main plan; all are linear concepts and devoid of nonlinear form.

31. Military planning doctrine at the Joint and Service level all feature linear campaign planning along reverse-engineered lines of effort. See: FM 5-0, *The Operations Process* (Washington, DC: GPO, 2010); See also: Department of Defense, Joint Publication 5-0, *Joint Operation Planning* (26 December 2006); see also: Jack Kem, *Campaign Planning: Tools of the Trade* (Department of Joint, Interagency, and Multinational Operations, U.S. Army Combined Arms Center, Fort Leavenworth, KS, 2009); see also: Jeffrey Reilly, *Operational Design: Shaping Decision Analysis through Cognitive Vision* (Department of Joint Warfare Studies, Air Command and Staff College, Maxwell AFB, AL, 2009). These sources feature excellent examples of linear planning, but do not explain *nonlinear planning*.

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

33. Army Doctrine Publication 3-0, 11.

34. U.S. Marine Corps, Department of the Navy, *Marine Corps Doctrinal Publication (MCDP) 5, Planning*, (Washington, DC: GPO, July 1997), 22-23. "War is an intrinsically chaotic phenomenon that denies precise, positive control over events . . . within the context of the complex environment of war we fully recognize it as one of the most challenging intellectual activities in which we can engage."

35. Shimon Naveh, *Operational Art and the IDF: A Critical Study of a Command Culture* (Center for Strategic & Budgetary Assessment [CSBA], contract: DASW01-02-D-0014-0084, 30 September 2007). See also: Mick Ryan, *Measuring Success and Failure in an "Adaptive" Army*, *Australian Army Journal for the Profession of Arms*, vol. VI, no. 3 (Duntroun: Land Warfare Studies Centre, 2009).

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

37. Stefan J. Banach, "Educating by Design; Preparing Leaders for Complex World," *Military Review* (March-April 2009), <http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20090430_art015.pdf> (6 March 2012). "Complex situations—by their very nature—present commanders with special challenges. To comprehend the situation requires deep study and reflection on the underlying system before engaging in action."

38. Ahl and Allen, *Hierarchy Theory: A Vision, Vocabulary, and Epistemology*, 1. "Contemporary society has ambitions of solving complex problems through technical understanding . . . the first strategy is to reduce complex problems by gaining tight control over behavior. It is a mechanical solution in the style of differential equations and Newtonian calculus."

39. Paul Ricoeur, trans. by Kathleen Blamey and David Pellauer, *Time and Narrative*, vol. 3 (Illinois: University of Chicago Press, 1985), 107. "We would be not able to make any sense of the idea of a new event that breaks with a previous era, inaugurating a course of events wholly different from what preceded it."

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