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To Design or Not to Design: In Conclusion

by Ben Zweibelson

Editor's Note: The essay is the final of six in a series on design.

Systems analysis is a new wine in an old bottle.

- Gerald Weinberg, *Rethinking Systems Analysis and Design*¹

Any operational system that does not possess an initial textual frame of theory will be incapable not only of creating knowledge relevant to a concrete circumstantial context, but also of rationalizing retrospectively its actions in relation to the results it has achieved. This is an exact reflection of a non-learning organization.

- Shimon Naveh, *Asymmetric Conflict*²

Is Design a necessary methodology for the U.S. Army? By codifying into service doctrine an entire chapter on design in FM 5-0, the Army appears to acknowledge the need for ontological approaches to complex systems. FM 3-24, *Counterinsurgency* also featured a new Design chapter when updated in 2006. Although the presence of design in doctrinal form validates a substantial requirement for alternative methodologies to JOPP and MDMP, Army design in current form suffers from an identity crisis as well as extensive *tacticization* via institutional bias. To take higher guidance without critical thinking and launch into MDMP prioritizes analysis and description over synthesis and explanation. Today's increasingly complex conflict environments cannot function without Design consideration prior to any detailed planning processes initiating.³ Yet Design by its logic is a cumbersome and problematic methodology when applied to traditional military planning processes.

Design methodology represents a military paradigm for the modern era of increased globalization, the „cyber-age“ of society, and the overall trend towards greater complexity. Scientific endeavors continue to advance technology and human society through a largely reductionist and descriptive approach to knowledge. “Science and technology have colonized the planet, and nothing in our lives is untouched. In this changing, they have revealed a complexity with which they are not prepared to deal.”⁴ Whereas previous eras of human conflict demonstrated strategic and tactical relationships that afforded localized and teleological dynamics, the Scientific and Industrial Revolutions ushered forward a more complex era where

¹ Gerald M. Weinberg, *Rethinking Systems Analysis and Design* (Boston: Little, Brown and Company, 1982) 3.

² Shimon Naveh, *Asymmetric Conflict; An Operational Reflection on Hegemonic Strategies* (Tel Aviv: The Eshed Group for Operational Knowledge, 2005) 14.

³ Trent Scott, *Adapt or Die; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 123.

⁴ Gerald M. Weinberg, *An Introduction to General Systems Thinking* (New York: John Wiley and Sons, 1975) 3.

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an operational level of conflict emerged.⁵ Today's battlefield reflects an environment where traditional procedures and lockstep methodology alone are generally unable to translate the pursuit of strategic aims into tactical action. Our enemies and rivals no longer "play ball" with any regard for rules; most adapt and innovate at exceptional rates.

This operational level of warfare resists reductionism and teleological approaches; holistic and ontological methods featured in Design offer greater potential for explanation and understanding of complex adaptive systems. At times, reducing things down is immensely beneficial for military operations, yet organizations should think critically about whether they should or should not apply the same logical constructs and procedures to all future conflicts. "Reduction is but one approach to understanding, one among many."⁶ *FM5-0 Chapter 3 Design* describes Design's purpose as a methodology used to "make sense of complex, ill-structured problems."⁷ Making sense of open systems requires a holistic and abstract mode of thinking that avoids reductionism, linear causality, and non-explanatory description.⁸ Unfortunately, military institutions have a strong propensity for *describing* an open system instead of *explaining* it. "In the analytic, or reductionist approach, the parts themselves cannot be analyzed any further, except by reducing them to still smaller parts."⁹ Explanation requires an entirely different line of questioning; *problematization*.

The concept of *problematization* requires an emphasis on explanatory questions over descriptive ones; the additional component of heretical querying makes design methodology antagonistic towards institutional self-preservation and doctrinal dogma. Institutional factions discredit design methodology either by dismissing the entire concept as „*mission analysis on steroids*“ or „*Effects Based Operations with another name*.“ Both of these critical positions reflect a fundamental misunderstanding of how holistic and ontological approaches towards open systems yield greater understanding over reductionist and teleological methodologies espoused in detailed planning.¹⁰ The greatest burden military design faces in doctrine codification is the overt *tacticization* to convert design theory into the confusing and brief design chapter of FM 5-0.

By employing dual-use vocabulary terms instead of unique Design lexicon, Design doctrine does not convey the deep understanding of complex systems synthesis to the military audience; attempting to perform this feat with a mere fifteen pages and one non-specific graphic seems almost absurd. Perhaps some of design doctrine's identity crisis has to do with design

⁵ Ibid, 160. "The scientific revolution, based on a strategy of reduction, has made enormous contributions to our understanding of the universe. In doing so, it has worked well on certain systems, poorly on others, and remains untried on many more."

⁶ Weinberg, 121.

⁷ United States Army Training and Doctrine Command, *Field Manual 5-0; The Operations Process*. (Headquarters, Department of the Army, 2010), 3-6.

⁸ Shimon Naveh, *In Pursuit of Military Excellence; The Evolution of Operational Theory* (New York: Frank Cass Publishers, 2004) 306. "The mechanistic approach that perceived the operational context as a distinctive level of activity is replaced by a new approach...thus, whereas military strategy and tactics strive, through the calculated investment of resources and optimization of their employment, to support the politician's intention to produce a new reality, the operational art interprets, through dialectical thinking, the military implications resulting from the political decisions, and initiates future situations to lead to the materialization of the desired reality."

⁹ Fritjof Capra, *The Web of Life*. (New York: Doubleday, 1996), 29.

¹⁰ Chris Smith, *Solving Twenty-First Century Problems with Cold War Metaphors; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 99-100. Smith argues in his paper that EBO is primarily influenced by the targeting process; the reductionist and prescriptive nature of targeting "generates seemingly purposeful action in a simple and holistic manner...[this] highly structured approach [is] antithetical to creativity, which is an important function of effective adaptation."

legacy. Is Army Design doctrine the spawn of General Systems Theory, or is design a military adaptation of postmodernist fields of philosophy, economics, or social science? Although the interests of continued relevance prevent the U.S. Army from acknowledging Israeli *Systemic Operational Design* or Soviet *Deep Operational Shock* as paternal methodologies for design, the complete absence of any theoretical foundation leaves design doctrine in an awkward state.¹¹ Without a theoretical bedrock, vocabulary and structure lack origin.

The lack of prescriptiveness in this case creates a hodge-podge of meaningless concepts that potentially do more damage to an organization attempting to “understand, visualize, and describe complex, ill-structured problems.”¹² Fifteen pages of doctrine does not begin to address the unique vocabulary essential for learning, applying, and communicating military design methodology, and FM 5-0’s underwhelming brevity in design doctrine content in some respects explains how the Army is hardly dithyrambic in accepting design as a new methodology.

One expects institutional resistance to change in all manners of social organization. Potentially, the antithetical nature of ontological methodology appears unwieldy to an organization comfortable with tacticizing virtually all aspects of planning and executing. Of the many tacticized structures within operational art, the continued emphasis for linear worldviews in the form of „lines of effort,“ „logical lines of operation,“ and the more conventional „physical line of operation“ form the institutional bedrock of reductionist hubris at the operational level of conflict. *FM5-0 Chapter 3 Design*’s reliance on „lines of effort“ and other linear processes inhibits military organizations from reaching metacognition and realizing fundamental phenomenon within open systems. “Linear chains of cause and effect exist very rarely in ecosystems.”¹³ Although in retrospect, nearly all observations of activity follow a linear causality where there is a beginning, middle, and an end, more complex phenomenon are difficult to predict in an open system where adaption and interconnectivity create uncertainty.¹⁴

To apply reductionism and model a linear transformation approach that links a pre-defined „end-state“ to a series of reverse-engineered objectives in time and space is not a recipe for holistic system understanding. Instead, „To Design or Not to Design“ advises non-teleological and holistic transformation approach through *non-linear processes* at the operational level. Subsequently, detailed planning methodology will tacticize these non-linear processes into reductionist smaller-scale linear applications in order to link strategic aim down to tactical action.

In order for *problematization* and non-linear transformative approaches to work, design methodology must take a different road to doctrinal codification for the military institution. FM 5-0’s fifteen pages of design doctrine require a significant modification; this series of design articles proposes some asymmetrical design doctrine options that deviate from traditional institutional dogma. Military institutions prefer doctrine to remain consistent for uniformity and

¹¹ John Brown, (Edited by Michael Krause, Cody Phillips), *The Maturation of Operational Art: Historical Perspectives of the Operational Art* (Center of Military History, United States Army, 2007) 439-441. “The belated American doctrinal recognition of the operational level of war in 1982 and operational art in 1986 was part of an overall post-Vietnam renaissance in the United States” military thinking that focused heavily on a Soviet adversary and took Soviet doctrine into account.”

¹² United States Army Training and Doctrine Command, *Field Manual 5-0; The Operations Process*. (Headquarters, Department of the Army, 2010), 3-1.

¹³ Fritjof Capra, *The Web of Life*. (New York: Doubleday, 1996), 299.

¹⁴ Justin Kelly and Mike Brennan, *OODA Versus ASDA: Metaphors at War; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 44. “The more interconnections there are between the elements of a system, the more dynamic it is. The more elements there are in a system, the less predictable its total behavior.”

repetition. However, creativity and adaptation run counter-culture to these tenets, as Nassim Taleb relates with a story about a writer attending a famous writing workshop in *The Black Swan*. The instructors wanted the students to imitate successful stories out of *The New Yorker Magazine* so that they would become better writers, “not realizing that most of what is new, by definition, cannot be modeled on past issues of *The New Yorker*.”¹⁵ Similarly, military organizations should not expect design teams to imitate any narrative or graphical depiction examples in a future form of design doctrine and expect greater understanding of the system under observation. Complexity refuses to be tamed by formulas, principles, or well-meaning doctrine. Metacognition offers the general cognitive tools from which a Design team may apply creativity and adaptation to address the unique open system under observation. Since the military organization turns to doctrine for instruction and synchronization of forces, such non-prescriptiveness appears counter-intuitive.

A non-prescriptive methodology that emphasizes creativity, adaptation, and non-conformity is the best doctrinal approach for military design. “*Complex War* is therefore a competitive learning environment.”¹⁶ A revised Design product requires unique vocabulary, non-linear approaches, and appropriate examples of metaphor and analogy in narrative and graphic depiction so that as an institution, the military can conceptualize ill-structured problems and transform a system towards the desired state. FM 5-0’s recent attempt at codifying military design into doctrine represents an initial foot forward for holistic approaches in dealing with complexity; as unwieldy and ambiguous a product it represents, it is nonetheless a step in the right direction.

Design’s logic may work with social production models of new knowledge such as Wikipedia, but they also reflect the flaws of self-organization without hierarchical control measures. Although discounted by academia, social production models such as Wikipedia reflect the dynamic and self-organizing narrative form that Design would potentially lend itself to instead of a formal codification.¹⁷ In regards to a military social production model for Design, how does the organization measure success or failure? Can the military “control” where Design logic moves the organization? What does the military do to prevent radical divergences into faulty logic? Additionally, how can the military teach and maintain standards and objectives in a self-organizing production model? These questions and others demonstrate the continued discourse that the military should pursue on how Design contributes to understanding complexity, and where detailed planning logic still maintains institutional relevance in the 21st century.

Many intellectual roadblocks litter the road between Design logic and the reductionist and mechanistic worldview. Reductionism, a preference for linear causality, and an emphasis on description over ontological explanation provide a framework for tactical vocabulary, educational processes, and planning logic that resists Design. Military doctrine such as FM5-0

¹⁵ Nassim Nicholas Taleb, *The Black Swan*. (New York: Random House, 2007), 24.

¹⁶ Australian Head Modernisation and Strategic Planning- Army, *Australian Army’s Future Land Operating Concept* (Australian Army Headquarters, Canberra, September 2009) 4.8-4.10. “In order to gain and retain the initiative, the Land Force must be constantly and rapidly learning and, as required, adapting to the emerging situation... Problems tend to change over time as new situations emerge from within the complex adaptive system. The adaptation cycle helps to ensure that the Land Force is solving the right problem (original emphasis).”

¹⁷ Paris Tech Review Editors, “It’s a Wiki Wiki World, Wikipedia and the Rise of a New Mode of Production,” *Paris Tech Review*, (<http://www.paristechreview.com/2011/02/18/wiki-world-wikipedia-new-mode-production/> accessed 19 April 2011). The editors of this article use the term „social production model” to define how social networks collaborate anonymously to generate new knowledge in a self-organizing non-hierarchical fashion.

Chapter 3 attempts no small feat in its brief fifteen pages, and the Army's decision to explore Design logic and attempt to write Design doctrine represents the acknowledgement that existing system of logic based in detailed planning is insufficient in the 21st century of warfare. Perhaps instead of writing Design in doctrine, the military could consider social production models as a future form for Design narratives and organizational discourse as recommended by this monograph.

Army doctrine's definition of Design implies that critical thinking is essential for understanding a complex system.¹⁸ Instead of seeking a „problem“ with a corresponding „end-state“, Design teams should unshackle themselves from the linear and reductionist terminology and conceptual structures of detailed planning logic.¹⁹ In order to become a critical thinker, one should consider that even hallmark processes and terminology of the host institution may potentially cause an organization to „solve the wrong problem.“ Sometimes, detailed planning alone will continue to function; however, applying it to all future challenges in the 21st century will increase the military's frequency of solving wrong problems effectively while missing the right problem entirely.

In order to communicate about Design within a new system of logic, the military could abandon the vocabulary restrictions of the obsolete and inadequate detailed planning system of logic. In other words, one cannot begin to talk about complexity when one lacks the very words to do so. The challenges of understanding and employing unique and appropriate operational language reflect an understated point of friction in U.S. Army doctrine concerning conceptual and detailed planning.²⁰ Design requires unique and descriptive lexicon to foster greater understanding of complex adaptive systems, and the military should allow its lexicon to expand as needed for Design discourse.

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

¹⁸ FM 5-0, 3-1.

¹⁹ Gary Jason, *Critical Thinking: Developing an Effective System Logic*, (San Diego State University: Wadsworth Thomson Learning, 2001) 114. “There are good reasons for introducing new terminology. For one thing, a judicious use of new words can increase the readability of the writing, by shortening many of the sentences involved;” See also: Deleuze, Guattari, 374. “The ambulant sciences confine themselves to *inventing problems* whose solution is tied to a whole set of collective, nonscientific activities but whose *scientific solution* depends, on the contrary, on royal science and the way it has transformed the problem by introducing it into its theoretical apparatus and its organization of work.” Deleuze and Guattari make the case that military institutions seek to label „problems“ based on familiar structures and containers that integrate with institutional practices. When military organizations face asymmetrical phenomena that reject or challenge these structures and containers, many institutions ignore them or misidentify them.

²⁰ White, I. “It is here that discourse itself must establish the adequacy of the language used in analyzing the field to the objects that appear to occupy it.” White's introduction on Tropology and discourse offer tremendous insight into how human beings understand and articulate meaning through various contents and forms.

Design presents novel and asymmetric approaches to solving a complex problem that go out of an organization's boundaries and may incorporate actions and efforts of numerous actors within the system that hardly match the detailed planning task organization chart. At the same time, Design may marginalize or even eliminate military organizations from the lead role in execution, or recast their actions in unfamiliar and unorthodox processes that conflict with institutional relevance and identity. In closing, Design presents a different opportunity in gaining „deep understanding“ of a significant phenomenon of a complex system by explaining the propensity of observed rivals and phenomenon. This explanation comes with the danger that the practitioner may outrage the organization because the Design deliverable does not take the familiar *form* that the organization identifies with. Again, the military could invite new forms such as social production models where self-organization, adaptation, and innovation generate persistent creativity and learning.

Currently, detailed planning assimilates chunks of Design logic into chapters of Army doctrine and reduces Design theoretical concepts into procedures and checklists. Instead of detailed planning performing bricolage and assembling components of Design into detailed planning logic, the military might consider reversing this process and assimilating detailed planning concepts into the overarching framework of Design logic.²¹ Understandably, this is a bold recommendation and will face significant resistance due to institutional self-interests.²² Detailed planning still works in many applications, and would continue to do so while incorporated into Design's holistic worldview. The process of bricolage would subsequently reverse, and those relevant components of detailed planning doctrine would assemble within the Design system of logic. In other words, people can still own volumes of Encyclopedia Britannica in their house, while referring to Wikipedia online for other needs as the conditions warrant. The social production model of Design would perpetually adapt and change through self-organization and innovation like a swarm of ants. Within this conceptual framework, the military could continue to publish volumes of doctrine within the hierarchical and reductionist logic that supports linear approaches. Sometimes MDMP is still the most effective means to accomplishing strategic goals through tactical applications. However, Design's logic potentially provides the military a different and innovative process for making sense of highly complex and dynamic systems. While a new edition of a printed encyclopedia takes months, a newly observed concept or identified „unknown“ is quickly contributed to the collective through social production by anyone. There are strengths and weaknesses for both logics; military leadership need to think critically about whether the Army is able to do both, or is still preventing Design from functioning at the expense of detailed planning logic.

²¹ Boxenbaum, Rouleau, 280-281. This process of knowledge production, defined as “bricolage” in organizational theory circles, turns one into „a handyperson who, rather than inventing a new theory or a new paradigm, repairs or remodels existing theories by combining various theoretical concepts.” See also: Thomas Schelling, *Arms and Influence*, (New Haven, Yale University Press, 1966) 66-68. Schelling's work dates from the 1960s and is a Cold War document concerning nuclear deterrence; however his concept on „gradual erosion” that he captures in his salami slice metaphor also applies to what detailed planning is doing to dismantle Design.

²² Alvesson, Sandberg, 259. Alvesson and Sandberg ask “how can assumptions be challenged without upsetting dominant groups, which hold them so strongly that they ignore the critique or even prevent one's study from being published?”

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