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DESIGN: THE FUTURE OF PLANNING?

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

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Contents

Abstract

The complexity of warfare in the 21st century has significantly evolved. The "wicked problems" that military planners face has forced the military to reexamine the practices that are used in developing solutions to these challenges. Army Field Manual (I) 5-2 Design dated 20 February 2009 was developed to assist military planners in these endeavors. This paper explores if Army Field Manual (I) 5-2, Design, is consistent with the practice of operational art in the U.S. military. Second, it examines early criticism and support for design. Finally, the paper draws conclusions concerning usage of design, and recommends areas for further research and analysis concerning the utility and applicability of design in operational art.

INTRODUCTION

The complexity of warfare in the 21st century has significantly evolved. The nature of the situation is that the "wicked problems"[i] that military planners face has forced the military to reexamine the practices that are used in developing solutions to these challenges. Army Field Manual (I) 5-2 Design dated 20 February 2009 was developed to assist military planners in these endeavors. This paper explores if Army Field Manual (I) 5-2, Design, is consistent with joint operational art in the U.S. military. Second, it examines early criticism and support for design. Finally, the paper supports the conclusion that design should be incorporated into U.S. joint military doctrine to offer commanders another tool to help accomplish complex missions. Other recommendations for further research and analysis concerning the utility, implementation, and applicability of design in operational art are shared.

Operational Art and Design

The purpose of this section is to provide the definition of two key terms that will be discussed in the remainder of the paper. Operational art is a term that is widely used in the academic study of warfare. Milan Vego, in Joint Operations Warfare, defines operational art as "a component of military art concerned with the theory and practice of planning, preparing, conducting, and sustaining campaigns and major operations aimed at accomplishing strategic or operational objectives in a given theater."[ii]

Vego makes the argument that the U.S. military is in disagreement as to what constitutes operational art.[iii] This claim may not be valid due to the fact Joint Publication 5-0, Joint Operations Planning, clearly defines operational art and its component parts. Joint Publication 5-0, Joint Operations Planning, defines operational art as "the application of

creative imagination by commanders and staffs – supported by their skills, knowledge, and experience – to design strategies, campaigns, and major operations and organize and employ military forces. Operational art integrates ends, ways, and means across all levels of war."[iv]

Design is defined by Army Field Manual (I) 5-2 in the following general manner:

> Design is a way of organizing conceptual work within a command to assist the commander in his formulation of operational concepts. Design assists the commander in leading adaptive work and underpins and guides planning, execution, assessment, and revision of organizational schemes of action.[v]

Similar to the discussion about the definition of operational art, authors have claimed that the definition of design is not clearly articulated and accepted.[vi] However, the publication of Field Manual (I) 5-2 has succinctly defined design which can now serve as a basis for further discussion and debate.

Purpose of the Research

The development of design as doctrine by the U.S. Army suggests that a gap existed in the military decision making/planning process (MDMP) and consequently in the Joint Operations Planning Process (JOPP) (an overview of JOPP is in Annex A). The purpose of this research is to explore how design can supplement and fill the gap when integrated into joint doctrine. By exploring the component parts, and both criticism and support for design, this research will illuminate the reader on design. In closing, the paper will make a recommendation as to how design can be adopted and improve joint doctrine.

Significance of the Research

Military planning can be a complex and ambiguous process that requires constant reflection and improvement. The U.S. Army, which strategically and operationally has been more heavily impacted than any of the branches of the U.S. military since the September 11, 2001 attacks on the U.S., has taken the lead and developed the design methodology as a

means to more effective planning. As the services of the U.S. military strive to become more joint and conform to legislation such as the 1986 Goldwater Nichols Act it would be logical that all of the services plan using the same doctrine and methodologies. In summation, this research will contribute recommendations to improve the way the U.S. military plans as a joint entity.

Statement of the Problem

Army Field Manual (I) 5-2, Design was developed to improve military planning. The design manual may or may not be consistent with the practice of joint operational art in the U.S. military. Army Field Manual (I) 5-2, Design can be used as a supplementary tool to the planning process and has helped fill a gap in the Army planning paradigm. It has the potential to do the same for the Joint Operational Planning Process (JOPP). A greater understanding of design and its strengths and weakness is necessary in order to continue to improve military planning for the joint force.

Research Questions

1. Is Army Field Manual (I) 5-2, Design, consistent with joint operational art in the U.S. military?
2. Should design be incorporated into U.S. joint military doctrine in order to offer commanders an additional planning tool that can be complimentary to the current JOPP?

Assumptions and Limitations

This research was conducted as part of a requirement for the Joint Military Operations course at the U.S. Navy War College. The scope and duration of the study was limited to a portion of a trimester. The analysis and discussion is based solely on document

review and personal interviews. The conclusions, while valid, could be further explored through additional resources such as the collection of additional qualitative data by interviewing scholars and practitioners of military planning. The recommendations section of this paper highlights several areas for future research that may be desirable.

DISCUSSION / ANALYSIS

The Nuts and Bolts of Design

Doctrinally, design is an emerging approach that is currently being revised with the release of Army Field Manual (I) 5-2. This section is an overview of design that will be the basis for the analysis and discussions that follow. Understanding the fundamentals of design is crucial in order to properly consider the research questions in this paper. According to Field Manual (I) 5-2, "design is an approach to critical and creative thinking that enables a commander to create understanding about a unique situation and on that basis, to visualize and describe how to generate change."[vii]

The design methodology is centered on seven fundamentals that are imperative to successful usage. Understanding the fundamentals of design is necessary in order to successfully implement the doctrine. The fundamentals are:

1. The commander's involvement is essential.
2. The uniqueness of each situation requires creating and sharing systemic understanding of the operational environment.
3. Participants must question the limits of existing knowledge.
4. Understanding is developed through hypothesis formulation and theory construction.
5. Hypothesis formulation and theory construction requires synthesis and evaluation.
6. Establishing a broad approach to problem resolution is the main objective.
7. Design establishes a basis for further learning.[viii]

Commander's Involvement

The commander must play a leadership role in the design process in order to continue to develop his own vision and understanding of the situation and possible solutions. The commander's staff may be able to execute design without the commander's involvement but this would not meet the intent of design. The commander must encourage discourse through critical and creative thinking as a means to generating new understanding. It is critical that the commander's understanding of the operational environment and support for divergent thinking be an integral part of the solutions that are generated.[ix]

Uniqueness of Each Situation

The wicked and complex problems that military planners face necessitate the sharing of the systemic understanding of the environment that is developed through design. Field Manual (I) 5-2 states that history should be used as a guide to develop an understanding but also cautions that no two situations are exactly alike. A systemic understanding of the situation may include complex relationships between people and organizations.[x] Planners should approach problems as a "biological system rather than a mechanical system" [xi] due to the non-linear and qualitative nature of the problems faced.

Design recognizes that the operational environment consists of many factors and variables such as political, military, economic, social, information, infrastructure, physical environment, and time (PMES II) which must be thoroughly explored individually and how they interact. The commander must effectively organize and integrate his staff so that information is synthesized into the most effective product and shared. In the design methodology a commander must be able to operate under limited or ambiguous guidance while still rendering effective results based on his understanding of the problem. Finally, a

commander must use the design process as a means to cross joint, interagency, and multinational lines to share the understanding that has been gained and be postured for feedback and revision. [xii]

Questioning Limits of Knowledge

A design team must constantly be inquisitive and "question the limits of existing knowledge and critically evaluate prevailing public presumptions and paradigms."[xiii] Following along this thought process design teams should view the situation through the eyes of the opponent or enemy in order to develop a greater understanding of the situation. Special care must be taken to avoid the usage of language that may reflect cultural ignorance of the adversary and situation. While working through these issues the design team will be focused on developing a hypothesis that is explanatory and helps to solve the problem.[xiv]

Understanding through Hypothesis Formulation and Theory Construction

The main purpose of "challenging existing paradigms and presumptions is to create conceptual models that have greater explanatory power and thus greater utility."[xv] This practice is continuous as new knowledge is gained the design team members must keep in mind that in many senses reality is fluid, which may result in a series of evolving hypothesis. The hypothesis should be challenged consistently as a means a reaffirming its validity.

Synthesis and Evaluation

The operational environment possesses a complexity that requires synthesis and evaluation in order to develop understanding. Synthesis and evaluation are at the highest levels of the cognitive domain taxonomy explained by the educational psychologist Dr. Benjamin Bloom. In summary, Bloom described synthesis as the ability to put the component parts of a situation or a problem together in a new way rendering a new reality or

structure. Evaluation is described as the ability to make judgments concerning validity or value.[xvi] Thought and cognition at this high level facilitates a broad approach to problem resolution.

Broad Approach to Problem Resolution

Design is significantly different from traditional military planning processes because the design team focuses on solving broadly stated problems, which are then framed with guidance from the commander. The commander should articulate changes that he will make internal to his command to prepare to solve the problem. The result will be an organizational paradigm shift that set boundaries and prepares the staff for planning and future learning.[xvii]

Basis for Future Learning

The ability to adapt over time is a key element to a design team. The team must "maintain a skeptical posture and treat all understanding as provisional in order to create continuous learning."[xviii] Design, when executed properly offers the opportunity for an organization to consistently adapt and improve.

A Case against Operational Design

One of the leading critics of the U.S. military's shift toward design or systemic operations design (SOD) is Dr. Milan Vego. Vego is Professor of Joint Military Operations at the U.S. Navy War College and a widely published and respected author in the area of joint operational warfare. Vego states that

> currently, the U.S. military seems well on the way to repeating its dismal experience with an effects-based approach to operations (EBAO) by adopting major parts of the so-called systemic operational design (SOD) into Army and joint doctrine. This new concept rests on dubious theoretical foundations.[xix]

Vego specifically cites the recent failure of SOD in July 2006 when the Israel Defense Forces attempted to use SOD in their operations against Lebanon.

As described in the opening of this paper, Vego argues that the concept of SOD is not clearly defined by the various entities that are proponents of SOD. Also criticized is the fact that SOD does not have a distinct position in the process of planning and that it has its own language. At the center of Vego's argument is that SOD is not based on sound theory. Each of these arguments will be explored and discussed in the following paragraphs.

Parochial Interests?

Vego's career has been dedicated to developing a greater understanding of joint operations and warfare. His lengthy tome entitled Joint Operations Warfare is the most comprehensive work on the subject. If SOD is successful and productive it could pose a threat to Vego's work and exposes a gap in his analysis and writing. Recently, Vego stated that "SOD is crap. It is the contractors, Booz Allen, that are pushing it."[xx] Knowing these facts as the background, the assumption can be made that Vego is not investing his knowledge and expertise in assisting the military in further developing and refining design (or SOD) so that it can be a productive tool for commanders.

Where does SOD fit in the Planning Process?

A major question that Vego asks about design is where it fits in the operational planning process. In an effort to try and discredit SOD's validity, Vego states that "proponents sometimes argued that SOD is a precursor to operational planning and sometimes it is not." The utility of SOD rests in the fact that it can be used at any point in time which includes before, during, and after planning has been conducted. SOD is a commander's tool that is exercised at his discretion rather than a step in a process that is mandated.

SOD Language

Vego's concerns with the language that SOD uses are valid and worth considering. The authors of the U.S. Army Design manual state that "because design involves understanding and communicating abstract concepts, it requires some technical language specific to design."[xxi] The language must then be translated into military terms. The design manual further explains that "although design has its own language reflecting the fact that it is based upon several different theoretical approaches, the product it produces must be articulated using standard doctrinal terms and formats."[xxii] SOD language is a major obstacle that must be grappled with for SOD to be effective in the U.S. military.

Contrasting Vego opinions, Lieutenant General Caldwell, Commander of the U.S. Army Combined Arms Center, posses a differ point of view. He states "that the operational language of our Army – must evolve to allow design to take root."[xxiii] Dr. Tom Clark further elaborated on Caldwell's comments by stating that

> doctrine is a lagging indicator of what we understand. Doctrine is the background or literature review – doctrine provides the stepping off-point. Purposeful discussion in a learning community is a leading indicator of intellectual capacity. Over reliance on doctrine brings false confidence in 'what we know.' Likewise, over indulgence in intellectual discourse becomes noise. Our lagging and leading indicators are sometimes opposing forces that require a steady hand for balance.[xxiv]

SOD Theory

SOD's main theoretical foundation rests in General System Theory (GST), which is attributed mainly to the Austrian Biologist Ludwig von Bertalanffy. Vego summarized that

> Bertalannfy believed there exists a general system of laws that can be applied to any system regardless of the system's properties and the elements involved. These general laws are broad, diverse, and fluid. He believed the system's elements and their attributes or characteristics can only be understood as fractions of the total system.[xxv]

Vego attempts to discredit GST and claims that GST is viewed as a pseudoscience by some The basis of Vego's analysis is two simplistic non-peer reviewed critiques of GST.[xxvi]

SOD Failures

Vego uses the recent 2006 Israeli Defense Force (IDF) conflict with Lebanon as a case study to highlight SODs failures. The case study illuminates several failures in the application of a combination of SOD and effects based approach to operations (EBAO) in the conflict with Lebanon. From an organizational effectiveness standpoint it appears that the IDF operations failed mainly because the IDF failed to fully invest and learn SOD rather than because SOD is an ineffective approach.

Support for SOD

As Army Field Manual (I) 5-2 was released several articles were published in Military Review as a means of publicizing and explaining design. Colonel Stefan J. Banach, the Director of the Army's School of Advanced Military Studies (SAMS), is a major supporter of the design methodology, which was in large part developed and exercised at SAMS. The articles were comprehensive in describing "a methodology for design to account for what military designers do and how they do it when they are confronted with a complex situation."[xxvii] The articles did not present any examples that detailed cases of successful design application or theoretical cases that speculated how design could be used successfully.

Examples of Design Success?

Examples of successful design usage are difficult to locate in military literature. U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-5-500, Commander's Appreciation and Campaign Design (CACD) offers one compare and contrast example that describe design in the broadest sense. The first part of the simplistic example describes the

experiences of Colonel Sean MacFarland, commander of 1st Brigade, 1st Armored Division in Iraq:

> In June 2006, Colonel MacFarland was ordered from Tal Afar in northern Iraq to Ramadi in the west. "I was given very broad guidance," he said. "Fix Ramadi, but don't destroy it. Don't do a Fallujah." He had to determine how to forge relationship with the residents and take the city back from insurgents without launching a general assault. It was his responsibility to share his understanding of his piece of the overall problem with his superiors, not the other way around.[xxviii]

A comparison of a similar situation framed in a Cold War paradigm is then presented:

> In contrast, had the North Atlantic Treaty Organization defended Western Europe from a Warsaw Pact attack in the 1980s, the commander of the Central Army Group would have exercised operational art and framed the problem for his subordinates. By the time orders trickled down to a brigade commander, like Colonel MacFarland, the situation paragraph of his division's operations order would have provided a structured problem, and his challenge would have been simply one of planning for execution within the framework established by doctrine and the division operations order.[xxix]

Overall, these examples are simplistic and lack overwhelming evidence that would convince one of design's utility.

Design in Retrospect

The design methodology is very distinct and difficult to apply as a template over historical situations to find examples of design or SOD success. To some degree it can be argued that components of the design methodology may have been used in the past to solve complex problems. Scholars of joint operations have questioned if the notion of "containment" during the Cold War or the surge of U.S. forces in Iraq may be examples of SOD type usage.[xxx] These arguments, while useful for continuing the dialog on SOD development, highlight that design cannot be used accidentally. The concepts and methodology of design dictates that it must be executed by educated and trained personnel. Due to its complexity, design does not happen without being specifically directed by the

commander.

Design has the potential for usage as a tool to solve complex problems that U.S. military commanders may face in the future. Future potential military challenges include the full spectrum of military operations. Future military involvement may include peace keeping operations, anti-piracy, counterinsurgency, traditional operations, etc. These operations may be in places such as Darfur or the Artic waters. Design has the potential to offer commanders a methodology outside of the military decision making processes to help solve complex problems in cooperation with other government agencies. In support of these facts the authors of the design methodology state that "design is fully compatible with an approach that integrates the collaborative efforts of the departments and agencies of the United States Government to achieve unity of effort toward shared understanding and shared goals."[xxxi]

CONCLUSIONS

Design is not consistent with operational art in many ways. The concerns that Vego raises are valid and pragmatic from a scholarly point of view. Specifically, the issue of a separate language for design could cause confusion and be a significant challenge for the U.S. military. Other concerns such as the validity of design methodology are not as urgent when taking into account that GST was developed mainly for solving social problems.

Implementation of design for the joint force is desirable even after careful thought and comparison of the risks associated with the implementation of design in joint doctrine against the empowerment potential it has for commanders. It must be restated that design is simply a means and another tool in a commander's skill set that may be used exactly as the Army intended it to be used by "implemented prior, during, and after MDMP instead of as a 'replacement' for the initial steps of planning."[xxxii] Design should not overtake/replace MDMP or JOPP. Even as design is executed commanders and staffs must ensure that the essentials of operational art are not lost and that they continue to be practiced and refined.

RECOMMENDATIONS

Design should be adopted and integrated into U.S. joint doctrine. The complexity of the problems that the U.S. military will face in the future will only become more tenuous. The fundamentals of operational art must continue to be the centerpiece and foundation of the U.S. military's planning and execution of operations to achieve strategic and operational objectives. Design will best serve the U.S. military as a complementary tool that has the potential to be useful and distinctly different than the doctrinal options that are currently available to joint military commanders.

Integrating design into the U.S. joint force will have implications for U.S. military planners and the joint force. The following recommendation should be considered and reviewed before, during, and after the implementation of design in the joint force. These suggestions are recommended areas for future research:

1. Who will learn design and when will they learn it? The design methodology is complex. Most certainly, all officers should be trained in the design methodology if it is going to be adopted by the joint force. Design must be introduced at the proper point in a junior officer's career in order to be able to fully utilize the officer's skills. This timeline may differ between the services. It may be at the offer's initial officer training with a much more comprehensive study at the mid-grade level during Joint Professional Education Phase I.

Design language and methodology will take a serious investment in time and resources to be learned and to be understood. Investments must be made for design to be successful. The institutions that provide military education must also learn design. At the

initial stages of design implementation across the joint force it may be challenging to find sufficient numbers of trained-educated design scholar-practitioners. A more complex challenge exists in developing a scheme of this nature for Non Commissioned Officers (NCOs).

2. Design must be tested and validated. Design itself espouses that it utility lies in solving complex broad problems. The design methodology should be tested in our joint training and simulation centers. As a way of validating design's utility, commanders and staffs should use and test design in combat. Ironically, due to the continuous learning loop inherent in the design process the use of design has the potential to validate that it is no longer useful or essential as a tool for military commanders.

In conclusion, without operational art the design methodology is useless. The joint force must determine how to balance the competing interests for training time and resources so that design can be a tool for commanders while still maintaining and improving the forces knowledge of operational art.

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Annex A – Overview of the Joint Operations Planning Process (JOPP)

The JOPP contains seven steps that should be followed sequentially. The steps in the process are:

Step 1: Initiation – "JOPP begins when an appropriate authority recognizes the potential for military capability to be employed in response to a potential or actual crisis"[xxxiii]

Step 2: Mission Analysis – "The primary purpose of mission analysis is to understand the problem and purpose of the operation and issue appropriate guidance to drive the rest of the planning process."[xxxiv]

Step 3: Course of Action (COA) Development - "To develop COAs, the staff must focus on key information necessary to make decisions, using data from mission analysis. The staff develops COAs to provide options to the commander."
[xxxv]

Step 4: COA Analysis and Wargaming - "The commander and staff analyze each tentative COA separately according to the commander's guidance. COA analysis identifies advantages and disadvantages of each proposed COA."[xxxvi]

"Wargaming provides a means for the commander and participants to analyze a tentative COA, improve their understanding of the operational environment, and obtain insights that might not have occurred."[xxxvii]

Step 5: COA Comparison – "COA comparison is an objective process whereby COAs are considered independently of each other and evaluated/compared against a set of criteria that are established by the staff and the commander. The goal is to identify the strengths and weaknesses of COAs so that a COA with the highest probability of success can be selected or developed."[xxxviii]

Step 6: COA Approval – "The staff determines the best COA to recommend to the commander…The staff briefs the commander on the COA comparison and the analysis and wargaming results…The commander selects a COA or forms an alternate COA…"[xxxix]

Step 7: Plan or Order Development – "The JFC (Joint Force Commander) guides plan development by issuing a PLANORD or similar planning directive to coordinate the activities of the commands and agencies involved."[xl]

NOTES

[i] John C. Camillus, "Strategy as a Wicked Problem," *Harvard Business Review*, May 2008, http://hbr.harvardbusiness.org/2008/05/strategy-as-a-wicked-problem/ar/1 (accessed 1 May 2009). A "wicked problem" is a term that was first used in a social context but has since been utilized by business and the military. Camillus states that "A wicked problem has innumerable causes, is tough to describe, and doesn't have a right answer."

[ii] Milan N. Vego, *Joint Operational Warfare* (Newport, RI: Naval War College, 2007), I-4

[iii] Vego, *Joint Operational Warfare*, I-4.

[iv] Chairman, U.S. Joint Chiefs of Staff, *Joint Operation Planning*, Joint Publication (JP) 5-0 (Washington, DC: CJCS, 26 December 2006), L-18.

[v] U.S. Army, Design, Field Manual (FM-I) 5-2(Washington, DC: Headquarters Department of the Army, 20 February 2009), iv.

[vi] Milan N. Vego, "A Case Against Systemic Operational Design," *Joint Force Quarterly* no. 53 (2nd Quarter, 2009). 69.

[vii] Stefan Banach, "Design," Powerpoint, 28 February 2009, Leavenworth, KS, United States Army Combined Arms Center.

[viii] U.S. Army, Design, Field Manual (FM-I) 5-2, 7.

[ix] Ibid., 7.

[x] Ibid., 8.

[xi] Ibid., 9.

[xii] Ibid., 9.

[xiii] Ibid., 10.

[xiv] Ibid., 10.

[xv] Ibid., 11.

[xvi] Benjamin Bloom et al., *Taxonomy of Educational Objectives: The Classification of Educational Goals* (New York: McKay, 1956)

[xvii] U.S. Army, Design, Field Manual (FM-I) 5-2, 13.

[xviii] Ibid., 13.

[xix] Vego, "A Case Against Systemic Operational Design," 69.

[xx] Milan Vego, conversation with author, April 27, 2009.

[xxi] U.S. Army, Design, Field Manual (FM-I) 5-2, 17.

[xxii] Ibid., 13.

[xxiii] Clark, Tom, "Reframing Design and Battle Command: Game Day is Between the Lines" *US Army Combined Arms Center Blog - The Engagement Area*, entry posted 25 March 2009, http://usacac.army.mil/BLOG/blogs/ctac/archive/2009/03/25/reframing-design-and-battle-command-game-day-is-between-the-lines.aspx

[xxiv] Ibid.

[xxv] Vego, "A Case Against Systemic Operational Design," 70.

[xxvi] Ibid. To view the two critiques of general system theory, see http://isss.org/laszlofw.htm and <http://outbacksoftware.com/systems/systems.html>

[xxvii] Stefan Banach and Alex Ryan, "The Art of Design: A Design Methodology," Military Review (March-April 2009). 105.

[xxviii] Department of the Army, Training and Doctrine Command Pamphlet 525-5-500, Commander's Appreciation and Campaign Design Version 1.0 (28 January 2008). 12.

[xxix] Ibid.

[xxx] Thomas Hone, email to author, April 30,2009

[xxxi] U.S. Army, Design, Field Manual (FM-I) 5-2, iii.

[xxxii] Ibid., 34.

[xxxiii] Chairman, U.S. Joint Chiefs of Staff, *Joint Operation Planning*, Joint Publication (JP) 5-0, III-19.
[xxxiv] Ibid., III-21.
[xxxv] Ibid., III-28.
[xxxvi] Ibid., III-30.
[xxxvii] Ibid., III-31.
[xxxviii] Ibid., III-32.
[xxxix] Ibid., III-34.
[xl] Ibid., 34., III-41.