UNLEASHING DESIGN

Planning and the Art of Battle Command

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Design is neither a process nor a checklist. It is a critical and creative thinking methodology to help commanders understand the environment, analyze problems, and consider potential approaches so they can exploit opportunities, identify vulnerabilities, and anticipate transitions during a campaign.

—FM 5-0, *The Operations Process*

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PRINT: Mongol amy at the Indus River in today's Pakistan, 1221. The Mongols were naturals at operational design. They drove the Khwarezmian Turks out of the Amu Darya region into India and Iraq, destroying that Muslim empire.

WITH THE PUBLICATION of the most recent edition of Field Manual (FM) 5-0, *The Operations Process*, our doctrine is on the cusp of what is arguably the most significant change to our planning methodology in more than a generation. While our proven methods for conducting deliberate planning have changed little since being introduced, the world around us has experienced fundamental paradigm shifts that threaten to invalidate those traditional methods. Although our Military Decision Making Process (MDMP) remains an indispensable model for the problems posed by a bipolar security environment, it fails to provide the advanced cognitive tools necessary to solve the complex, ill-structured problems common to contemporary operations. The introduction of *design* in FM 5-0 addresses that gap in our doctrine, while providing a sound approach to address the challenges inherent to 21st-century conflict.

FM 5-0 defines design as "a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them."[1] Unlike formal, detailed planning, design is not a process but an approach to organizing the higher-order, more conceptual activities of battle command. It is an iterative activity occurring throughout the operations process "before and during detailed planning, through preparation, and during execution and assessment."[2]

Why Design?

Design is not a function to be accomplished, but rather a living process. It should reflect ongoing learning and adaptation . . . It is dynamic, even as the environment and . . . understanding of the environment is dynamic.

—FM 3-24, *Counterinsurgency*

Army doctrine draws a fine distinction in planning, recognizing that it consists of two separate, but closely related, components: design, which

represents the conceptual component of planning, and detailed planning, conducted through formal processes such as the MDMP or the Joint Operations Planning Process (JOPP).[3] Design is not a replacement for such processes, nor is it intended to replicate any of the established detailed planning steps. Instead, design complements traditional planning processes (see Figure 1). In an era when operations are typically affected by far more factors than at any time in our history, design offers the *thinking tools* necessary to develop a deeper understanding of the context of the situation, identify the underlying causes of conflict, and formulate flexible approaches to solve them.[4]

Many of the concepts underpinning design are not new. For years, intuitive senior commanders have used the fundamentals of design to improve their understanding of the operational environment, form teams of select individuals to assist in providing analysis and advice, and leverage dialog and assessment to build learning organizations. The introduction of a doctrinal approach in FM 5-0 marks the codification of a design methodology that complements and reinforces the successful articulation of battle command.

Other models emerged in the past decade that promised to optimize our ability to formulate solutions to the complex, ill-structured problems becoming increasingly common. Effects-based operations (EBO) drew on complexity theory and closed-systems analysis to offer a holistic view of the operational environment in its constituent, interrelated parts. While the Air Force successfully implemented a model of EBO based on structural complexity, it was not well suited to the interactive nature of operations among the people. Systemic operational design (SOD) shares many of the same characteristics of design, but in application proved too complicated and staff-centric for most operational commanders. Though both EBO and SOD initially appeared to hold great promise, they were ultimately rejected. Building on the lessons from these earlier models, design offers a relatively simple methodology that can be applied at any level, in any situation.

Systemic operational design (SOD) shares many of the same characteristics of design, but in application proved too complicated…

The Goals of Design

The commander's thinking, foresight, instinct, experience, and visualization are particularly important during the early design effort, when identifying the true nature of a complex problem and designing an approach to the solution will drive subsequent planning and execution.[5]

—General James N. Mattis, U.S. Joint Forces Command

Broadly, design seeks to accomplish four distinct goals that are essential to transforming the conditions of the operational environment. These goals underpin the cognitive logic of the activities of battle command and are reflected in the reasoning that ultimately guides detailed planning. Individually, the goals of design are vital components to the effective application of operational art. Collectively, they are essential to mitigating the effects of complexity—uncertainty, chance, and friction—on operations in an era of *persistent conflict*.[6]

Army Planning		
	Design	**MDMP**
Battle Command Role	Understand/Visualize/Describe	Direct
Planning Component	Conceptual	Detailed
Problem Approach	Framing	Solving
Critical Reasoning	Inductive	Deductive
Output	Design Concept	Plan or Order

Figure 1. The Army Planning Construct.

Understand ill-structured problems. Persistent conflict underpins our view of the operational environment and presents a broad array of problems to commanders and their staffs in 21st century operations.[7] Understanding these problems within the context of the operational environment—both their nature and their central characteristics—is fundamental to design and essential to success in an era of persistent conflict. In general terms, these range from simple, well-structured problems to complex, ill-structured problems.[8]

Understanding complex, ill-structured problems is essential to mitigating the effects of complexity on full spectrum operations. This understanding, achieved through collaborative dialog and analysis, facilitates learning and allows commanders to better appreciate numerous factors that influence and interact with operations. Assessing the complex interrelationships among these factors and their influence on operations is fundamental to understanding and enables the commander to make qualitatively better decisions.

Anticipate change. Rather than responding to events as they unfold, commanders and staffs use design to anticipate change in the problem and operational environment and manage transitions before they occur. Through the application of design, commanders and staffs consider potential decisions and actions, and assess possible operational approaches to determine how they contribute to achieving the desired end state. Design alone does not assure success in anticipating change, nor does it guarantee that friendly actions will improve the situation. However, design does provide an invaluable set of thinking tools to help commanders and staffs anticipate change and develop, innovate, and adapt approaches. Iterative, collaborative, and focused design offers the means to effectively anticipate change, increasing both the adaptability and agility of the force.

Create opportunities. The design methodology helps commanders set in motion the actions that allow friendly forces to act decisively and purposefully, shaping the situation as events unfold. The exercise of design is inherently continuous and proactive; it creates opportunities for success by setting the conditions for success before the onset of operations. It also facilitates mission command, ensuring that forces are postured to seize the initiative and, through detailed planning, consistently able to seek opportunities to exploit that initiative while concurrently safeguarding potential vulnerabilities. This ensures commanders act promptly as opportunities arise or leverage risk to create opportunities in the absence of clear direction.

Design alone does not assure success in anticipating change…

Recognize and Manage Transitions. In an era of persistent conflict, our Army requires versatile leaders, critical and creative thinkers capable of recognizing and managing the myriad transitions necessary to achieve success. In a dynamic and complex situation, these include not just friendly transitions but those of adversaries as well as the operational environment. Commanders and staffs must possess the versatility to operate anywhere along the spectrum of conflict and the vision to anticipate and adapt to transitions that will occur over the course of an operation. Design provides the cognitive tools to recognize and manage transitions, identify and employ adaptive, innovative solutions, create and exploit opportunities, protect potential vulnerabilities, and leverage risk to advantage during these transitions.

Design and Battle Command

Given the inherently uncertain nature of war, the object of planning is not to eliminate or minimize uncertainty but to foster decisive and effective action in the midst of such uncertainty.

—FM 3-07, *Stability Operations*

The commander is the central figure in leading design. Utilizing both experience and understanding, his presence is essential for wise direction, sound judgment, and decision making throughout the operations process. His leadership and interaction with the staff is enriched with experience, knowledge, character, and intuition. Design supports his execution of battle command, providing a methodology that fosters the development of understanding in uniquely dynamic situations (Figure 2). Design underpins the cognitive expression of battle command, enhancing the commander's ability to understand, visualize, and

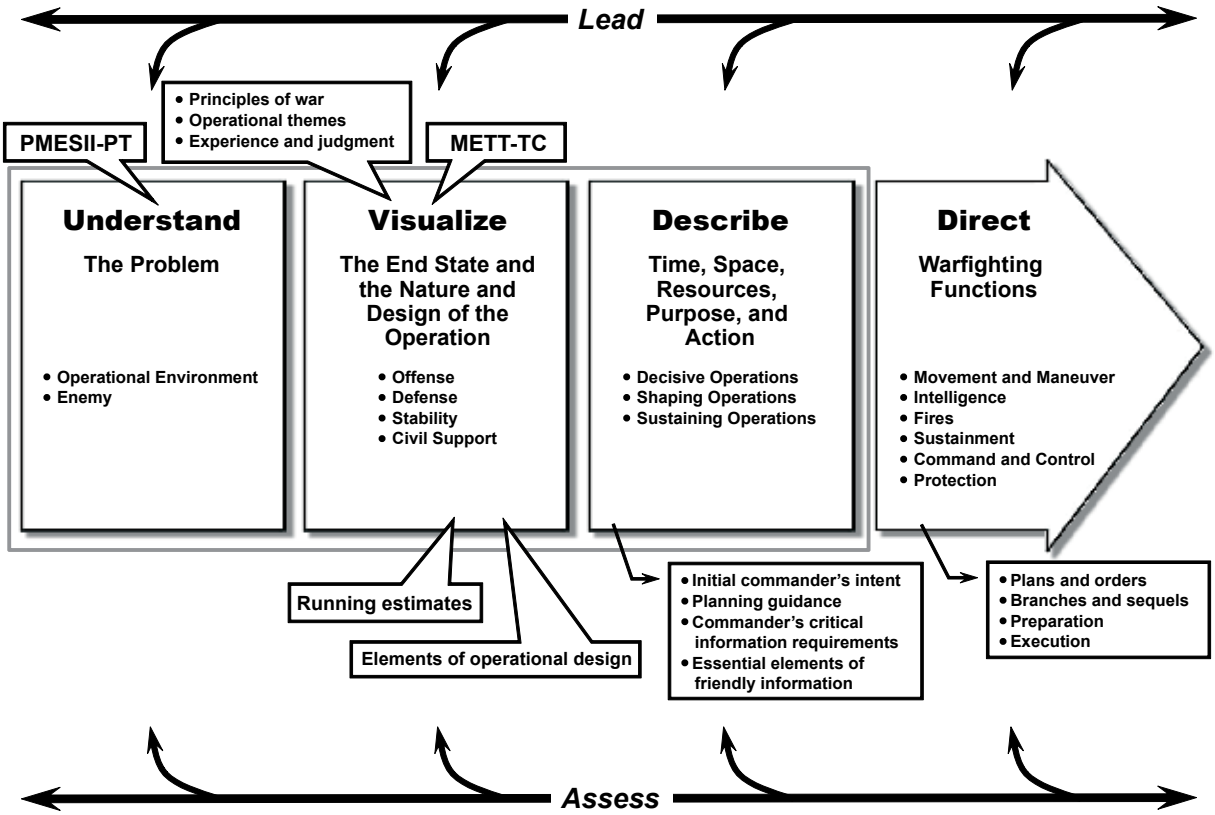

Figure 2. Design and Battle Command.

describe.[9] It helps commanders and staffs develop a thorough understanding of the operational environment, frame the context of the situation, and formulate effective solutions to complex, ill-structured problems. It provides the thinking tools to generate change, shaping an existing situation into a desired objective or condition.

Successful exercise of design relies on effective and decisive leadership built on a foundation of active engagement and continuous dialog and collaboration. This facilitates parallel and collaborative planning and assessment, and supports the development of the shared understanding and visualization essential to leveraging the full potential of a learning organization. Through the design methodology, the commander and staff convert raw intellectual power into effective combat power.

Innovation and adaptation are vital to battle command and among the central tenets of design. FM 5-0 states that "innovation involves taking a new approach to a familiar or known situation, whereas adaptation involves taking a known solution and modifying it to a particular situation or responding effectively to changes in the operational environment."[10] Articulating battle command through design helps the commander lead innovative and adaptive work and guides the operations process. Design fosters continuous learning while facilitating the active dialog and collaboration critical to understanding and decision making throughout battle command.

Fundamentals of Design

Today's operational environment presents situations so complex that understanding them—let alone attempting to change them—is beyond the ability of a single individual.

—FM 5-0, *The Operations Process*

At its essence, design provides the thinking tools to better understand and mitigate the adverse effects of complexity on full spectrum operations. According to research psychologist Gary A. Klein, in persistent conflict, where operations among the people are the norm, complexity is ubiquitous; uncertainty, chance, and friction are common to every operational environment.[11] Simplicity is a key

to building a shared understanding of the situation, the problem, and the solution. Simplicity begins with a common frame of reference derived through continuous dialog and collaboration—central tenets of design. As with any activity, these tenets reflect the fundamentals upon which success depends. In design, the fundamentals help to counter the effects of complexity by encouraging commanders to exercise initiative, embrace risk, and seize opportunities.

Apply critical thinking. The effective exercise of design is deeply rooted in the fundamentals of critical and creative thought. Critical thinking derives from purposeful, reflective judgment and reasoning, and drives the continuous learning essential to adaptation in design. Creative thinking fosters innovation by capitalizing on imagination, insight, and novel ideas. In applying critical and creative thinking, continuous dialog and collaboration help to develop a shared understanding of the situation and the operational environment while improving upon the often-flawed nature of individual thought. Critical thinking involves asking appropriate questions, gathering relevant information, deriving sound conclusions, and effectively communicating the essence of those conclusions to others.

Critical thinking also helps distill the immense amounts of information and determine those elements of information that are most relevant to the situation. This is an important step in mitigating the risk associated with guidance that does not fully account for the complexities of the operational environment. Critical thinking helps to clarify guidance and enables commanders to achieve a mutual understanding of the current situation and the desired end state.

Understand the operational environment. Understanding is fundamental to design. It allows leaders to gain an appreciation for the dynamic nature of the operational environment to better visualize the effects of their decisions and actions on the operational environment. This fosters more effective decision making and better integration of military operations with the other instruments of national and international power. In an operational environment characterized by the presence of joint, interagency, intergovernmental, and multinational partners, such understanding is essential to success.

Critical thinking involves asking appropriate questions…

Developing understanding is a continuous process, facilitated through dialog, collaboration, and circulation. Understanding will never be perfect, but developing an appreciation for its incomplete nature helps identify both intended and unintended consequences that may result from, and undermine, well-intentioned efforts. This appreciation reveals the dynamic nature of human interactions and the importance of analyzing those factors that contribute to understanding. Leaders can gain this understanding by leveraging multiple sources and perspectives and consulting with varied sources of knowledge. Understanding allows the commander and staff to seek and address complexity before attempting to impose simplicity.

Solve the right problem. In recent years, our traditional, detailed planning processes have proven to be especially effective at problem solving, but not always *the right problem*. The effective application of design is often the difference between solving the problem right and solving the right problem. Design is essential to identifying and solving the right problem. Commanders and staffs use design to closely examine the symptoms, the underlying tensions, and the root causes of conflict in the operational environment. From this perspective, they can identify the underlying problem with greater clarity and determine how best to solve it with feasible plans and orders.

Adapt to dynamic conditions. Innovation and adaptation provide the flexibility that allows the commander and staff to adjust to the dynamic nature of the operational environment. In doing so, they capitalize on fleeting opportunities by quickly recognizing and exploiting decisions and actions that produce favorable results while dismissing those that do not. Leaders do not rely on being able to anticipate every challenge or opportunity; instead, they use continuous assessment, innovation, and adaptation to cognitively maneuver the complex, dynamic conditions of the operational environment. Assessment fuels innovation and adaptation and is crucial to the design methodology.

Adaptation demands clearly articulated measures of effectiveness, which in turn provide a means of gauging success and failure while revealing opportunities for innovation. Typically, this involves reframing the situation to align with new information and experi-

ences that challenge existing understanding. Through framing and reframing, design provides a foundation for learning and contributes to the improved clarity of vision vital to successful commanders.

Achieve the designated goals. The articulation of battle command through design is vital to success across the levels of war: As Klein states, "If the link between strategy and tactics is clear, the likelihood that tactical actions will translate into strategic success increases significantly."[12] Integrating and synchronizing sequences of tactical actions to achieve a strategic aim often proves elusive, and even more so with complex, ill-structured problems. Through design, commanders set in motion the cognitive activities that cement the link between tactical actions and strategic objectives. As understanding of the operational environment and problem improves, the design methodology helps to strengthen this link between tactics and strategy, promoting operational coherence, unity of effort, and strategic success.

The Design Methodology

Designing focuses on learning about an unfamiliar problem and exploits that understanding to create a broad approach to problem solving… Designers learn about the problem through discourse with the client in which the designer is constantly questioning his assumptions and probing the limits of his knowledge.

—TP 525-5-500, *Commander's Appreciation and Campaign Design*

In application, design consists of three distinct activities or *spaces*: framing the operational environment, which corresponds to the *environmental space*; framing the problem, which accounts for the *problem space*; and considering operational approaches, which determines the *solution space* (see Figure 3). These spaces represent the iterative, continuous activities that collectively produce an actionable design concept to guide detailed planning. Together, they represent an organizational learning paradigm that seeks to answer three basic questions:

- What is the context in which design will be implemented (the environmental space)?.
- What problems should be addressed and what must be acted upon (the problem space)?
- How will the problem be solved or managed (the solution space)?

With the exercise of design, the commander and staff consider the conditions, circumstances, and factors that affect the use of capabilities and resources as well as those variables that bear on decision making. When initial efforts do not achieve the necessary understanding of behavior or events, commanders reframe their understanding of the operational environment and problem. This cycle of logical inquiry, contextual analysis, transformational learning, and synthesis is rooted in continuous dialog and collaboration. Dialog and collaboration are fundamental to design, providing opportunities to revise understanding or approaches

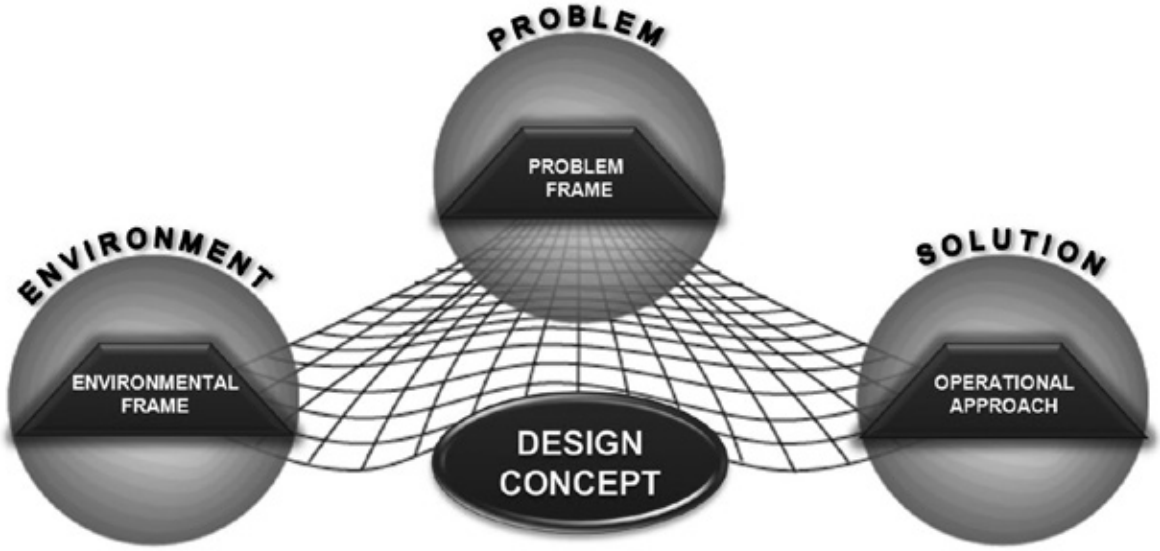

Figure 3. The design activities.

as the problem and the dynamic conditions of the operational environment continue to evolve.

Design is a nonlinear methodology, flowing freely between environmental framing and problem framing while concurrently considering operational approaches. No hard lines delineate individual activities. When an idea or issue is raised, the commander and staff can address it in the appropriate space, even if the idea or issue is outside the current focus. As they gain additional knowledge or begin a new line of questioning, they may shift their focus among the activities, building understanding and refining potential operational approaches to solve the problem.

Framing the Operational Environment

Framing involves selecting, organizing, interpreting, and defining a complex reality to provide boundaries for analyzing, understanding, and acting. It facilitates hypothesizing, or modeling that scopes the aspect of the operational environment or problem under consideration, providing a perspective from which complex, ill-structured problems can be better understood and acted upon.

To develop a more thorough understanding of the operational environment, the commander and staff focus on defining, analyzing, and synthesizing the characteristics of the operational variables.[13] This helps to visualize and describe the groupings, relationships, or interactions among relevant actors and operational variables. It is an important learning activity that typically involves an analysis of the operational variables and an examination of the dynamic interaction and relationships among the myriad of other factors in the operational environment.

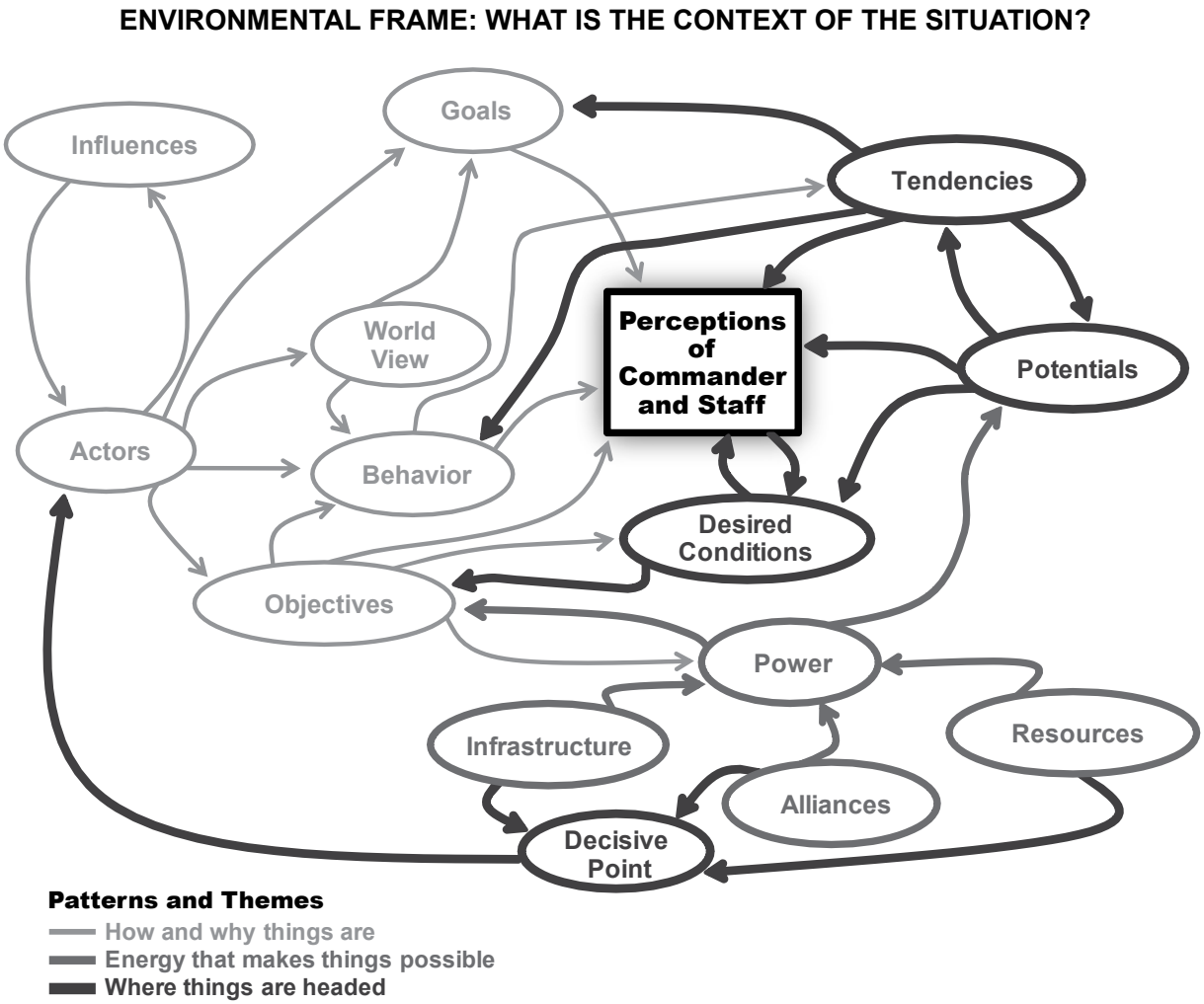

Figure 4. Example environmental frame.

Environmental frame. The commander and staff develop a contextual understanding of the situation by framing the operational environment. The environmental frame underpins understanding within battle command, capturing the history, culture, current state, and future goals of relevant actors in the operational environment. It enables commanders to forecast future events and the effects of potential actions and decisions. The environmental frame explains the actors and relationships within the operational environment and evolves through continuous learning.

Within the environmental frame, commanders and staffs review existing guidance and directives, articulate existing conditions, determine the desired end state and supporting conditions, and identify relationships and interactions among relevant actors and operational variables. They analyze actors that exert significant influence within the operational environment, with the understanding that individual actors rarely share common goals.

End state and conditions. The desired end state consists of those conditions that, if achieved, represent the accomplishment of the mission.[14] Since every operation should focus on a clearly defined, decisive, and attainable end state, success hinges on accurately describing those conditions. These conditions may be tangible or intangible. They may be military or nonmilitary. They may focus on physical or psychological factors. They may describe or relate to perceptions, levels of comprehension, cohesion among groups, or relationships between organizations or individuals. Ultimately, they form the basis for decisions that ensure operations progress consistently toward the desired end state.

Relevant actors. An actor is an individual or group within a social network who acts to advance his personal interests. Relevant actors within such a network may include states and governments; multinational actors such as coalitions, alliances, and regional groupings; and terrorist networks, criminal organizations, and cartels. They may also include multinational and international corporations, nongovernmental organizations, and other actors able to influence the situation either through, or in spite of, a legitimate civil, religious, or military authority.

Tendencies and potentials. In developing their understanding of the interactions and relationships among relevant actors, commanders and staffs consider tendencies and potentials in their analyses. Tendencies reflect the inclination of relevant actors to think or behave in a certain manner. Potential represents the inherent capacity for growth within a specific relationship. Tendencies and potentials are important factors for consideration since not all interactions and relationships support achieving the desired end state.

Framing the Problem

Problem framing involves understanding and isolating the underlying causes of conflict, identifying and defining the fundamental problems to be solved. Problem framing begins with refining the evaluation of tendencies and potentials and identifying tensions between the current and future conditions of the operational environment. Problem framing is used to assess the potential of the operational variables to foster (or resist) transformation and how environmental inertia can be leveraged to achieve the desired conditions.

The problem frame. The problem frame refines the environmental frame that articulates the actions that will achieve the desired end state. It identifies areas of tension and competition–as well as opportunities and vulnerabilities–commanders must address to achieve the desired end state. Tension reflects the resistance among, or friction between, individual actors. The commander and staff identify tension by analyzing and evaluating the tendencies, potentials, and trends within the context of the operational environment. They identify motivations and agendas among the actors, and social, cultural, and ideological factors that may influence them.

During problem framing, commanders and staffs seek to identify the positive, neutral, and negative implications of the natural tensions between existing and desired conditions. These tensions may be exploited to stimulate change and are thus vital to transforming existing conditions. Other tensions may undermine transformation and must be

…tensions may be exploited to stimulate change, and are thus vital to transforming existing conditions.

addressed appropriately. Tensions also arise from differences in perceptions, goals, and capabilities among relevant actors; they are inherently problematic and may foster (or impede) transformation. The analysis of these tensions, and the synthesis of the knowledge gained from such analysis, helps the commander and staff identify the underlying problem to be solved.

Identifying the problem. A concise problem statement clearly and succinctly describes the problem or problem set to solve. It illustrates how tension and competition affect the operational environment and articulates how to transform the current conditions to the desired end state. The problem statement defines the requirements for transformation, forecasting changes in the operational environment while identifying critical transitions.

Considering Operational Approaches

Activities within the solution space provide focus and set boundaries for identifying possible actions to transform the conditions of the operational environment. The staff considers how these actions support achieving the desired end state, and creates a conceptual framework or approach, linking potential actions to conditions. They also consider how to best orchestrate those actions to solve the problem within the context of the environmental frame.

The operational approach is a conceptualization of the actions that will produce the conditions that define the desired end state.[15] In developing the operational approach, commanders and staffs evaluate the direct or indirect nature of interaction and relationships among relevant actors and operational variables within the operational environment. The operational approach helps commanders to visualize and describe broad combinations and sequences of actions to achieve the desired end state. As courses of action are developed and refined during detailed planning, the operational approach provides the logic that underpins the unique combinations of tasks required to transform the conditions of the operational environment.

Operational initiative. The commander and staff also identify specific actions that enable the force to seize and maintain the initiative. They seek opportunities to exploit the initiative and recognize the likelihood of unintended consequences or threats. The staff explores the risks and opportunities of action by identifying exploitable tensions, including the capabilities and vulnerabilities of the actors who oppose the desired end state. They can then formulate methods to neutralize those capabilities and exploit such vulnerabilities, essentially leveraging uncertainty against an adversary.

Resources and risks. While formulating operational approaches, the commander and staff also consider resources and risks. The staff provides an initial estimate of the resources required for each recommended action in the design concept. Creative and efficient approaches are essential to conserving and optimizing the limited resources directly controlled by the commander. Risks are identified and considered throughout design. The initial planning guidance addresses risk; it explains the acceptable level of risk necessary to seize, retain, or exploit the initiative and broadly outlines risk mitigation measures.

Forging the Design Concept

The design concept is the link between design and detailed planning. It reflects understanding of the operational environment and the problem while describing the commander's visualization of a broad approach for achieving the desired end state. The design concept is the proper output of design, and includes—

- Problem statement.
- Initial commander's intent.
- Commander's initial planning guidance (including the operational approach).
- Mission narrative.
- Other products created during design (graphics, narratives, etc.).

The products created during design include the text and graphics of the operational environment and problem and diagrams that represent relationships between relevant actors and convey understanding to the planning staff. The problem statement generated during problem framing communicates the commander's understanding of the fundamental problem that detailed planning seeks to solve. The initial commander's intent and planning guidance articulate the desired end state, describing the potential actions in time, space, and purpose that link the desired end state to the conduct of full spectrum operations.

The mission narrative is the expression of the operational approach for a specified mission. It describes the intended effects for the mission, including the conditions that define the desired end state.[16] FM 5-0 explains that the mission narrative "represents the articulation, or description, of the commander's visualization for a specified mission and forms the basis for the concept of the operation developed during detailed planning. An explicit reflection of the commander's logic, it is used to inform and educate the various relevant actors whose perceptions, attitudes, beliefs, and behaviors are pertinent to the operation."[17] The mission narrative is also a key step in the development of supporting themes and messages for the operation. As the articulation of the commander's visualization of the mission, it is a vital tool for integrating information engagement tasks with other activities during execution.

Reframing

Reframing reflects a shift in understanding that leads to a new perspective on the problem or environmental frames. It typically involves significantly refining or discarding the problem statement that formed the basis of the design concept, and can stem from considerable changes in understanding the situation, the conditions of the operational environment, or the desired end state. Generally, reframing is triggered in one of three ways: a major event causes a significant or catastrophic change in the operational environment; a scheduled review reveals a major problem; or assessment challenges understanding of the existing problem and, thus, the relevance of the operational approach. Reframing allows the commander and staff to make adjustments throughout the operations process, ensuring that tactical actions remain fundamentally linked to the desired end state.

The operational environment is in a constant state of flux. Therefore, the problem frame must also evolve. Recognizing when an operation—or planning—is not progressing as envisioned provides the impetus for reframing. During execution, commanders choose to reframe when the desired conditions have changed, are not achievable, or cannot be attained through the existing operational approach. Conditions will invariably change during the course of an operation; such change is inevitable due to the interaction and relationships among relevant actors within the operational environment. Although organizations are strongly motivated to reflect and reframe following failure, reframing is equally important in the wake of success. Success transforms the operational environment and creates unforeseen opportunities to exploit the initiative. Recognizing and anticipating change is fundamental to design and essential to continuous learning.

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Design represents the most significant change to our planning methodology in more than a generation. It provides the thinking tools that support the commander's ability to understand, visualize, and describe, underpinning the effective exercise of battle command. Design supports this articulation of battle command, helping commanders to develop a thorough understanding of complex, ill-structured problems while providing a logic framework to generate change from an existing situation to a desired objective or condition. It derives success from innovation, adaptation, dialog, and collaboration; it provides the intellectual foundation that facilitates parallel and collaborative planning while supporting shared understanding, visualization, and learning across the echelons of command and among diverse organizations. In an era of persistent conflict, where the operational environment is as fundamentally dynamic as the human element that dominates it, design represents an intellectual paradigm shift that postures leaders for success in the 21st century. ***MR***

NOTES

1. U.S. Army Field Manual (FM) 5-0, *The Operations Process* (Washington D.C: Government printing Office [GPO], 26 Marsh 2010), 3-1.

2. Ibid.

3. FM 3-07, *Stability Operations* (Washington, DC: Government Printing Office [GPO], October 2008), 4-1.

4. Note: Design is closely related to, but not synonymous with operational design. Design sets the broad template for action, the operational approach; the elements of operational design are used to add definition and specificity to that template during detailed planning. While design is not process-oriented, the application of the elements of operational design is a focused process that results in actionable tasks and missions intended to produce the desired end state conditions and objectives.

5. GEN James N. Mattis, "Vision for a Joint Approach to Operational Design." Memorandum to U.S. Joint Forces Command, 6 October 2009.

6. FM 5-0 describes persistent conflict as "protracted confrontation among state, nonstate, and individual actors that are increasingly willing to use violence to achieve their political and ideological ends." Persistent conflict is a central theme in both our Future Force Capstone Concept (TRADOC Pamphlet [TP] 525-3-0, December 2009) and our capstone operational doctrine, FM 3-0. In his white paper, *The Army of the 21st Century*, Army Chief of Staff General George W. Casey Jr., draws on persistent conflict to frame the future operational environment.

7. A problem represents the difference between a current state and a future state. In planning, the problem is reflected in the difference between the conditions of the operational environment at the outset of operations, and the conditions present when the desired end state is achieved. Design is essential to determining the broad approach that will shape those conditions appropriately and thus accomplish the mission.

8. TP 525-5-500, *Commander's Appreciation and Campaign Design* (Fort Monroe, VA: U.S. Army Training and Doctrine Command, 28 January 2008), 8-11. TP 525-5-500 includes a lengthy discussion of the three types of operational problems (well structured, medium-structured, and ill structured), with a particular emphasis on the complex, ill-structured problems that are central to design.

9. The "describe" activity within battle command lies at the confluence of cognition and action, reflecting the overlap between design and deliberate, formal planning.

10. FM 5-0, 3-1.

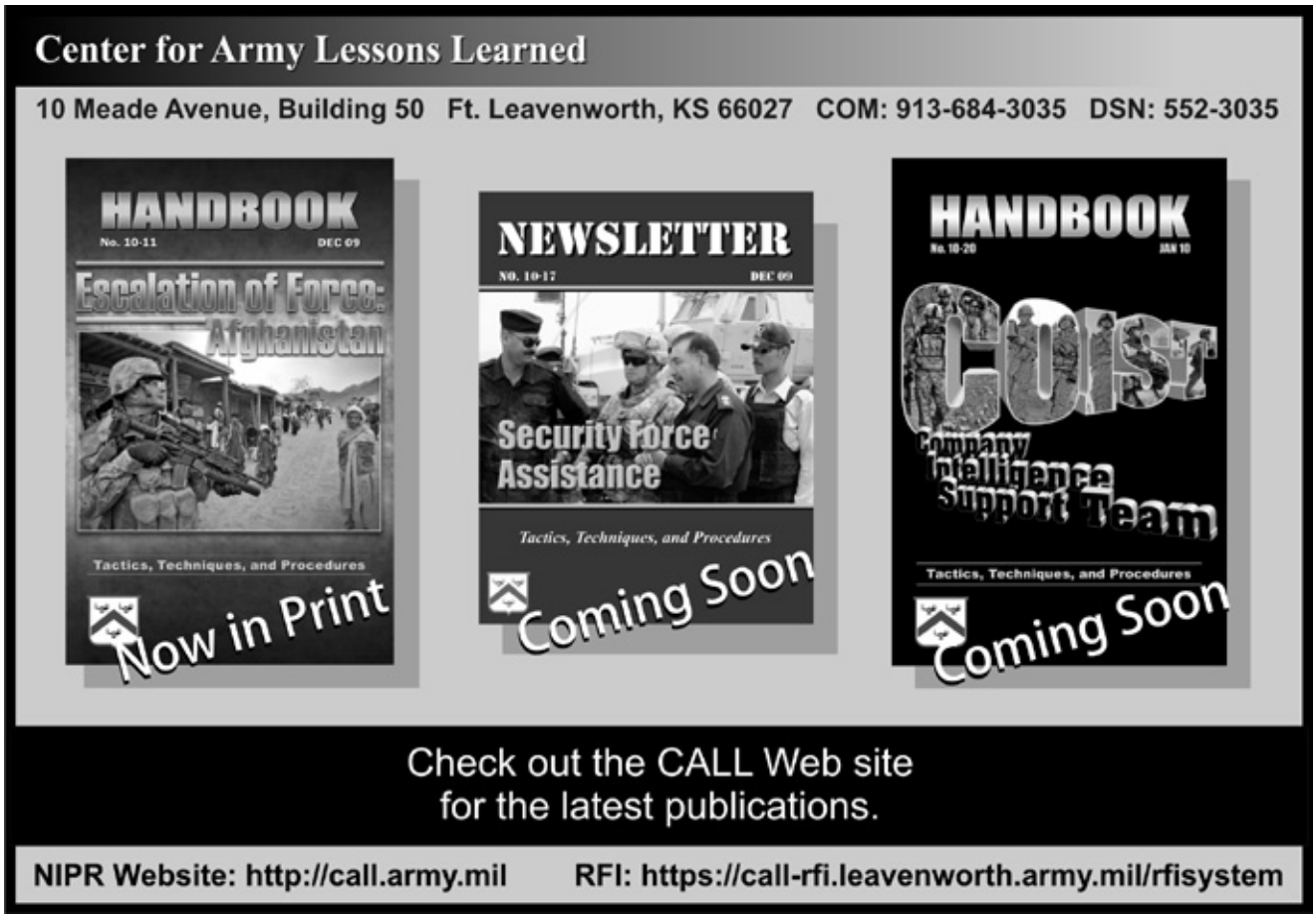
11. In his book, *Sources of Power: How People Make Decisions*, research psychologist Gary A. Klein noted that even as we develop advanced technological solutions to close the information gaps that cause uncertainty, other environmental changes will ensure that uncertainty remains central to our experiences. As a result, decisions will never be perfect, and the experience, judgment, character, and intuition of the commander become all the more important.

12. Ibid, 3-6.

13. The operational variables (PMESII-PT) are described in detail in FM 3-0, chap. 1.

14. FM 3-07, 4-6.

15. FM 3-0 defines *operational approach* as "the manner in which a commander contends with a center of gravity." This singular focus on a center of gravity limits the application of the operational approach in a fashion consistent with operations in an era of persistent conflict. FM 5-0 applies the operational approach in a broader context better suited to the future operational environment, where complex, ill-structured problems are the norm. This description of the operational approach ensures that it is framed by the commander and staff during design and not limited to center of gravity analysis during deliberate planning.

16. FM 5-0, 3-13.

17. Ibid.