



By RICHARD M. SWAIN

ADM Mullen and GEN Petraeus observe flight operations aboard USS *Abraham Lincoln*

U.S. Navy (James R. Evans)

Commander's Business

LEARNING TO PRACTICE OPERATIONAL DESIGN

Operational Design is commander's business. Its principles and practices are useful to all leaders contending with complex situations and problems. Those who champion structuring the practice of systemic design through systematic doctrinal discussion seek to enhance a creative function practiced more or less self-consciously, and more or less systematically, by all successful commanders. It is an error of perspective to consider design as either a competitor or an inconvenient supplement to formal planning processes—such as the military decisionmaking process/joint operation planning process—or a function of a select group of staff officers closeted in secret with a commander cooking up strategic plots. Planning is a formal analytic process intended to maximize utilization of a particular force to achieve given aims.² Design is a heuristic (trial and error or “rule of thumb”) or abductive (after Charles S. Peirce, meaning, more or less, reasoning by best inference or inference to the best explanation³) practice intended to develop strategies and stratagems⁴ to transform complex social-cultural-political systems that have slipped beyond the bounds of tolerance. Design is an element of the art of operational and battle command.⁵ This is not to say that staff officers do not have a role in supporting the commander in developing a design, both as source of information and as alter ego, only that the staff role remains, rightly, supporting and secondary.

Without understanding one cannot control causes; only treat effects, suppress symptoms. With understanding one can *design and create the future.*¹

—JAMSHID GHARAJEDAGHI
and RUSSELL L. ACKOFF

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Commanders may employ staff design groups to aid their learning about the situations they seek to influence, but these formal bodies, and the staff organs they come from, are only one source of inquiry available. Commanders and their subordinates engaged in learning about common projects constitute another “design group,” as does the ensemble of actors from external agencies who can be engaged in a collective discourse of peers to ground collaborative action to achieve unity of effort in projects of common or complementary interest. *It is the engagement of a commander with others in learning through purposeful discussion that defines a design group.* A commander will participate in and serve as the *key link* between several such groups. The commander will participate both as the central figure in his own design groups and as a contributing actor in those of others. In the end, design is what commanders do *before* formulating their commander’s guidance and statement of intent that initiate formal planning. It is what they do during operations, when they consider not only whether they are doing things well, but also if they are doing the right things.⁶ *Design* is “a method of problem solving that utilizes learning and rigorous dialectic to derive sound appreciation of the problem and the best options available for managing and treating” the underlying causes of complex transformative situations.⁷

Why Do Operational Design?

Current attention to the practice of operational design is a response to the recognition that there were conceptual problems early on in the conduct of the current wars, which were attributable to flaws in imagination and understanding. Moreover, for the foreseeable future, military commanders at all levels will confront similar situations, characterized by a high political content and shaped by issues of identity, values, and individual and group agendas, as much as calculable military capabilities. The social-political structures encountered may be characterized as complex transformative (human) systems—complex because they involve a large number of autonomous actors interacting with one another; transformative because the systems that the actors constitute change their systemic nature in response to external infusions of energy.

We ascribe nonlinear behavior to what we call *complex systems*. In complex systems

science, complex systems are characterized not just by multiple actors (complicated systems), but by the frequency of interactions between autonomous actors—interactions that make system behavior nonlinear in magnitude and unpredictable in direction. Small infusions of energy into complex systems can produce entirely disproportional effects. Unintended and unanticipated responses to actions are the norm.

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Human systems, and systems with significant human components, differ from mechanical and biological systems precisely because human beings possess autonomous will and respond to subjective values and motivations as well as objective conditions.⁸ Groups of humans may interpret identical situations in diametrically different ways, depending on how they perceive their interests and relevant identity group. Gharajedaghi and Ackoff (see the epigraph) describe such social complexes as “purposeful systems” and observe, “their parts [too] are purposeful systems, and they are part of larger social, hence purposeful systems. . . . Managing a social system not only requires dealing with ends that may be in conflict at the different levels, but dealing with conflicting ends at any or all the levels.”⁹ Complex human systems produce ill-structured problems in which both the nature of the problem and the appropriate response are unique and fluid. Because of their nature, such problems are not susceptible to intuitive solution grounded solely on comparison with prior experience. Effective action requires significant insight into the relationships defining the wider system.

The conditions inherent in the world today produce situations where traditional military action alone is unlikely to bring finality, although it may be essential to apply military force to enable use of more effective tools of influence. Where the nature of the situation lacks recognizable structure, and system behavior is largely unpredictable, the best that can be done is to formulate strategies for change that apply a process of informed trial and error, sensitive always to independent self-reorganization by the actors who make up the target system. In such circumstances, initiating action often constitutes the best way to learn how the target system operates.

As the context for his term of service as Army Chief of Staff, General George Casey set forth a vision of balancing the Army for a world in a condition of persistent conflict. Institutionally this has been enshrined in the August 2008 *Army Strategy*.¹⁰ What General Casey means by his vision is that the multiple observable conditions in the world today that promise a future of continuous global instability will require a range of national

responses from peacetime engagement to interstate war. The clear implication is that most future conflicts will be the result of a complex of forces not lending themselves to the operational clarity of the Cold War, or even Operation *Desert Storm*. The Army will have to prepare for a variety of roles and missions, ranging from response to the implications of nuclear proliferation, to traditional warfighting, to constabulary work, to peacetime engagement and stability and support operations. Probabilities, most agree, are more likely to be centered at the middle and lower end, with the threat of the superempowered outlaw individual ever present.

British General Sir Rupert Smith, in his perceptive book *The Utility of Force*, takes a nuanced look at conflict based on his experiences in the Balkans and Northern Ireland. He characterizes contemporary conflict as *wars amongst the peoples* and observes that these struggles are unlikely to lend themselves to resolution by force or, for that matter, to any rapid resolution at all. In these conflicts, the best that can be sought in the short- and midterm is management of unsatisfactory situations, often for long periods.¹¹ Smith is discussing the limitations on the employment of limited military forces to effect lasting change in complex social-political situations or problems. Operational design becomes a necessary conceptual tool for management and, ultimately, resolution of just such problems.

Retired Israeli Brigadier General Shimon Naveh uses two examples to illustrate the key ideas of what he calls *Systemic Operational Design*: T.E. Lawrence’s reverie at Wadi Ais in March-April 1917, described in chapter 33 of *Seven Pillars of Wisdom* (and in the 1921 *Army Quarterly* essay “The Evolution of a Revolt”), and the model of the command and

battle learning exemplified by Lord Horatio Nelson, reflected in various documents and histories. Lawrence, a graduate of Oxford and well read in military classics, was an advisor to the leaders of the Arab Revolt. He acquired a deep understanding of the Arab language and culture while living among the Arabs to research a book on Crusader castles and work on archeological projects. Nelson was a gifted commander of established reputation for aggressive action by the time he led his squadrons against the French at the Battle of the Nile and later at Trafalgar.

The Lawrence case describes a process of cognitive reframing, or reflective reconsideration of Arab strategy, carried out as a highly individual process of critical thinking during a period of enforced inactivity due to illness. Lawrence's private musings led to recognition that his existing understanding of the Arab Revolt, and the associated operational concepts, were not relevant to the actual situation, so he created new versions of each in his mind. Lawrence's reframing, or conceptual redesign of his understanding of the requirements of his situation and the nature of the Arab forces, resulted in adoption of a revised guerrilla strategy based on mobility and hit and run tactics.

Nelson's problem—how to achieve decisive tactical defeat of an approximately equal, or slightly superior, enemy force—differed in quality and kind from that of Lawrence. Nelson appears to have solved his problem through the same kind of conceptual process that Lawrence used to solve the puzzle of Arab strategy. That is, Nelson compared the

possibilities of existing practice (parallel attack) to his needs (decisive victory over the French-Spanish fleet), considered the critical variables involved, and formulated (designed) a tactical procedure to achieve the Jominian goal of throwing the mass of his force on a fraction of the enemy's.¹²

The Nelson example also portrays what one author calls a "consensual style of command," carried out in part by fraternal discussions conducted by Nelson with subordinate captains on board his flagship before the Battle of the Nile, and then by meeting and correspondence before Trafalgar. Each method vested subordinate commanders with a common vested understanding of the admiral's vision of a battle stratagem in an anticipated

but still future engagement as well as the authority to act as required within the admiral's intentions to achieve his goals.¹³

In both cases, design consisted of individual reflective learning by a leader—formulation of new patterns of action (a strategy in the case of Lawrence and a stratagem in the example of Nelson) to transform existing situations through action, or to achieve success in future combats through enthusiastic collaborative action. Notably, neither provides an example of a staff-centric process in which the commander is simply an appendage.

In teaching design, much attention is paid to the conduct of challenging egalitarian discourse and the creation of shared understandings. However, these activities ought not to be conflated, for they have different groups and purposes in mind. *Discourse* is a learning technique based on classical dialectics, where ideas from multiple perspectives are offered and tested in argument, challenging fact with fact and triangulating meaning. *Shared understanding*, which may be achieved not only by discourse but also by dialogue, a clear substantive directive, or explanatory memoranda, is a requirement for decentralized operations—what the Army calls mission command. Too often, when these ideas are thrown together while exercising

T.E. Lawrence's reframing, or conceptual redesign of his understanding of the requirements of his situation, resulted in adoption of a revised guerrilla strategy

a staff design group, the impression is given that design is a staff activity in which commanders' participation is incidental and the outcome a mystery shared only by the participants in the *discourse*.

As described here, design is a commander-centric leadership approach, part of what Army doctrine calls *Battle Command*. The explanation that follows describes a logical order of cognitive actions that suggests a sequence of performance. In fact, while some things necessarily precede others, logically, the design activities may be thought



C-17 Globemaster IIIs fly as part of 20-ship formation during strategic airdrop exercise

U.S. Air Force (Richard W. Rose, Jr)

of as a pattern of files on a desktop, each of which, once begun, may be reopened as new information is developed and new understanding is created. Actual performance of design follows an order dictated by the process of learning and continuous retesting of existing understanding.

Design is a collaborative, interdisciplinary approach to operations to help the commander develop a fuller situational understanding, shared with superiors, key subordinates, partners, and allies so the commander can formulate a strategy (or stratagem) for changing unacceptable circumstances to more acceptable ones. Design is what commanders do when called upon to create unique responses to complex situations, aided by informed discourse conducted with and by dissipative groups of subordinate commanders and staff officers, supporting and allied leaders, and leaders of external groups willing and able to collaborate. The commander manages his design teams with varying degrees of formality to build his operational understanding and shape his design through a process of an informed dialectic. Commanders themselves are often members of their superior commander's design team.

Doing Operational Design

Unless the commander himself initiates exploration of a problem, the first thing his design groups will have to do is figure out what inspired the external directive that opened their deliberations.¹⁴ Why has a higher authority directed action? What are the sponsor's expectations? What about the system that existed heretofore has been judged to require change? There may have been a dramatic event; or the mere accumulation of unsatisfactory incidents, each tolerable in itself, may have reached a critical point; or the political authorities may have developed a new ambition to which they want to give practical form through action. In any event, what is done first is not the routine mission analysis of the military decisionmaking process or joint operation planning process; rather, it is an exploration of the sponsor's motivation and expectations.

Mission analysis, as planners generally understand it, involves breaking assigned missions into discrete tasks that can be delegated to subordinates for accomplishment. In contrast, and anticipating this, designers want to understand the motives underlying the sponsor's decision to take action and the

expectations concerning the consequences of employing military forces for satisfying larger goals. Designers review their existing knowledge of the social-political system in which the directed operation is to be conducted, look for changes in the status quo that might have inspired the new instructions, and compare the new directive to existing guidance in case

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clarification is required where the new orders may conflict with standing instructions. They will ask if the mission and the sponsor's apparent expectations make sense in view of what is known. Is the expectation of change coherent, given what is understood about the system in question? Standing headquarters with regional responsibilities will know quite a bit about their regions and about likely responses to new initiatives, often more than national policymakers know.

Once available information has been examined, the commander will want to have a dialogue with his superior to ensure complete understanding between sponsor and actor as to the sponsor's motivations and expectations for the meaning of success and the role(s) the assigned military forces are expected to play.

Design proper, then, consists of two broad groups of activities. The first, *System(s) Framing*, is an effort to learn all one can in the time available about the nature and content of the system creating the unsatisfactory situation. The second, *Operational Framing*, involves the commander's *formulation of a strategy*—that is, creating a proposal of a flexible pattern of operations or actions that seems likely to move the system from one state of affairs to another. This pattern, which gives form and function to action, is expressed as planning guidance and a preliminary intent to initiate formal planning processes.

When the higher authority's initial guidance is understood, the commander and his design group(s) will begin *System(s) Framing* to learn all they can about the system in which the intervention will be required. They record their learning by creating a *Systems Frame*.

A *frame*, as used here, is nothing more than a bounded hypothetical portrayal of a relevant system, captured graphically and in narrative. A *Systems Frame* is a portrayal of the existing human system into which higher authorities have directed intervention. The system portrayed will consist in the first place of a group of interacting actors and potential actors. Inquirers will cast their net wide, identifying state and nonstate actors influencing or interested in the situation the sponsor wants transformed. In the case of a geographic combatant commander, the system will be constituted by states; nonstate actors such as transnational industries, financial authorities, international criminal cartels, and terrorist groups; and international political organizations and other interested actors external to the immediate system. The group of actors will always include the United States, either as an actor or interested onlooker. The operators identified will be broken into their competing interest groups for full understanding of system behavior.

Once the actors and operators in the system are identified, the existing relationships that govern interactions must be defined. These may be domestic, regional, cultural, economic, political, or historical; indeed, the range of influences is limited only by imagination. The joint doctrinal combination of political, military, economic, social, informational, and infrastructure (PMESII) elements is a good place to begin, though experience with design has shown grounds exist to rethink these and other planning paradigms. System propensities, potentials, trends, and tensions must be identified. Understanding cross-cutting regional tensions, such as the Sunni-Shia and Arab-Persian divides in the Middle East, are often critical to understanding system functioning. *Assemblages*, subgroups of actors in contingent relationships giving them a unique collective influence on system behavior, must be identified. One example of an assemblage can be seen in the interactions of poppy farmers, corrupt officials, criminal cartels, bankers, and political insurgents forming a contingent community of interest in some regions. Another example is found in the systemic influence exercised in other states by transnational industries, corrupt officials, and local extragovernmental security forces.

After an understanding of the broad system has been created, at least hypothetically, the design group moves from gaining

understanding to contemplating operations. This requires a cognitive transition from learning to action. Building on the understanding of the constructed Systems Frame, and their understanding of the sponsor's expectations, the design group creates a "mental model" or depiction of the sponsor's desired state of affairs (or system) as a basis of dialogue and, when complete, a reference point toward the state that the sponsor intends the process of intervention to achieve. This *Desired System* not only is based on the understanding of the sponsor's guidance, but also reflects the professional judgment "of what would be desirable and attainable *based on what has been learned*" about the existing state of affairs. It is a hypothesis that must be revised periodically as more thorough understanding is developed.¹⁵

Then, relevant to the desired transformation from the existing state of the Systems Frame to the desired state (Desired System), the designers refine their portrayal of the existing system, identifying the composition and underlying logics of opposing and potentially friendly forces and influences (called by some practitioners the *logic of the enemy as rationale* and the *logic of command as rationale*). They also assess mobilizable energy (*logistics as rationale*) that might be brought to bear by all interested parties and agencies to advance or retard the sponsor's project. Some cases may require speculation on different or unique categories for adequate systems explanation. Commanders do not limit themselves on the friendly side to consideration only of organizations under their command. They identify all interested parties with whom some form of common or harmonious action might be concocted, and the design group speculates about the adequacy of existing organizational arrangements to achieve unity of effort with heterogeneous partners.

The defining part of the transitional series follows this refinement of the Systems Frame. This action, *problem formulation*, involves the development of an understanding of what needs to be done to establish the conditions to achieve desired goals. The commander must be intimately involved in this critical task, and agreement about the articulated form of the problem of transition will usually be sought with superiors. This is the critical conceptual event, moving from system understanding to design of action. Problem formulation consists of estimating the requirements for transforming the *existing system*,

defined by the Systems Frame (informed by identification of opponents, allies, and potential resources), into the Desired System, identifying the obstacles and opponents to be overcome, and the opportunities (favorable potentials, propensities, tensions, and trends) existing within the system that can be exploited for success. Movement from one state to the other can then be expressed as a set of partial or intermediate goals, and the commander and design team(s) can move forward to formulate a theory of action, a coherent expression of things to be done to achieve the transformation, and then to articulate a strategy, corresponding to the theory and discriminating among short, intermediate, and long-term events required to move the unsatisfactory system into tolerances.

Strategy is a word that has migrated a good deal in the past 200 years. In the 18th century, it meant simply the art of the general. Carl von Clausewitz defined it as "the use of an engagement for the purpose of the war" and his rival, Antoine-Henri Jomini, as "the art of properly directing masses upon the theater of war, either for defense or for invasion."¹⁶ Julian Corbett, the late 19th-/early 20th-century British naval historian, defined strategy as "the art of directing force to the ends in view," and classified it as *major* and *minor*, the former a branch of statesmanship and the latter having to do with plans of operations.¹⁷

alternate courses of action to achieve the ends within the available means will remain a feature of strategy formulation

Joint Publication 3-0, *Joint Operations*, currently defines strategy as "a prudent idea or set of ideas for employing the instruments of national power in a synchronized and integrated fashion to achieve theater, national, and/or multinational objectives."¹⁸

While retaining the hierarchical locus of strategy, Sir Rupert Smith characterizes its expression as "a desired pattern of events . . . an expression of the aim and its links to the overall purpose and the context of the conflict, together with the limitations on action that flow from the political purpose in the circumstances."¹⁹ Where the theory of action portrays what must be done, strategy, as used here, indicates the pattern of actions by which it will be accomplished—regardless of the hierarchical level at which such patterns must be proposed. There may be qualitative differences between the decisions made by theater and

brigade combat team commanders in Iraq and Afghanistan, but both would seem to involve creation of *strategies*, thus understood, to achieve long-term goals. Developing strategies, so understood, is the defining act of design.

A *design* is a vision expressed in terms of *intent* (what I want to do), *concept* (how I want to do it), and *narrative* (my instructions). Proponents of design often say that if one has done his system framing and problem formulation properly, there is only one course of action, which will more or less present itself. This creates some unnecessary misunderstandings. In theory, if the Systems Frame has been created in sufficient depth, problem formulation will reveal everything that must be done to transform the system. But design acknowledges that full understanding is an ideal unlikely to be achieved, and this complex of actions is seldom a course of action. More often it is a menu of things that, if accomplished together, would resolve all issues. Normally, the sponsor, his partners, and allies will not have sufficient resources to accomplish all identified tasks simultaneously. Choices must be made. Resolution and patience must be stretched to make up for deficits in resources. Creating the strategy (the desired pattern of events) and assigning emphasis (priority) and place and timing (essentially operational art) will remain a task of fine judgments. Alternate courses of action

to achieve the ends within the available means will remain a feature of strategy formulation, as will development of traditional branches and sequels in plans for execution.

Formulating a strategy, or pattern of actions, to change the system described by the Systems Frame is called *Operational Framing*, which is a narrower perspective derived from the Systems Frame. It identifies the smaller system of actors, friendly and opposing, among which focused transformative action is proposed to realize the desired state. Defining the pattern of intended actions, giving the strategy form and function, remains pretty much the sole business of the commander compared to the earlier Systems Framing, which is largely a staff exercise performed by the staff design group. Conceiving a strategy for the operations comprehends, in terms of the Army model of Battle Command, the

cognitive process of visualization and ends with the issue of commander's broad guidance and statement of a preliminary intent to subordinate commanders and staff to initiate formal planning. The commander may avail himself of the advice of others in this action, but only he can decide and direct, giving form and function to actions intended to realize the abstract goals set by the action's sponsor.

This translation of the strategic to the tactical remains the essence of operational command. The commander's guidance to planners should include as a minimum:

- direction about the combination of parallel and sequential objectives that lead to mission success and define the way the mission will be performed
- identified points of influence that provide the best potential for advantageous action, the relationships and tendencies that can be exploited, and the lines of least resistance and least expectation that might lead to success
- ways and means of assessing the continued relevance of his situational understanding, particularly what indicators he believes would indicate reframing was called for
- the logic of the commander and his intentions for collaborating with coordinating authorities
- the national "message" that military actions and words are intended to convey, as a boundary condition for anticipated actions.²⁰

Once in receipt of the commander's guidance and intent, the planning staff formulates various alternative uses of the available resources, which, on approval by the commander, are translated further into plans and orders for subordinates.

Unlike planning, which is intended to guide events from start to finish, Operational Design is grounded on a presumption of unpredictable system transformation and an inevitable decay of the accuracy of understanding and relevance of intended actions. The planning process, focused on concrete realities of forces, time, and space, may require adjustments to understanding and strategies. Therefore, design continues even while planning and execution go on. While planners monitor operations to see whether the commander's instructions are carried out efficiently, designers monitor the system to see whether their systemic understanding remains adequate to explain individual actor and collective system response. When the system responds in ways that cannot be accounted for by the existing understanding (or when new knowledge becomes available challenging prior understanding), it is time to *reframe*—to go back to the original analysis and formulate a new understanding in light of new data. Once this is done, commanders must ask if their strategy is still relevant to achieving the desired outcome, and if not, they must formulate a new theory of operations and strategy consistent with

their revised understanding. Design is by nature continuous and recursive. Successful practice requires self-confidence and the humility to admit the likelihood of error when dealing with complex human systems. Success demands openness to challenges to one's understanding without impeding the will to decide and see an action through to completion.

Leading Collaborative Learning

The notion of leading collaborative learning is a central feature of the theory of operational design. Collaborative learning is desirable in situations involving complex transformative states for the fairly obvious reason that by their very nature such systems resist rapid understanding through the kind of pattern recognition that underlies the intuitive leadership of great captains. Rather, insight, or *coup d'oeil*, in addressing complex problems is expected to come from deep collaborative study of the human systems that create them. This learning provides structure to guide decision by illuminating the internal lineaments of the systems, revealing the range of actors and underlying relationships that define them. Lawrence and Nelson seem to have arrived at their understandings largely through individual reflection on their personal experiences and to have shared their visions by discussion and composition of detailed memoranda. Today, proponents of design propose to enhance this highly individual practice by suggesting the use of a kind of collaborative learning that will enable a commander to study questions deeply in spite of the pressures on his time that were not part of the experience of either Lawrence or Nelson. The belief is that the technique of collaborative discourse, or dialectic by knowledgeable participants, can tease out the hidden meanings of ambiguous facts and that the understanding gained can be shared with others.

A wise commander uses different groups to study the system in question and to develop with them a shared understanding of how the system is constituted and how it works, based on the best available evidence. The core groups will normally be made up of knowledgeable staff officers who can focus on learning, the commander and his subordinates, and finally the commander and coordinating leaders who will depend on the harmony of actions to produce desired outcomes. The staff group is the more formal,



U.S. Army medical technician examines sick villager during medical civil affairs project in Djibouti

U.S. Air Force (Samuel Rogers)

and it will require general management by the commander or a senior leader and engagement with the commander at critical points if it is to advance his understanding.

Management of learning discourse is a skill acquired only through practice.

*collaborative discourse
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Participants must be mature enough to depersonalize disagreement. Effective dialectical discourse requires building confidence among subordinates that their honest critical ideas are desired, and that their understanding will be tested and often rejected, without reflection on the overall respect in which they, the subordinates, are held. The commander must be prepared to offer his counterviews for challenge and be open to disagreement about them. He must manage his relationships with the design group so debate over understanding remains separate from questioning of integrity or authority to decide. These are distinctions that will place demands on the commander's leadership and the professionalism of the design group, both showing the humility of admitting the possibility of error and recognizing the essential requirement for reserving decision and direction for the commander. The commander who desires only applause from his subordinates may receive it but will learn little from them.

Operational design proposes that inclusive collaborative learning results from a process of challenging open discourse by groups of informed colleagues who approach situations from a variety of perspectives. In this sense, discourse is the combination of individual searching for relevant information about the subject system and a collective, challenging examination of data, in which individuals offer hypotheses about the meaning of the information and are required to confront challenges from other perspectives as a means of hammering out a more refined understanding. Discourse in this sense is dialectical—both “egalitarian” and “asymmetric.” It is egalitarian in that everyone is expected to participate, offering both data and insights. It is asymmetric in recognizing some participants are more knowledgeable

than others, though this recognition does not privilege the views of the experts absent presentation of evidence.

These critical discussions are expected to be passionate and uncompromising. The object is not to arrive at the lowest common denominator but to identify alternative interpretations, resolve those that can be concluded with additional evidence, and identify and preserve the differences where they cannot be resolved without still more information. Common understanding does not mean a common narrative of how things are but the story of how things can be agreed to be and where there are alternative, competing views of the same phenomena. Collective understanding is built incrementally, not by consensus but through accumulation of perspectives that cannot be rejected because of clearly contrary evidence. The design group will seek information internally and externally, drawing in experts where they are available, and they will begin to construct a conceptual picture of the system and a narrative that accounts for system behavior as they observe and understand it.

Generally a staff group proceeds by identifying the actors who make up the system through some sort of graphic mind-mapping. Through individual research, they discover various facts and formulate individual or subgroup hypotheses about system behavior, which they present for collective assessment and rigorous dialectical or conceptual testing. As the practice of learning continues, a kind of shared understanding is built up by the group. When meeting with the commander, the group can present its understanding or the commander can open with his own, formed from the variety of sources available to him. The commander must be open to having his judgments challenged, based on evidence, and the group must be free and willing to defend its views so long as it holds them; otherwise, the group will do the commander no good in testing his evolving understanding.

While the commander may not be present for much of the debate, he must take part enough to take on the nuance of the argument, offer his unique expertise, infuse information from external sources and groups, and manage the search for understanding to meet his needs and timelines. The commander must both keep his distance from the debates—take the “balcony perspective” (position of exteriority), in the terminology

of Harvard professor Ronald Heifetz—and get involved, or “go down on the dance floor” (position of interiority), to manage inquiry.²¹ As an artifact of its deliberations, the design group should produce a graphic and narrative summary of the basis of its conclusions. This record can be used as a reference to share conclusions with others and to allow the commander and group to reflect on the continued relevance of their understanding as new facts are discovered and new observations of the system reveal more about its behavior.

Success in this sort of discourse does not arise from agreement in interpretation so much as understanding how the parties conclude what they do in light of common evidence. Multiple interpretations are likely. The one that seems more likely to the commander will guide action but rejected understandings are not losses. They are retained to serve as conceptual alternatives later when reframing is required. Finally, both the commander and the various design groups must be self-conscious and reflective about how they learn, while they learn. Observation, reflection, and skepticism must lead all those engaged to challenge their practices and understandings. Commanders must balance their perseverance to see their decisions through in the face of doubts, with a willingness to change course when the balance of evidence turns against their existing understanding. Open to discussion during learning, commanders will still find themselves required to drive their subordinates to overcome doubts and hesitations in execution.

Design and Operational Art

In creating operational concepts, and underpinning the conduct of operations, design constitutes the essential preamble for the practice of operational art, especially in an era of persistent conflict. The notion of *operational art* originated with Red Army theorists in the 1920s. Aleksandr A. Svechin inserted the activity of operational art between strategy and tactics in his 1927 book, *Strategy*, though others had already written about it. Svechin observed that strategy, which called for a single operation from mobilization to surrender, was no longer feasible. *Tactics*, he wrote, had to do with maximization of weapon or material capabilities within particular contexts to solve immediate problems. Strategy, he acknowledged, now set broad goals to be achieved over relatively long periods compared with tactics. Operational

art, between them, translated the broad abstract goals of strategy into discrete tactical tasks and provided the wherewithal to sustain action to accomplish intermediate goals, developing, in the whole, accomplishment of the strategic design.²² Most useful in Svechin's taxonomy is the differentiation of tactics as the resolution of problems through maximization of material capabilities, contrasted with the largely cognitive and coordinative operational art, and the goal setting and resourcing (national) strategy.

The U.S. Army adopted the notion of an operational level of war in its 1982 Field Manual 100-5, *Operations*.²³ A concept of operational art as an identifiable activity was adopted in 1986. That year, three "Key Concepts of Operational Design"—center of gravity, lines of operation, and culmination—were adopted into Army doctrine, reflecting the neo-Clausewitzian cast to Army thinking.²⁴ The notions of both operational art and the operational level of war were carried into joint doctrine when the Goldwater-Nichols Department of Defense Reorganization Act created a system of doctrine under authority of the Chairman of the Joint Chiefs of Staff. Current doctrinal notions of strategy, operational art, and tactics may need to be rescued from their Cold War connotations and post-Cold War hardening and be returned to the looser, more traditional sense that Svechin captured in order to differentiate activities consisting of maximizing tools to solve practical problems (tactics), setting long-term goals (strategy), and those mediating between the two by creation of imaginative patterns of actions (operational art). (Svechin, it must be noted, focused on major wars between large armies of first-class powers and did ascribe function to hierarchical levels relevant to his frame.)

The performance of a professional is marked by the discretionary application of a special knowledge to achieve purposes of social value. The practice of Operational Design will enhance commanders' professional talent for creative work in the face of problems that resist simple experiential response. Exploring the basis of instructions from higher authorities will lead to more intelligent obedience. Employment of searching discourse will allow commanders to draw on the knowledge and understanding of others, viewing the same situation from a variety of perspectives, and to test conclusions, theirs and those of others, in the fire

of debate. This focused learning would seem as vital in confronting complex strategic and operational issues in conventional war as it does in less conventional "wars amongst the peoples." As the war in Iraq has shown, apparently simple operational tasks often carry in their consequences complex situations that cannot be ignored. In the end, the commander must move from the edges of learning to the center, avoiding creation of unintended consequences, and reflectively and self-consciously creating strategies to move unsatisfactory situations within bounds for resolution by other means when they cannot be resolved directly by application of force. The practice of design, translating strategic guidance into tactical acts, is operational art for the 21st century. **JFQ**

NOTES

¹ Jamshid Gharajedaghi and Russell L. Ackoff, "Mechanisms, Organisms and Social Systems," *Strategic Management Journal* 5 (1984), 289.

² For a more thorough discussion of the contrast between *design* and *planning*, see Field Manual (FM) 3-24/Marine Corps Warfighting Publication (MCWP) 3-33.5, *Counterinsurgency*, chapter 4 (Washington, DC: Headquarters U.S. Army, December 2006), 4-2, 4-3.

³ See "Charles Sanders Peirce," available at <<http://plato.stanford.edu/archives/fall2008/entries/peirce/>>.

⁴ The term *strategy* is used here in the generic fashion indicating a pattern of actions intended to achieve a broad goal. *Stratagem* refers generally to "a tactic or maneuver that is designed to deceive an enemy."

⁵ The connection to Battle Command was pointed out by Jeffrey Powell and John Lockhart Clark in a draft manuscript, which became a chapter in the School of Advanced Military Studies *Art of Design; Student Text, Version 1.0* (September 24, 2008), 48. The concept was briefed to General William Wallace, commander, U.S. Army Training and Doctrine Command, at the Unified Quest Capstone event in May 2008.

⁶ See Joint Publication (JP) 5-0, *Joint Operation Planning* (Washington, DC: Joint Chiefs of Staff, December 26, 2006), paragraph b, "Levels of War and Assessment" (2), III-59.

⁷ Colonel Timothy Daniel, USA (Ret.), Booz Allen Hamilton, Leavenworth, Kansas.

⁸ Gharajedaghi and Ackoff, 294-297.

⁹ *Ibid.*, 297.

¹⁰ George W. Casey, Jr., "The Strength of the Nation," *Army* (October 2007), 19-28.

¹¹ Sir Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (London: Penguin, 2005), xiii, 372.

¹² Julian Corbett, *The Campaign of Trafalgar* (The Mill, Brimscombe Port, UK: Nonsuch Books, 2005), 204-214, 220-226, 271-275.

¹³ Roger Knight, *The Pursuit of Victory* (London: Basic Books, 2005), 285-286; Robert Southey, *The Life of Horatio Lord Nelson* (London: J.M. Dent & Co., 1905), 112.

¹⁴ JP 5-0, section C, I-15-I-22, offers procedural pathways for contingency and crisis action scenarios.

¹⁵ I am obliged to Colonel Timothy Daniel, USA (Ret.), for pointing out the importance of the discussion of the creation of a model of the Desired System.

¹⁶ Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 177; Antoine-Henri Jomini, *The Art of War* (London: Greenhill Books, 2006), 11.

¹⁷ Julian S. Corbett, *Some Principles of Maritime Strategy* (Annapolis, MD: Naval Institute Press, 1911), 308-309.

¹⁸ JP 3-0, *Joint Operations* (Washington, DC: Joint Chiefs of Staff, September 17, 2006, Incorporating Change 1, February 28, 2008), GL-26.

¹⁹ Smith, 13.

²⁰ Department of the Army, U.S. Army Training and Doctrine Command, TRADOC Pamphlet 525-5-500, "The United States Army Commander's Appreciation and Campaign Design," version 1.0 (January 28, 2008), 19-20.

²¹ Ronald A. Heifetz and Marty Linsky, *Leadership on the Line: Staying Alive through the Dangers of Leadership* (Cambridge: Harvard Business School Press, 2002), 51 et seq.

²² Aleksandr A. Svechin, *Strategy* (Minneapolis: East View Publications, 1992), 68-69, especially note 1, page 68. Also, Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass, 1997), provides some of the theoretical underpinning for Systemic Operational Design. Much, however, remains unpublished.

²³ FM 100-5, *Operations* (Washington, DC: Headquarters Department of the Army, August 20, 1982), 2-3.

²⁴ FM 100-5, *Operations* (Washington, DC: Headquarters Department of the Army, May 1986), appendix B, 179-180. These were the center of gravity, culminating points, and lines of operation. By 2008, joint doctrine contained 17 terms, and Army doctrine no less than 12 terms, divided according to "Frame/Reframe the Design," "Formulate the Design," and "Refine the Design." See FM 3-0, *Operations* (Washington, DC: Headquarters Department of the Army, February 2008), 6-7, and JP 5-0, IV-3. The Iraq War—era joint and Army doctrine includes a number of concepts about Operational Design without formulating a comprehensive explanation. The best doctrinal attempt to do so is chapter 4 of FM 3-24/MCWP 3-33.5, *Counterinsurgency*, 4-1-4-9.