Are We Winning?

A Brief History of Military Operations Assessment

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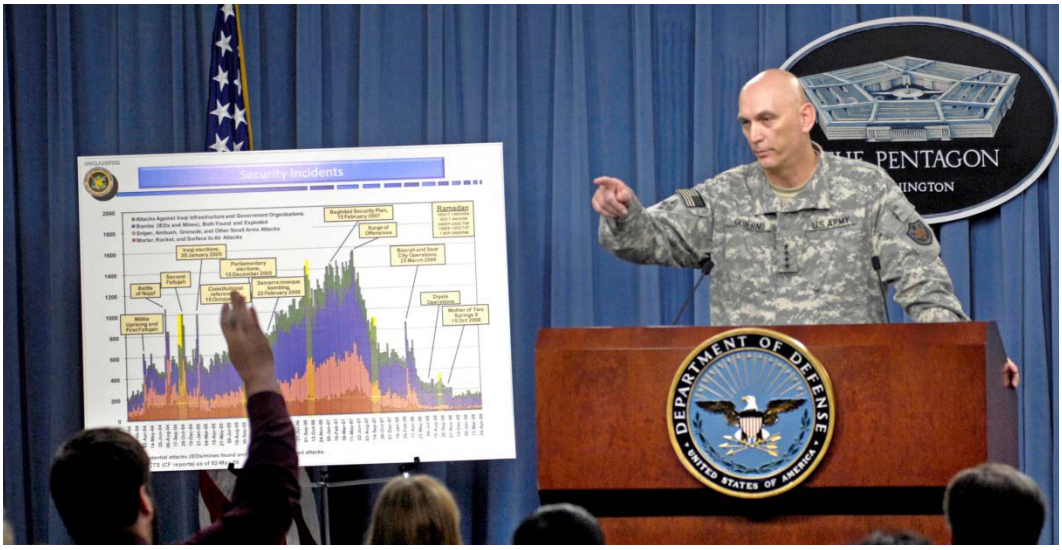
September 2014



CNA
ANALYSIS & SOLUTIONS

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
SEP 2014		**00-00-2014 to 00-00-2014**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Are We Winning? A Brief History of Military Operations Assessment	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **CNA Analysis & Solutions,3003 Washington Boulevard,Arlington,VA,22201**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**56**	

Distribution

Distribution unlimited. Specific authority: N00014-11-D-0323.

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Cover Photo: Army General Raymond T. Odierno, commander of Multinational Force Iraq, provides an operational update briefing May 8, 2009, to the Pentagon press corps. (DoD photo by R.D. Ward.)

Approved by: **September 2014**

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Executive Summary

"Are we winning?" That simple question has proven decidedly difficult for the U.S. military to answer at various times in its history, and in recent decades has given rise to formal processes for trying to measure progress in warfare—a practice that has become known as "operations assessment." Over the past decade, CNA analysts have found themselves increasingly involved in operations assessment, as has the broader military operations research community. Yet, to our knowledge, there is no comprehensive account of the history of operations assessment. This paper aims to serve as a primer on the subject to provide context on how operations assessment has grown and developed over the past several decades. We hope that it serves as a foundation and source of encouragement for a more robust history on this topic.

Although the genesis of what we now refer to as operations assessment began in World War II with the growth of operations research, the Vietnam era saw the emergence and practice of the concept take on a significance that was unprecedented. As the United States became immersed in a counterinsurgency fraught with ambiguities, nascent operations research and systems analysis (ORSA) analysts, among others, strove to find ways to measure progress on the ground. The main driving force behind this effort was Secretary of Defense Robert McNamara. A strong proponent of systems analysis and other quantitative methods, McNamara drove the idea that data collected on the ground could be used to develop accurate and precise measures of progress.

McNamara's approach took the form of three primary assessment models: body counts, the Hamlet Evaluation System, and the Southeast Asia Analysis Reports. Each depended on highly quantitative inputs to produce measurements that reflected the degree to which the U.S. military was meeting its objectives in Vietnam. While this effort represented a highly innovative approach to a very difficult problem, the process proved highly unreliable as an accurate reflection of progress. The emphasis on quantitative measures obviated the inclusion of qualitative judgment and ignored the disparate nature of the environment in Vietnam, failing to account for nuance and context. By the end of the war, policymakers and Defense leaders were wholly disenchanted with the assessments process and summarily dismissed it as invalid and useless.

In the years following Vietnam and leading up to the end of the Cold War, doctrine and thinking on operations assessment was minimal and tended to revert back to

pre-Vietnam methods like battle damage assessment and the commander's estimate. The explanation for this lack of emphasis lies primarily in the geopolitical dynamics that characterized the Cold War. Because the U.S. defense posture was oriented almost exclusively toward countering the Soviet Union, it became much more important to compare and measure the *capabilities* of the two nations' militaries, rather than the effectiveness of their operations. Since the two superpowers never actually engaged in "hot" conflict, the perceived need for a robust operations assessment process was virtually nonexistent. Coupled with the backlash against the highly quantitative Vietnam-era approach, the later years of the Cold War saw operations assessment fall into relative obscurity.

With the collapse of the Soviet Union, the United States took on a new role as the sole superpower, and with that shift came new global responsibilities. U.S. engagement around the world began to grow and the need for an assessments process re-emerged. At the same time, the world was entering the Information Age, where vastly improved computing capabilities were prompting sweeping changes in every sector, including defense.

With these changes came several new conceptual undercurrents that would ultimately influence the development of a new approach to operations assessment. Network-centric warfare, the "Revolution in Military Affairs," and, ultimately, effects-based operations all grew out of the idea that advanced technologies would usher in a new era in warfare—one that made war almost, if not entirely, calculable. For operations assessment, these changes signaled a similar shift in thinking, back to more quantitative approaches. The emergence of effects-based assessment, which emphasized the use of measures of performance and measures of effectiveness—expressed quantitatively—to determine the level of progress, became the dominating framework for operations assessment.

The wars in Iraq and Afghanistan have brought operations assessment significance and attention unparalleled in U.S. military history. Initially relying on effects-based assessment to provide the necessary framework, assessors in both conflicts met with hindrance after hindrance as the shortcomings of this approach became more apparent. The disconnect between counterinsurgency theory and the assessments process that had plagued operations assessment in Vietnam re-emerged and the result has been equally frustrating. The promise of technological advancement and the effects-based framework to help make sense of the vast amount of data coming from both theaters has fallen short. Once again, the failure of the process to account for local context and the pitfalls in trying to quantify complex dynamics has made the production of accurate and useful assessments a persistently elusive aim.

This brief history of operations assessment has revealed important trends and provides insight into how the process can be improved in the future. The oscillation between quantitative and qualitative inputs and approaches to assessment has been a persistent theme. Also, the emphasis on operations assessments seems to ebb and

flow according to the level of demand for them, especially from high-level Defense Department leadership. The level of demand, in turn, seems proportional to a lack of obvious progress. When progress is difficult to demonstrate and communicate, which is especially true in counterinsurgency, there is a greater demand for accurate assessments. Conversely, in eras like the Cold War, where the focus resided in pre-conflict comparisons of forces, demand for operations assessment was almost nonexistent.

Recent trends in operations assessment include some high-level commanders' use of assessments to help bolster the message they wish to communicate to higher leadership and public audiences. In an effort to gain the support of policymakers and other civilian audiences, some commanders have selected metrics and molded assessments in ways that paint a picture of progress consistent with their intended message. This development has had significant implications for operations assessment, and the processes at numerous high-level commands have undergone substantial overhauls as subsequent commanders seek an appropriate balance in satisfying the high-level civilian audience while building assessments that still provide meaningful inputs to their commands' internal planning processes.

The recent high level of demand for assessments has brought about what General James Mattis referred to as a "renaissance" in operations assessment. Currently there is great momentum behind efforts to build a workable and effective framework for assessments, which has given rise to revisions of major U.S. doctrinal publications on the subject. There is great opportunity at this time to take lessons learned from operations assessment history and apply them to the development of processes that avoid the problems of the past and anticipate future considerations.

Challenges such as "big data" and limited analytic capacity, increased emphasis on operations assessment amidst discord as to how to conduct it, demands of competing audiences, lack of training and education for practitioners, and the uncertainties and ambiguities of warfare will continue to make the conduct of operations assessment a challenging endeavor. Yet, if we are to avoid adding another chapter of failing and frustration to the history of operations assessment, it is imperative for the U.S. military to seize the momentum and opportunity that currently exists to re-examine and redesign effective means of assessing progress in future operations.

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Introduction

In more than a decade of war in Iraq and Afghanistan, the United States' armed forces have encountered myriad challenges in their efforts to execute simultaneous counterinsurgency campaigns. Assessing progress on the ground—what we will refer to here as "operations assessment"—has proven an especially challenging task.[1] For CNA analysts, as well as uniformed operations research and systems analysis (ORSA) personnel, the operations assessment process has grown in importance and consumed increasing analytic resources over the course of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). While there have been new and innovative approaches to operations assessment in recent years, there has also been a great deal of relearning old lessons from previous eras (under different conditions). This relearning is, at least in part, attributable to the lack of a comprehensive history of operations assessment.

Examining the history of assessment can help practitioners be successful and avoid relearning past lessons, and it can better prepare the next generation of practitioners for ascertaining progress in future operations. This paper has two aims: First, to serve as a primer on operations assessment by laying out some of the major trends in its development and employment over time. Second, to serve as a foundation and source of encouragement for the research and production of a more complete history of operations assessment.

The process that we refer to today as operations assessment finds its origins in the World War II era. During that time, U.S. armed forces began to dedicate significant resources to the relatively new field of operations research (OR).[2] Current U.S. joint

1. The U.S. Joint Staff, *Commander's Handbook for Assessment Planning and Execution* (Washington, DC: U.S. Joint Staff, 2011) describes the activity of assessment (referred to in this document as operations assessment) as follows: Commanders, assisted by their staffs and subordinate commanders, along with interagency and multinational partners and other stakeholders, will continuously assess the operational environment and the progress of the operation toward the desired end state in the time frame desired. Based on their assessment, commanders direct adjustments, thus ensuring the operation remains focused on accomplishing the mission. Assessment is applicable across the range of military operations. It offers perspective and insight, and provides the opportunity for self-correction, adaptation, and thoughtful results-oriented learning. (p. vii)

2. The history of operations research is well-documented, while the purpose here is to examine the history of operations assessment. See Maurice W. Kirby, *Operational Research in War and*

doctrine defines OR as "the analytical study of military problems undertaken to provide responsible commanders and staff agencies with a scientific basis for decision on action to improve military operations."[3] With the adoption of OR among the armed forces, statistical models and quantitative measures became common in the conduct of warfare, bringing much more "science" to traditional ideas of the "art" of war. Since that time, the development of OR has brought substantial changes to the way the United States and its partners fight their wars. Much of the thinking behind contemporary operations assessment is founded in OR principles, emphasizing quantitative metrics to demonstrate progress. However, practitioners of these methods have also encountered significant obstacles, often resulting in the movement away from the quantitative in favor of more balanced approaches.

As we will see, the major trends in operations assessment essentially follow the path of a pendulum swinging between highly quantitative methods and loose guidelines that place much of the burden of assessment on the commander's judgment and staff inputs. It has also become clear through this study that the emphasis placed by the military on operations assessment is typically proportional to the level of demand for assessments by policymakers and the U.S. public. There have been prolonged periods in U.S. history where the absence of open conflict has obviated the perceived need for operations assessment, relegating the practice to a comparatively minor role in the planning process. This oscillation over time is the result of many factors, including the level of U.S. involvement in armed conflict, the global balance of power, technological advances, and economic and business practices. The remainder of this paper will trace the development of operations assessment in light of these factors. We will begin in the Vietnam era, follow the decline of assessment during the Cold War and a renewed emphasis that accompanied the Information Age, and examine the struggles and evolution of assessment during the wars in Iraq and Afghanistan. Having examined this history, we will conclude with some thoughts on what the future might hold for operations assessment.

Peace: The British Experience from the 1930s to 1970 (London: Imperial College Press, 2003). See also Charles R. Shrader, *History of Operations Research in the United States Army*, 3 vols., vol. 1 (Washington, DC, 2006).

3. U.S. Joint Staff, *Department of Defense Dictionary of Military and Associated Terms*, Joint Publication 1-02 (Washington, DC: U.S. Joint Staff, 2014), p. 197.

The Vietnam Era

The United States emerged from World War II a changed nation in a changed world. Old power balances had crumbled, and the United States was moving forward into unfamiliar territory as a world superpower in a volatile security environment. To stem the spreading influence of the other superpower—the Soviet Union—U.S. leaders adopted the policy of Containment, which sought to stem the spread of Soviet influence without engaging in a direct confrontation with the USSR. Military and foreign policy budgets swelled, and the preponderance of U.S. defense and diplomatic resources were dedicated to keeping Soviet power contained. This policy had far-reaching implications, none more costly than the Vietnam War. In Vietnam, U.S. armed forces encountered a very different kind of warfare from previous large-scale conflicts, and the ambiguities associated with fighting a counterinsurgency brought operations assessment to the forefront for the first time in U.S. military history.

The "McNamara Revolution"

The Vietnam War was a revolutionary period in the development of operations assessment. It represented the first effort to build a systematic assessments process to measure progress in a counterinsurgency. The methods employed tended to be highly quantitative, reflecting the scientific undercurrents of the time, including operations research and its companion field of systems analysis. One of the most influential advocates of the systems analysis approach was Secretary of Defense Robert McNamara. His experience at Harvard Business School, in the World War II Army Air Forces Statistical Control Division, and subsequently at Ford Motor Company, formed the foundation on which he built the ideas he brought to the Department of Defense.

McNamara's approach was data-centered and emphasized mathematical precision. He had found success at Ford, where his methods helped generate a remarkable financial recovery of a business that was failing when he joined it. When he was tapped to be Defense Secretary in 1961, the Pentagon was beset by bureaucratic inefficiency, and Defense leaders were increasingly occupied with the growing U.S.

commitment in Vietnam. McNamara was intent on applying his methods to both problems.[4]

Prior to his arrival in Washington, McNamara spent 15 years at Ford, eventually taking over as president in 1960. McNamara, the "high priest of the new religion of rational, scientific decision making,"[5] came to the Pentagon intent on streamlining and improving operating procedures as he had streamlined and improved production at Ford. Dubbed the "McNamara Revolution," his time in office produced lasting changes, including the emergence of operations research and systems analysis (ORSA).[6] Operations research was already decades into its development by 1961, but under McNamara it was deliberately paired with systems analysis. The growth of ORSA certainly made waves in the Pentagon bureaucracy, but it also spilled over into the conduct and assessment of the Vietnam War. Since McNamara's institutionalization of the practice, ORSA analysts have typically constituted some, if not most, of the personnel responsible for operations assessment.

Assessing Progress in Vietnam

When Robert McNamara took over at the Pentagon under newly elected President John F. Kennedy, the U.S. commitment in Vietnam was relatively small, consisting of military advisors. Kennedy and McNamara increased the number of advisors significantly, and under President Johnson the U.S. role escalated from a robust advisory effort to full-scale armed conflict by 1965. The irregular nature of the war posed formidable challenges for U.S. forces in every aspect, including assessments.

As the war progressed and the United States pledged more resources to it, McNamara and his staff devoted significant effort to developing methods to measure progress in a conflict plagued by ambiguities and inconsistencies. They relied on the same

4. This paper provides a cursory overview of the assessments process in Vietnam. For a detailed examination of the subject, see Ben Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency," (2012). See also Gregory A. Daddis, *No Sure Victory: Measuring U.S. Army Effectiveness and Progress in the Vietnam War* (New York, NY: Oxford University Press, 2011).

5. Charles R. Shrader, *History of Operations Research in the United States Army*, 3 vols., vol. 2 (Washington, DC, 2008), p. 40.

6. While the two are not wholly distinct from each other, operations research tends to focus on how to make a given system operate effectively, while systems analysis is concerned with the bigger picture of whether that system is right for the job and how it fits with other systems in the larger effort toward achieving an objective; see ibid., pp. 55-56. While it is important to note that ORSA should not be equated with operations assessment, it did contribute greatly to the foundation of scientific methods on which those assessments rested.

types of quantitative, systems-based methods that McNamara had applied at the Pentagon to help make sense of what was happening on the ground in Vietnam. A likeminded official in this effort was the head of the Southeast Asia Division in the newly created Office of Systems Analysis (OSA) at the Pentagon, Thomas Thayer.[7] Endeavoring to bring precise metrics of progress to the conflict, McNamara, Thayer, and the so-called "Whiz Kids" of the Pentagon built an assessments process essentially from scratch.[8] As with many innovations, their approach generated pushback from the start. Senior military officials in particular balked at what seemed a categorical dismissal of their own experience and judgment in assessing operations.[9] The backlash against these new methods is particularly evident in the years after Vietnam (discussed in the next section).

The Pentagon's penchant for hard numbers was not new,[10] but for quantitative metrics to be useful, they must be based on a sound strategic model. In 1966, the U.S. adopted a strategic model centered on attrition of Viet Cong fighters. The corresponding attrition model for assessment was manifested most notably in the infamous "body count" metric.[11] Body counts were part of the monthly reports that the Military Assistance Command, Vietnam (MACV) submitted detailing progress on the ground throughout the country. These periodic reports evolved over time as the assessments process changed, but the body count metric is of particular note because it represented the primary measure of progress from 1966 to 1968.

The goal for using the body count metric was to quantitatively identify a desired "crossover point" where attrition of enemy forces occurred faster than the enemy could replenish them.[12] Units across Vietnam would submit numbers of enemy killed, resulting in a substantial amount of raw data that analysts would process (with the aid of new computing technologies) at MACV headquarters. However, many body count estimations were highly inaccurate, either due to an inability to confirm the number of enemy killed or to a deliberate inflation of the numbers in an effort to

7. Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency," p. 99.

8. The "Whiz Kids" were relatively young, intelligent, aggressive minds brought on for their knowledge of systems analysis and other scientific approaches. Their approach tended to alienate senior military leaders, however, who considered them arrogant and ignorant of how warfare actually works. For more on the "Whiz Kids," see Shrader, *History of Operations Research in the United States Army*, vol. 1.

9. Ibid., p. 63-64.

10. World War II saw the advent of an increasingly robust operations research capability, which relied on quantitative and scientific methods to understand and improve friendly force capacity and capability. U.S. forces used similar methods in the Korean War.

11. Daddis, *No Sure Victory: Measuring U.S. Army Effectiveness and Progress in the Vietnam War*, p. 91.

12. Ibid.

please higher headquarters. Top-down demand for progress toward the crossover point drove units to misrepresent their numbers to satisfy their leadership. Inconsistencies among units in how and whom they counted (for example, some units' numbers included civilian casualties) further added to the dubiousness of the metric.[13] However, regardless of accuracy, the most fundamental problem with body counts was that they were highly unsuitable as a measure of effectiveness or progress in a counterinsurgency—in other words, they were a metric derived from a failed strategic model. As we will see in a later section, the search for the "right" metrics for failing strategic models was a problem that recurred in both Iraq and Afghanistan.

Another notable assessment tool used to inform decision makers in Vietnam was the Hamlet Evaluation System (HES). The HES was designed with the intent to provide senior decision makers with an objective account of progress on the ground. The system was based on survey data collected monthly at the sub-village, or "hamlet," level. Since there were 11,000–13,000 hamlets surveyed each month, the sheer volume of data propelled the system toward its first major flaw: to manage the data, results were distilled to numeric scores.[14] To produce those scores, HES used a set of six major factors, each of which had an associated indicator. The output from the surveys was a set of numbers that could be highly arbitrary, with no mechanism to account for qualitative nuance. The numbers were then aggregated to create a single "overall pacification number" that was reported to the highest levels of Defense leadership.[15] This aggregation points to the second major problem with HES, which was the highly centralized nature of data management and analysis. In Vietnam, where the number of boots on the ground translated into a proportionately large capacity to collect information, analysts had to turn reams of data from highly disparate environments into manageable assessments. Unfortunately, this effort precluded the inclusion of nuanced factors peculiar to local hamlets and villages, resulting in the loss of critical information and painting a distorted picture of progress.

Not all assessments in Vietnam lacked qualitative injects, however. In his role at OSA, Thomas Thayer developed an influential operations assessment product that used body counts, HES reports, and other data as its inputs. His bimonthly "Southeast Asia Analysis Reports" applied rigorous and systematic analytic methods to vast amounts of quantitative and qualitative data from the field. The approach was holistic and comprehensive, focused on identifying patterns and trends that would be useful in

13. Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency," pp. 108-10.

14. Ibid., p. 114.

15. Ibid., p. 119; Erwin R. Brigham, "Pacification Measurement in Vietnam: The Hamlet Evaluation System," in *SEATO Internal Security Seminar* (Manila1968), p. 2.

shaping U.S. strategy. Thayer's reflections in his book, *War Without Fronts*, are honest about the shortcomings of the process. Reflecting on the pitfalls of the body count metric, for example, he writes that "the adoption of an attrition strategy by the United States ('destroy the enemy forces faster than they can be replaced') complicated the process by making the number of communist forces a prime measure of success or failure."[16] However, Thayer most often highlights deficiencies in the *data* and the *analysis*, rather than the *process*, in his review.[17] He holds firmly to the idea that systems analysis and its associated methods could provide a workable framework for assessments in counterinsurgency.

Implications for Operations Assessment

The Vietnam era was a transformative period in U.S. history for operations assessment. The sheer amount of time and resources dedicated to the effort was unprecedented to that point. Even World War II—a conflict conducted on a massive scale—did not place such a heavy emphasis on collecting data and developing methods to measure progress.[18] Likewise, the application of systems analysis to develop a rigorous assessments process was an innovation of marked significance. The foundations had been laid decades earlier with the advent of operations research, but Vietnam saw the implementation of those fundamental ideas on a large scale. This period also marked the first time U.S. military leaders attempted to build a workable framework for assessments in a counterinsurgency. Much of what exists today on that topic grew out of the American experience in Vietnam.

Historical treatment of these developments in operations assessment tends to be highly critical. While the U.S. strategy and approach to counterinsurgency in Vietnam was highly ineffective, flawed assessments undoubtedly contributed to the ultimate failure of U.S. efforts there. As one author writes when considering McNamara's legacy, the "single-minded emphasis on rational analysis based on quantifiable data"

16. Thomas C. Thayer, *War without Fronts: The American Experience in Vietnam* (Boulder, CO: Westview Press, 1985), p. 28.

17. Ibid., p. 5.

18. The U.S. military largely created their operations assessment process "on the fly." While Vietnam was the first major counterinsurgency in the American military experience, other nations had engaged in similar conflicts (e.g., the British experience with the Malayan Emergency). However, U.S. military leaders did not draw on lessons learned from those efforts in building their own assessments process, but instead started essentially from scratch (see Daddis, *No Sure Victory: Measuring U.S. Army Effectiveness and Progress in the Vietnam War*, p. 12).

that he advocated "led to grave errors."[19] The translation of demonstrably effective methods in improving the business side of Defense (e.g., weapons development, acquisitions, and inventory control) to the assessments process proved untenable.[20] Despite the efforts of those like Thayer, who sought to account for qualitative factors in his reports, numbers and statistics dominated the assessment approach, glossing over highly relevant complexities that characterize counterinsurgency operations. Not only were the results of the assessments process unreliable, but there was notable disproportionality between the resources dedicated to operations assessments and their utility. Feeding the assessments process, as Connable describes, "became a military objective unto itself."[21] Pressure from U.S. policymakers to produce accurate assessments only compounded this problem. However, absent a sound strategic model and without reliable data at its core, the assessments process was bound to produce misleading results.

The general distaste for Vietnam era assessments was most prevalent in the immediate postwar years, when Defense leadership resoundingly dismissed McNamara and his colleagues' methods as ineffective and counterproductive. However, their application of systems analysis established a precedent that future leaders would revive. Many of the issues that plagued Vietnam assessments have re-emerged in the counterinsurgency environments of Iraq and Afghanistan. Like Thayer, many of the more recent practitioners of, and commentators on, operations assessment have asserted that the process is valid, if only we select a sound strategic model and the associated "right" metrics. However, as we will discuss in more detail later in this paper, there has also been a growing chorus of voices against the process in recent years.

19. Phil Rosenzweig, "McNamara and the Evolution of Modern Business Management," *Harvard Business Review* (December 2010): p. 92.

20. Shrader, *History of Operations Research in the United States Army*, vol. 2, p. 66.

21. Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency," p. 112.

The Cold War

As the U.S. Department of Defense limped forward after the grueling experience of Vietnam, it concentrated its (much diminished) resources back on the Soviet Union as the ultimate threat that defined and shaped Defense policy and doctrine. The bipolar balance of power between the two countries and their allies fostered a constant tendency to compare capabilities and view policy and defense considerations in light of that evaluation. This shift had implications for operations assessment, which fell into relative obscurity during the height of the Cold War.

The Rise of Net Assessment

The conclusion of U.S. operations in Vietnam brought about a time of reconsideration in U.S. defense policy. Much of the thinking reflected a reaction against Vietnam-era approaches, since they were often associated with the failures the U.S. encountered in that conflict. One of the major conceptual developments that came to prominence during this time was net assessment.[22] One author, writing in 1990, defines net assessment as "the craft and discipline of analyzing military balances."[23] It takes a strategic, long-term look at how countries measure up against one another. Such a comparative approach bears some similarities to the correlation of forces doctrine that is addressed in more detail below. The use of the word "net" refers to the comparison of many factors (especially friendly and enemy) simultaneously and drawing analysis from the "net result" of those comparisons. Net assessment also reflects the post-Vietnam rejection of systems analysis in favor of a more balanced approach that emphasizes the importance and relevance of qualitative factors. Net assessment embraces complexity, rather than seeking to reduce a problem to simple, quantitative components, and emphasizes human

22. The Office of Net Assessment at the Pentagon was established in 1973 to provide long-range assessments comparing U.S. strengths and capabilities against those of its adversaries (i.e., the Soviet Union and its allies).

23. Eliot A. Cohen, *Net Assessment: An American Approach*, JCSS Memorandum no. 29 (April 1990), p. 4.

thought over scientific models to manage that complexity.[24] Numbers are an important input to net assessment, but they are taken into consideration along with many other factors and subjected to a number of different analytic methods.

Despite these notable divergences from systems analysis, there are certain practices common to both approaches, including the call to assess military effectiveness.[25] However, in the absence of armed conflict, the approaches measure the *anticipated* effectiveness of *friendly forces*, rather than the *real-time* effectiveness of *military operations*. The 1990 Joint Military Net Assessment (JMNA)[26] reflects the influence of net assessment at the strategic and policy level. Its lists objectives pertaining to "the potential effectiveness of the FY 1990 U.S. force … against the FY 1990 force of potential adversaries," as well as "the expected effectiveness of anticipated U.S. future field forces."[27] As we will show, this appraisal of one force against another dominated thinking on assessments in the Cold War. Operations assessment was largely irrelevant during this period—and is not explicitly addressed in net assessment—since it was deemed necessary only once open conflict begins.

Development of U.S. Doctrine

In the years immediately following withdrawal from Vietnam, the Pentagon's comparatively meager means and pessimistic outlook compelled leaders to adopt a highly defensive posture, officially labeled "Active Defense." Active Defense focused on defending Europe against potential Soviet encroachment as the primary objective, based around a tactical-level comparison of forces. Owing to the Soviet numerical advantage at the tactical level, Active Defense essentially came down to preparations to "fight to win a draw." CNA analyst Douglas Skinner criticizes this concept as the

24. Paul Bracken, "Net Assessment: A Practical Guide," *Parameters* 36, no. 1 (Spring 2006): p. 100.

25. To gain useful perspective on the consideration of military effectiveness in the 1980s, see Allan R. Millett, Williamson Murray, and Kenneth H. Watman, "The Effectiveness of Military Organizations," *International Security* 11, no. 1 (Summer 1986). Here, the authors observe the lack of clarity in defining military effectiveness and provide a conceptualization of how to approach it at the political, strategic, operational, and tactical levels. However, "effectiveness" throughout the work refers to how well the force measures up to an ideal version of itself, rather than whether it meets its objectives.

26. The JMNA was a net assessment prepared by the Chairman of the Joint Chiefs of Staff. Closely tied to the defense budget, it compared defense capabilities and programs of the U.S. and its allies to their adversaries. It was very influential in the years leading up to the collapse of the Soviet Union, but lost relevance once the Warsaw Pact dissolved.

27. U.S. Department of Defense, *1990 Joint Military Net Assessment* (Washington, DC: U.S. Department of Defense, 1990), p. I-2.

"result of a doctrinal vacuum" that followed the Vietnam War.[28] U.S. military leaders had been engrossed in that conflict for so long that it had come to define their thinking at the expense of other very pressing issues, leaving them with a weak intellectual framework for facing a formidable foe. In this environment, where objectives were defensively oriented, operations assessment was considered largely irrelevant. The zero sum Cold War mentality prevailed: either the U.S. and its allies kept the Soviets at bay, or they didn't.[29]

By the late 1970s and early 1980s, the post-Vietnam malaise had subsided to a degree and doctrine had evolved from Active Defense to AirLand Battle.[30] This shift brought a much more assertive orientation to U.S. military doctrine. AirLand Battle lifted the focus from the tactical to the operational level. It emphasized flexibility and outmaneuvering the enemy, even in the face of numeric disadvantage, rather than the direct quantitative comparison of forces and capabilities.[31] Still, operations assessment continued to play a minor role and was a responsibility largely relegated to the commander. Army Field Manual 100-5 (from 1982) characterizes that responsibility as follows:

> To insure [*sic*] that his concept is driving the operation to completion, the commander must follow up. He must have an overall view of the battle based on reports from subordinates, information from surveillance systems, and his own personal observations. He must compare enemy and friendly situations, assess progress, and if necessary, issue fragmentary orders (FRAGO) to adjust assigned tasks. This process of follow-up and reassessment is one of the commander's critical responsibilities.[32]

Doctrine on the "command estimate" also provides useful insight into the late Cold War perspective on operations assessment. Like most guidance on assessments, it resides in planning publications. One student of the planning process in 1990 describes the command estimate as a "logical and orderly examination of all factors affecting the accomplishment of the mission."[33] He goes on to characterize it as a "continuing mental process for the commander … who must observe, evaluate,

28. Douglas W. Skinner, *Airland Battle Doctrine*, CNA Professional Paper 463 (1988), p. 9.

29. Ibid., p. 1.

30. For a detailed look at AirLand Battle, see U.S. Department of the Army, *Operations*, Field Manual 100-5 (Washington, DC: U.S. Department of the Army, 1982).

31. Skinner, *Airland Battle Doctrine*, p. 1.

32. U.S. Department of the Army, *Operations*, pp. 2-7 - 2-8.

33. Timothy R. Puckett, "Rule-Based Expert Systems in the Command Estimate: An Operational Perspective" (U.S. Army Command and General Staff College, 1990), p. 21.

revise, decide, and observe again" throughout an operation.[34] The commander's estimate comprised the most comprehensive doctrinal guidance on operations assessment at that time. Again, because the U.S. was not engaged in any large-scale or prolonged armed conflicts, demand for assessments was minimal.

Development of Soviet Doctrine

Also of note during the Cold War were the concurrent developments in Soviet doctrine and theory. The Soviets had devoted significant resources to operations research since the early days under Vladimir Lenin, who encouraged the use of scientific methods in understanding warfare. Subsequent changes to doctrine in the 1920s and '30s were based on highly scientific systems theory.[35] That emphasis continued to have influence on Soviet doctrine throughout the Cold War.

The concept of correlation of forces and means (COFM) is one example of this effect.[36] Essentially, COFM (sometimes referred to simply as correlation of forces, or COF) seeks to compare the relative power of one military force against another, using rigorous quantitative methods. It became especially prevalent in Soviet military dogma in the 1970s because the USSR understood and sought to exploit their quantitative tactical advantage over the United States.[37] The influence of this concept on U.S. doctrine is apparent in areas like net assessment and more generally in the focus on comparing forces. Still, like their U.S. counterparts, Soviet military thinkers devoted their energy to assessing friendly force capabilities, rather than measuring progress toward meeting identified objectives during an operation.[38]

34. Ibid. Views on the command estimate varied in the 1980s. Some proponents of net assessment tended to view it as too formulaic and short-sighted (see Cohen, "Net Assessment: An American Approach," pp. 7-8.). Others thought its consideration of qualitative and quantitative inputs left too much room for bias and subjectivity. As automation and computing capabilities advanced, so did recommendations to apply these advantages to military decision making processes to help compensate for shortfalls (see Puckett, "Rule-Based Expert Systems in the Command Estimate: An Operational Perspective," pp. 21-24.).

35. Justin Kelly and David Kilcullen, "Chaos Versus Predictability: A Critique of Effects Based Operations," *Australian Army Journal* 2, no. 1 (2006).

36. James K. Womack, "Soviet Correlation of Forces and Means: Quantifying Modern Operations" (US Army Command and Staff College, 1990).

37. Mackubin T. Owens, "The Correlation of Forces: Then and Now," *Ashbrook* (February 2004).

38. COFM found its way into U.S. military parlance as well. At the strategic level, it is essentially analogous to the Western concept of "balance of power." In its application at the tactical level, it involves the effort to assess systematically one's own combat power relative to the adversary, which is commonly found in contemporary U.S. military doctrine. (See Richard E. Porter, "Correlation of Forces: Revolutionary Legacy," *Air University Review* (March-April 1977).)

Implications for Operations Assessment

The lack of a deliberate and detailed approach to operations assessment during the Cold War era can be attributed to two major factors. The first was the persistent potential for conflict with the USSR that consumed the minds of Cold War leaders. U.S. defense policy was based almost entirely on how its own forces and capabilities stacked up against the adversary. All resources and faculties concentrated on *deterring* conflict, and so little thought was given to how to assess it once it began. The destructive power of nuclear weapons and the implications of their use (e.g., Mutually Assured Destruction) also made the idea of measuring success on the battlefield seem largely unimportant. As such, there was little demand for a rigorous process to structure assessments.

The second factor contributing to the relative obscurity of operations assessment was the forsaking of the quantitative measures of Vietnam for the more balanced approach of relying on commanders to use experience, feedback from subordinates, and data from the battlefield to build assessments around a loose set of guidelines. With much of the onus on the commander, there was no significant push for a more robust assessment process. However, in the years ahead, the collapse of the Soviet Union and the rise of the Information Age would bring a new perspective and renewed emphasis on operations assessment in the U.S. armed forces.

Comparing Soviet doctrine to that of the West, an Army Command and General Staff College student in 1990 writes that “the Soviet COFM methodology has some distinct merits which ought to attract the attention of Western armies, who typically eschew numerical methods in military decisionmaking.” (Womack, "Soviet Correlation of Forces and Means: Quantifying Modern Operations," p. 96.)

The Information Age

With the dramatic conclusion of the Cold War, the United States found itself the only remaining superpower in an era that was filled with opportunities. One of the most important concurrent developments was the emergence of the so-called "Information Age." Computing capabilities were increasing exponentially in very short periods of time and their reach was extending into all aspects of American life. Transformation on a large scale was occurring across all sectors of society, and the Pentagon was eager to leverage its dominant global position by exploiting new technologies to stay ahead of any competitors that might arise. While we are ultimately concerned with how Information Age developments affected operations assessment, first we will briefly examine the major theoretical undercurrents of the time to provide context.[39]

Conceptual Trends

Revolution in Military Affairs (RMA)

The Revolution in Military Affairs broadly refers to the changes that technological advancements have brought to modern warfare across a wide swath of systems, areas, and issues. U.S. Navy Admiral William (Bill) Owens, who has written extensively on the RMA concept, concedes that it is difficult to pinpoint exactly when the revolution began. Rumblings of a major overhaul in the way the United States fights its wars were apparent as early as the 1960s, though the RMA is typically associated with the post–Cold War era.[40] Owens groups developments like AirLand Battle and advances in communications technology under the general heading of the early days of RMA. Following Operation Desert Storm, the potential of this revolution became increasingly apparent and "advantages of precision, reach, battlespace awareness, space-based observation, and advanced communications became prominent in the

39. Note that while they are addressed individually, there is significant overlap among these concepts and trends, both in content and in timing.

40. William A. Owens, "The Once and Future Revolution in Military Affairs," *Joint Forces Quarterly*, no. 31 (2002).

Armed Forces."[41] With the RMA, capabilities like speed, agility, and precision replaced a long-held emphasis on toe-to-toe engagements.

Also important to the RMA was the return of systems analysis to prominence after its influence diminished in the post-Vietnam years. Most often referred to as a "system of systems" approach in the context of RMA, this take on decades-old methods emphasizes the interconnectedness of modern military operations and the need to exploit the potential of a number of advanced systems simultaneously (e.g., precision guided weapons, advanced intelligence, surveillance, and reconnaissance (ISR), and command, control, communications, computers (C4)).[42] What results is a whole that is greater than the sum of its parts, able to carry out operations and meet objectives with greater efficacy and efficiency than the systems could achieve separately.

Network-Centric Warfare (NCW)

Closely related to the RMA is the concept of network-centric warfare (NCW), which emerged around the same time in the mid-1990s. Admiral Arthur Cebrowski, a prominent advocate of NCW, sums it up by stating, "NCW is not narrowly about technology, but broadly about an emerging military response to the information age."[43] As such, it encompasses more than advanced computing and greater networkability (though these are central to NCW). Cebrowski distills the characterization of NCW to three main points: networks take precedence over platforms; actors are viewed in the context of the system in which they operate; and adaptability becomes paramount.[44]

The origins of NCW exist in part in the defense industry itself, where concepts like the Internet first developed. However, NCW owes much of its genesis and subsequent development to the economic sector. By the 1990s, the concept of "network-centric computing" had revolutionized the way businesses operated. The interconnectedness of the various nodes of a business' "ecosystem" enabled real-time information sharing and analysis that dramatically increased the pace of operations. Moving faster gave pioneering businesses a distinct advantage over their competitors. Defense industry leaders sought to replicate those benefits and exploit the warfighting advantages of network centricity. Soon the language and methods of the Information Age were appearing across the defense industry. Phrases like "network-

41. Ibid.

42. "The Emerging System of Systems," *Military Review* 75, no. 3 (1995).

43. Arthur K. Cebrowski, "Network-Centric Warfare," *Military Technology* 27, no. 5 (2003).

44. "Network-Centric Warfare: Its Origin and Future," *U.S. Naval Proceedings* 124 (January 1998).

centric operations" and "competitive advantage" over an adversary, typically found in business parlance, became common in defense circles.[45] As for operations assessment, the economic sector had demonstrated the potential for advanced data gathering and processing capabilities to provide timely and accurate measures of success. Expectations that a similar approach could be applied in the context of military operations began to emerge and gain influence.

Effects-Based Operations (EBO)

These pivotal shifts in thinking on warfare produced yet another important concept that would have significant implications for operations assessment. The idea of effects-based operations (EBO) surfaced at the same time as trends like RMA and NCW, but was focused on the *application* of the new capabilities brought on by the Information Age, rather than the capabilities themselves. Instead of measuring success through targeting and inflicting damage on the enemy for its own sake, EBO attempts to achieve a desired *effect* by using the right stimulus to create the desired response.[46] EBO approaches developed in the 1990s were largely focused on warfare against states and emphasized the conduct of "Systems of Systems Analysis" (SOSA) or "Operational Net Assessments" (ONA) as the initial steps in planning to achieve effects. These activities consisted of identifying and analyzing the nodes and connections within and amongst enemy systems in an effort to identify those that, if destroyed, would create the maximum desired effect on the enemy (perhaps while also minimizing any undesired effects).

Assessing the success of effects-based operations required the development of new ways of measuring progress toward achieving a commander's objectives, which gave rise to the development of a new assessment framework beyond traditional methods like the command estimate or battle damage assessment (BDA). Labeled effects-based assessment (EBA), this framework would comprise most of the guidance on assessments as the U.S. headed into the wars in Iraq and Afghanistan. Central to EBA is the idea of using measures of effectiveness (MOE) and measures of performance (MOP) to evaluate whether the commander's objectives are being met and associated tasks are being completed, respectively. In this framework, MOPs and MOEs would naturally fall out of the SOSA or ONA activities, since presumably once the enemy's systems were understood, the targeting and destruction of key nodes and connections would produce effects that could be predicted and therefore measured.

45. For example, see U.S. Department of Defense, *The Implementation of Network-Centric Warfare* (Washington, DC: U.S. Department of Defense, 2005).

46. Edward A. Smith, *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War* (Command and Control Research Program, 2002), p. xiv.

Like NCW, EBO mirrors concepts embraced in the business world. The idea of measuring outcomes, rather than inputs and processes, took the form of what is known as results-based management (RBM), which came to prominence in American business practices in the 1980s.[47] Under RBM, measuring success in management was based on the out*comes*, rather than the out*puts*, produced. Peter Druker, a prolific writer on management and an RBM advocate, states simply, "A business management has failed if it fails to produce economic results."[48] In 1991, strategists in Desert Storm built a similar approach to measuring success in a military context. Its ultimate focus was on the results (or *effects*) of, for example, destroying a target rather than the destruction itself. The EBO concept continued to gain influence and advocates after Desert Storm and was eventually incorporated into official U.S. military doctrine.

These developments represented the most robust attempt at developing a quantitative operations assessment process since Vietnam. General James Mattis, in a famous memo to his subordinates at the United States' Joint Forces Command (JFCOM), referred to this shift as a "renaissance in combat assessment beyond simple battle damage assessment."[49] However, as we will see in the next section, the EBO concept was unceremoniously killed in the same memo, leaving a vacuum of operations assessment doctrine in the midst of two major wars.

The NATO Experience

NATO's involvement in the Balkans in the 1990s offers a helpful case study for operations assessment after the Cold War. Because NATO was preoccupied with countering the Soviet Union and the Warsaw Pact for decades, the alliance did not participate in actual military operations until the Cold War had ended. In 1992, NATO became engaged in the former Yugoslavia in what would become its first major military operation. The NATO experience in Bosnia and Herzegovina (BiH) began with an air campaign, but the bulk of the assessments work occurred in the years of stabilization that followed the Dayton Peace Accords in December 1995. The Implementation Force (IFOR) and subsequent Stabilization Force (SFOR) employed an "Operational Analysis" (OA)[50] office to conduct assessments that measured progress

47. John C. Morris and Andrew P. Williams, "The Development of Theory-Driven Evaluation in the Military," *American Journal of Evaluation* 30, no. 1 (March 2009).

48. Peter F. Druker, *Management: Tasks, Responsibilities, Practices* (New York: Truman Talley Books, 1986), p. 33.

49. James N. Mattis, "U.S. Joint Forces Command Commander's Guidance for Effects-Based Operations," *Parameters* 38, no. 3 (Autumn 2008).

50. In this context, operations analysis is analogous with operations research.

on the ground. Their experience afforded several important lessons in the field of operations assessment. We will highlight some of the most notable findings from those operations.[51]

First, it is important to note that the NATO assessment process was not established prior to its involvement in the Balkans. Owing to the nature of the operation—stabilization rather than offensive operations—"few of the standard military OA tools could be profitably applied to the circumstances of BiH."[52] Analysts had to create a process through trial and error in real time. Consequently, the organization and methods used to do assessments were (by necessity) very flexible and were adjusted fairly often to compensate or account for shortfalls.[53]

Analysts took a very scientific approach to this development process, relying on quantitative data with qualitative interpretation. Collectors would gather data and analysts would use their expertise to interpret them and make necessary changes, assign scores, and present their findings. A significant portion of the data came from surveys that NATO forces conducted and from interaction with civilian aid organizations and other similar bodies.[54] To aggregate and report the data, analysts developed a scoring system, based on "carefully worded scoring criteria," which resembled the "stoplight charts" that would become common in assessments in the Iraq and Afghanistan theaters.[55] They also used the language "measures of effectiveness" and "measures of success" in their assessments, reflecting the influence of EBO. Because the approach leaned heavily on mathematical methods,

51. For a detailed treatment of this topic, see Nicholas J. Lambert, "Measuring the Success of the Nato Operation in Bosnia & Herzegovina 1995-2000," in *17th European Conference on Operations Research* (Budapest, Hungary, 2001); Stephan B. Flemming and William J. Owen, *Measurement of Post-Conflict Resolution in Bosnia-Herzegovina*, ed. Alexander E. R. Woodcock and David F. Davis, The Cornwallis Group VI: Analysis for Assessment, Evaluation and Crisis Management (Clementsport, N.S.: Canadian Peacekeeping Press, 2002); and Suzanne Griffin, "Operational Analysis at the Frontline - a Generic Approach to Measuring Progress?," in *171SMOR, Session J* (2000).

52. Flemming and Owen, *Measurement of Post-Conflict Resolution in Bosnia-Herzegovina*, p. 347.

53. The first iteration of assessments measuring progress in NATO operations in BiH involved the use of "Normality Indicators," which analysts built to measure how close to normal different areas were. ("Normal" was based on a "control" town that had been left largely untouched by the recent violence.) Next, analysts used the "Measures of Effectiveness" process, followed by the "Six-Month Review." (Griffin, "Operational Analysis at the Frontline - a Generic Approach to Measuring Progress?," p. 3.) Each of these approaches was based on several factors, including the nature of NATO operations at the time, the security situation on the ground, and the types of data that were of most interest.

54. Lambert, "Measuring the Success of the Nato Operation in Bosnia & Herzegovina 1995-2000."

55. Ibid., p. 465.

one of the recommendations coming out of NATO's experience in the Balkans was for better automation and computing capabilities to enable a more systematic way to deal with the large amounts of data.[56]

NATO's dedication to developing a workable operations assessment process has continued since the conclusion of operations in the Balkans, first (and somewhat simultaneously) in Kosovo,[57] and then in the NATO commitment to Afghanistan from 2003 to the present. EBO has been particularly influential in NATO's development of an operations assessment process, and that influence continued even after U.S. defense leaders largely rejected the concept and its application to assessments. We will discuss these developments in the next section.

Implications for Operations Assessment

The major undercurrents in the transformation that occurred in the defense industry after the Cold War had a marked impact on the way the armed forces approached operations assessment. Simply put, military leaders posited that the Information Age brought with it the ability to do what previous generations had found untenable: leverage vast information gathering and computing capabilities to make precise, nuanced, and quantified measurements of developments on the battlefield. Rather than relying on "intuition and ad hoc metrics," commanders and their subordinates could now, in theory, build more informed and objective assessments.[58]

Military doctrine predictably reflected these fundamental changes in thought and theory. In addition to the impact of the Information Age, the rapid disintegration of the Cold War bipolar paradigm that had shaped defense policy for decades signaled a huge shift in doctrine, which had to evolve to keep pace with new thinking on a 21st century conception of warfare.[59] The Joint Operations Planning and Execution System (JOPES) provides a clear example of the changes occurring in doctrine and specifically in operations assessment.[60] The 1996 version of JOPES refers to assessments in very

56. Ibid., p. 478.

57. For more details on NATO assessments in Kosovo, see M.R. Neighbour et al., "Providing Operational Analysis to a Peace Support Operation: The Kosovo Experience," *Journal of the Operational Research Society* 53, no. 5 (2002).

58. Smith, *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War*, p. 356.

59. While doctrinal changes were manifold, the focus here is limited to changes in operations assessment.

60. As mentioned previously, doctrinal discussion on operations assessment is typically nested in the planning process.

general terms with little specific guidance. However, with the 1999 version came much more detail, including language like “measures of merit” to assist planners in assessing how well forces were doing at meeting the commander’s objectives. This more quantitative, systems-based approach reflects the growing influence of EBO and similar concepts on doctrine and practices in the late 1990s—concepts that promised clarity and predictability of outcomes in warfare. Their impact on operations assessment would become even more profound when the U.S. became engaged in two simultaneous counterinsurgencies.

The Post–9/11 Era

The attacks by Al Qaeda against the United States on 11 September 2001 and the Global War on Terror that ensued ushered in a new era of United States and coalition warfighting that is still ongoing. In addition to pursuing Al Qaeda and its affiliates via small footprint engagements across the globe, the United States conducted regular and irregular major combat operations against the governments of Iraq and Afghanistan, respectively, leading directly to the overthrow of the ruling establishments in those countries and prolonged insurgencies that continue to this day. Developing a workable operations assessment framework in these conflicts has proven difficult, just as it was for Defense leaders in Vietnam.

Coming out of the Information Age, operations assessment was continuing its evolution back to an emphasis on quantitative and systems analysis tools and methods, as evidenced by the prevalence of EBO and its associated analytic techniques, SOSA and ONA. This shift continued in the early years of the wars in Iraq and Afghanistan. The preference for scientific and mathematical approaches among many assessment groups (which were often staffed by ORSA personnel) and an appetite for hard numbers from U.S. military and policy leaders created a situation where quantitative metrics dominated the formation of centralized operations assessments. However, as the wars progressed, the doctrinal death of EBO and dissatisfaction with the results of quantitative assessments in Iraq and Afghanistan caused the pendulum of operations assessment to swing back towards a greater emphasis on qualitative inputs.

The War in Iraq

Operation Iraqi Freedom began on 20 March 2003, with the United States leading major combat operations against the government of Saddam Hussein. The conventional nature and speed of those operations meant that assessments during the invasion were focused on the location and conditions of various fighting units as well as collating and analyzing BDA reports to show progress relative to the operational plan. In the wake of the collapse of Saddam Hussein's government, the coalition, led by the United States, was slow to transition from major combat to

stability operations, in part because policymakers had forbidden military planners from engaging in detailed planning for the post-conflict phase.[61] In the years that followed, a virulent insurgency developed and military forces from the United States and its coalition partners engaged in (or supported) counterinsurgency operations in Iraq until the end of 2011.[62]

From 2004 to 2006, the gradual shift in United States military operations to a focus on counterinsurgency, combined with the continuing prevalence of EBO and its quantitative approach to assessment, resulted in a sustained emphasis on the development and use of quantitative metrics for assessing progress in the war.[63] As it became clear that the growing insurgency would require significant effort to quell, operations assessment became increasingly significant. Methods used to build assessments varied widely, but many included the use of indicators[64] plotted over time to identify trends. From these data, assessors could extrapolate MOEs and MOPs, in keeping with EBA doctrine. Frequently used indicators included the number and quality (i.e., how well trained and equipped) of Iraqi security forces, which proved to be extremely difficult to measure.[65] Other countrywide assessment processes were developed to measure progress in areas such as security, governance, and the provision of basic essential services (e.g., water, electricity, sanitation).[66] In some cases, indicators were assigned weights (expressed numerically), which were then aggregated and averaged to characterize progress.

Other methods that became more common around 2007 included color-coded charts (often called "stoplight charts" for the frequently used green/amber/red

61. Michael Gordon and Bernard Trainor, *Cobra II: The inside Story of the Invasion and Occupation of Iraq* (New York: Vintage, 2006).

62. As this paper was being written, the U.S. and several other nations were sending military advisors to, and conducting airstrikes in, Iraq to counter a terrorist organization called the "Islamic State," which grew out of the primary Sunni insurgent group in the country—al Qaeda in Iraq.

63. Unfortunately, the details of operations assessment processes and products from this time period in the Iraq war are not well documented. Much of what follows regarding the operations assessment process in Iraq is based on the authors' observations and experience in al Anbar province from 2007-2009, as well as on a number of informal conversations with military members who served in Iraq during this time.

64. Indicators were usually derived from MOEs and MOPs, and together they were considered the "metrics" used in building assessments. We will discuss the issues associated with choosing metrics below.

65. Frederick W. Kagan, "Measuring Success," *Armed Forces Journal* (January 2006).

66. Center for Strategic and International Studies, "Progress or Peril? Measuring Iraq's Reconstruction," (September 2004).

designations).[67] Stoplight charts took different forms, but they typically used a single color to represent the state of an indicator or measure (e.g., areas with high levels of enemy activity would be designated as "red"). While this approach allowed assessment teams to account for more qualitative factors, it was difficult to communicate sufficient detail in a single color. Much of the data and judgment used to generate that color designation remained opaque to the audience. Overall, however, operations assessment continued to emphasize the importance of quantifying indicators and plotting trends over time.

To enable the quantitative approach to assessments, a central repository was created for the data that would be used to calculate quantitative MOEs and MOPs. In late 2006 and early 2007, there was a concerted effort on the part of the strategic and operational commands in Iraq (Multi-National Force–Iraq, and Multi-National Corps–Iraq, respectively) to consolidate all of the military's operational reports into a single, classified database (called the Combined Information Data Network Exchange, or CIDNE).[68] Operations analysts at MNF-I and MNC-I led this effort, and CIDNE eventually became the primary database for recording events on the ground (along with other data). Even with this tool, however, making sense of the vast amount of data stored in it was a challenge that persisted for the duration of the war.

While much of the assessment effort in Iraq was based in quantitative methods using hard data from sources like CIDNE, there were exceptions. The assessment process conducted by Multi-National Forces–West (MNF-W) in 2007, for example, relied on more qualitative methods involving the use of standards. These standards were defined for a number of "levels" in each of several areas deemed important for counterinsurgency efforts (e.g., security, governance, essential services, and rule of law), and were applied to a number of key cities and towns in Anbar Province. A collaborative, cross-functional working group met on a weekly basis to produce

67. Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency," p. 49.

68. The CIDNE database was a contracted effort to compile what had previously been a hodgepodge of spreadsheets, databases, and loose files into a single repository of military operations reports (so-called Significant Activity (SIGACT) reports). Most operational commands, and many operational units, in Iraq eventually transitioned to reporting their activities directly into CIDNE—though the Marines in al Anbar province never did (they retained their own database which was manually cross-loaded into CIDNE at MNC-I). As a result, the CIDNE database became rife with duplicate entries, as well as incorrect or missing information. MNC-I addressed this by creating a data collation cell to perform quality control on the entries in CIDNE. Once a week, this cell published an off-line repository of "scrubbed and vetted" SIGACTs, called the SIGACTS III database. This became the "database of record" for deployed analysts. Unfortunately, in the wake of the U.S. withdrawal from Iraq, this database appears to have been lost, though the raw, "dirty" data still reside in the CIDNE database at U.S. Central Command. The CIDNE database was later transported to Afghanistan and served a similar purpose there, though with a much wider aperture of data inputs: it included polling results, atmospherics and intelligence reports, and the like.

ratings against these standards via discussion and debate, and then communicated the ratings directly to the Commanding General of MNF-W.[69] EBA tended to devalue such qualitative inputs as necessarily subjective and therefore less reliable. However, as the limitations of effects-based thinking became more apparent, there was an effort at some commands to shift to a more balanced approach like that used by MNF-W.

At the strategic level, though, the Iraq assessments process encountered the same difficulties and pitfalls of operations assessment in Vietnam. The hopes that EBO and vastly improved technological capabilities would bring the same kind of precision to assessments as it had to weapons and communications systems quickly faded. Early in the war, the United States' political objectives and overall strategy were ill-defined, making it difficult to know what to assess against. While analysts had endless amounts of data at their fingertips, they had no real framework to help determine how to use it.[70] Consequently, multiple assessments emerged simultaneously that were neither coordinated nor consistent with one another.[71] As one author wrote, "The media are counting U.S. casualties. The military counts Iraqi soldiers. Both are measures of convenience, reflecting the ease with which data can be collected and presented rather than its inherent importance. Neither tells us whether we are winning or losing in Iraq."[72] By 2006, this criticism of the choice of metrics in Iraq assessments had become a common theme, and would remain so for the rest of the war.

Even after the United States clarified its aims and strategy as part of the so-called "surge" effort, assessment processes continued to falter. They generally remained very centralized, even though the areas assessed were extremely disparate and there were few mechanisms to capture differences among them. Centralized data omitted the nuance and context necessary to properly interpret conditions on the ground, which is especially problematic in counterinsurgency.[73] In fact, metrics used in Iraq assessments were often divorced from any meaningful theory of counterinsurgency,

69. In the interest of full disclosure, one of the authors (Schroden) supported this assessment process (though did not design it). Schroden was impressed by its general simplicity and effectiveness and later transported it to Afghanistan during the redesign of ISAF's assessment process in late 2011/early 2012.

70. James Clancy and Chuck Crossett, "Measuring Effectiveness in Irregular Warfare," *Parameters* 37, no. 2 (Summer 2007).

71. Craig Cohen, "Measuring Progress in Stabilization and Reconstruction," in *Stabilization and Reconstruction Series No. 1* (USIP, March 2006), p. 4.

72. Kagan, "Measuring Success."

73. Anthony Cordesman argues in a 2007 article that "no set of metrics is more useless in counterinsurgency … than national totals and national averages." (See Anthony Cordesman, "The Uncertain "Metrics" of Afghanistan (and Iraq)," (May 2007).)

and more often than not were calculated and analyzed simply because the capability existed to do so. Compounding the problem, data were often inaccurate or incomplete, though aggregation often obscured these issues and gave the consumer a greater sense of confidence in their accuracy than was often warranted. The appeal of concrete numbers that helped drive the assessments process in Vietnam reappeared as leadership sought a clear picture of progress in Iraq. Once again, significant demand from top policy leaders prompted a heavy emphasis on operations assessments and created pressure to produce accurate reports.

The Death of Effects-Based Operations

As discussed earlier, EBO and its associated quantitative assessment processes were developed in the late 1990's, and the impact of these concepts was clearly evident in the Iraq war. However, in 2008, the Commanding General of the United States Joint Forces Command (USJFCOM)—the organization responsible for the inclusion of EBO in joint doctrine—issued a memo to his subordinates in which he blasted the fundamental precepts on which EBO was founded, saying "it is my view that EBO has been misapplied and overextended to the point that it actually hinders rather than helps joint operations." He listed his criticisms with EBO in order:

> First, operations in the future will require a balance of regular and irregular competencies. Second, the enemy is smart, and adaptive. Third, all operating environments are dynamic with an infinite number of variables; therefore, it is not scientifically possible to accurately predict the outcome of an action. To suggest otherwise runs contrary to historical experience and the nature of war. Fourth, we are in error when we think that what works (or does not work) in one theater is universally applicable to all theaters. Finally, to quote Sherman, "Every attempt to make war easy and safe will result in humiliation and disaster." History is replete with such examples and further denies us any confidence that the acute predictability promised by EBO's long assessment cycle can strengthen our doctrine.[74]

Near the end of his memo, General Mattis provided the following direction to the United States Joint Force: "Effective immediately, USJFCOM will no longer use, sponsor, or export the terms and concepts related to EBO, ONA, and SOSA in our

74. Mattis, "U.S. Joint Forces Command Commander's Guidance for Effects-Based Operations."

training, doctrine development, and support of JPME [Joint Professional Military Education]."[75]

The impact of this memo was instant and far-reaching—even beyond General Mattis' intent. While he expressly stated his belief that *effects-based targeting* was a useful concept, the weight and forcefulness of his memo effectively killed an approach to planning, operations, and assessment that had been in development and use for over a decade. However, the death of EBO in name did not effectively lead to the elimination of many of its precepts for operations assessment. Rather, the suddenness of EBO's demise meant that there were few viable alternative concepts for operations assessment, creating a vacuum that proved detrimental to assessment practices in Afghanistan.

The impact of the rejection of EBO was not as great in Iraq for several reasons. First, OIF began as a conventional major combat operation, and so the period of time when operations assessment processes focused on counterinsurgency was comparatively short (approximately 2006–2009[76]) and, for the most part, occurred before the end of EBO. Second, once violence levels in Iraq fell dramatically in 2008, the demand for operations assessment diminished in the United States.[77] By 2009, policymakers were preoccupied with domestic concerns and no longer clamoring to know how Iraq was progressing. As we will discuss in the next section, however, the death of EBO had a much greater impact on the war in Afghanistan.

The War in Afghanistan

On 7 October 2001, the United States initiated military operations in Afghanistan to pursue the members of al Qaeda responsible for the attacks of 11 September 2001 and to remove the Taliban government that had provided them safe haven. By December 2001, the Taliban and al Qaeda had largely fled Afghanistan. The newly created International Security Assistance Force (ISAF) took responsibility for the security mission in Afghanistan under the leadership of NATO.

The size, structure, and missions of ISAF evolved and increased considerably over the course of 2002–2008, during which time operations assessment activities were

75. Ibid.

76. By the end of 2009, Iraqi Security Forces had assumed responsibility for security in Iraq under the Security Agreement and most of the 18 provinces had completed transition to Iraqi control. Assessments became very difficult at that point as coalition data collection decreased dramatically and Iraqi-reported data often could not be verified.

77. Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency," p. 7.

largely nascent and uncoordinated across the theater of operations.[78] While a number of commands (to include ISAF), had embedded operations analysts, these personnel were largely engaged in traditional operations research activities (e.g., analyzing the effective application of resources, such as those designed to counter improvised explosive devices). During one of the authors' first visit to headquarters (HQ) ISAF in October 2008, he met with the Operational Analysis Group (OAG) and found that they were largely focused on analyzing quantitative data sources (e.g., violence statistics) and developing mathematical models of the insurgency. There was no formal assessment group or process at HQ ISAF at that time.

In early 2009, ISAF established the Afghan Assessment Group (or AAG, which absorbed the OAG) to serve as the theater lead for strategic and operational assessment. The AAG created a formal assessment process and set of products that drew heavily on quantitative metrics and weighted-averaging "roll-up" techniques, such as that described in Appendix H of the U.S. Army's Field Manual 5-0, *The Operations Process*.[79] This approach was data-intensive, mechanistic, and it relied on mathematical formulations that obscured underlying causes and effects—criticisms that had already been levied against similar approaches used in Iraq and elsewhere. Additionally, the specific metrics that the AAG developed were the subject of widespread criticism in the 2009–2010 timeframe.[80] To wit, the head of the AAG at that time was quoted as saying, "Our metrics suck."[81]

78. This section will focus on operations assessment as practiced at ISAF, in part because of the authors' sustained engagement with that command. Much of the description here is adapted from Jonathan Schroden, "Operations Assessment at Isaf: Changing Paradigms," in *Innovation in Operations Assessment: Recent Developments in Measuring Results in Conflict Environments*, ed. Andrew P. Williams, et al. (Norfolk, VA: NATO Supreme Allied Command Transformation, 2013). The changing nature of operations assessment and the challenges faced by HQ ISAF were similar to the situations at the Regional Commands (RC) and lower echelons, as well. See, for example, William Upshur, Jonathan Roginski, and David Kilcullen, "Recognizing Systems in Afghanistan: Lessons Learned and New Approaches to Operational Assessments," *PRISM* 3, no. 3 (June 2012). See also Gerald Woodill, Ewen Stockbridge, and Mike Cumberland, "Defence R&D Canada Centre for Operational Research and Analysis Technical Memorandum 2010-008," in *Counterinsurgency Campaign Assessment and Direction in Regional Command South*. Military forces and civilian organizations faced similar challenges in assessing the effects of their actions; see Joakim Marklund et al., "Challenges in Assessing Progress in Multifunctional Operations: Experiences from a Provincial Reconstruction Team in Afghanistan," in *16th International Command and Control Research and Technology Symposium* (Quebec, Canada, 2011).

79. U.S. Department of the Army, *The Operations Process*, Field Manual 5-0 (Washington, DC: U.S. Department of the Army, 2010).

80. Jason Campbell, Michael O'Hanlon, and Jacob Shapiro, "How to Measure the War," *Policy Review* 157 (2009); Andrew Exum et al., "Triage: The Next Twelve Months in Afghanistan and Pakistan," (2009); Jonathan Schroden, "Measures for Security in a Counterinsurgency," *Journal of Strategic Studies* 32 (2009); John Agoglia, Michael Dziedzic, and Barbara Sotirin, "Measuring

In mid-2009, when General Stanley McChrystal took command of ISAF, his personal critique (which was leaked to the press) lent weight to these criticisms, stating:

> ISAF must develop effective assessment architectures…to measure the effects of the strategy, assess progress toward key objectives, and make necessary adjustments. ISAF must identify and refine appropriate indicators to assess progress, clarifying the difference between operational measures of effectiveness critical to practitioners on the ground and strategic measures more appropriate to national capitals.[82]

In the wake of this conclusion, ISAF revised its assessment processes and products to include both qualitative and quantitative information in a more holistic manner. It continued to collect data for, and to calculate, many of the quantitative metrics that formed the core of its previous assessment products, but it placed greater emphasis on the professional military judgment of commanders in the field, especially those of the ISAF Joint Command (IJC) and NATO Training Mission–Afghanistan (NTM-A).[83] As a result of General McChrystal's shift to a population-centric counterinsurgency strategy and the associated surge of U.S. and NATO military forces into Afghanistan, ISAF shifted its assessment focus to addressing progress along three major lines of operation (LOOs): protecting the population, building the Afghan National Security Forces (ANSF), and increasing the capacity of the Afghan government. ISAF's assessment products also shifted, from mostly quantitative and data-intensive charts and graphs to more nuanced narrative "judgments." General McChrystal also placed a heavy emphasis on the transparency and openness of the assessment, pushing hard to declassify ISAF's assessment products and distribute them widely (e.g., to academics, think tanks, and the media). Ultimately, these efforts were overruled by his superiors and ISAF's primary assessment products remained classified and limited in distribution.

The approach to operations assessment would change again in mid-2010, when General David Petraeus took command of ISAF and brought with him a stronger emphasis on transitioning security responsibility to the Afghans. Under his command, ISAF rewrote its campaign plan to include six LOOs, each with its own operational objective and set of intermediate objectives (waypoints on the path to

Progress in Conflict Environments," (2010); David Kilcullen, "Measuring Progress in Afghanistan," in *Counterinsurgency* (New York: Oxford University Press, 2010); Michael O'Hanlon and Hassina Sherjan, "Toughing It out in Afghanistan," (2010).

[81] *Managing Military Organizations: Theory and Practice*, ed. Joseph Soeters, P.C. van Fenema, and R. Beeres (New York: Routledge, 2010).

[82] Stanley McChrystal, "COMISAF's Initial Assessment," (2009).

[83] These were subordinate commands to ISAF that were newly stood up around that time.

the operational objective). To assess these intermediate objectives, the AAG went back to a set of largely quantitative metrics aimed at "measuring" progress in its campaign. These metrics were then used to determine where, on a "thermograph" (a scale of red to green), ISAF stood with respect to accomplishing each intermediate and operational objective. ISAF's assessment products in this period largely consisted of PowerPoint slides showing these thermographs and specific trends for a variety of quantitative indicators (e.g., level of violence)—all of which were classified.

General John R. Allen, who took command of ISAF in September 2011, made even more fundamental changes to assessment by directing the AAG to redesign the process altogether. Dissatisfied with the heavy emphasis on quantitative metrics and lack of context that he observed in the command's assessment products, he directed the AAG to be "revolutionary" in creating something new. He also directed the AAG to reach out to a number of experts in the operations assessment field to solicit their assistance.[84]

The new assessment process and products created by the AAG did not conform to either U.S. or NATO doctrine; rather, the new assessment "paradigm" was designed specifically to address the unique complexities of the counterinsurgency in Afghanistan and the needs of the ISAF Commander at that time.[85] The assessment paradigm had a two-tier structure consisting of both strategic and campaign assessments. The strategic assessment focused on answering so-called "Strategic Questions"—high-level, multifaceted questions designed to be of primary interest to senior decision-makers—in narrative, analytic form. The operational assessment used sets of qualitative standards and accompanying narrative responses to gauge accomplishment of campaign tasks. Both tiers were designed to capture the current state of the war while emphasizing a need to anticipate and prepare for future challenges and opportunities. Additionally, the two assessments and their associated processes were designed to stimulate discussions leading directly to decisions by senior leaders on actions they could take, direct, or request. In essence, this approach provided them the information and impetus to make (or argue for) changes and actions critical to the continued progress of the campaign.

ISAF used this two-tier assessment system for nearly a year, with continued modifications to the Strategic Questions and specific operational standards. In mid-2013, the AAG dropped the operational assessment component and streamlined the assessment development process by reducing the number of coordination meetings

84. Full disclosure: one of the authors (Schroden) was asked to deploy to help the AAG with this redesign and did so from November 2011 to February 2012.

85. The assessment paradigm developed by the AAG in late 2011/early 2012 is described in detail in Schroden, "Operations Assessment at ISAF: Changing Paradigms." See also "A New Paradigm for Assessment in Counterinsurgency," *Military Operations Research* 18, no. 3 (2013).

and assessment working groups. As of the writing of this paper, ISAF was still using the Strategic Questions and continued to structure its main assessment report (the Quarterly Strategic Assessment Report, or QSAR) around them, though it also retained annexes to the report containing significant amounts of quantitative information (e.g., violence statistics and polling results).

Implications for Operations Assessment

The wars in Iraq and Afghanistan witnessed the collision of vague political objectives with complex, ill-defined battlefields. At the same time, the overly reductionist systems thinking present in the Vietnam era reemerged, coupled with Information Age increases in computing speed and the ability to collect, store, and analyze large volumes of data. As a result, analysts and assessors often found themselves awash in data, but unable to convert them into information useful to senior decision makers, who were often struggling to grasp the situation on the ground. By 2010, it was not uncommon to hear the environment in theater described as "data rich, but knowledge poor."

Despite the problems that assessment teams encountered in these two counterinsurgencies, there were exceptions that showed that the use of quantitative data in building assessments is not entirely misguided. In Iraq, for example, problems resulted from the application of assessment methods without considering the complex nature of the war, and from the effort to centralize results in what was a highly localized conflict. However, some analysts (often working at operational and tactical levels), were able to mitigate these issues. For example, one of the authors (Schroden) worked with MNF-W to develop quantitative metrics and analyses tied directly to specific theories of counterinsurgency and objectives derived from them.[86] These metrics suffered from some of the same difficulties as other quantitative approaches (e.g., imperfect data sources), but because they were calculated at a lower echelon of command and were related directly to hypotheses about how to

86. "Measures for Security in a Counterinsurgency." One metric that was deemed particularly useful in demonstrating progress in al Anbar was the ratio of friendly-initiated to enemy-initiated attacks. This ratio is tied directly to a theory of counterinsurgency that says initiative is one of the few advantages that an insurgent force can have over a typically stronger, better equipped counterinsurgent force. As such, knowing whether the counterinsurgent force is reducing this advantage of initiative is fundamental to knowing whether it is being successful. Another example of a useful metric was the number of tips that Iraqi civilians provided to coalition forces to aid in countering the enemy. While insufficient to provide a sweeping assessment on its own, this metric reflected many important conditions on the ground, such as local support for counterinsurgency efforts and locals' sense of security as reflected in their willingness to actively risk retribution by reporting insurgent activities.

effectively prosecute the counterinsurgency campaign in al Anbar, they were nonetheless deemed useful by decision-makers at the command.

Of note for the war in Iraq and especially in Afghanistan, commanders have had a notable impact on the assessments process, and their shifting preferences have often directly generated the oscillation between quantitative and qualitative approaches. In Iraq, operations assessment was a central issue for a relatively short period of time. The assessments process underwent some changes with new MNF-I commanders, but as violence levels began to drop dramatically in 2007, so did the demand for assessments and the perceived need to make significant changes to the assessment process. Essentially, commanders had tangible results, which satisfied interested parties.[87] The war in Afghanistan, in contrast, has lasted much longer and commanders have taken highly disparate approaches to operations assessment. Because progress has been difficult to demonstrate, ISAF commanders have sought out new ways to understand the environment and to communicate their understanding to policy leaders.

These persistent changes to the assessments process in part reflect the commander's prerogative, as outlined in current and past doctrine, since the burden of proof to show progress rests largely on his shoulders. But in a data-rich age where an audience is accustomed to seeing numbers to back up opinions or claims, a commander's judgment has proved a necessary but insufficient component of the assessments process. While EBA ostensibly provided a framework to bring quantitative corroboration to qualitative judgments, its manifold and consistent inadequacies have prompted commanders to seek alternatives. The doctrinal vacuum that followed the death of EBO/EBA and the malleable nature of the assessments processes that have been created in EBA's wake have allowed for significant variation in the way commanders approach assessment. Some have considered it an activity designed to produce and analyze precise measurements of on-the-ground performance. Others have leveraged assessment capabilities as one component of a broader messaging effort to communicate and further progress towards their objectives. Regardless of the approach, each commander has sought effective ways to produce assessments that can stand up under a high level of scrutiny from top defense and policy leaders.

We are still in the midst of what General Mattis called the "renaissance" in operations assessment. Its rare successes and common failures in Iraq and Afghanistan have elevated the discussion of the issue to unprecedented levels in U.S. military history. In recent years, a number of people with direct experience in conducting or supporting operations assessment in both theaters, along with an increasing number

87. There were certainly changes to the assessments process at lower echelons (e.g., MNF-W), but there were not the major overhauls at the highest levels that we have seen in Afghanistan.

of academic researchers, have begun publishing hypotheses for why assessments failed to live up to their theoretical promise in Iraq and Afghanistan. For example, Ben Connable has examined in detail the parallels and pitfalls of the systems thinking and quantitative metrics approaches used in Vietnam, Iraq, and Afghanistan and argued that an emphasis on quantitative analysis for gauging progress in counterinsurgency is fundamentally unsound given its nature as a social (versus nation-state) conflict.[88] Others such as Stephen Downes-Martin have argued that the reductionist mathematical approach taken by U.S. and NATO doctrine (most notably in the effects-based approach to operations and assessment) is flawed in that it greatly oversimplifies the complexities of counterinsurgency warfare and assumes a much higher level of capability for modeling and analyzing it than we currently possess.[89] Jonathan Schroden has argued that in addition to these flaws in theory, doctrine, and practice, the military has failed to educate, train, and properly prepare those being tasked to conduct and consume operations assessment in the field.[90] Other authors continue to press the notion that the problem remains one of not having the *right* quantitative metrics.[91]

These authors have clearly not yet reached a consensus answer to the question of why operations assessments in Iraq and Afghanistan were so challenging and often failed to provide the kinds of insights senior decision-makers (and the general public) desired. However, it is clear that there exists widespread dissatisfaction with operations assessment doctrine and the assessment principles that accompanied concepts like effects-based operations. This dissatisfaction came to a head at a special meeting held jointly by the Military Operations Research Society (MORS) and the U.S. Central Command (CENTCOM) in November 2012.[92] This meeting consisted of plenary sessions and working groups focused on strategic theater, campaign, operational, and tactical assessments (among other topics). One of the authors was a presenter at the meeting, and noted that the level of frustration with the current state of operations assessment among attendees was palpable and surprisingly consistent across many of the working groups. It seemed that no matter what level of command the attendees had experience in, or whether their experiences were in Iraq,

88. Connable, "Embracing the Fog of War: Assessment and Metrics in Counterinsurgency."

89. Stephen Downes-Martin, "Operations Assessment in Afghanistan Is Broken: What Is to Be Done?," *Naval War College Review* 64, no. 4 (Autumn 2011).

90. Jonathan Schroden, "Why Operations Assessments Fail: It's Not Just the Metrics," ibid.

91. See, for example, Ethan Kapstein, "Military Metrics: How Do We Know When We're Winning (or Losing) a War?," *Small Wars Journal* (July 2011). See also Joshua Foust, "Measuring Success: Are We Winning?," (May 2012).

92. Military Operations Research Society, *Assessments of Multinational Operations: From Analysis to Doctrine and Policy*. (Report on Proceedings of the MORS Special Meeting, 5–8 November 2012, MacDill AFB, Tampa, FL), http://www.mors.org/UserFiles/file/2012%20-%20Meeting%20AMNO/MORS%20Assessments%20Special%20Meeting%20Report%20v4.pdf.

Afghanistan, or other regions of the world, they encountered similar levels of frustration trying to design and implement effective operations assessment processes. It appears, therefore, that consensus exists on at least one level: as Downes-Martin asserted, "operations assessment … is broken."

Conclusion

In examining the history of operations assessment, we find consistent themes in its evolution. We will first discuss these important themes, and then briefly comment on the present state and possible future challenges for operations assessment.

Historical Themes of Operations Assessment

Oscillation between quantitative and qualitative approaches

One of the most readily apparent themes in operations assessment history has been the oscillation between highly quantitative approaches and more balanced approaches that include quantitative inputs, but place significant value on qualitative considerations. Those responsible for operations assessment have struggled to produce assessments that exhibit both precision and insight, often forsaking one for the other.[93] Myriad pressures have exacerbated the challenges associated with finding this balance, including the persistent demand for progress reports from internal and external audiences, the compulsion to leverage new technologies to improve the assessments process, and the lack of a proven assessments framework for regular and irregular warfare.

In the Vietnam era, the combination of a heavy emphasis on systems analysis and the uncertainty and inconsistency that characterizes a counterinsurgency produced an unfortunate confluence. In that environment, centralized assessments became singularly focused on quantifying the unquantifiable in the effort to measure progress. The general lack of qualitative inputs excluded important contextual information and weakened the overall assessment. The subsequent backlash against the methods used in Vietnam assessments coincided with a period when the United States was committed to deterring war, rather than fighting it. This status obviated any perceived need to fix the problems assessors encountered in Vietnam or produce

93. Upshur, Roginski, and Kilcullen, "Recognizing Systems in Afghanistan: Lessons Learned and New Approaches to Operational Assessments."

a better method for assessing operations. Consequently, the Cold War saw operations assessment return to its pre-Vietnam status almost by default. Quantitative inputs like battle damage assessment were combined with qualitative factors—most importantly the commander's judgment—to form an overall assessment.

The Information Age brought renewed emphasis on quantitative methods with the idea that advanced computing capabilities could make possible the level of precision that had eluded assessors in Vietnam. The transformation occurring in other sectors like business and finance only reinforced the adamancy in military circles that this "revolution" would make efforts like operations assessment a mere matter of leveraging the right technical assets and mathematical models. Embodied in the effects-based assessment framework, this line of thinking dominated the assessments process for much of the wars in Iraq and Afghanistan, despite the fact that pitfalls and obstacles associated with EBA resulted in highly skewed progress reports.

Emphasis on operations assessment is proportional to the lack of obvious progress

A brief study of the history of operations assessment also reveals that the level of effort dedicated to the process (including efforts to change or improve it) tends to be proportional to the level of demand for assessments. In turn, the demand for assessments seems to be highest when our political objectives are murkiest or strategic models are weakest. When progress is readily apparent and the traditional approaches of battle damage assessment and the commander's estimate satisfy, the operations assessment process remains fairly static and receives little attention. If a commander can observe developments in real time and communicate up to higher echelons with tangible results (e.g., ground taken, targets destroyed, or enemy killed), demand for assessments is low.[94] However, in more protracted conflicts—especially those that are shrouded in the ambiguities of irregular warfare—objectives tend to be opaque and shifting, so leaders work to find ways to communicate progress, which may not be readily apparent and is often difficult to measure. This dynamic was first evident in Vietnam, where operations assessment gained significant attention as signs of progress proved elusive. The quantitative methods that came to dominate the assessments process were so pervasive, in part, because they were fairly easy to comprehend and came at a time when U.S. leadership was clamoring for evidence that efforts were succeeding. Daddis summarizes this dynamic in his treatment of

94. James G. Diehl and Charles E. Sloan, "Battle Damage Assessment: The Ground Truth," *Joint Forces Quarterly* 37 (Spring 2005): 59.

the assessments process in Vietnam by saying that "numbers whetted an appetite for more numbers."[95] Supply rose to meet demand, often at the expense of accuracy.

In contrast, there was little demand for robust assessments in the decades that followed the Vietnam War because U.S. Cold War policy concentrated on *comparisons of capabilities* in the absence of open conflict. Doctrine on operations assessment, which was relatively sparse and nested in the planning process, provided as much guidance as was deemed necessary. As the United States became much more globally engaged following the collapse of the Soviet Union, however, the need for a useful way to measure progress in nonconventional operations reemerged. While this changing dynamic was evident throughout the 1990s, it took on much more significance during the counterinsurgency operations in Iraq and Afghanistan. Once again, the lack of clear progress in the midst of prolonged conflict drove demand for more rigorous (or simply better) ways to measure the impact of tens of thousands of boots on the ground. Initially, leaders assumed EBA would meet that need, but its dismissal left a doctrinal vacuum that remains unfilled. With doctrine falling short amidst persistent calls for signs of progress, there was, and continues to be, significant support for a thorough revamp of the operations assessment process.

Operations assessment has to serve distinct, and competing, audiences

The demand for operations assessments typically originates with two distinct audiences that drive the process in very deliberate, but often competing, directions. The first audience is internal to the unit: the commander, staff, and other planners. Assessments for this audience serve the purpose of informing the planning process as dictated by doctrine, moving "down and in" for use inside the force.[96] As such, often there is a degree of skepticism of assessment inputs and results, since the commander and his staff seek the most accurate and objective material to form the basis from which they plan future operations. There can be a greater appetite for raw, unaltered data to help build the fullest understanding of the battlespace. The internal nature of the planning process allows a commander to work with such unpolished assessments without significant scrutiny.

By contrast, policymakers and other senior leadership comprise the second audience and they have brought a high level of scrutiny to the assessments process in recent years. Assessments inform their understanding and perception of progress, which aids in their determination of whether to support a commander's recommendations

95. Daddis, *No Sure Victory: Measuring U.S. Army Effectiveness and Progress in the Vietnam War*, p. 53.

96. Military Operations Research Society, *Assessments of Multinational Operations.*

and ultimately decides the duration and extent of U.S. commitment in a conflict. This dynamic has produced a propensity in operations assessment that is worth examining. Assessments that reflect bottom-up data collection and analysis, while ostensibly objective, risk creating dissatisfaction among higher leadership if the results do not show sufficient progress. As a consequence, unlike the skeptical approach commanders often take to assessments in the planning process, those delivered "up and out" to policymakers often reflect an optimism that is either not present in or even counter to internal, bottom-up assessments.

In the wars in Iraq and Afghanistan, we have observed some high-level commanders using assessments as a vehicle to deliver a specific message to the policymaking audience, adding a new dimension to the evolution of operations assessment. To a large extent, this tendency reflects the commander's response to pressure generated by the existence of two distinct audiences. Both groups demand his attention, but the assessments for each are often built with different inputs and approaches. When a commander focuses more on one audience over another, it directly affects assessment methods and approaches. What a commander chooses to measure reveals his priorities, and when civilian leadership is the primary audience, that selection tends to shift to include those metrics that can best bolster the position he intends to defend. This influence threatens to erode the objectivity of the assessment, but mitigates the risk of losing support from higher leadership. Ultimately, the effort to satisfy very different audiences has hindered the development of an effective framework for operations assessment, as the processes used have changed significantly depending on the commander and the audience.

Operations assessment tends to follow trends in civilian and business sectors

Another notable trend in operations assessment history is the tendency for its development to mirror major trends in civilian circles. One of the clearest manifestations of this phenomenon is in the parallels between the development of operations assessment and business management practices. The influence of business on operations assessment first became evident in World War II, as the assessment effort came to include business-oriented minds like Robert McNamara. This influence on operations assessment grew exponentially during McNamara's time at the Pentagon, where he applied his systems analysis approach to the Vietnam assessments process. Years later, the growing popularity of results-based management from the late 1980s through the Information Age found its way into operations assessment, most clearly in effects-based operations doctrine. However, like McNamara and systems analysis, this translation has revealed some of the limitations in applying business practices to military operations assessments. Even with the same technology that is revolutionizing the way the world uses data to

measure results in business, the operations assessment process is still hindered by the lack of a useful framework for exploiting vast amounts of data.

Future Challenges of Operations Assessment

Having an understanding of the history of operations assessment allows us to look ahead and make some informed speculation as to what challenges may face practitioners in the future.

Meeting consumer and audience expectations

Tracing the patterns of U.S. business development may provide some indication of where operations assessment is headed, and how it can be shaped so that it benefits from successful business practices and avoids repeating past missteps. For example, business trends like customer centricity will likely only add to the demand for accurate and timely assessments, since consumers are increasingly accustomed to receiving goods and services that are tailored to the individual and delivered rapidly. New technologies have enabled this development, freeing up human effort to focus on ensuring customer satisfaction. Although the defense industry has access to similar technologies, they have encountered significant obstacles in trying to automate certain processes, including assessments. Therefore, meeting expectations of modern audiences without compromising the integrity of the assessment may prove even more challenging in the future.

Increasing emphasis on operations assessment, but continuing discord on how it should be conducted

As the United States' commitment in Afghanistan diminishes, it is worthwhile to consider how the future operating environment might affect operations assessment. The current momentum behind doctrinal revision is promising, but demand for assessments may dwindle as forces have fewer operations to assess. Because there is a tendency to neglect assessments when there is not significant demand for them, the potential for a return to obscurity exists. However, two important dynamics point to a likely break with this historical trend. First, as discussed above, there is broad agreement that the development of a sound assessments process is a valuable pursuit, and many defense organizations have dedicated resources to that effort. Secondly, according to national strategic policy, the United States will continue to be

engaged around the globe in limited footprint operations in the coming years.[97] In the post-Vietnam era the United States was singularly focused on deterring a peer competitor and its global engagement was comparatively minimal. In that climate, assessments played an insignificant role. That bipolar dynamic no longer exists, and likely will not exist in the near future. Indeed, the new security environment is actually contributing to the momentum behind operations assessment.

Today, the United States engages in operations ranging from theater security cooperation to crisis response on a regular basis. Civilian government and non-profit organizations have built significant experience in the discipline of evaluation[98] of efforts like development and reconstruction, which has had notable influence on military operations assessment and helped propel the effort to build an effective process. Additionally, policymakers, who are now accustomed to receiving frequent progress reports on military engagements, will likely continue to expect assessments from "Phase 0" operations going forward. There are current examples that affirm this trend, such as the requirement for the geographic combatant commands (GCC) to produce a theater campaign plan and assess against that plan on an annual basis. Requiring such reports from permanent, standing units points to the significance of operations assessment in the modern context and makes it less likely that it will fade into obscurity going forward. However, even with this continued emphasis, there are current and emerging dynamics that add to the uncertainty surrounding exactly how operations assessment will develop.

The challenges associated with the assessments process in Iraq and Afghanistan have elevated operations assessment to a level unprecedented in U.S. military history. As the United States moves forward from these conflicts, there is broad consensus that the assessments process is broken; however, there is not a clear way forward on how to fix it. The vacuum left in the wake of EBA remains, though various bodies are dedicating significant effort to fill it. The overhaul of assessments doctrine is already occurring in several places. The Air Land Sea Application Center has produced a multiservice tactics, techniques, and procedures (MTTP) publication on operations assessment that lists the basic tenets of the process and provides examples of approaches that have been useful in the past. The most influential doctrinal publication on irregular warfare to come out in decades, Army Field Manual 3-24 on *Counterinsurgency*, provided almost no guidance on operations assessment in its first iteration in 2006. It has since been updated and the current version of FM 3-24 dedicates a chapter to assessments and includes much greater depth on the issue.

97. See, for example, White House, "National Security Strategy," (2010).

98. The civilian sector typically uses the word "evaluation" to refer to measuring progress, rather than assessment. The experience in and literature on evaluation in civilian circles is extensive. While we do not address it in depth here, evaluation in non-military applications is important to consider when thinking about the future of operations assessment.

The same is true of the joint publication on counterinsurgency (JP 3-24), which was updated in November 2013. There are also planned efforts to revise joint doctrine on assessments (specifically, the sections of JP 3-0 and JP 5-0 that discuss the topic). However, these publications still fall short in providing consensus on the future of operations assessment and the necessary practical guidance on the actual process of conducting assessments. Doctrinal revisions would benefit from the inclusion of lessons learned in operations assessment over the past several decades, but it is also important to be forward-looking to help equip leaders and assessors and avoid cold starts in future conflicts.

Continuing lack of training and education on how to conduct operations assessment

The consensus that has emerged regarding the need to "fix" operations assessment is helpful and has led to significant efforts to revise assessment doctrine. However, there appear to be no concurrent efforts within the U.S. military to address the general lack of training and education provided to those tasked with conducting operations assessment. Over the past decade, the ORSA community has had the task of operations assessment fall to them, and they have begrudgingly accepted and conducted the mission—often to the detriment of their ability to support commanders and units with traditional operations research activities. Yet, there remain significant debates about whether ORSA techniques are the most optimal ones for assessing progress in military operations. Beyond simply assuming that ORSAs inherently have the best skill set for operations assessment, it would behoove the military to think about, research, and experiment with other skill sets and to use the results of such studies and experiments to inform the creation of training and educational courses for those expected to conduct operations assessment in the future. Even if assessments doctrine gets "fixed," simply handing it to ORSAs or untrained staff officers does not fairly empower them to be successful in the challenging endeavor that is operations assessment.

The rise of "big data" amidst limited analytical resources

The rise of "big data" and social networking promises to have a profound impact on the future of operations assessment. As private and public sectors endeavor to organize and leverage the vast amount of data that is produced and collected in short periods of time, it is important to consider the associated risks and opportunities for operations assessment. The challenge of too much data is not new to military assessments and has plagued the process since Vietnam. However, there have been exponential increases in the amount of available data since that time, and the pace of that growth is only getting faster. This "Information Age 2.0" is already

having a substantial impact across many sectors. Today, the collection capabilities of military assets are phenomenal, but the capacity to analyze collected data is severely lacking. In operations assessment, we risk reverting back to an EBO-like mindset, where the magnitude of the data belies the challenges associated with understanding and leveraging it. Defense and business leaders have already dedicated significant resources to finding ways and building tools to deal with big data, which may prove extremely beneficial. However, approaching the use of big data in assessments with caution and bearing in mind the lessons of the past can assist in enhancing the integrity and reliability of the process.

The changing conduct, but steadfast nature, of warfare

Military theorists and futurists continue to pontificate as to how warfare will be conducted in the future. Concepts such as "hybrid warfare" and "fourth generation warfare" have been developed and are useful constructs for thinking about what types of operations we may be asked to assess going forward. However, students of military history know that the underlying nature of warfare remains constant through the ages. War is uncertain and often ambiguous, and operations assessment will continue to be challenging as a result. Years of experience in assessment and a determination to institutionalize the lessons learned as a result of this history have the potential to leave us better postured for future challenges in assessing progress. As the operating environment shifts and U.S. commitments change, the conduct of operations assessment will likely need to change as well. But having reliable assessment methods to enable better planning and decision making at all levels is likely to be a constant requirement going forward. Therefore, we must harness the current momentum in the operations assessment community to address the likely challenges of future assessment and ensure the development of effective operations assessment processes going forward.

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DOP-2014-U-008512-1Rev

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