



# Clouds or Clocks

## The Limitations of Intelligence Preparation of the Battlefield in a Complex World

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At the heart of the new *U.S. Army Operating Concept: Win in a Complex World 2020-2040* (AOC) is “complexity.” The AOC defines a complex environment as one “that is not only unknown, but unknowable and constantly changing.”<sup>1</sup> Globalization and advances in technology have made the world more complex and interconnected than at any other time in history. At the same time, those factors have facilitated attacks against U.S. national interests globally on an omnipresent battlefield by enemies who can use such factors to more effectively employ irregular capabilities to achieve traditional military effects. Such attacks are being conducted

by state actors like Russia, China, North Korea, and Iran, as well as by nonstate actors like the Islamic State and al-Qaida.

Together, globalization and advances in technology have changed the nature and character of warfare. The era of clearly defined battle lines and firm coalitions is over. Therefore, winning in a complex world depends, more than ever, on popular support and, as the AOC points out, “more than just firepower.”<sup>2</sup>

A central component to success in the contemporary operating environment (COE) is developing and maintaining a high degree of situational awareness.<sup>3</sup> This herculean task of finding clarity and generating



(Photo illustration by Michael Hogg)

understanding for the commander and the organization is a core intelligence function, but the Army's current intelligence doctrine is too myopic and rigid to support commanders in this regard.

For the Army, the current default analytical model for generating understanding and supporting the military decision making process is *intelligence preparation of the battlefield* (IPB), defined by the U.S. Army as "the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations."<sup>4</sup>

By virtue of being an analytical model, IPB eliminates consideration of certain paradigms while restricting the framing of thinking upfront in order to produce consistent and predictable results under specified conditions. One resulting fundamental problem with using IPB in the COE is that it was designed for well-structured problems of the past and not the "wicked problems" of today.<sup>5</sup> In other words, IPB was designed to support commanders against a relatively well-known enemy in a conventional combined arms maneuver fight. In such a capacity, IPB served the Army exceptionally well.

However, as intelligence professionals look out into today's sea of uncertainty and increasingly complex environments, they must ask themselves if IPB—their primary *modus operandi*—is best suited

to support commanders operating in the COE. IPB is, at best, suboptimal for employment in complex environments because it is conventional-enemy centric and fails to contextualize environmental variables over time, thereby potentially concealing the root causes of conflict and instability. Better alternatives to IPB are systemic operational design or similar systems theory approaches because they focus on environmental systems. Such alternative approaches give the commander and organization a more in-depth understanding of the operating environment and problem than does IPB.

To put this in mathematical terms, IPB solves for  $x$  and design solves for  $y$ . Therefore, it makes little sense to attempt to solve for  $y$  using the  $x$  model.

To draw on the work of English philosopher Karl Popper, his analogy between "clouds" and "clocks" illustrates the point.<sup>6</sup> Popper asserted that the world was broken down into two categories, clouds and clocks. Clocks are well-defined and systematic, and are easily disassembled and reduced to parts. One result is that, most often, there are correct, well-defined solutions for repairing or maintaining clocks.

On the other hand, clouds are amorphous, messy, and ill-defined. Compared to the predictable functions produced by the precision construction of clocks, clouds cannot be disassembled in any similar way to clocks and are highly unpredictable.

Similarly, IPB strives to be clock-like in describing the battlefield and predicting developments, which means that those who use it may be inclined to make the false assumption—as do many military practitioners—that everything is “clock-like” and predictable in a given operational area. Such an approach may result in discounting—or failing to observe—important factors that lie outside the parameters of the IPB analytical construct, including difficult-to-discern nuances of the human domain.

The dangers associated with analytical models characterized by rigid processes are well documented. Most notably, Carl von Clausewitz warned of the hazards of “methodism,” later expanded on by Dietrich Dörmer, which is “the unthinking application of a sequence of action we have once learned.”<sup>7</sup> Their warning is clear: anything that prevents or inhibits the free flow of ideas, scope of inquiry, and critical thinking limits and impedes the commanders’ ability to understand and visualize.

Methodism is also similar to the social psychology theory of fundamental attribution error, which is the tendency to over emphasize internal characteristics while simultaneously underestimating contextual aspects of a situation.<sup>8</sup> Consequently, since IPB narrowly frames critical thinking in just such ways, using it in complex environments may constrain thought and critical thinking

about the environment and underlying problems, thereby limiting both understanding of it together with the development of options made available to the commander.

More to the point, as Lt. Col. Grant Martin opined in “The Deniers of ‘The Truth’: Why an Agnostic Approach to Warfare is Key,” the problem is with the Army’s religious-like commitment to analytical models, what he calls “technically rational paradigms,” that are ill-suited for the task of understanding complex adaptive systems (environment) and the human domain.<sup>9</sup> Consider for a moment the impact on the operations process and overall understanding if a picture of the operating environment is derived from only one perspective. IPB leads to one such perspective—a reductionist approach to something that is not easily reduced or quantitatively understood. Therefore, in complex environments, IPB may give artificial structure and form to something that may not actually exist.

An illustration of this point is the use of the term anti-coalition movement (ACM) during the early years in Afghanistan. ACM was a catch-all term of convenience that gave the illusion of structure, form, and affinity among groups opposing the U.S.-led coalition. However, an ACM did not actually exist. As a result, this artificial construct was misleading and



(Photo courtesy of 4th Infantry Division PAO)

Soldiers from 1st Battalion, 66th Armor Regiment, 3rd Armored Brigade Combat Team, 4th Infantry Division, plan for a defense 16 November 2014 during Decisive Action Rotation 15-02 at the National Training Center on Fort Irwin, California. Decisive action rotations are designed to test the capabilities of brigade combat teams against similarly equipped enemy forces.



(Photo by Ashraf Shazly, Agence France-Presse)

Insurgent fighters belonging to the Justice and Equality Movement (JEM), a rebel group in Sudan's Darfur conflict, await orders circa 2011. JEM claims that its main objective is to overthrow the current Sudanese dictatorship, which governs under Islamic law, and establish in its place a democratic state that respects the rights of Sudan's women and diverse ethnic groups. However, the conflict is characterized by other observers as having much more complex roots, a clash between Arab and diverse non-Arab ethnicities vying for control of land and resources.

counterproductive to developing accurate knowledge and understanding of core issues and the enemy.

In known environments characterized by conventional enemies, IPB is a fantastic tool for systematically identifying mission variables which, when applied to a template, can provide indicators and warnings of enemy intentions and activities—clock problems.<sup>10</sup> Unfortunately, in unknown environments (ill-structured, or cloud problems) that have no templates, IPB products become random, uncontextualized information and data points. From this, it is easy to see how the value of IPB begins to diminish as the level of complexity increases.<sup>11</sup>

IPB falls short with regard to unearthing the unknown nature and character of instability and conflict because IPB is enemy-centric and parochial. It presupposes there is a unified “enemy/threat” in the traditional sense, which then becomes the primary focus of the commander. However, it is conceivable that in a given complex operating environment there is no “enemy,” only conditions or systems that require

adjustment to solve the problem and accomplish the mission. Therefore, in such contexts, IPB would fail to reveal root causes of problems or show relationships between variables because IPB's enemy/threat perspective would restrict and inhibit full understanding of complex situations.

IPB also comes up short temporally; it is not well suited to detect changes in the environment and human domain. In military operations among populations, tracking the evolution and character of the conflict is a priority information requirement for any commander. Maj. Scott Stafford captured the point in an article when he wrote, “Today's enemy is just as likely to be yesterday's or tomorrow's friend,” and “success or failure, tactical or strategic, depends on the Army's ability to anticipate and shape how people and their identity groups perceive military missions in relations to their interests, and what they do about it.”<sup>12</sup>

Obtaining the kind of information Stafford specifies as vital to success is rarely a priority and, in my

experience, rarely revisited after steps one and two of IPB. The constant reframing of Army design methodology (systemic operational design) with focus on the environmental system(s) would better serve commanders in the COE.

Design allows commanders to take an unstructured approach or “agnostic” approach to generating understanding.<sup>13</sup> As Martin states, an agnostic approach is more inclusive and “appreciates multiple view points and paradigms.”<sup>14</sup> He goes on to observe, “Creatively thinking about warfare ought to be encouraged, and we must resist institutional attempts to codify how to approach thinking.”<sup>15</sup> Therefore, to be truly successful in the COE, Army leaders have to challenge fundamental beliefs, take a critical approach to warfare, and unweave themselves from any one approach or checklist. More than ever before, the Army needs unbridled critical and creative thinkers; this is especially true for intelligence professionals.

With that said, the Army cannot completely divorce itself from models; it must have something to help guide it, and systemic operational design and systems theories offer a better way to analyze and understand unstructured problems than IPB. On the operational side of the house, the use of systemic concepts is not new—Army design methodology is well codified in doctrine. However, on the intelligence side, the embrace of systems thinking and incorporation of it into doctrine and into tactics, techniques, and procedures has been slow going, even though understanding the complex adaptive systems that comprise the environment is the lynchpin to success in the COE.

In the COE, commanders do not have the luxury of clarity, certainty, or templates. In most cases, the commander’s set of circumstances will be wholly unique and unlike anything experienced in the past. The value of having a profound and penetrating understanding and awareness, or what soft systems theorists would call a “rich picture” understanding, cannot be overstated because it helps the commander understand “why” things are happening and drives center of gravity analysis, collection planning, targeting, and the overall operational design.<sup>16</sup>

Thus, the systemic approach focuses on the environment and problem as opposed to IPB’s focus on the enemy.

Systemic thinking characterizes the environment and identifies root causes to such problems, not just the symptoms. Lt. Col. Brigham Mann puts it this way: “In essence, systemic thinkers attempt to ensure the military is ‘doing the right things,’ which is arguably much more important than just ‘doing things right.’”<sup>17</sup>

IPB is first in class for structured, enemy-centric problems, but systems theory-based approaches will better satisfy the commander’s information requirements in complex environments. Experiences over the last decade in Iraq and Afghanistan show the potential consequences of failing to understand the environment, a failure partly due to the limitations of IPB. Not to be misunderstood, this article does not advocate the death of IPB, but draws attention to the limitations and drawbacks concomitant with IPB, and advises using it only where appropriate (i.e., structured, enemy-centric operating environments).

## Conclusion

The consequences of failure in the COE are high. So it is incumbent on intelligence professionals and commanders to take every step and precaution necessary to avoid psychological traps that would lead to the use of ill-suited analytical models and framing tools.

Therefore, for operating in the complex world, the Army should update intelligence doctrine to include systems theory analysis and intelligence operations. By understanding the character, function, and behavior of the complex adaptive systems of an operational environment, an intelligence staff officer will be better able to characterize the environment and help the commander frame the problem, thus making sense of the chaos.

We can never fully understand the full complexity of the “cloud” in the same way we understand the “clock,” but we can develop a better appreciation for it as well as greater understanding on how to deal with it by incorporating systemic approaches. To this end, IPB and systems theory approaches complement each other and together are a great one-two punch. ■

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## Notes

1. U.S. Army Training and Doctrine Command (TRADOC) Pamphlet (TP) 525-3-1, *The U.S. Army Operating Concept: Winning in a Complex World 2020-2040* (Fort Eustis, VA: TRADOC, 31 October 2014), iii, accessed 2 October 2015, <http://www.tradoc.army.mil/tpubs/pams/tp525-3-1.pdf>.
2. Ibid.
3. Ibid., 19 and 31.
4. Army Techniques Publication (ATP) 2-01.3, *Intelligence Preparation of the Battlefield/Battlespace* (Washington, DC: U.S. Government Printing Office [GPO], November 2014), 1-1, accessed 2 October 2015, [http://armypubs.army.mil/doctrine/DR\\_pubs/dr\\_a/pdf/atp2\\_01x3.pdf](http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/atp2_01x3.pdf).
5. Horst W. J. Rittel, "On the Planning Crisis: Systems Analysis of the 'First and Second Generations,'" *Bedriftsokonomien* 8 (1972), 392-393; TP 525-5-500, *The United States Army Commander's Appreciation and Campaign Design* (Fort Eustis, VA: TRADOC, 28 January 2008). Originally coined by Rittel, the term "wicked problems" is used here as defined in TP 525-5-500 as problems that are ill-structured, complex, nonlinear, and chaotic.
6. Karl R. Popper, *Of Clouds and Clocks: An Approach to the Problem of Rationality and the Freedom of Man*, 1972, The Rathouse website, accessed 2 October 2015, <http://www.the-rathouse.com/2011/Clouds-and-Clocks.html>.
7. Carl von Clausewitz, *Principles of War*, trans. and ed. Hans W. Gatzke (Mineola, NY: Dover Publications, 2003), 19; Dietrich Dörner, *The Logic of Failure, Recognizing and Avoiding Error in Complex Situations* (Cambridge, MA: Perseus Books, 1996), 170; U.S. Army School of Advanced Military Studies, *The Art of Design*, Student Text, version 2.0. 2011, 48, accessed 2 October 2015, [http://usacac.army.mil/cac2/CGSC/events/sams/ArtofDesign\\_v2.pdf](http://usacac.army.mil/cac2/CGSC/events/sams/ArtofDesign_v2.pdf).
8. Malcolm Gladwell, *The Tipping Point: How Little Things Can Make a Big Difference* (New York: Back Bay Books, 2002), 160.
9. Grant Martin, "Deniers of 'the Truth': Why an Agnostic Approach to Warfare is Key," *Military Review* (January-February 2015): 42, accessed 2 October 2015, <http://www.joomag.com/magazine/military-review-english-edition-january-february-2015/0458792001419375392>.
10. ATP 2-01.3, *Intelligence Preparation*, 1-1.
11. Brigham J. Mann, *Systemic Thinking: Enhancing Intelligence Preparation and Estimates*, Naval War College paper, 30 April 2010, accessed 2 October 2015, <http://dtic.mil/dtic/tr/fulltext/u2/a525138.pdf>.
12. Scott Stanford, "Enemies Wanted: No Experience Necessary - The Army's Addiction to Enemies Inhibits Analysis of the Operational Environment," *Small Wars Journal*, 1 April 2015, accessed 2 October 2015, <http://smallwarsjournal.com/jrnl/art/enemies-wanted-no-experience-necessary-the-army%E2%80%99s-addiction-to-enemies-inhibits-analysis-of>.
13. Martin, "Deniers," 44.
14. Ibid., 50.
15. Ibid.
16. Peter Checkland, *Systems Thinking, Systems Practice: Includes a 30-Year Retrospective* (New York: Wiley, 1999), A16. "Rich Picture" is a soft systems methodology concept for developing deep understanding of ill-structured/complex problems by going through the process of drawing extremely detailed pictures, which enhances understanding of the environment and problem.
17. Mann, *Systemic Thinking*, 13.

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