

# Shared Situational Understanding

## Fundamental Principles and Iconoclastic Observations

Richard Stuart Maltz



**S**ITUATIONAL UNDERSTANDING (by a single decision maker, however august) and shared situational understanding (by multiple decision makers who must act in concert to achieve shared goals and desired outcomes) pose two related but very distinct sets of challenges. There has been a great deal of discussion within the defense community in the past several years on these subjects. Some approaches offer “common operational pictures” to eliminate fog and friction in war and stimulate “self-synchronization” between friendly units by providing comprehensive information concerning everything deemed to be of interest in the battlespace.

Needless to say, there are problems. As with most such projects, the problems start with a poor philosophical foundation. In each instance, it is assumed that human decision makers are essentially interchangeable and need only access to a common set of data to achieve “shared situational awareness.” This is generally presumed to automatically result in “shared situational understanding,” which, in turn, is generally presumed to automatically yield the ultimate goal of self-synchronization (disparate units automatically acting in concert, even with limited communications).

Aside from the fact that this chain of causality presumes a great deal too much, and therefore cannot be relied upon, I also see some fundamental philosophical errors and important unaddressed questions. I have observed that even in very sophisticated environments populated with first-rate minds, such concerns are generally overlooked in favor of those to which our cultures of productivity and warfighting reflexively drive us.

Situational *awareness* (shared or otherwise) is not the same thing as *understanding* (which, unlike awareness, requires some useful grasp of the information at hand). One might argue further that *understanding* is different from and inferior to *insight* or *wisdom*, and that either of these should be a recognized goal on the path toward self-synchronization (which does not automatically result, even from shared situational insight or wisdom).

That said, shared situational understanding is not a desired end in itself. It is valuable only as a means of enabling desired emergent behaviors, notably synergy, adaptability, and opportunism. These, in turn, facilitate self-synchronization (and vice versa). All of this promotes the ultimate

Richard Stuart Maltz is a “military philosopher” with 28 years commissioned service in military intelligence, counterterrorism, defense analysis, and leadership and organizational productivity enhancement. He currently works as a military doctrine, policy, and futures analyst and as a concept developer on various Joint and service projects. His writings frequently appear in professional military journals. He may be reached at [richard.maltz@us.army.mil](mailto:richard.maltz@us.army.mil).

PHOTO: Soldiers with the 101st Airborne Division patrol a small village during an air assault mission in eastern Afghanistan, 4 November 2008. (Photo by Spc. Mary L. Gonzalez, CJTF-101 Public Affairs)

values of any military enterprise, enhanced effectiveness, efficiency, and economy. The only reason we need shared situational understanding is to achieve these values. Keeping this hierarchy of needs and purposes in mind will help us solve related challenges.

Culture (personal and shared beliefs and values) is the strongest determinant of emergent (indeed, all) behaviors. The culture of warfighting (which is a type of the culture of productivity) determines how and if a warfighter decides to lift his weapon and place himself in harm's way. It also determines (through frames of reference) what he sees, hears, tastes, smells, feels, emotes, and thinks individually and in groups (in multiple layers of group identity) in response to any given stimulus. Culture does this to a greater degree than do intelligence, aptitude, or any training, instruction, orders, technology, or any other aspect of DOTMLPF (doctrine, organization, training, materiel, leadership, personnel, and facilities).<sup>1</sup> We ignore this fact at our peril.

Any stimulus that we may try to convey in order to foster shared situational understanding will have meaning to the recipients only in the context of

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the disparate frames of reference through which the stimulus must pass within their minds. The same image viewed by 100 people may mean 100 different sets of things to them, unless we shape their frames of reference to increase their predisposition to attain shared understanding. A shared "warfighting culture" is therefore the ultimate key to shared situational understanding in the battlespace. It is on this then that we must focus.

We must, however, guard against any tendency toward tunnel vision or "group think" when we try to shape and promulgate "shared frames of reference." We should differentiate between the issue



SNc. Q. 3990 from the Imperial War Museum collection No. 1900-13.

**A soldier positions himself in a British trench near the Albert-Bapaume Road at Ovillers-la-Boisselle, July 1916, during the Battle of the Somme. The men are from A Company, 11th Battalion, The Cheshire Regiment.**

of group culture and that of cognitive preferences (such as *linear, reductive, and analytic* versus *nonlinear, holistic, and intuitive*) when there is a critical need to diversify our ranks further (by expanding the numbers of those who favor the latter approach). Cultures, warfighting and otherwise, exist on several levels simultaneously, from that of the individual to that of the nation, the religion, or other overarching entity. These levels share a fractal relationship reflected in the organizational structure and beyond. At each level, disparate lower-level cultures must be reconciled so that a common vision can be pursued at that level, in support of the vision at a higher level. The common culture formed is an overlay on the subordinate cultures. These overlays can form haphazardly or by design or by some combination of the two. We need to leverage the tendency of such overlays to occur spontaneously while we consciously seek to incorporate essential or desirable elements. With an adequate cultural overlay, each decision maker will intuitively understand what his colleagues are likely to infer from the same information and sense their likely responses, thus permitting “instinctive self-synchronization.” The goal should be to establish shared frames of reference without destroying existing frames of reference shared with other groups.

During World War I, the practice of attempting to substitute the situational understanding of rear command elements for those of forward commanders was called “chateau generalship.” Today, it is known as “network-centric warfare.” It has never worked as expected. Network-centric warfare is based on several technocentric fallacies that do not adequately take into account the immutable aspects of warfighting and warfighters and the primacy of warfighting culture, not machines, in ultimately determining actions in battle. Network-centric warfare strongly resembles other technocentric delusions, such as the notions that airpower alone can reliably win wars, that precision engagement will destroy all threats, or that elaborate intelligence, surveillance, and reconnaissance will eliminate ambiguity, uncertainty, and deception from the battlespace. Our enduring infatuation with such shibboleths illustrates the philosophical and theoretical poverty of our efforts and deprives our generally expert planning of a context and a

sound “trajectory.” This leads to random outcomes and the systemic predisposition to expend infinite resources without any assurance of achieving desired outcomes.

While technological and materiel solutions are critically important, we cannot rely on them to carry the day in warfighting. They have inherent limitations to which our culture is generally blind, and they are ultimately inferior to *human-centric* solutions. In spite of this, we reflexively recoil from using human-centric solutions because they are too difficult to quantify, require more abstract thinking than we care to muster, and offend our cultural imperative for “radical egalitarianism.” (Everyone is equal as far as machines are concerned; but human differences come to the fore in a human-centric paradigm).

Technological and materiel solutions have helped to build great empires, but these empires ultimately foundered on human-centric problems. Athens fell to Sparta, Carthage and Greece fell to Rome, Rome fell to the Goths, Persia fell to the Arabs, Byzantium fell to the Normans, and then finally, to the Turks. China fell to the Mongols, and then to the Manchus. Wealthy, sophisticated, technologically advanced civilizations being crushed by more primitive but vigorous competitors is an historical commonplace. It may happen to us too, if we continue to disregard history.

Shared situational understanding consists of multiple subordinate elements. Many observers reduce these to the concept of “connectivity.” This is partially true, but connectivity manifests itself as “technical connectivity” and “perceptual connectivity.”<sup>22</sup> The former is the network of sensor and communications grids that link users through mechanical and electronic interfaces in order to acquire and share information. The latter is a network of shared frames of reference *within the users themselves* that enables them to make sense of the information transmitted via the technical connections, and to intuitively understand what other, similar users will infer from that information. In the absence of reliable technical connections, perceptual connectivity can help bridge inevitable gaps in communications through logical assumptions based on shared perspectives.

Therefore, perceptual connectivity is superior; in its absence, technical connectivity conveys only empty symbols, not meaning. But in the absence of technical connectivity, perceptual connectivity can

go a long way toward facilitating shared understanding and, through it, self-synchronization, even with very little data. Our culture, however, embraces and invests heavily in technical connectivity; we do not generally bother ourselves with the imponderables associated with perceptual connectivity.

“*Shared situational understanding on the move*” adds additional, special requirements that are primarily cultural in nature. These requirements result from the challenges of less support, less time, and the need to think, understand, design, and plan while physically moving. In addition, there are additional challenges associated with the dynamism and complexity of the environment through which you and your adversaries are both passing. Such events require a greater emphasis on emergent behaviors, including the need to adapt mentally while the circumstances around you are in constant flux.

Shared situational understanding on the move requires a very different philosophy of conflict and command and renders most of our traditional assumptions on these subjects dangerous anachronisms. In a complex and dynamic environment and with post-industrial-age, third-generation forces, control of one’s own forces in battle is generally only an illusion with respect to actual outcomes in the battlespace. True control of outcomes can

usually only be obtained by abandoning direct, prescriptive control of one’s forces and giving them the latitude to adapt freely to circumstances in pursuit of shared goals as defined by the commander’s intent.

Building shared frames of reference is a daunting challenge, but success in doing so is not unprecedented. It generally requires a high level of socialization on the part of the persons and forces involved. W. Edwards Deming’s theories can illuminate the challenges here.<sup>3</sup> Consider also the Prussian “Scharnhorst Reforms” of 1808.<sup>4</sup> Applying lessons he learned before and during the Napoleonic Wars, Gerhard Von Scharnhorst set in motion a process that led to Erich Von Ludendorff’s “stormtroop tactics” and later evolved into “blitzkrieg.”<sup>5</sup> The Israel Defense Force later emulated this process with great success, and our own Marine Corps has been trying to assimilate it since the 1980s under the name “maneuver warfare doctrine.”<sup>6</sup> At their core, all of these approaches are post-industrial-age<sup>7</sup>, third-generation<sup>8</sup> techniques of warfighting that focus on strong, shared cultural overlays as a means of consciously and systemically enabling desired emergent behaviors and fostering self-synchronization, even in the absence of direct guidance and assured communication. **MR**

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## NOTES

1. The acronym DOTMLPF, having evolved and expanded over recent years from a smaller acronym, is now widely accepted as describing the entire universe of those sets of things that must be taken into account when implementing and accommodating military concepts and actions. This is another fundamental error because this acronym omits the two most important things that determine the success or failure of any military (or other) enterprise: “policy” and “culture.” Thus, if correctly conceived, the acronym would be *PCDOTMLPF*. We might better express such an unwieldy acronym (in the Chinese style) as “the nine critical determinants of success or failure,” but then some perverse bureaucrat will inevitably come to refer to them as the NCDSF.

2. Technical and perceptual connectivity can be described together as “comprehensive connectivity.” Others have recently discussed this; but to my knowledge, I coined these terms in U.S. Joint Forces Command’s “Joint Operational Warfighting” concept in 2001.

3. W. Edwards Deming was a statistician and organizational productivity theorist and lecturer. The Japanese credit him with reviving their economy after World War II. The once popular “Total Quality Management” (TQM) and “Total Quality Leadership” (TQL) movements claim to be based on his work, although he rejected them as perversions of his theories. His work spans three generations of thought, the first based on “statistical process control,” the second on organizational practices (“14 Points and 7 Diseases”), and the last on “profound knowledge,” which he defined as the union of systems theory, variation theory, psychology, and epistemology. Deming Theory properly applies to a post-industrial-age milieu, superseding the “scientific management” of the industrial age. Among the many luminaries and theories in this field, Deming and his work remain preeminent.

4. Between 1801 and 1805, Gerhard von Scharnhorst organized and presided in Berlin over the *Militarische Gesellschaft* (Military Society), the world’s first voluntary membership organization dedicated to the advancement of military art. In 1806, Napoleon destroyed the Prussian Army in a single day in the battle of Jena-Auerstadt. In 1808, the King of Prussia invited Scharnhorst to rebuild the Prussian Army and transform it from a feudal possession to the military instrument of a modern state

(the “Scharnhorst Reforms”). In so doing, Scharnhorst used people and ideas culled from the *Militarische Gesellschaft*. The process that he initiated crystallized 109 years later as “stormtroop tactics.” It succeeded in bridging previously irreconcilable cultures and interests of disparate classes in Prussia and ranks in the Prussian Army and did the same for the myriad German kingdoms, principalities, and city-states over which Prussia assumed control in 1871. The successes of this approach are evident in the German “defense in depth” and “stormtroop tactics” of late World War I and their “blitzkrieg” operations of World War II. Their ultimate failure at the strategic level, due to bad senior leadership and being massively under-resourced, does not detract from the spectacular successes demonstrated at the tactical and operational levels.

5. “Blitzkrieg” or “lightning war” was an operational military technique perfected by Germany in the 1930s. It was based substantially on British and Russian theories of armored and combined arms warfare, built on a foundation of the German World War I doctrine (and culture) of “stormtroop tactics” (with the addition of 1930s’ technology in the form of tanks, aircraft, and radios). It entailed the synchronization of artillery and air support assets to support the deep maneuver of concentrated armored and mechanized units spearheading the attack of larger infantry armies. Blitzkrieg is a post-industrial-age, third-generation warfighting approach (called “maneuver warfare doctrine” by the U.S. Marine Corps). It is dependent upon both technology and “maneuver culture” to achieve its maximum effect. By 1945, in the absence of maneuver culture, none of the Allies were able to reliably employ the same techniques with more than 80 percent of the combat effectiveness enjoyed by the Germans. They were able to mimic its form (technology, synchronization, concentration, etc.), but not its substance.

6. “Maneuver warfare doctrine” is the term used by the Marine Corps to describe their distillation of the German and Israeli military experience, as interpreted through the insights of COL John Boyd. It is historical, theoretical, philosophical, and cultural. It is post-industrial-age and third-generation and stands in contrast to the methodical, industrial-age, second-generation, control-focused approach that reached its apogee under the French Army of 1917. It is not, properly speaking, a doctrine, and it is completely unrelated to what the Army means when it uses that term.

## SITUATIONAL UNDERSTANDING

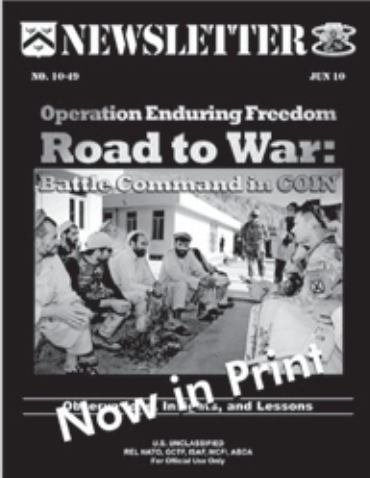


7. "Post-industrial-age" is a term used to describe a paradigm of productivity and social interaction characterized by a high level of socialization and mass group self-identification (as a nation, rather than as an individual, family, clan, tribe, or other special interest group). This promotes trust, which promotes synergy (and other desirable emergent behaviors such as adaptability and opportunism). These promote productivity and affluence that in turn reinforce higher levels of socialization, trust, etc. The bulk of the working population of this age is intrinsically motivated to be industrious and creative in support of community goals (shared vision) and requires only the removal of systemic barriers to excellence. This age stands in contrast to the industrial-age, wherein the principles of Frederick Taylor's Scientific Management were the most effective way to synchronize the labors of peoples with low levels of socialization, whose work is motivated primarily by extrinsic factors (direct rewards and punishments), and maintaining "control" was of paramount importance. In an industrial-age environment, emergent behaviors would be deemed beyond direct centralized control, and therefore disruptive and intolerable. Post-industrial-age workforces generally achieve *at least 20 percent greater productivity* than industrial-age workforces because of increased synergies.

8. "Third-generation" is a term used to describe a paradigm of warfighting. It is a direct analogue and reflection of the post-industrial-age. Like that age, it is

characterized by a high level of socialization and mass group self-identification. Many contemporary military theorists describe it as "maneuver warfare doctrine." It came into being in 1917 as the German response to the trench warfare of the Western Front. Its defining characteristic is an outward focus on the mission, the environment, and the adversary. This, in turn, leads to the systemic stimulation of desired emergent behaviors (notably synergy, adaptability, and opportunism). It stands in contrast to "second-generation" warfighting, which is the industrial-age approach to warfare perfected by the French at the same time in response to the same situation (and which maintains an inward focus on the replication and maintenance of existing structures, processes, and culture that it characterizes). "First-generation" warfighting is pre-industrial age; "fourth-generation" warfighting is "extra-national" (waged by other than nation-states); and "fifth-generation" warfighting transcends the physical battlespace to directly target an adversary's polity (traditionally known as "political warfare"). The research of COL Trevor N. Dupuy, Martin Van Creveld, Martin Samuels, and others has demonstrated that, when the force employed is properly organized and conditioned, third-generation warfighting is reliably *at least 20 percent more combat effective* than the "methodical," second-generation, industrial-age approaches with which we are more familiar.

# Center for Army Lessons Learned

10 Meade Avenue, Building 50 Ft. Leavenworth, KS 66027 COM: 913-684-3035 DSN: 552-3035



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## Landmine

A ponderous, bloated contraption  
Lumbers up the road,  
Troopies peer over its sides, rifles at the ready,  
Casually chatting  
But with their eyes  
In the bush; searching, seeking  
For ambush.

But they cannot see, nor can the driver see  
What sits beneath the road  
Laid in the silent hours  
To wait out its short, appointed time  
Until  
A massive wheel seeks, depresses  
A switch  
Then a deafening roar as the debris-cloud rises.  
Our metallic protector lurches and skids  
As the driver becomes  
Another passenger.

In the truck behind muscles tighten and  
Eyes swivel forward. Their driver brakes. But  
They cannot help us. They are observers.  
We are lost in the cloud as our shattering ride continues.

Debris is falling. Reaction! We gather ourselves,  
Grope for triggers; fire in case of ambush  
Hopelessly.  
For the danger's not out there.  
It is past. It was beneath us.  
Dust settles. Fire ceases.  
We spring to life, urgently debussing.  
Take cover in the bush nearby.

Two men remain lying on the truck.

We gather our senses. Look around.  
The sky is still out there. The earth remains firm  
Beneath our feet.  
The Dark Angel has only touched us. No more.  
We look at each other.  
A hard knot of resolution takes form  
To catch and to kill  
Those who did this to us.

From the book *Echoes of an African War*, by Chas Lotter, who served as a field medic for nine years in the Rhodesian Army during that country's civil war, which lasted from 1964 to 1979. Rhodesia is now Zimbabwe, and former Sergeant Lotter now resides in Pretoria, South Africa.