We live in a dynamic, turbulent world. Society, culture and international affairs have changes more dramatically in the last 25 years than in almost any other quarter-century period in history.

“It’s the system, stupid!”

How can we make sense out of the rapid rate of change in society, technology, politics, international relations, and economics that we’ve experienced? The short answer is to take a whole-systems perspective on the world.

This description of systems by Donella Meadows is probably the essence of what a system is:

“A system is more than the sum of its parts. It may exhibit adaptive, dynamic, goal-seeking, self-preserving, and sometimes evolutionary behavior.”

And Russell Ackoff’s assertion about the relationship of the whole system to its parts is just as cogent:

“Understanding proceeds from the whole to its parts, not from the parts to the whole, as knowledge does.”

Here’s a typical example of a hugely complex, multidimensional system (Figure 1). It has physical, geological, social, economic, meteorological, social, cultural, political and biological components. Each of these can be complex system in itself, and to make matters more complicated, they all interact with one another.

Multidimensional complexity has two basic “views”: lateral, or horizontal, and vertical. (Figures 2 and 3) Laterally, a business, for example, has a substantial number of internal interactions among its components. And to add to the complexity, it also has an indeterminate number of interactions with the ex-
ternal environment: governments, education systems, customers, competitors, the economy…the range is almost endless.

Then there’s vertical complexity. Individuals interact to form groups, which interact as parts of organizations. And the organizations are all part of a community. Of course, there’s an infinite number of communities that all interact as components of regional and national governments. And nations, as super-systems, interact as parts of international meta-systems that comprise the planetary system.

It’s all very complex, and complicated.

The Siphonaptera

Vertical hierarchies are particularly interesting, and they’re characterized by this little poem about fleas (Figure 4):

Big fleas have little fleas
Upon their backs to bite ’em.
Little fleas have lesser fleas,
And so on, ad infinitum.

The Cynefin Framework

How can we make sense out of system complexity? About eight years ago, Dr. David Snowden, formerly of IBM, conceived something he called the Cynefin [a Welsh word, pronounced koo-NEV-in] framework. He characterizes it as a “sense-making” framework—how convenient! Just when we need it, it appears!

Snowden hypothesizes that all systems can be generally categorized as ordered or unordered. Ordered systems can be either simple or complicated. Their structures and functions are well established, even if the complicated systems are more elaborate. Snowden divides unordered systems into complex and chaotic. These kinds of systems are less structured and certainly less predictable. (Figure 5)

In the larger scheme of things, by Snowden’s lights, most of the systems we deal with daily are complicated, perhaps as many as three-quarters of them. It’s the interactions with these kinds of systems that provide most of us the sense of security and confidence that we need to function effectively in our lives. There may be some stress involved in accommodating the variation that is an inseparable part of these systems. But generally it’s nothing that we can’t handle.

However, for many systems, the external environment is more unordered. There are many variables, and the range in variation can be wide. This can impose great stress on us, because the performance of our systems is not predictable with any degree of confidence, and the nature of that performance can only be understood in retrospect (after the fact) for complex systems, and maybe not at all for chaotic systems. Here are some of the characteristics of the different categories of systems and their environmental domains. (Figure 6)

Considering organizations as system, some actually straddle more than one domain. For example, a manufacturing company’s production and supply chain parts might be merely complicated, while sales and marketing might actually be complex, as illustrated here with System-C (Figure 7).

Systems can migrate to different domains over time. Here are a few examples of this phenomenon. Auto repair shops used to be simple up until the 1960s. “Shade tree” mechanics could maintain their own cars with a few basic
tools. However, by the turn of the millennium, even auto repair had become so complicated that only professional mechanics could handle it.

Before 9/11, it would be fair to say that the airlines were merely complicated. But the unpredictability to all aspects of their operations imposed by the terrorist attacks made that domain complex (unpredictable, and only understandable in retrospect).

Insurance companies were fairly simple in the 1950s. As they increased in size, they may have become complicated, but no more than that. However, the increasing complexity, and even chaos, imposed by the shrinking of our world and the unpredictability of international events, providing insurance has become equally complex. And sometimes insurance companies such as AIG fail to grapple with it effectively.

Computer manufacturing in the 1970s was fairly simple, enough so that Jobs and Wosniak could build their first commercial machines in their garage. By the 1990s, computers and their manufacture had become complicated. But it took the uncertainty of the Worldwide Web to make the whole business complex…and sometimes chaotic.

An Inadequate Management “Toolbox”

As we try to engage with and control the systems we are part of, we instinctively look for tools to help us—tools that can “turbocharge” our efforts and make us more effective. But there’s a problem with our toolbox: most of the tools we have (or have mastered) are quantitative, and intended to be used at the tactical or operational level, in either simple or (at most) complicated systems. There are far fewer qualitative or strategic-level tools to help leaders manage whole systems. Some of the existing system-level tools are no more than tactical-quantitative tools that people try to “elevate” to applications at strategic system levels. (Figure 8)

To briefly summarize, most of our available tools are suitable for ordered systems where variation, if not completely controlled, is at least predictable. In other words, they work like a charm in stable systems, but not so much in highly variable, unstable systems.

One way that leaders have attempted to deal with the vagaries of complex systems is through planning. But as Will Rogers once said, “Plans get you into things, but you got to...
work your own way out.” More to the point, though, is the old military axiom that “no plan survives first contact with the enemy.” And the military should know—they work in the most complex, often chaotic environment of all: the battlefield.

**Traditional Military Engagements**

Because of the inherent complexity and sometimes chaos of the combat environment, let’s consider military systems for a few minutes. Historically, dating back to the Greeks and Romans, warfare in western civilizations has been fairly simple, or at most, complicated. Masses of armies would line up against one another and advance in massive, deadly frontal assaults.

When the weapon were mostly spears, lances and swords it was bad enough. When firearms entered the equation, battles became devastating. And with the advent of automatic weapons and long-range artillery, frontal engagements became national level catastrophes.

Here’s what a typical frontal engagement of the 16th or 17th century looked like. (Figure 8) Notice the forces lined up directly against each other. Now consider that this is essentially the same kind of formation that the Greek phalanx used in battles 400 years before the birth of Christ.

And here are the results. These images, from World War I, show the fields of France, which stagnated into trench warfare for years, turned into the craters of the moon. (Figure 9) Casualties were massive, but who actually won these engagements? Nobody. It was a war of attrition, until Germany ran out of resources first. But as World War II approached, it was clear that at least some military minds were thinking differently. They were learning from past mistakes.

Fast-forward momentarily to today. We don’t see the pitched, massed battles of the first and second World Wars anymore. The last such engagement was Operation Desert Storm, about which a little more later. But the watchwords in the military these days are maneuver warfare and asymmetric warfare, executed by highly specialized, fast, violent, dangerous special warfare operators…such as Navy SEALs. Direct frontal assault is the farthest thing from their minds.

One of the brilliant military men of World War II was George Patton, whose Second Corps beat Rommel’s previously unbeatable Afrika Korps in North Africa. Patton was a student of history and of his opponents. He knew what the enemy was going to do, and that allowed him to do—heaven forfend!—the unexpected! (Figure 10)

Knowing your enemy is the key—the first step—in breaking the mold of traditional frontal assaults…whether in war or in business. The recognition of a new world of combat, and the transition from the traditional to the maneuver warfare world, really occurred in 1991, with the Desert Storm operation. The US military establishment was slow to wake up to the fact that
the asymmetric conflict that was Vietnam War was the trend of things to come. The “dinosaurs” held sway in the military community right up through 1990.

**Operation Desert Storm**

As the coalition forces built up during the last five months of 1990, readying themselves to eject the Iraqis from Kuwait, the coalition supreme commander, General Norman Schwarzkopf arrayed his forces much like this and built his war plan to overwhelm Iraqi strength with American and coalition strength. (Figure 11)

In early November 1990, General Schwarzkopf came back to Washington to brief Secretary of Defense Cheney on his war plan. When it came to the expected casualty estimates, Schwarzkopf said the planning models predicted 10,000 killed and many more wounded. Cheney, to his everlasting credit, balked.

Unknown to just about everyone in the country, Cheney called in a new participant. That new participant was retired Air Force colonel John Boyd, a former Pentagon staff officer whom Cheney had known when he was on the House Armed Services committee in Congress.

Boyd had cut a wide swath during his years in the Pentagon, rising from major to colonel before retiring in 1976. He had a well-earned reputation as “Genghis John,” and “the mad major” (before he was promoted to colonel). But after retirement, he stayed on as a consultant in the Office of the Secretary of Defense for more than a decade afterward. And he kept trying to convince anyone and everyone who would listen that the wave of the future was maneuver warfare.

In November 1990, Cheney brought Boyd to the Pentagon in the dead of night, and in a matter of hours Boyd laid out a daring plan to “bag” the Iraqi army by surprise. Cheney dispatched Schwarzkopf back to the Middle East to plan what became famously known as the “left hook.”

Per Boyd’s suggestion, the American 18th Corps and 7th Corps were secretly deployed a hundred miles to the west. When the air war started, the rest of the coalition moved up to the Kuwaiti border, in full sight of the Iraqis. When it was time for ground operations to begin, a US Marine Expeditionary Force pressed forward along the coast, heading for Kuwait City, as the Iraqis expected them to do. While their attention was fixed on this expected
frontal assault (which was a diversion), the 7th and 18th Corps raced forward, well out of Iraqi visual range to the west. The Iraqis weren’t even looking that way. Within 48 hours, these forces wheeled right and directly (and unexpectedly) into west flank of the Iraqi regular army and the Republican Guard. The devastation they wrought was terrible.

The air campaign “softened” the entrenched Iraqi positions for 40 days. Once the ground invasion commenced, the fighting was over in 96 hours. The Iraqi regular army was totally destroyed. 100,000 Iraqis were killed and 150,000 were captured. Two of three Republican Guard Divisions were totally destroyed, and the third retreated, wounded, to fight another day. On the US side, after advancing all the way to the Tigris River in Iraq, the American casualties totaled only 79. Boyd’s maneuver warfare concept was proven.

Boyd’s interest in the tactical aspects of maneuver warfare was a natural extension of his experience as a fighter pilot. He read voraciously, and his interests were eclectic—from thermodynamics and Heisenberg’s uncertainty principle to Erich Fromm’s *The Crisis of Psychoanalysis*. But he leaned heavily on the Sun Tzu’s *The Art of War*, Miyamoto Musashi’s *The Book of Five Rings*, and Heinz Guderian’s *Achtung Panzer!* in which he described his concept of the *blitzkrieg*, a German word meaning “lightning war.”

**Sun Tzu: *The Art of War***

Sun Tzu wrote about nearly every aspect of warfare and related statecraft. These are just a few of his most noteworthy prescriptions.

- **Plan ahead.** “The one who figures on victory at headquarters before even doing battle is the one who has the most strategic factors on his side…

- **Aim to deceive.** “All warfare is based on deception.”

- **Strike hard, fast, and get it over with quickly.** “There is no instance of a country having benefited from prolonged warfare.”
• **Know your enemy.** “If you know the enemy and know yourself, you need not fear the result of a hundred battles.”

• **Attack when the enemy is not prepared.** “Attack when they are unprepared. Make your move when they do not expect it.”

• **Attack where they don’t expect it.** “It is critical to attack resolutely where enemies are not expecting it…”

• **Don’t be rigid and inflexible; adapt to the conditions and the enemy’s formation.** “So a military force has no constant formation, water has no constant shape: the ability to gain victory by changing and adapting according to the opponent is called genius.”

Sun Tzu considered the pinnacle of military skill to be able to win without fighting. In other words, to create a “no-win” mentality in the opponent, so that they concede victory without even engaging forces.

**The Battle of Singapore**

Here’s a classic example of that philosophy. On December 8, 1941, General Tomoyuki Yamashita crossed Thailand with the 25th Imperial Japanese Army and attacked northern Malaya. This did not escape the notice of Lt. General Arthur Percival, the British commander in Singapore. But Yamashita had no ships, and the 25th Army was 800 miles away. More to the point, however, Percival received some really bad intelligence from his staff.

This poster, in the museum at Fort Siloso says everything that needs to be said about how much the British knew of the Japanese. *(Figure 13)*

Because the Malay Peninsula was so rugged and the 25th Army was so far away, there was no way the Japanese could ever approach from the landward side of Singapore. Consequently, all wartime preparation were focused seaward. All the heavy artillery was aimed that way.

Unfortunately, on February 1, Yamashita showed up at Percival’s back door with 36,000 combat troops. Across the strait, Percival still had more than 85,000 Australian, Indian, and British troops—nearly a 3-to-1 advantage. Percival blew up the causeway connecting Singapore with Johor Bahru and waited for Yamashita to try to cross over.

But though Percival had the manpower advantage and the water barrier in his favor, Yamashita had something better: audacity, and knowledge that Percival didn’t have...he knew Percival didn’t know how big his force was.

So on February 11, Yamashita demanded Percival’s unconditional surrender. And four days later, without even putting up a token resistance, Percival surrendered...to a force one-third the size of his own, on the other side of a water barrier. *(Figure 14)*

Here are some of the principles of Sun Tzu that proved their efficacy in the Battle of Singapore. Every one of them applied to Singapore, but the last four are particularly important.

Let me draw your attention in particular to the last one: **victory is a matter of unorthodox and orthodox methods.** This is the essence of the Chinese concept of *cheng* and *ch‘i*. 

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Cheng and ch’i are opposite sides of the same coin. (Figure 15) Cheng is the orthodox, what the adversary expects. It’s what you visibly appear to be doing. And it represents deception. Ch’i, on the other hand, represents the unorthodox, surprise. It’s the move that you keep hidden until the last possible second, when there’s no time for the adversary to counter it. In other words, it’s what you really intend to do, not what you show to the other side.

Musashi: The Prototypical Samurai Warrior

The next profound influence on Boyd was Miyamoto Musashi, the most famous person in Japanese history. He was the prototype of the Samurai warrior, killing 60 men in single combat by the age of 29. He killed his first opponent—an adult—when he was only 13 years old. Musashi invented the two-sword fighting technique. After his last victory, he retired to form his own fighting school. In 1645, he captured the philosophy of a lifetime devoted to perfecting his skill in The Book of Five Rings.

Much of what Musashi wrote coincided with, or independently reinforced, what Sun Tzu and his followers codified in The Art of War. But most of what Musashi wrote was intended for the individual, to help a fighter develop his own personal professional skill. This quotation from The Book of Five Rings is particularly important, and it’s related to something we’ll see in a few moments. (Figure 16)

Guderian and the Blitzkrieg

The next significant influence on Boyd was Heinz Guderian, the Prussian general who conceived the famous blitzkrieg, or lightning war, in his book about tank warfare in 1935. But Guderian’s contribution to Boyd’s philosophy had nothing to do with tanks and everything to do with leadership. It was more this leadership, and less the tanks, that made the blitzkrieg concept so devastatingly effective.

These were Guderian’s four leadership principles: Einheit, fingerspitzengefühl, auftragstaktik, and schwerpunkt.

Einheit means mutual trust. This is trust between the leader and those he or she leads. It’s also trust among subordinates, so it’s both vertical and horizontal.

Fingerspitzengefühl means, literally, “fingertip feel.” It’s the consummate skill developed over years of practice and training —the kind of practice that begins at the foot of the path and results in no-sword and no-intention, as prescribed my Musashi. Action becomes second nature.

Auftragstaktik is a kind of moral or social contract between a leader and subordinates. It’s a contract that sounds like this: “I, as a leader, will not ask you to do something that you are incapable of doing, or ask you to sacrifice your life for no good reason. You, if you accept my charge, agree to spare no effort to accomplish the mission that I’ve asked you to undertake, even to the sacrifice of your life.” This, of course, was the meaning as applied to warfare.

The final principle was that of schwerpunkt, or focus point. It represents the ultimate goal or objective. It can also mean a leverage point. Another way of looking at it is that this is the mission of the unit or organization. It is the responsibility of the leader to explain what the schwerpunkt is for everyone in the organization in away that everyone clearly understands it. In other words, everyone knows what the ultimate objective is.
So, if you’re able to apply those four principles, what do you get? In Guderian’s case, you get a large unit composed of many parts that can operate independently, reliably and with full assurance that they will both get the job done and be true to the mission.

First, this allows the leader to avoid micromanagement. Rather, he or she can lead by intent. What this means is that once the leader has established the *schwerpunkt*, he or she can say, “I want you to achieve this objective (described) by this date and time.” Then the planning and execution details can be left to the subordinate, with full confidence that the job will be done without having to be continually checking.

Second, it gives the subordinate the authority to operate independently, to be creative and even audacious. There is no need to go up-chain to ask the leader for guidance. When faced with an obstacle, the subordinate, who is already “in the boss’s head” as far as ultimate intent is concerned, can self-Pose the question: “What would the boss do in my place?” And knowing that answer without asking, the subordinate can press on with full confidence that he or she is doing the right thing.

From the perspective of the mission, it enables faster reaction to changing conditions. There’s no need to continually ask, “Mother may I?” In fact, the opposite is true. If a subordinate makes an error, it’s better to ask for forgiveness, while being “forward-leaning,” than to have to get permission for everything. This is the kind of leadership and operating philosophy that allowed a German panzer division composed of hundreds of independent units to move quickly, act in a coordinated way, and roll over entire countries in days or weeks, instead of the years of stagnation that the opposing forces experienced in World War I.

With Sun Tzu, Musashi and Guderian as prelude, what, then was Boyd’s contribution to maneuver warfare?

**John Boyd and the OODA Loop**

In his early years, as an instructor for six years at the Fighter Weapons School—the Air Force’s version of “Top Gun”—he was known as “40-second Boyd.” He got this name because of a standing offer he made to every fighter pilot who came through the school: *I can beat you in an aerial combat in 40 seconds or less, or I’ll pay you 40 dollars.* In six years, nobody ever collected on that bet, because in most cases he won in about 20 seconds.

In the 1960s, Boyd went on to develop what became known as the energy-maneuverability theory, the same principles that allowed him to become “40-second Boyd.” This theory was not only taught as the basis for both the Air Force and Navy fighter weapons schools, but it also dictated the designs of three of the most successful fighter aircraft in the world: The F-15, F-16, and A-10.

![Figure 17](Image)

John R. Boyd, 1992
As he neared retirement from the military, Boyd’s interests expanded as he saw maneuver warfare as an extension of his energy-maneuverability theory. He developed a simple but powerful concept called the OODA Loop.

The OODA Loop

Figure 17 depicts the OODA Loop. OODA is an acronym that stands for observe-orient-decide-act. Boyd suggested that whenever we act to do anything, from a lightning-fast fighter engagement to the completion of a complicated project, we unconsciously go through this four-step process. We observe what’s going on around us, taking in information from the external environment and unfolding events. Then we merge those observations with our established view of the world and how we believe things must, or ought to, be. This includes bringing to bear prior knowledge and experiences, cultural traditions, and even our genetic heritage to analyze and synthesize everything. The outcome of this orient step of the loop is a determination of the mismatch between what is really going on and what we think should be going on (or want to have going on). The magnitude and direction of that mismatch then drives us to decide what to do to close that gap. And when we’ve decided what to do, the final step in the loop is to act on that decision.

But that’s not the end of the process. It’s called a “loop” for a reason. Our action will have some impact on the environment. If it was the right action, the gap (or mismatch) between desires and reality should be closing. But how do we know that this is happening? We go back to the beginning and make a second set of observations, then re-orient again, and—if required—decide and act again. And this process repeats until the gap is closed, or until a new gap opens somewhere else.

In an aerial combat engagement, Boyd would go through this loop in a matter of seconds. In a tactical ground engagement, a loop might take hours or days. In business, it might take weeks or months. But the loop is basically the same: see what’s happening, process that information, decide what to do about it, and act. Then repeat the process.

Now, here’s the key with the OODA loop: If you’re in a competitive situation, whether it’s business or mortal combat, the faster you can complete a single cycle of the OODA loop, the better off you are. And if you can complete one cycle before your opponent does, the odds are high that you will win the engagement. If you can do two or more cycles before your adversary can complete one—as Musashi was able to do—your opponent becomes confused, uncertain, and often collapses from stagnation or inaction.

This is what Boyd referred to as “getting inside the opponent’s decision loop.” Before he can react to what you’ve done, you’re doing something completely different. This is exactly what happened to the Iraqi army and the Republican Guard during Operation Desert Storm.

The OODA Loop is based on two factors, one a requirement and the other a principle. The requirement is the practice of good situational awareness. It’s a military term that means noticing everything going on around you—the little things—and be continually processing these observations with what you expect to see. Any deviation may indicate an emerging situation that requires immediate action.

But to exercise situational awareness, you can’t have “tunnel vision.” You must exercise a whole-system perspective. Pay some attention to things that aren’t directly in front of you. For example, if you’re driving your car into an intersection where you have the green light, in your peripheral vision you may notice a car approaching from the left. You’re still looking ahead, but you’re noticing what’s happening on your left. And if you notice that car isn’t slowing down for the red light, your “orient” step should be telling you “Danger, Will Robinson!” so that you can slow down and avoid the car that may be about to run the red light. That’s situational awareness.

The second factor is speed. As the Iraqi army found out, “speed kills.” The faster you can complete a decision cycle in the OODA loop, the higher your chances for ultimate success. The difference between you and your adversary is this: though you both go through this OODA process, in many cases (maybe even most), your opponent is not consciously controlling the process. But if you are, and, like Musashi, you practice-practice-practice until sword becomes no-sword and intention becomes no-intention, your cycles naturally become faster…and it’s your opponent who dies, instead of you.

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Boyd offered a few other gems of wisdom to the maneuver warfare philosophy. One of these was the idea that the quality of OODA loop decisions was a function of individual creativity—the more creative you can be, the more effective your decisions can be and the faster the mismatches disappear.

Building Snowmobiles

Boyd used the analogy of building snowmobiles to illustrate what he called creative destruction. He suggested that someone took the idea of the seat and steering system from a lawn tractor, the boards from a set of skis, the treads from a tank, and the engine from an outboard motor, recombining them all to produce…a snowmobile—something that didn’t exist previously.

Boyd also insisted that people were the most important asset in any competition. I suspect that the Navy SEALs would agree with that statement. Boyd recognized that organizations are typically seduced by high-technology. He asserted that the right sequence of importance was PEOPLE, IDEAS, and then TECHNOLOGY—in that order.

Applying Maneuver Warfare Concepts to Business

So, now we come to the question I know you all have been wondering about: How do systems thinking and the concepts on maneuver warfare apply to us, in our organization? It’s obvious how these concepts apply to adversaries in war, because we have a tangible opponent that really exists. But it may be less obvious in a business setting.

The fact remains, however, that we may face one or more competitors in our line of business. If that’s the case, the applicability of maneuver warfare principles is fairly obvious—we have someone that we have to outthink.

But even if we’re not a competitive business—a not-for-profit organization, a government agency, or even a professional society—we still must function in an ever-changing environment, and those changes might be both quick and unpredictable. Even in this situation, the principles still apply—the OODA loops still works—because the changing environment constitutes the opponent. Instead of a live adversary, the opponent is an inanimate, insen-sate, but continually evolving external situation. Being able to detect changes and adjust quickly still produces similar results.

What would be your next steps from here? The first one would be “getting smart” on the theoretical foundations. Read the original sources first, then the modern adaptations of that theory to a contemporary environment. Then, applying Guderian’s concept of schwerpunkt, consider your system and decide what the single, overriding goal is and the limited set of critical success factors—probably no more than three or four—that must be satisfied in order to achieve that goal.

This diagram you see here (Figure 19), called a goal tree, is designed to graphically illustrate the dependent relationships between a goal, critical success factors, and the necessary tasks or conditions that must be completed.
to achieve them. This is a kind of roadmap to the goal. The one you see here might be appropriate for a not-for-profit organization.

The next thing you need is a general framework to guide your actions in attempting to achieve your goal. This diagram shows such a framework. It specifies the steps in developing and deploying a strategy at the top organizational level. If you look carefully, you can see the steps of the OODA Loop superimposed on the seven steps of the strategic framework. (Figure 20)

To summarize, we’ve examined four major components of effective maneuver warfare: blitzkrieg-type leadership, a guiding framework, basic operating principles, and a concrete methodology. All of these combine to deliver positive results, with speed and flexibility. And, aiding our understanding of the observation and orient step in the OODA loop, the entire paradigm in overlaid—embedded, actually—in an essential understanding of systems thinking. (Figure 21)

My advice to you: DON’T DELAY…you never know who might be getting inside your decision cycle!
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