Organic Design
for
Command and Control

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For information on this edition, please
see the last page.

The title chart provokes a couple of questions:

- Why the focus on C&C?
- What do we mean by “organic design”?

Failures

The past few years have seen the fiascos associated with **Nifty-Nugget** and **Proud Spirit** C&C exercises together with the real world fiascos epitomized by the evacuation of Saigon, Desert I and others.

Response

The institutional response for overcoming these fiascos is: more and better sensors, more communications, more and better computers, more and better display devices, more satellites, more and better fusion centers, etc.—all tied into one giant fully informed, fully capable C&C system. This way of thinking emphasizes hardware as the solution.

Another way

I think there is a different way—a way that emphasizes the implicit nature of human beings. In this sense, the following discussion will uncover what we mean by both implicit nature and organic design.

Implications

- Need **insight and vision**, to unveil adversary plans and actions as well as “foresee” own goals and appropriate plans and actions.
- Need **focus and direction**, to achieve some goal or aim.
- Need **adaptability**, to cope with uncertain and ever-changing circumstances.
- Need **security**, to remain unpredictable.

Elaboration

- **Why insight and vision?**

  Without insight and vision there can be no **orientation** to deal with both **present** and **future**.

- **Why focus and direction?**

  Without focus and direction, implied or explicit, there can be neither **harmony** of effort nor **initiative** for vigorous effort.

- **Why adaptability?**

  Adaptability implies variety and rapidity. Without **variety** and **rapidity** one can neither be unpredictable nor cope with changing and unforeseen circumstances.

- **Why security?**

  Without security one becomes predictable, hence one loses the benefits of the above.

Comment

With these thoughts in mind let's take a look at some appropriate samples from the historical environment that will, as we shall see, prove useful before trying to evolve any operational philosophy or command and control concept.

Samples from historical environment

Sun Tzu (around 400 B.C.)

Probe enemy to unmask his strengths, weaknesses, patterns of movement and intentions. Shape enemy's perception of world to manipulate/undermine his plans and actions. Employ *Cheng/Ch'i* maneuvers to quickly and unexpectedly hurl strength against weaknesses.

Bourcet (1764-71)

A plan ought to have several branches ... One should ... mislead the enemy and make him imagine that the main effort is coming at some other part. And ... one must be ready to profit by a second or third branch of the plan without giving one's enemy time to consider it.

Napoleon (early-1800's)

Strategy is the art of making use of time and space. I am less chary of the latter than the former. Space we can recover, time never ... I may lose a battle, but I shall never lose a minute. The whole art of war consists in a well reasoned and circumspect defensive, followed by rapid and audacious attack.

Clausewitz (1832)

Friction (which includes the interaction of many factors, such as uncertainty, psychological/moral forces and effects, etc.) impedes activity. "Friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper." In this sense, friction represents the climate or atmosphere of war.

Jomini (1836)

By free and rapid movements carry bulk of the forces (successively) against fractions of the enemy.

Samples from historical environment
(continued)

N.B. Forrest (1860's)

Git thar the fustest with the mostest.

Blumentritt (1947)

The entire operational and tactical leadership method hinged upon … **rapid,** concise assessment of situations ... **quick** decisions and **quick** execution, on the principle: 'each minute ahead of the enemy is an advantage.'

Balck (1980)

Emphasis upon creation of **implicit connections or bonds** based upon **trust**, **not mistrust**, that permit wide freedom for subordinates to exercise imagination and initiative—yet, harmonize within intent of superior commanders. Benefit: internal simplicity that permits rapid adaptability.

Yours Truly

Operate inside adversary's observation-orientation-decision-action loops to enmesh adversary in a world of uncertainty, doubt, mistrust, confusion, disorder, fear, panic chaos … and/or fold adversary back inside himself so that he cannot cope with events/efforts as they unfold.

Key points

- The atmosphere of war is friction.
- Friction is generated and magnified by menace, ambiguity, deception, rapidity, uncertainty, mistrust, etc.
- Friction is diminished by implicit understanding, trust, cooperation, simplicity, focus, etc.
- In this sense, variety and rapidity tend to magnify friction, while harmony and initiative tend to diminish friction.

In other words

- Variety/rapidity without harmony/initiative lead to confusion, disorder and ultimately to chaos.

on the other hand

- Harmony/initiative without variety/rapidity lead to (rigid) uniformity, predictability and ultimately to non-adaptability.

? Raises the question ?

- How do we generate harmony/initiative so that we can exploit variety/rapidity?

Comment

- We must uncover those **interactions** that foster harmony and initiative—yet do not destroy variety and rapidity.

Interactions

Positive

Activities

- Radio transmission/reception
- Conversation/writing
- Operational intelligence center
- Teamwork
- Tradeoffs
- Hans Rudel

Linkages

- Common frequencies
- Common language
- Correlation among multiple sources
- Harmony of different efforts
- Inversely related characteristics
- Image of activities and changes thereto

Negative

- Compartmentation
- Non-cooperative centers of gravity
- Alienation
- Non-adaptation
- Fixed recipe
- Disconnected bits and pieces
- Islands of disconnected effort
- Disconnected from other humans
- Disconnected from environment
- Disconnected from environment, but connected to some formality

Insight

Interactions, as shown, represent a **many-sided implicit cross-referencing process of projection, empathy, correlation, and rejection**.

Suspicion

Seems as though this insight is related in some way to orientation, hence it ...

? Raises the question ?

What do we mean by orientation?

Message

Orientation, **seen as a result**, represents images, views, or impressions of the world shaped by **genetic heritage**, **cultural tradition**, **previous experiences**, and **unfolding circumstances**.

? Raises another question ?

How are these images, views, or impressions created?

Message

Referring back to our previous discussion, we can say: orientation **is an interactive process of many-sided implicit cross-referencing projections, empathies, correlations, and rejections** that is **shaped by** and **shapes** the interplay **of genetic heritage, cultural tradition, previous experiences,** and **unfolding circumstances**.

Illumination

- Orientation is the *Schwerpunkt*. It shapes the way we interact with the environment—hence orientation shapes the way we **observe**, the way we **decide**, the way we **act**.

In this sense

- Orientation shapes the character of present observation-orientation-decision-action loops—while these **present** loops shape the character of **future** orientation.

Implication

- We need to create mental images, views, or impressions, hence patterns that match with activity of world.
- We need to deny adversary the possibility of uncovering or discerning patterns that match our activity, or other aspects of reality in the world.

Essential idea

Patterns (hence, orientation), right or wrong or lack thereof, suggest ability or inability to conduct many-sided implicit cross-references.

? Raises question ?

How do we set-up and take advantage of the many-sided implicit cross-referencing process of projection, empathy, and correlation, rejection that make appropriate orientation possible?

Message

Expose individuals, with different skills and abilities, against a variety of situations—whereby each individual can **observe** and **orient** himself simultaneously to the others and to the variety of changing situations.

? Why ?

In such an environment, a harmony, or focus and direction, in operations is created by the bonds of **implicit communications** and **trust** that evolve as a consequence of the similar mental images or impressions each individual creates and commits to memory by repeatedly sharing the **same** variety of experiences in the **same** ways.

Beneficial payoff

A command and control system whose secret lies in what's unstated or not communicated to one another (in an explicit sense)—in order to exploit lower-level initiative yet realize higher-level intent, thereby diminish friction and compress time, hence gain both quickness and security.

? Raises question ?

What happens if we **cannot establish these implicit connections or bonds**—via similar mental images or impressions—as basis to cope with a many-sided uncertain and ever-changing environment?

Illumination

- The previous discussion assumes interaction with both the **external** and **internal** environment. Now, let us assume, for whatever reason or combination of circumstances, that we design a command and control system that hinders interaction with **external** environment. This implies a focus inward, rather than outward.
- Picking up on this idea, we observe from Darwin that:
  - The environment selects.
  - Ability or inability to interact and adapt to exigencies of environment select one **in** or **out**.
- Furthermore, according to the Gödel Proof, the Heisenberg Uncertainty Principle, and the Second Law of Thermodynamics:
  - One cannot determine the character or nature of a system within itself.
  - Moreover, attempts to do so lead to confusion and disorder. Why? Because in the "real world" the environment intrudes (my view).
- Now, by applying the ideas of Darwin, the Second Law, Heisenberg, and Gödel to Clausewitz one can see that:

> He who can generate many non-cooperative centers of gravity magnifies friction. Why? Many non-cooperative centers of gravity within a system restrict interaction and adaptability of system with its surroundings, thereby leading to a focus inward (i.e., within itself), which in turn generates confusion and disorder, which impedes vigorous or directed activity, hence, by definition, magnifies friction or entropy.

Point

- Any command and control system that forces adherents to look inward, leads to dissolution/disintegration (i.e., system comes unglued).

In a much larger sense

- **Without the implicit bonds or connections**, associated with similar images or impressions, there can be **neither harmony nor individual initiative** within a collective entity, therefore, **no way** that such an organic whole can stay together and cope with a many-sided uncertain and ever-changing environment.

or equivalently

- **Without implicit bonds or connections**, we magnify friction, produce paralysis, and get system collapse.

Insight

The key idea is to emphasize **implicit** over explicit in order to gain a favorable mismatch in **friction** and **time** (i.e, ours lower than any adversary's) for superiority in shaping and adapting to circumstances.

? Raises question ?

How do we do this?

Message

- Suppress tendency to build-up **explicit internal** arrangements that **hinder interaction** with **external** world.

Instead

- Arrange setting and circumstances so that leaders and subordinates alike are given opportunity to continuously **interact** with **external** world, and with each other, in order to **more quickly** make many-sided implicit cross-referencing projections, empathies, correlations, and rejections as well as create the similar images or impressions, hence a similar implicit orientation, needed to form an organic whole.

Why?

- A **similar implicit orientation** for commanders and subordinates alike will allow them to:
  - Diminish their friction and reduce time, thereby permit them to:
  - Exploit variety/rapidity while maintaining harmony/initiative, thereby permit them to:
  - Get inside adversary's O-O-D-A loops, thereby:
  - Magnify adversary's friction and stretch-out his time (for a favorable mismatch in friction and time), thereby:
  - Deny adversary the opportunity to cope with events/efforts as they unfold.

Circling back to the beginning

- We can see that **implicit orientation** shapes the character of:
  - Insight and vision
  - Focus and direction
  - Adaptability
  - Security

Implication

- Since a first rate command and control system should possess above qualities, any design or related operational methods should play to and expand, not play down and diminish, **implicit orientation**.

Comment

Up to this point we have shown **orientation** as being a critical element in command and control—implying that without orientation there is no command and control worthy of the name.

Very nice

But, simply stated, what does this comment and everything else we've discussed so far tell us about command and control?

Illumination

- The process of observation-orientation-decision-action represents what takes place during the command and control process—which means that the O-O-D-A loop can be thought of as being the C&C loop.
- The second O, orientation—as the repository of our genetic heritage, cultural tradition, and previous experiences—is the **most important part** of the O-O-D-A loop since it shapes the way we observe, the way we decide, the way we act.

Implication

- Operating inside adversary's O-O-D-A loop means the same thing as operating inside adversary's C&C loop.

Which

? Raises the question ?

How can we get effective command and control?

Some historical snapshots

In responding to this question let us take a look at some evidence (provided by Martin van Creveld as well as myself) that may help in this regard:

- Napoleon's use of staff officers for personal reconnaissance
- Moltke's message "directives" of few words
- British tight control at the Battle of the Somme in 1916
- British GHQ "phantom" recce regiment in WW II
- Patton's "household cavalry"
- My use of "legal eagle" and comptroller at NKP.

A richer view

In the June 1967 War, " ... General Yashayahu Gavish spent most of his time either 'accompanying' units down to brigade level—by which, according to his own definition, he meant staying at that unit's command post and observing developments at first hand—or else helicoptering from one unit to another; again, in his own words, 'there is no alternative to looking into a subordinate's eyes, listening to his tone of voice'. Other sources of information at his disposal included the usual reporting system; a radio network linking him with three divisional commanders, which also served to link those commanders with each other; a signals staff whose task it was to listen in to the divisional communications networks, working around the clock and reporting to Gavish in writing; messages passed from the rear, i.e., from General Headquarters in Tel Aviv, linked to Gavish by 'private' radiotelephone circuit; and the results of air reconnaissance forwarded by the Air Force and processed by Rear Headquarters. Gavish did not depend on these sources exclusively, however; not only did he spend some time personally listening in to the radio networks of subordinate units (on one occasion, Gavish says, he was thereby able to correct an 'entirely false' impression of the battle being formed at Brigadier Gonen's headquarters) but he also had a 'directed telescope' in the form of elements of his staff, mounted on half tracks, following in the wake of the two northernmost divisions and constantly reporting on developments."

Martin van Creveld, *Command in War*, 1982, pp. 199-200.

Point

The previous discussion once again reveals our old friend—the many-sided implicit cross-referencing process of projection, empathy, correlation, and rejection.

? Raises question ?

Where does this lead us?

Epitome of “Command and Control”

Nature

- Command and control must permit one to direct and shape what is to be done as well as permit one to modify that direction and shaping by assessing what is being done.

What does this mean?

- Command must give direction in terms of what is to be done in a clear unambiguous way. In this sense, command must interact with system to shape the character or nature of that system in order to realize what is to be done;

whereas

- Control must provide assessment of what is being done also in a clear unambiguous way. In this sense, control must not interact nor interfere with system but must ascertain (not shape) the character/nature of what is being done.

Implication

- Direction and shaping, hence “command”, should be evident while assessment and ascertainment, hence "control", should be invisible and should not interfere—otherwise “command and control” does not exist as an effective means to improve our fitness to shape and cope with unfolding circumstances.

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- Control must provide assessment of what is being done also in a clear unambiguous way. In this sense, control must not interact nor interfere with system but must determine (not shape) the character/nature of what is being done.

Implication

- Direction and shaping, hence “command,” should be evident while assessment and determination, hence “control”, should be invisible and should not interfere—otherwise “command and control” does not exist as an effective means to improve our fitness to shape and cope with unfolding circumstances.

Illumination

- Reflection upon the statements associated with the Epitome of “Command and Control” leave one unsettled as to the accuracy of these statements. Why? Command, by definition, means to direct, order, or compel while control means to regulate, restrain, or hold to a certain standard as well as to direct or command.
- Against these standards it seems that the command and control (C&C) we are speaking of is different than the kind that is being applied. In this sense, the C&C we are speaking of seems more closely aligned to **leadership** (rather than command) and to some kind of **monitoring** ability (rather than control) that permits leadership to be effective.
- In other words, leadership with monitoring, rather than C&C, seems to be a better way to cope with the multi-faceted aspects of uncertainty, change, and stress. On the other hand, monitoring, *per se*, does not appear to be an adequate substitute for control. Instead, after some sorting and reflection, the idea of **appreciation** seems better. Why? First of all, appreciation includes the recognition of worth or value and the idea of clear perception as well as the ability to monitor. Moreover, next, it is difficult to believe that leadership can even exist without appreciation.
- Pulling these threads together suggests that **appreciation and leadership** offer a more appropriate and richer means than C&C for shaping and adapting to circumstances.

? Raises question ?

Where does this lead us?

Appreciation and leadership

Nature

- Appreciation and leadership permit one to discern, direct and shape what is to be done as well as permit one to modify the direction and shaping by assessing what is being done or about to be done (by friendlies as well as adversaries).

What does this mean?

- Appreciation, as part of leadership, must provide assessment of what is being done in a clear unambiguous way. In this sense, appreciation must not interact nor interfere with system but must discern (not shape) the character/nature of what is being done or about to be done;

whereas

- Leadership must give direction in terms of what is to be done also in a clear unambiguous way. In this sense, leadership must interact with system to shape the character or nature of that system in order to realize what is to be done.

Implication

- Assessment and discernment should be invisible and should not interfere with operations while direction and shaping should be evident to system-otherwise appreciation and leadership do not exist as an effective means to improve our fitness to shape and cope with unfolding circumstances.

Suspicion

The previous discussion suggests that the title “Organic Design for Command and Control” is not appropriate.

? Why ?

C&C represents a top-down mentality applied in a rigid or mechanical (or electrical) way that ignores as well as stifles the **implicit** nature of human beings to deal. with uncertainty, change, and stress. (Examples: The Battle of the Somme, Evacuation of Saigon, Mayaguez Affair, Desert I, Nifty-Nugget and Proud Spirit C&C exercises, etc.).

Resolution

With these thoughts in mind, I suggest that the following title more clearly reflects the spirit and content of this presentation.

Appreciation and leadership

Definitions

- **Understanding** - means to comprehend or apprehend the import or meaning of something.
- **Command** - refers to the ability to direct, order, compel with or without authority or power.
- **Control** - means to have power or authority to regulate, restrain, verify, (usually against some standard) direct or command. Comes from medieval Latin *contrarotulus*, a “counter roll” or checklist (*contra*, against plus *rotulus*, list).
- **Monitoring** - refers to the process that permits one to oversee, listen, observe, or keep track of as well as to advise, warn, or admonish.
- **Appreciation** - refers to the recognition of worth or value, clear perception, understanding, comprehension, discernment, etc.
- **Leadership** - implies the art of inspiring people to enthusiastically take action toward the achievement of uncommon goals.

About this edition

This edition of “Organic Design” is our attempt to recreate the last version of the briefing actually presented by the late Col John Boyd, USAF (1927 – 1997). The last printed version known to exist carries the date May 1987. We have used that as the starting point, and then modified the text based on changes we received from Col Boyd, which continued until around 1991. By that time, he had moved on to other activities, including the briefing *Conceptual Spiral* (1992), his advice to then-Secretary of Defense Dick Cheney during the First Gulf War, and his interest in other forms of conflict, including business.

About the Editors

Chuck Spinney was a colleague of Boyd’s both in the Air Force and in the Office of the Secretary of Defense, where he participated in every edition of the *Discourse.* Chuck is the author of *Defense Facts of Life* and numerous monographs and op-eds. His commentaries on defense issues appear from time to time in his blog, http://chuckspinney.blogspot.com/.

Chet Richards worked with Col Boyd on his first paper, “Destruction and Creation,” on his later presentations, *Conceptual Spiral* and *The Essence of Winning and Losing*, and near the end of Boyd’s life, on business applications. He is a retired colonel in the Air Force, and wrote a book, *Certain to Win (2004)*, that applies Boyd’s concepts to business. He is also the author of three books on defense policy. His blog is http://slightlyeastofnew.com

Ginger Richards was co-owner and president of Kettle Creek Corporation and created the layouts for the PowerPoint and Keynote versions of all Boyd’s briefings.

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