

I

I might

I Situation Result

- letter → word
- word → sentence
- sentence → paragraph
- paragraph → page/chapter
- page → book
- book → volume
- volume → delivery

• More meaning and richness as we climb the mountain of connections.

II Immediate Ideas

- Against this framework one word principles of war have no meaning - since they have no connections
- On the other hand, carefully crafted treatises (dropping with logic) that supposedly "reveal" all connections make for stereotype, like cookbooks, tactics and strategy

III Way Out

- Lay out statements (à la Sun Tzu style) that stand independently yet admit or suggest multiple connections to the disciplined mind tempered by varied experiences and education

ORGANIC DESIGN

for

COMMAND AND CONTROL

10/2/82

11/3/82

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1

THE TITLE CHART PROVOKES A COUPLE QUESTIONS:

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

1A
30/6/82

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 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.

1 B
30/6/82

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 everchanging 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 BC)

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 those 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 (CONT'D)

- 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 initiative and imagination--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 as basis to destroy his cohesion or harmony, thereby deprive him of the opportunity to 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 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 Rude1

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, 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?

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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, 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, 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 communication and trust developed 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 diminish friction, compress time, and exploit initiative at all levels, thereby gain both quickness and security.

? - RAISES QUESTION - ?

What happens if we cannot establish implicit connections or bonds as basis to cope with
a many-sided uncertain and everchanging 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/ascertain the character or nature of a system via self reference (i.e., 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 restrict interaction and adaptability, thereby leading to a form of self reference, 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 implicit bonds or connections, 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 everchanging 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), 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, correlations, and rejections (i.e., implicit orientation) as well as create the implicit connections or bonds necessary to form an organic whole.

? Why ?

- Implicit orientation will permit commanders and subordinates alike 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.

revised model are: (1) a source, (2) an encoder, (3) a message, (4) a channel, (5) a decoder, and (6) a receiver. For some communication systems, the components are as simple to specify as, for instance, (1) a man on the telephone, (2) the mouthpiece of the telephone, (3) the words the man speaks, (4) the electrical wires along which the words (now electrical impulses) travel, (5) the earpiece of another telephone, and (6) the mind of the listener. In other communication systems, the components are more difficult to isolate; e.g., the communication of the emotions of a fine artist by means of a painting to people who may respond to the message long after the artist's death.

Begging a multitude of psychological, aesthetic, and sociological questions concerning the exact nature of each component, the model appeared, from the common-sense perspective, to explain in general terms the ways in which certain classes of communication occurred. It did not indicate the reason for the inability of certain communications—obvious in daily life—to fit its neat paradigm.

Entropy, negative entropy, and redundancy. Another concept, first called by Shannon a "noise source" but later associated with the notion of entropy (a principle derived from physics), was imposed upon the communication model. Entropy is analogous in most communication to audio or visual static—that is, to outside influences that diminish the integrity of the communication and, possibly, distort the message for the receiver. Negative entropy may also occur in instances in which incomplete or blurred messages are nevertheless received intact, either because of the ability of the receiver to fill in missing details or to recognize, despite distortion or a paucity of information, both the intent and content of the communication.

Although rarely shown on diagrammatic models of this version of the communication process, redundancy—the repetition of elements within a message that prevents the failure of communication of information—is the greatest enemy of entropy. Most written and spoken languages, for example, are roughly half-redundant. If 50 percent of the words of this article were taken away at random, there would still remain an intelligible—although somewhat peculiar—essay. Similarly, if one-half of the words of a radio news commentator are heard, the broadcast can usually be understood. Redundancy is apparently involved in most human activities, and, because it helps to overcome the various forms of entropy that tend to turn intelligible messages into unintelligible ones (including psychological entropy on the part of the receiver), it is an indispensable element for effective communication.

Messages are therefore susceptible to considerable modification and mediation. Entropy distorts, while negative entropy and redundancy clarify; as each occurs differentially in the communication process, the chances of the message being received and correctly understood vary. Still, the process (and the model of it) remains conceptually static, because it is fundamentally concerned with messages sent from point to point, and not with their results or possible influences upon sender and receiver.

Feedback. To correct this flaw, the principle of feedback was added to the model and provided a closer approximation of interpersonal human interaction than was known theretofore. This construct was derived from the studies of Norbert Wiener, the so-called father of the science of cybernetics (q.v.). Wiener's cybernetic models, some of which provide the basis for current computer technology, were designed to be responsive to their own behaviour; that is, they audited their own performances mathematically or electronically in order to avoid errors of entropy, unnecessary redundancy, or other simple hazards.

Certain types of common communications—Christmas cards, for instance—usually require little feedback. Others, particularly interactions between human beings in conversation, cannot function without the ability of the message sender to weigh and calculate the apparent effect of his words on his listener. It is largely the aspect of feedback that provides for this model the qualities of a process, because each instance of feedback conditions or alters the subsequent messages.

Dynamic models. Other models of communication processes have been constructed to meet the needs of students of communication whose interests differ from quantitatively oriented theorists like Shannon, Weaver and Wiener. While the model described above displays some generality and shows simplicity, it lacks some of the predictive, descriptive, and analytic powers found in other approaches. A psychologist, Theodore M. Newcomb for example, has articulated a more fluid system of dimensions to represent the individual interacting in his environment. Newcomb's model and others similar to it are not as precisely mathematical (quantitative) as Shannon's and thus permit more flexible accounts of human behaviour and its variable relationships. They do not deny the relevance of linear models to Shannon and Weaver's main concerns—quanta of information and the delivery of messages under controlled conditions—but they question their completeness and utility in describing cognitive emotional, and artistic aspects of communication as they occur in socio-cultural matrices.

Students concerned mainly with persuasive and artistic communication often centre attention upon different kinds, or modes, of communication (i.e., narrative, pictorial, and dramatic) and theorize that the messages they contain, including messages of emotional quality and artistic content, are communicated in various manners to and from different sorts of people. For them, the stability and function of channel or medium are more variable and less mechanistically related to the process than they are for followers of Shannon and Weaver and psychologists like Newcomb. (McLuhan, indeed, asserts that the channel actually dictates, or severely influences, the message—both as sent and received.) Many analysts of communication, linguistic philosophers, and others are concerned with the nature of messages, particularly their compatibility with sense and emotion, their style, and the intentions behind them. They find both linear and geometric models of process of little interest to their concerns, although considerations related to these models particularly those of entropy, redundancy, and feedback have provided significant and productive concepts for most students of communication (see also CYBERNETICS INFORMATION THEORY).

Applications of formal logic and mathematics. Despite the numerous types of communication or information theory extant today—and those likely to be formulated tomorrow—the most rationally and experimentally consistent approaches to communication theory so far developed follow the constructions of Shannon and others described above. Such approaches tend to employ the structural rigours of logic rather than the looser syntaxes of grammars, and vocabularies of common languages, with their symbolic, poetic, and inferential aspects of meaning.

Cybernetic theory and computer technology require rigorous but straightforward languages to permit translation into nonambiguous, special symbols that can be stored and utilized for statistical manipulations. The closed system of formal logic proved ideal for this need. Premises and conclusions drawn from syllogisms according to logical rules may be easily tested in a consistent, scientific manner, as long as all parties communicating share the rational premises employed by the particular system.

That this logical mode of communication drew its frame of discourse from the logic of the ancient Greeks was inevitable. Translated into an Aristotelian manner of discourse, meaningful interactions between individuals could be transferred to an equally rational closed system of mathematics: an arithmetic for simple transactions, an algebra for solving certain well-delimited puzzles, a calculus to simulate changes, rates and flows, and a geometry for purposes of illustration and model construction. This progression has proved quite useful for handling those limited classes of communications that arise out of certain structured, rational operations, like those in economics, inductively oriented sociology, experimental psychology, and other behavioral and social sciences, as well as in most of the natural sciences.