

WAR, CHAOS, AND BUSINESS

Results From The New
Philosophy Of Conflict,

With Conjectures Concerning
The World Of Business

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Revision 5
June 1989

 **Lockheed**
Aeronautical Systems Company

SAMURAI STRATEGY

VICTORY IS ACHIEVED IN THE HEIHŌ OF CONFLICT
BY ASCERTAINING THE RHYTHM OF EACH OPPONENT, BY
ATTACKING WITH A RHYTHM NOT ANTICIPATED BY THE
OPPONENT, AND BY THE USE OF KNOWLEDGE OF THE
RHYTHM OF THE ABSTRACT.

MIYAMOTO MUSASHI, THE BOOK OF FIVE
RINGS, C. 1645.

AGENDA

Two Exerpts From The Historical Record

Lessons From War

Applications To Business

Why Some Teams Win (Time After Time)

What's Going On In The Literature

Sources and References

The race is not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favor to men of skill; but time and chance happeneth to them all.

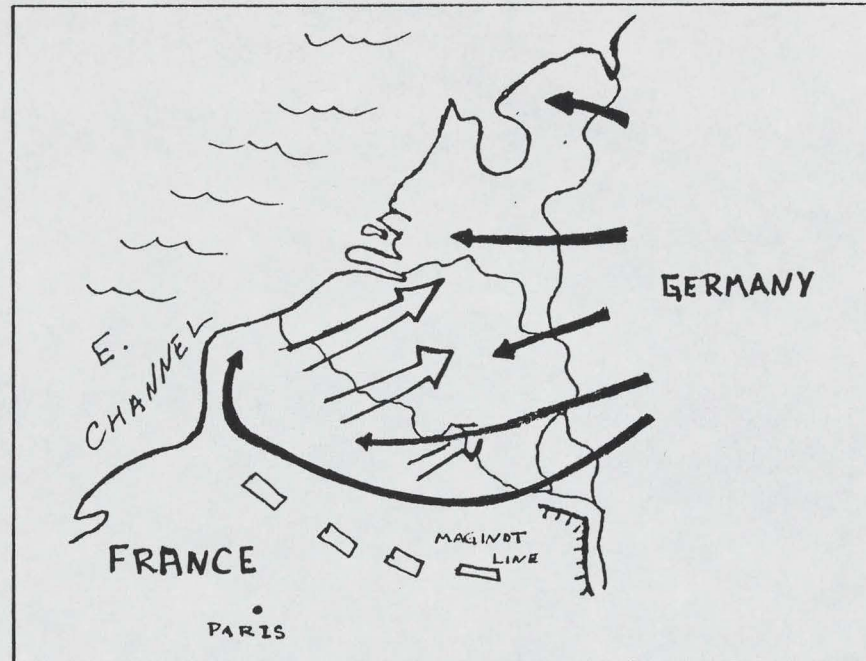
Ecclesiastes, 9,11

Lesson From the Theory of Conflict

In a competitive situation, there are things you can do to help time and chance along.

BLITZKRIEG!

Western Front, May 1940



Interesting Facts:

1. The two forces were roughly equal in size. The Allies actually had more tanks.
2. The French had been preparing for a German attack (France declared war on Germany on September 3, 1939.)
3. The Germans had to attack between the Maginot Line and the English Channel, a front of less than 200 miles.

HOW THE GERMANS DID IT

LIDDELL HART'S ANALYSIS

"THE ISSUE TURNED ON THE TIME FACTOR AT STAGE AFTER STAGE.
FRENCH COUNTER-MOVEMENTS WERE REPEATEDLY THROWN OUT OF
GEAR BECAUSE THEIR TIMING WAS TOO SLOW TO CATCH UP WITH
THE CHANGING SITUATIONS . . .

"THE FRENCH, TRAINED IN THE SLOW-MOTION METHODS OF WORLD
WAR I WERE MENTALLY UNFIT TO TO COPE WITH THE NEW TEMPO,
AND IT CAUSED A SPREADING PARALYSIS AMONG THEM."

(EMPHASIS ADDED)

STRATEGY, PP. 131-132.

IN 1981, YAMAHA ANNOUNCED THAT IT WOULD BECOME THE WORLD'S LARGEST MOTORCYCLE MANUFACTURER, A POSITION THEN HELD BY HONDA.

ITS PRESTIGE THUS CHALLENGED, HONDA COUNTERATTACKED BY:

1. ADOPTING THE WAR CRY "YAMAHA WO TSUBUSU!" ("WE WILL CRUSH, SQUASH, SLAUGHTER YAMAHA!")
2. CUTTING PRICES, FLOODING DISTRIBUTION CHANNELS, AND INCREASING ADVERTISING.
3. IN THE NEXT EIGHTEEN MONTHS, INTRODUCING 113 NEW MODELS TO REPLACE THE 60 IT HAD AT THE START OF THE WAR, EFFECTIVELY TURNING OVER ITS ENTIRE PRODUCT LINE TWICE.

IN CONTRAST, YAMAHA WAS ONLY ABLE TO BRING OUT 37 NEW MODELS.

4. REDEFINING THE TERMS OF THE MOTORCYCLE MARKET AS A MATTER OF FASHION, WHERE NEWNESS WAS OF ITSELF A MATTER OF CUSTOMER VALUE.

NEXT TO A HONDA, A YAMAHA LOOKED DRAB AND UNIMAGINATIVE.

ANALYSIS: HONDA HAD "MANAGED STRUCTURAL CHANGES THAT ENABLED THEIR OPERATIONS TO EXECUTE THEIR PROCESSES MUCH FASTER."

AFTER 18 MONTHS, YAMAHA ACCEPTED A HUMILIATING SURRENDER: "WE WANT TO END THE H-Y WAR. IT WAS OUR FAULT."

SOURCE: STALK, "TIME--THE NEXT SOURCE OF COMPETITIVE ADVANTAGE," HBR 4/88.

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LESSONS FROM THAT MOST COMPETITIVE OF
HUMAN ENDEAVOURS:

-- WAR --

NATURE OF WAR

IS IT:

$$\begin{array}{c} \text{CAPABILITY OF} \\ \text{A FORCE} \end{array} = \left(\begin{array}{c} \text{EFFECTIVENESS OF} \\ \text{EACH WEAPON} \end{array} \right) \times \left(\begin{array}{c} \text{NUMBER OF} \\ \text{WEAPONS} \end{array} \right) ?$$

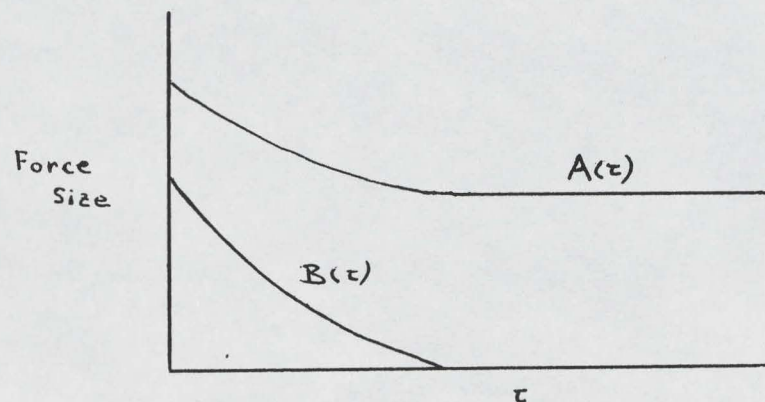
TRADITIONAL MODELS OF COMBAT

AT THE HEART OF PRACTICALLY EVERY "SIMULATION" OF
COMBAT LIES THE LANCHESTER SQUARE LAW:

$$dA/dt = -b * B(t)$$

$$dB/dt = -a * A(t)$$

WHICH LEADS TO:



QUESTION: WHY DOES THE LOSING FORCE JUST
SIT THERE AND TAKE IT?

QUITE OFTEN THE SMALLER, OR LESS
TECHNOLOGICALLY ADVANCED,
FORCE WINS

ARABS VS. PERSIA, BYZANTINE EMPIRE, ETC.	633 - 732
MONGOLS VS. CHINA, RUSSIA, ETC	1211 - 1260
AMERICAN COLONIES VS. GREAT BRITAIN	1775 - 1781
GERMANY VS. FRANCE & ENGLAND	1940
ISRAEL VS. ARAB STATES	1947 - 1973
VIETNAM VS. UNITED STATES	1958 - 1975
AFGHANISTAN VS. USSR	1980 - 1988
CHAD VS. LIBYA	1987

"The Americans would be less dangerous if they had a regular army."

--British General Frederick Haldimand, Boston, 1776, in
Weigley, 18

PERHAPS LANCHESTER DOES NOT
DESCRIBE REAL WAR?

"ALL WARFARE IS BASED UPON DECEPTION." -- SUN TZU, C. 500 BC

"WAR IS TRICKERY." -- MUHAMMAD, PROPHET OF ISLAM, C. 600 AD

"FRICTION IS THE ONLY CONCEPT THAT ... DISTINGUISHES
REAL WAR FROM WAR ON PAPER. -- CLAUSEWETZ, 1830.

"MYSTIFY, MISLEAD, AND SURPRISE." -- STONEWALL JACKSON

"FLOAT LIKE A BUTTERFLY, STING LIKE A BEE." -- MUHAMMED ALI,
C. 1965

"Ah Colonel, all is fair in love and war, you know." -- Confederate
General Nathan Bedford Forrest to Union Colonel Streight, who had
just been tricked into surrendering his 1700 men to Forrest's 400,
Alabama, May, 1863 (Herr, 100).

SUCCESS IN WAR

APPEARS TO DEPEND MORE ON OUT-THINKING AN OPPONENT THAN ON OVERPOWERING HIM:

"...slip around past the formation...then break the enemy formation into meaningless chunks that didn't know what they were doing...the way they fought seemed like the only intelligent way, the only possible way." (Orson Scott Card, Ender's Game, 194.)

QUESTION: HOW TO DO THIS, GIVEN:

1. $IQ(\text{ours}) = IQ(\text{theirs})$
2. WE CANNOT (ACCURATELY) PREDICT THE FUTURE.

RESULTS FROM MILITARY PHILOSOPHY

TO WIN:

1. SIMULTANEOUSLY APPEAR MENACING AND AMBIGUOUS

BY

2. OPERATING AT A FASTER DECISION TEMPO THAN YOUR OPPONENT

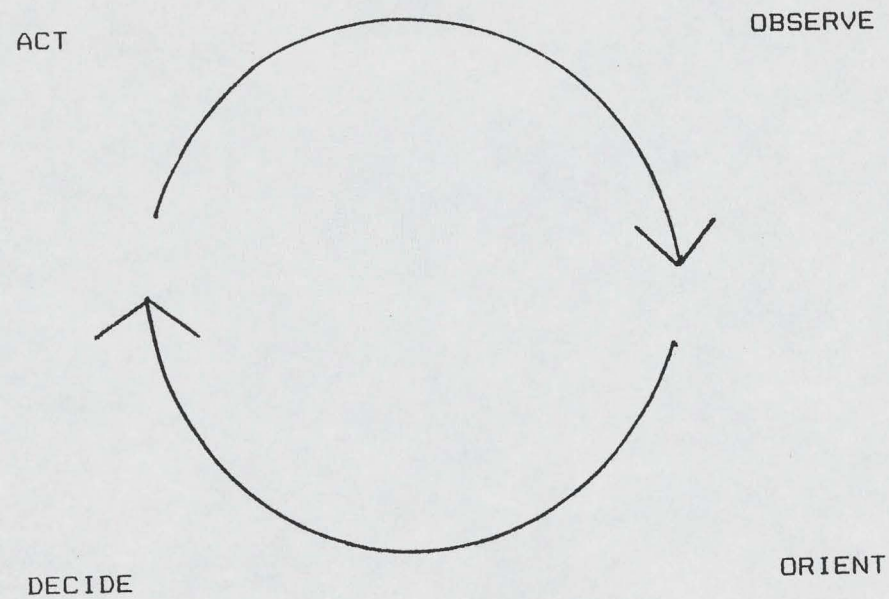
WHILE

3. STRESSING INTELLIGENCE AND SECURITY

"I have been obliged to practice that by finesse which I dared not attempt by force."

--American Revolutionary War General
Nathanael Greene, in Weigley, 36.

DECISION TEMPO AND AGILITY



THE OODA LOOP

J.R. BOYD,
"PATTERNS"

FUNDAMENTAL OBSERVATIONS OF
AGILITY THEORY

1. GIVEN TWO SYSTEMS IN A ZERO-SUM SITUATION WITH SURVIVAL OR SURVIVAL-ON-OWN-TERMS AT STAKE, THEN THE SYSTEM THAT EXECUTES ITS OODA LOOP MORE RAPIDLY WILL BEGIN TO APPEAR AMBIGUOUS TO ITS OPPONENT.
2. IF THIS CONTINUES, THE RESULT WILL BE TO "GENERATE UNCERTAINTY, CONFUSION, DISORDER, PANIC, CHAOS, ... TO SHATTER COHESION, PRODUCE PARALYSIS, AND BRING ABOUT COLLAPSE" OF THE LESS AGILE SYSTEM.

BOYD, op. cit.

SECOND IMPRESSION

Transients

- Observe, Orient, Decide and Act more inconspicuously, more quickly, and with more irregularity...

or put another way

- Operate inside adversary's Observation-Orient-Decision-Action loops or get inside his Mind-Time-Space.

Permits
one to

Intentions

- Probe and test adversary to unmask strengths, weaknesses, maneuvers, and intentions.
- Employ a variety of measures that interweave menace-uncertainty-mistrust with tangles of ambiguity-deception-novelty as basis to sever adversary's moral ties and disorient...
- Select initiative (or response) that is least expected.
- Establish focus of main effort together with other effort and pursue directions that permit many happenings, offer many branches, and threaten alternative objectives.
- Move along paths of least resistance (to reinforce and exploit success).
- Exploit, rather than disrupt or destroy, those differences, frictions, and obsessions of adversary organism that interfere with his ability to cope...
- Subvert, disorient, disrupt, overload, or seize adversary's vulnerable, yet critical, connections, centers, and activities...in order to dismember organism and isolate remnants for mop-up or absorption.
- Generate uncertainty, confusion, disorder, panic, chaos,...to shatter cohesion, produce paralysis and bring about collapse.
- Become an extraordinary commander.

PATHOLOGY OF CLOSEDNESS

1. 2ND LAW OF THERMODYNAMICS

$$S = K * \text{LOG}(W) \qquad dS = dQ/T$$

2. HEISENBERG UNCERTAINTY PRINCIPLE

$$\Delta P * \Delta Q \geq h_v$$

3. GÖDEL'S THEOREM

BOYD OBSERVES THAT THE LESS AGILE SYSTEM BEGINS TO ACT "CLOSED" WITH RESPECT TO THE MORE AGILE, AND AN ANALOG OF ENTROPY -- THE FAMOUS FOG OF WAR -- BEGINS TO GROW WITHIN IT.

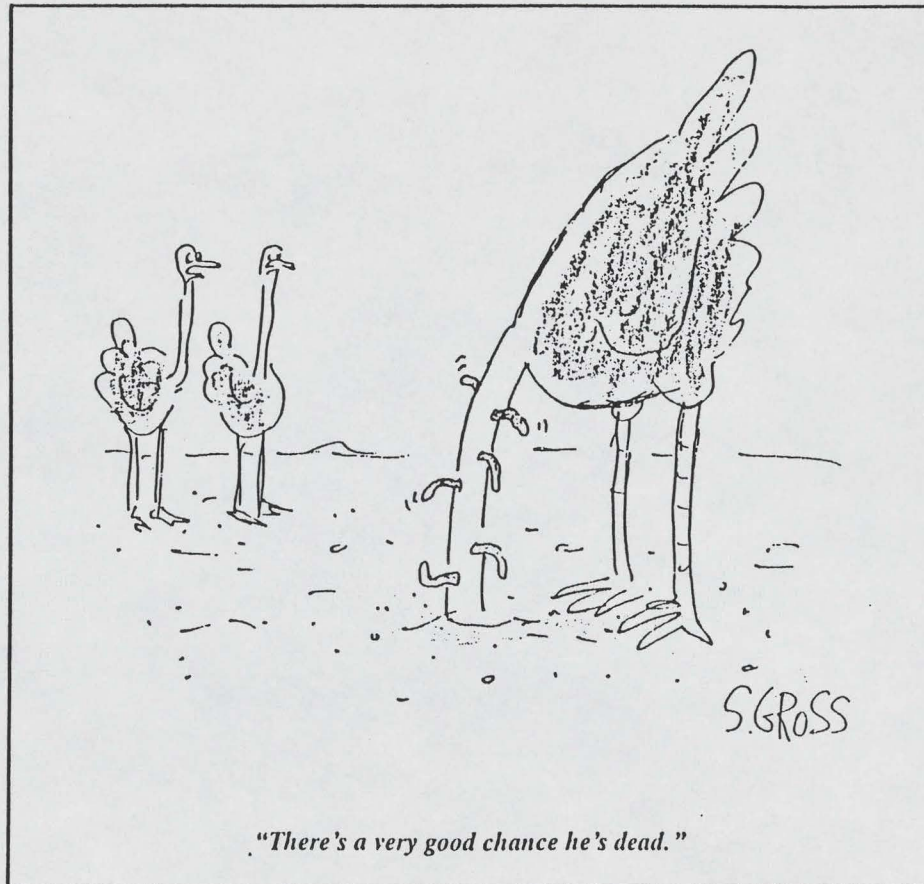
HOW TO TELL IT'S WORKING--
WAR

1. VEHICLES OR COURIERS BLUNDERING INTO YOUR LINES
2. SHELLING OF YOUR LAST POSITION AFTER YOU LEFT
3. SURRENDER AFTER TOKEN RESISTENCE
4. RATIONS STILL BEING COOKED

--GENERAL JAMES H. POLK, "THE
CRITICALITY OF TIME IN
COMBAT," ARMOR, 5/6, 1988

"Terror in the hearts of their enemies was why there were so many
routs during the Muslim conquests, but it was a factor concealed
from men's eyes." -- Ibn Khaldun, 229.

IN OTHER WORDS, A CLOSED ORGANIZATION PROVIDES
A GREENHOUSE EFFECT FOR MURPHY'S LAW.



National Lampoon,
August 1988

INCORPORATION INTO MILITARY DOCTRINE

"AGILITY--THE ABILITY OF FRIENDLY FORCES TO ACT
FASTER THAN THE ENEMY--IS THE FIRST PREREQUISITE
FOR SEIZING AND HOLDING THE INITIATIVE."

US ARMY FIELD MANUAL 100-5,
OPERATIONS, MAY 1986, P. 16

THE PURPOSE OF TIMING AND TEMPO IS TO "DOMINATE
THE ACTION, REMAIN UNPREDICTABLE, AND CREATE UNCER-
TAINTY IN THE MIND OF THE ENEMY."

US AIR FORCE MANUAL 1-1,
BASIC DOCTRINE, MARCH 1984,
P. 2-8.

MARINE CORPS DOCTRINE

The most advanced combat doctrine in the world today belongs to the U. S. Marine Corps. The Corps' new basic manual, "Warfighting," lays out a concept of maneuver warfare entirely consistent with the latest concepts of agility:

"A competitive rhythm develops in combat, with each belligerent trying to generate speed when it is to his advantage."

"By our actions, we seek to impose menacing dilemmas in which events happen unexpectedly and faster than the enemy can keep up with them. . . . The ultimate goal is panic and paralysis, an enemy who has lost the will to resist."

USMC FMFM 1, Warfighting, March 1989,
pp. 32, 60.

SUMMARY OF LESSONS FROM WAR

1. The battle (much less the war) does not always go to the strong.
2. Instead, there is a quality called "agility" that is a much better predictor of victory.
3. A more agile organization executes its OODA loops more rapidly than its competitors.
4. The less agile organization will begin to feel the fog of war--confusion, chaos, and mistrust.

WHAT ALL THIS MEANS FOR BUSINESS

Victory in war, as we have seen, is not guaranteed by size or technological sophistication. Similarly, neither size nor spending on technology guarantees success in business:

General Motors, the world's largest carmaker, has spent more than \$40 billion on automation since 1980, while its market share has dropped from over 50% to around 36%, and its profitability lags Ford's.

"Meanwhile, a naive faith in technological silver bullets diverts manufacturers from the hard work of rebuilding North America's industrial base." (Warner)

"Most thriving firms in the U.S. have also realized that business strategies based on throwing hardware at performance problems are unlikely to work." (MIT Commission on Industrial Productivity, May 1989)

What, then, is the secret of success in business? This section shows that business has some of the conflict attributes of war. As in war, success frequently goes to the player which can outsmart his competition.

IS BUSINESS A CONFLICT ENVIRONMENT?

1. THE MOST IMPORTANT FACTORS THAT DETERMINE LONG-TERM PROFITABILITY ARE:

THE QUALITY OF THE BUSINESS'S PRODUCTS, AS PERCEIVED BY THE CUSTOMER, RELATIVE TO COMPETITORS

AND

MARKET SHARE.

SOURCE: BUZZELL & GALE, THE PIMS PRINCIPLES, PP. 7,8

2. MARKET SHARE IS ZERO-SUM.
3. IT IS IMPOSSIBLE TO ACCURATELY PREDICT WHAT THE CUSTOMER WILL PERCEIVE AS QUALITY, OR WHAT THE COMPETITION WILL DO, OR HOW MUCH TIME WE HAVE, ETC.

THE OODA LOOP IN BUSINESS

A HIGHLY COMPETITIVE "FAST CYCLE" COMPANY IS LIKE A
FIGHTER ACE, EXECUTING ITS OBSERVE-ORIENT-DECIDE-ACT
(OODA) LOOPS MORE RAPIDLY THAN ITS COMPETITORS: IN THE
CASE OF TOYOTA VERSUS DETROIT, BETWEEN 2 AND 5 TIMES AS
FAST. (BOWER & HOUT, "FAST-CYCLE CAPABILITY FOR
COMPETITIVE POWER," HARVARD BUS. REV., NOV-DEC 1988,
110-118)

THIS SHOULD LOOK FAMILIAR

STUDY THE RESULTS
WHAT DID WE LEARN?
WHAT CAN WE PREDICT?

PLAN
DECIDE WHAT TO
DO NEXT

OBSERVE THE EFFECTS

CARRY OUT
DECISIONS

THE SHEWHART/DEMING CYCLE

SOURCE: W. EDWARDS DEMING, OUT
OF THE CRISIS, P. 88

HOW TO TELL IT'S WORKING--
BUSINESS

You're beginning to get to a competitor when you see things
like:

His new products are consistently late

Turnover is high throughout his organization

He constantly blames his customers

He launches witchhunts, and other ever-intensifying
internal searches for The Cause of His Problem

"Lacking victories over their competitors, and unable to defend
themselves from their bosses, they lash out at each other, making
unity of purpose even harder to achieve."

J. M. Juran, Managerial Breakthrough, p. 74.

PATHOLOGY OF CLOSEDNESS IN BUSINESS

"This internal focus has wasted our time, wasted our energy, frustrated us, made us so mad some nights over some bureaucratic jackass boss that we'd punch a hole in the wall." -- Jack Welch, CEO, General Electric, January 1988
(Sherman, 46)

AGILITY IN THE CORPORATE SETTING

"THE SURVIVAL OF ALL COMPANIES IN THE FUTURE DEPENDS ON WHETHER
THEY CAN RESPOND QUICKLY TO CUSTOMER ORDERS. . . IF THE CUSTOMER
WANTS IT NOW, YOU PRODUCE IT AND DELIVER IT NOW."

ISAO SHINOHARA, NEW PRODUCTION SYSTEM,
P. 167

OPEN SYSTEMS IN WORLD AFFAIRS

"The United States is less likely to decline than any other major country. It is distinguished by the openess of its economy, society, and politics. Its engines of renewal are competition, mobility, and immigration." (Emphasis added)

Samuel P. Huntington
("The U.S.--Decline
or Renewal," 89)

WHY CAN SOME ORGANIZATIONS SUSTAIN

FAST OODA LOOPS?

HOW TO PROJECT ENTROPY

Why can some organizations execute OODA loops more rapidly and less predictably than their competitors (and so accelerate the build-up of mistrust and disharmony within the competing organization)?

The answer lies in taking actions within our own organization to create a culture that fosters mutual trust and encourages decision-making at the lowest possible level.

One organization that had such a culture and enjoyed great success in conflict was the German Army of 1939-1940. It was guided by the principles shown on the next chart.

PRINCIPLES OF THE BLITZKRIEG

An Organizational Climate for Operational Success
--Col. John R. Boyd

1. EINHEITSPRINZIP (UNITY, THROUGH MUTUAL TRUST
AND UNDERSTANDING)
2. AUFTRAG (CONTRACT BETWEEN SUPERIOR AND
SUBORDINATE)
3. FINGERSPITZENGEFÜHL (INTUITIVE UNDERSTANDING,
"FEEL")
4. SCHWERPUNKT (FOCUS AND DIRECTION)
5. BEWEGLICHKEIT (MENTAL AGILITY)
6. AUFROLLEN (EXPANDING TORRENT)
7. KESSELSCHLACHTEN (ENCIRCLEMENT AND
ANNIHILATION)

KEY POINT: FIVE OF THE SEVEN ADDRESS HUMAN/CULTURAL
ELEMENTS

SOURCES: Nos. 1-4, Boyd, "Patterns"
Nos. 5-7, Livingston

DEVELOPING COMPETITIVE POWER

1. TREAT THE COMPANY AS A SYSTEM.
2. ORGANIZE WORK IN MULTIFUNCTIONAL TEAMS
3. TRACK CYCLE (OODA LOOP) TIMES THROUGHOUT THE ORGANIZATION. MANAGE THE CYCLE TIMES OF THE INDIVIDUAL ACTIVITIES AND OF THE WHOLE COMPANY SYSTEM.
4. BUILD LEARNING LOOPS INTO THE ORGANIZATION. DECENTRALIZE. DE-BUREAUCRATIZE. CONSTANTLY "RENEW AND REDESIGN" THE SYSTEM.
5. EXAMINE CYCLE TIMES AND RAISE STANDARDS. THE COMPETITION'S PERFORMANCE IS JUST OUR MINIMUM TARGET. "IMPROVEMENTS OF 5% PER YEAR WON'T CHALLENGE THE STATUS QUO."
6. SET UP UNUSUAL ORGANIZATION MECHANISMS TO FOCUS ON CYCLE TIME. PURSUE CONFLICT IN MEETINGS. RESOLVE IT WITH DATA. DON'T JUST LIVE WITH PROBLEMS. KEEP ASKING "WHY?"
7. DEVELOP INFORMATION SYSTEMS TO TRACK VALUE-ADDING ACTIVITY.
8. MAKE TIME COUNT IN MANAGING EMPLOYEES. GET PEOPLE USED TO CHALLENGING AND RETHINKING THEIR OWN ACTIVITIES.
9. POSITION PEOPLE TO ACCELERATE THEIR LEARNING.

ORGANIZATIONAL CLIMATE--JAPANESE STYLE

WE ARE ALL FAMILIAR WITH THE SUCCESS OF JAPAN'S
ELECTRONIC AND CAR INDUSTRIES, WITH A PRODUCTIVITY
EXCEEDING TWICE THE U.S. AVERAGE. HOW DO THEY DO IT?
WORK LIKE SLAVES? OBSERVE WHAT THE "DEAN OF JAPANESE
PRODUCTIVITY CONSULTANTS" SAYS:

"IT IS POSSIBLE TO DEVELOP WORKERS WITH TYPE Y NATURES.
THE SUCCESS OF THE JAPANESE PRODUCTION SYSTEMS RESTS
ON THIS. . . I BELIEVE THE MOST IMPORTANT FACTOR IS
MAINTAINING A RELATIONSHIP OF TRUST BETWEEN LABOR AND
MANAGEMENT." (EMPHASIS ADDED) PROFESSOR SHIGEO SHINGO,
NON-STOCK PRODUCTION, PP. 286, 419.

CULTURE AND THE BOTTOM LINE

A strong culture is an informal system of values that are known and shared by all employees. In a strong culture, people intuitively know what to do most of the time. This translates directly into increased productivity:

"The impact of a strong culture is amazing. In the extreme, we estimate that a company can gain as much as one or two hours of productive work per employee per day."

(Deal & Kennedy, 15, 22)

In contrast, many authoritarian, "Theory X," cultures are actually weak because their systems rely on explicit rules, orders, and supervision.

WRAP-UP

BLITZKRIEG: WAR AGAINST THE MIND

"It was to employ mobility as a psychological weapon: not to kill but to move; not to move to kill but to move to terrify, to bewilder, to perplex, to cause consternation, doubt and confusion in the rear of the enemy, which rumour would magnify until panic became monstrous. In short, its aim was to paralyse . . . and the paralysation would be in direct proportion to velocity."

(Fuller, 256-257)

It had been done before. Leignitz, April 9, 1241:

"As always, the incredible mobility of the Mongol army had made the Poles assess its strength at five times greater than it was . . . stupified and shattered, the Poles were unable to understand what had happened to them."

(Chambers, 100)

AGILITY -- A GENERAL DEFINITION

1. The ability to shift from one unfolding pattern of ideas and actions to another by being able to transition from one orientation to another.

Or put another way,

2. The ability to shift from one unfolding OODA loop pattern to another by being able to transition from one orientation to another.

(Boyd, DoD Agility Conference,
Los Angeles, 26 January 1988)

Implications for business:

This definition illuminates how agility -- and thus the ability to compete and survive -- rests on a cultural foundation. To the extent that physical or organizational factors "lock-in" certain orientations or hinder the ability to discard old orientations and form new ones, these factors decrease the likelihood of survival.

IN SUMMARY...

Recent work by theorists at the Department of Defense suggests that agility is a fundamental determinant of one's ability to out-think an opponent or competitor.

In particular, chaos, disharmony, and dysfunctional behaviors will begin to occur with increasing frequency in the less agile opponent.

These results are equally applicable to the world of business.

WHAT'S GOING ON IN THE LITERATURE

Decision-making in crises: "high stakes, severe time constraints, fear, and other elements of stress."
(Research opportunity noted by Little, 9)

"High performing firms may be high performing precisely because they routinely engage in alteration of activity patterns that at least seek better alignments with environments." (Romanelli and Tushman, 619)

"In high-velocity environments, the shorter the time frame in which strategic decisions are made, the better the performance of the firm." (Bourgeois and Eisenhardt, 829)

MORE LITERATURE

"Because technological progress depends largely on the number of successful experiments accomplished per unit of time, fast-moving small entrepreneurs can gain both timing and performance advantages over clumsier competitors." (Quinn, 76)

"Cutting-edge Japanese companies today are capitalizing on time as a critical source of competitive advantage: shortening the planning loop in the product development cycle and trimming process time in the factory -- managing time the way most companies manage costs, quality, or inventory." (Stalk, 41)

Strategic changes towards increasing flexibility are more profitable. "Firms which did not change their strategies (in response to deregulation) are likely 'out of alignment' with their environments, resulting in poorer performance." (Smith and Grimm, 366, 373)

STILL MORE LITERATURE

"Many defense analyses conceal spurious content beneath protective layers of mathematics and statistics. . . Stacking details and complexities in an effort to capture reality simply has not resulted in much useful or productive insight." (Brewer, 803, 809)

ENTROPY CAN BE CALCULATED

<u>Substance</u>	<u>Entropy/J K⁻¹ mol⁻¹</u>
Diamond	2.4
Copper Metal	33.1
Copper sulfate	300.4
Water	69.9
Ethanol	160.7
Oxygen Gas	205.0

SOURCE: Atkins, 205

QUESTION: Given that organizations do not have physical attributes such as energy, heat, and temperature, are there measurable analogues of entropy and the Second Law for such systems?

TOPICS FOR RESEARCH

1. Can mathematical models be derived that relate rapidity of execution of OODA loops to "quality" of decision making? What data exist?
2. How far can we carry the analogy of decreasing quality of energy (entropy) and decreasing quality of decisions?
3. Are there ways to quantify how "closed" one business, for example, is with respect to another (e.g., analogous to how entropy is calculated)? In particular, can we look at a company and predict how well its decision-making will hold up in the types of competitive situations described in this presentation?

MORE RESEARCH TOPICS

4. What decision tools are most compatible with efforts to speed execution of OODA loops? Which tend to hinder such execution? Why?
5. How can business managers tell if another company is operating inside their OODA loop? In other words, is the decrease in quality of decision-making evident from the inside?
6. Can simple experiments be designed that measure the effects of asymmetrical OODA loop execution speed? For example, could a business simulation be rigged to give one side a faster OODA loop capability than the other?

An input from the user community:

"Equipment that permits overcontrol of units in battle is in conflict with the Marine Corps' philosophy of command and is not justifiable."

USMC, Warfighting, p. 52.

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