

TACWAR # 197

28 July 76

THE CRUX OF THE ANATOMY OF COMBAT ANALYTIC APPROACH

1. From Concept to Deployment of any System, there are *SIX LEVELS OF ANALYSIS* ---- These are I. Department of Defense level, II. Joint Chiefs of Staff level, III. Theater level, IV. Engagement level, V. Duel level, and VI. Procurement level.
2. Identifies *TEN TACTICAL WAR FUNCTIONS*. They are: Direct Fire & Maneuver, Support Fire, Interdiction Fire, Strategic Fire, Air Defense, Defense Suppression, Air Superiority, Naval Surface Combat, Anti-Submarine Warfare, and Intelligence.
3. Functional representation of Combat interrelates *COMMAND*; the Combat Functions of *FIRE*, *MANEUVER*, and *INTELLIGENCE*; and the Support Functions of *SUPPLY*, *TRANSPORTATION*, *MAINTENANCE*, *CONSTRUCTION* and *SIGNAL*.
- 4.* Develops *MILITARY ELEMENT VALUE THEORY* which explicitly introduces the Value of Time and Elemental Value contributions to Combat Potential of a force.
- 5.* Concept of *COMBAT POTENTIAL* interrelates Maneuver and Fire as decisive functions of Combat and recognizes the value of Disruption and Suppressive, as well as Destructive, fires.
- 6.* Models *COMMAND* as a *GAME MATRIX* enabling the introduction of variable doctrine for both sides seeking to maximize their individual Objective Functions.
- 7.* Models *INFORMATION FLOW* of specific Directive Information (Command) and items of Intelligence in a network, making it possible to specify exact information needs, sources of that information, and the effect of errors therein.
8. Provides for Study of *HUMAN FACTORS*, such as Skill and Motivation.
- 9.* Recognizes Three Separate Levels of Performance for any Combat System. These are: *CAPABILITY* as produced, which is modified by the situation to become *POTENTIAL*, which is then released by Command to become *PERFORMANCE*.
10. Develops a *SYSTEM EVALUATION CRITERIA* which merges the Combat Potential considerations and those Procurement considerations bearing on Levels I and VI.
11. Constructs Sets of Interrelated Analytic Computational Models with defined Interface Variables permitting high-visibility investigation of military problems to the level of detail desired.
12. Develops militarily credible *SCENARIOS*, balanced within forces and between opposing forces, designed for use in Force-Balancing as well as for evaluation of systems.
13. Simplified *TERRAIN* representation by Features, Routes, and Obstacles is tied directly to formulations for Fire, Maneuver, and Combat Potential.

UNUSUAL OR UNIQUE* FACETS OF TACTICAL WARFARE ANALYTIC APPROACH

HCBrown, RJVolluz

1. From Concept to Deployment of any System, there are *SIX LEVELS OF ANALYSIS* ---- These are I. Department of Defense level, II. Joint Chiefs of Staff level, III. Theater level, IV. Engagement level, V. Duel level, and VI. Procurement level.

CONCEPT OF SIX LEVELS OF ANALYSIS

(UNUSUAL)

This concept assists in classifying and clarifying the many questions which can be formulated on any given subject for analysis, and in preparing a suitable study plan. It also illustrates the futility of searching for a single quantitative "measure of effectiveness" or a single grandiose simulation model to govern important procurement decisions.

2. Identifies *TEN TACTICAL WAR FUNCTIONS*. They are: Direct Fire & Maneuver, Support Fire, Interdiction Fire, Strategic Fire, Air Defense, Defense Suppression, Air Superiority, Naval Surface Combat, Anti-Submarine Warfare, and Intelligence.

TACTICAL WAR FUNCTIONAL DIAGRAM

(UNUSUAL)

The various interactions of the component forces involved in modern warfare could be represented differently. However, this particular diagram has been endorsed at various times by representatives of all three military services and has served as a useful tool for guidance and recording of our study activities.

3. Functional representation of Combat interrelates *COMMAND*; the Combat Functions of *FIRE*, *MANEUVER*, and *INTELLIGENCE*; and the Support Functions of *SUPPLY*, *TRANSPORTATION*, *MAINTENANCE*, *CONSTRUCTION* and *SIGNAL*.

FUNCTIONAL REPRESENTATION OF GROUND COMBAT

(UNUSUAL)

This "road map" or descriptive model of the functions of a combat organization accomplishes these things:

- a) Enables interrelation of Fire and Maneuver through the concept of Combat Potential (see Para. 5).
- b) Enables definition of information-handling loops which influence the outcome of combat. (See Para. 6)
- c) Directly relates the performance of logistic functions to the outcome of combat.

4.* Develops *MILITARY ELEMENT VALUE THEORY* which explicitly introduces the Value of Time and Elemental Value contributions to Combat Potential of a force.

MILITARY ELEMENT VALUE THEORY

(UNIQUE)

The value theory interrelates the interests and concerns of various tactical echelons, and explicitly introduces the value of time. It is tied closely to the concept of Combat Potential, because the value of an element is simply its contribution to Combat Potential of the force.

5.* Concept of *COMBAT POTENTIAL* interrelates Maneuver and Fire as decisive functions of Combat and recognizes the value of Disruption and Suppressive, as well as Destructive, fires.

CONCEPT OF COMBAT POTENTIAL

(UNIQUE)

This concept interrelates Maneuver and Fire as the decisive functions of ground combat. It explicitly introduces time and provides recognition of the value of suppressive, as well as destructive, fire.

Combat Potential provides a means other than manpower or dollar cost for comparing the effectiveness of combat organizations. In addition, this comparison is situation-dependent and terrain-dependent.

6.* Models *COMMAND* as a *GAME MATRIX* enabling the introduction of variable doctrine for both sides seeking to maximize their individual Objective Functions.

MODELING OF COMMAND AS A GAME MATRIX

(UNIQUE)

The matrix elements are values of an Objective Function, which each side seeks to maximize. This Objective Function is in terms of relative Combat Potential. The formulation enables the introduction of variable doctrine for both sides.

This matrix concept can be used to illustrate and quantify the effects of such factors as Generalship, lack of Intelligence information, or delays in Command/Communications.

7.* Models *INFORMATION FLOW* of specific Directive Information (Command) and items of Intelligence in a network, making it possible to specify exact information needs, sources of that information, and the effect of errors therein.

MODELING OF INFORMATION FLOW (UNIQUE)

This development describes the information flow in terms of the network and of the information flowing through that network. The network is defined in terms of nodes (command elements and information processors) and channels (communication channels and signal channels). The information is described as specific directive information and items of intelligence.

This modeling, taken in conjunction with the value theory and the functional representation of ground combat, makes it possible to specify the exact information required for each type of combat decision, the sources from which it can be obtained, and the effect of error in that information.

The description of information-handling performance in terms of errors and delay times needs further development, but is expected to lead to useful analysis of its effect on combat outcomes

8. Provides for Study of *HUMAN FACTORS*, such as Skill and Motivation.

HUMAN FACTORS

(UNUSUAL)

This theory of command and information-handling leads directly to postulation of two descriptors of "human performance" - Skill and Motivation. Skill measures the effectiveness with which a human performs a military task, if he performs it at all (e.g., accuracy in firing a rifle). Motivation determines whether he performs it. Motivation determines the extent to which directive information (from higher authority) is accepted and used.

It is further postulated that physical and mental condition affects both Skill and Motivation. This line of investigation has not been pursued further.

9.* Recognizes Three Separate Levels of Performance for any Combat System. These are: *CAPABILITY* as produced, which is modified by the situation to become *POTENTIAL*, which is then released by Command to become *PERFORMANCE*.

CAPABILITY, POTENTIAL, PERFORMANCE

(UNIQUE)

This concept leads to identification of the factors which cause a system to perform in battle far below its designed Capability. Potential is affected by situational factors such as terrain, force dispositions, and availability of supplies. Performance is further affected by Command inefficiencies and delays.

10. Develops a *SYSTEM EVALUATION CRITERIA* which merges the Combat Potential considerations and those Procurement considerations bearing on Levels I and VI.

SYSTEM EVALUATION CRITERIA

(UNUSUAL)

This set of criteria merges the Combat Potential considerations and those procurement considerations bearing on Levels I (Department of Defense) and VI (Procurement).

11. Constructs Sets of Interrelated Analytic Computational Models with defined Interface Variables permitting high-visibility investigation of military problems to the level of detail desired.

INTERRELATED ANALYTIC COMPUTATIONAL MODELS (UNUSUAL)

Construction of a single simulation model to represent combat requires extreme simplification of a very complicated process. The construction of a set of models with interface variables defined by our theory of combat makes it possible to investigate any problem to the level of detail desired.

12. Develops militarily credible *SCENARIOS*, balanced within forces and between opposing forces, designed for use in Force-Balancing as well as for evaluation of systems.

SCENARIO COMPLETENESS AND BALANCE (UNUSUAL)

Because the concept of Combat Potential permits comparison of the widely-differing systems, our scenarios are designed for use in force-balancing as well as for evaluation of systems. The scenarios are developed to show the complete picture of some hypothetical conflict. Manpower allocations are balanced within forces and between opposing forces, so that no single system is given disproportionate attention and any particularized "threat" is kept within reasonable bounds.

13. Simplified *TERRAIN* representation by Features, Routes, and Obstacles is tied directly to formulations for Fire, Maneuver, and Combat Potential.

TERRAIN REPRESENTATION (UNUSUAL)

Our simplified representation of terrain by Features, Routes, and Obstacles is tied directly to the formulations for Fire, Maneuver, and Combat Potential.